

<b>SCH</b>	<b>TABLE OF CONTENTS</b>	<b>SECTION 00 00 00</b>
<b>FLOATING WHARVES</b>		<b>PAGE 1</b>
<b>REPLACEMENT AND INSTALLATION</b>		
<b>STUART TOWN WHARF</b>		
<b>DEER ISLAND</b>		
<b>CHARLOTTE COUNTY, N.B.</b>		
<b>PROJECT NO.723261</b>		

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<b>Section</b>	<b>Title</b>	<b>Pages</b>
<b>Division 00 - Procurement and Contracting Requirements</b>		
00 00 01	List of Drawings	1
00 01 07	Specification Approvals	1
<b>Division 01 - General Requirements</b>		
01 11 00	Summary of Work	9
01 22 00	Measurement and Payment	4
01 29 00	Payment Procedures	2
01 31 19	Project Meetings	3
01 33 00	Submittal Procedures	3
01 35 29.06	Health and Safety Requirements	10
01 35 44	Environmental Mitigation Requirements	18
01 41 00	Regulatory Requirements	1
01 45 00	Quality Control	2
01 51 00	Temporary Utilities	2
01 52 00	Construction Facilities	5
01 56 00	Temporary Barriers and Enclosures	2
01 61 00	Common Product Requirements	4
01 74 11	Cleaning	2
01 74 21	Construction/Demolition Waste Management and Disposal	3
01 77 00	Closeout Procedures	2
01 78 00	Closeout Submittals	2
<b>Division 02 - Existing Conditions</b>		
02 41 16	Sitework, Demolition and Removal	3
<b>Division 03 - Concrete</b>		
03 05 10	Concrete General	4
03 10 00	Concrete Forming and Accessories	3
03 20 00	Concrete Reinforcing	5
03 30 00	Cast-in-Place Concrete	7
03 37 26	Underwater Placed Concrete	4
<b>Division 05 - Metals</b>		
05 50 00	Metal Fabrications	10
<b>Division 06 - Wood, Plastics and Composites</b>		
06 08 99	Rough Carpentry for Minor Works	4
06 30 00	Wood Treatment	3
<b>Division 31 - Earthwork</b>		
31 61 13	Pile Foundations, General Requirements	4
31 62 16.19	Steel Pipe Piles	4
<b>Division 35 - Water and Marine Construction</b>		
35 51 24	Floating Wharves Installation	2

---

SCH	TABLE OF CONTENTS	SECTION 00 00 00
FLOATING WHARVES		PAGE 2
REPLACEMENT AND INSTALLATION		
STUART TOWN WHARF		
DEER ISLAND		
CHARLOTTE COUNTY, N.B.		
PROJECT NO.723261		

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END OF SECTION

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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, NB  
PROJECT NO.723261

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LIST OF DRAWINGS

Section 00 00 01  
PAGE 1

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DRAWING NO.	TITLE	Date
M1	Existing Site Plan	August 2020
M2	Exiting Floating Wharves Plan and Detail	August 2020
M3	Plan of New Work Sections and Details	August 2020
M4	Floating Wharves Plan, Sections and Details - Type 1	August 2020
M5	Floating Wharves Plan, Sections and Details - Type 2	August 2020
M6	Sections and Details	August 2020
M7	Sections and Details	August 2020
M8	New Gangway Sections and Details	August 2020
M9	Boreholes Records	August 2020
M10	Boreholes Records	August 2020

END OF SECTION

SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

SPECIFICATION APPROVALS

SECTION 00 01 07  
PAGE 1

SPECIFICATION APPROVALS



1. APPROVED BY: \_\_\_\_\_ DATE: 2020-08-27  
Senior Project Engineering, SCH

1. TENDERED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

END OF SECTION

## 1 GENERAL

### 1.01 WORK COVERED BY CONTRACT DOCUMENTS

- .1 The work covered under this project consists of the furnishing of all plant, labour, equipment and material for the Replacement of the existing timber floating wharves with reinforced concrete anchor blocks, steel guide pile connections, concrete filled steel pipe piles and all associated items at Stuart town Wharf located on Deer Island, New Brunswick, in strict accordance with specifications and accompanying drawings and subject to all terms and condition of this contract.
- .2 **Please note that no alternative floats or materials will be considered for review.**
- .3 Only items in the Unit Price Table will be measured for payment. All other work necessary to complete the Contract will be considered incidental to the project and will not be measured separately for payment.

### 1.02 DESCRIPTION OF WORK

- .1 The work will consist of but will not necessarily be limited to the following:
  - .1 Mobilization and demobilization.
  - .2 Submittal of environmental mitigation plan and its implementation(s).
  - .3 Submittal of a Health and Safety Plan, including provision for Covid-19 protection and its implementation (s).
  - .4 Removal and disposal of a H steel beam presently located next to the gangway, on top of the wheelguard, as specified on the drawings.
  - .5 Construction, supply and installation of new floating wharves, including inter float connections, cover plates, floating containers, cleats, tire fender system, yokes etc, as indicated on the drawings.
  - .6 Steel pipe piles will be delivered on site by other. Contractor must supply and install pile shoes, drive piles, weld any required splices, supply and fill pipe piles with concrete and supply and install cathodic protection.
  - .7 Supply and installation of steel guide pile connections as indicated on the drawings.
  - .8 Disconnection of floating wharves electrical.
  - .9 Removal of existing timber floating wharves along with concrete anchor blocks and chains, and electrical which are to be hauled to the shore and stored at a location next to the wharf. Exact storage location will be agreed upon between the harbor authority, Departmental Representative and the Contractor.
  - .10 Cutoff existing anchor H piles to the mud line, including ones that were previously cut short, disposal at an approved facility.
  - .11 Supply and installation of concrete anchor blocks including chains, shackles and any other required item for their complete installation, as shown on the drawings.
  - .12 Supply and installation of a new aluminum gangway as specified on the drawings.
  - .13 Dust Control.
  - .14 Cleaning.

### 1.03 DELIVERY

- .1 The Contractor will deliver the required floats at a designated location specified by the Departmental Representative at Stuart town Wharf. The floats will be unloaded and stockpiled in an orderly fashion, at an agreed location at the wharf.
  - .1 Unless the floats are constructed on site.
- .2 Steel Pipe piles will be delivered on site by a third party. Pipe pile lengths are ±15.24m to ±18.30m, sizes as indicated on the drawings.

### 1.04 PERMIT CERTIFICATES AND FEES

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

### 1.05 INSPECTION OF SITE

- .1 All bidders, before submitting their bid, is strongly recommended to inspect and examine the site and its surroundings and satisfy themselves as to the form and nature of the work and materials necessary for the completion of the works, the means of access to the site, severity, exposure and uncertainty of weather, soil conditions, any accommodations they may require, and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their bid. No allowance shall be made subsequently in this connection on account of error or negligence to properly observe and determine the conditions that will apply.
- .2 Contractors, bidders or those they invite to site are to review specification Section 01 35 29.06 - Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.

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### 1.06 DATUM

- .1 Datum used for this project is Lowest Normal Tides (LNT) and is assumed to be 8.90 meters below Benchmark BM Pointe Deck Benchmark.
- .2 Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.

### 1.07 EXISTING SUB-SURFACE CONDITIONS

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

### 1.08 CODES AND STANDARDS

- .1 Perform work in accordance with the latest edition of the National Building Code of Canada, FCC Standard 373 - Standard for Piers and Wharves (<http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/373.shtml>), and any other code of provincial or local application including all amendments up to project bid closing date provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

### 1.09 LAYOUT OF WORK

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

### 1.10 WORK SCHEDULE

- .1 Submit within 7 work days of notification of acceptance of bid, a construction schedule showing commencement and completion of all work within the time stated on the Bid and Acceptance Form and the date stated in the bid acceptance letter.
- .2 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve

- completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .3 As a minimum, work schedule to be prepared and submitted in the form of Bar (GANTT) Charts, indicating work activities, tasks and other project elements, their anticipated durations and planned dates for achieving key activities and major project milestones provided in sufficient details and supported by narratives to demonstrate a reasonable plan for completion of project within designated time. Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.
  - .4 Submit Schedule updates on a minimum monthly basis and more often, when requested by Departmental Representative, due to frequent changing project conditions. Provide a narrative explanation of necessary changes and schedule revisions at each update.
  - .5 The Schedule, including updates, shall be to Departmental Representative's approval. Take necessary measures to complete work within approved time. Do not change schedule without Departmental Representative's approval.
  - .6 All work on the project will be completed within the time indicated on the Bid and Acceptance Form.
  - .7 Work on site will not be permitted as of October 19<sup>th</sup>, 2020 until February 1st, 2021 to not disrupt the lobster fishing season. Float construction can commence off site immediately after acceptance of bid and Site Specific Safety Plan.

### 1.11 ABBREVIATIONS

- .1 Following abbreviations of standard specifications have been used in this specification and on the drawings:  
CGSB - Canadian Government Specifications Board  
CSA - Canadian Standards Association  
NLGA - National Lumber Grades Authority  
ASTM - American Society for Testing and Materials
- .2 Where these abbreviations and standards are used in this project, latest edition in effect on date of bid call will be considered applicable.

### 1.12 QUARRY AND EXPLOSIVES

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

### 1.13 SITE OPERATIONS

- .1 Arrange for sufficient space adjacent to project site for conduct of operations, storage of materials and so on. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day



operations in progress at site. All arrangements for space and access will be made by Contractor.

- .2 Remove snow and ice as required to maintain safe access in a manner that does not damage existing structures or interfere with the operations of others.

#### 1.14 PROTECTION

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

#### 1.15 PAYMENT

- .1 Payment for all work under this contract to be according to the "Articles of Agreement".
- .2 Dimensional changes as directed by the Departmental Representative to suit existing conditions, but not resulting in additional work or materials, will not be considered as extra to the Contract.

#### 1.16 DISPOSAL OF DEBRIS

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

#### 1.17 LOCATION OF EQUIPMENT

- .1 Location of buildings, tanks, equipment, fixtures, shown or specified shall be considered as approximate. Actual locations shall be as required to suit conditions at time of installation and as is reasonable. Obtain approval of Departmental Representative.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

#### 1.18 PROJECT MEETINGS

- .1 Contractor will arrange project meetings and assume responsibility for setting times and recording minutes.
- .2 Project meetings will take place on site of work unless so directed by the Departmental Representative.

- .3 Contractor will assume responsibility for recording minutes of meetings and forwarding copies to all parties present at the meetings.
- .4 Have a responsible member of firm present at all project meetings.

#### 1.19 ACCEPTANCE

- .1 Prior to the issuance of the Certificate of Substantial Performance, in Company with Departmental Representative, make a check of all work. Correct all discrepancies before final inspection and acceptance.
- .2 Before Work can be accepted, the Contractor must clean up the site and leave it in a condition which is acceptable to the Departmental Representative.

#### 1.20 WORKS COORDINATION

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

#### 1.21 CONTRACTOR'S USE OF SITE

- .1 The Contractor's use of site is limited to the locations of the Float Anchor System Replacement, as specified on the drawings.
- .2 Co-ordinate use of premises under direction of Departmental Representative.
- .3 Contractor is responsible for arranging the storage of materials on or off site, and any materials stored at the site which interfere with any of the day to day activities at or near the site will be moved promptly at the Contractor's expense, upon request by Departmental Representative.
- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 Contractor will note that fishing activity in the harbour includes fishing boats, moorings, etc. The Contractor will note that fishing boats, etc. must be able to berth in the harbour during construction operations therefore Contractor must cooperate with boats and activities in the harbour. No compensation will be paid to Contractor for loss of time or any other as a result of activities in each harbour.

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## 1.22 INTERPRETATION OF DOCUMENTS

- .1 Supplementary to GC1.1 of the General Conditions, the Division 01 sections of the specifications take precedence over technical specifications in other divisions of the specifications.

## 1.23 HIGHWAY SPRING WEIGHT RESTRICTIONS

- .1 Comply with Provincial regulations for spring weight restrictions on Provincial Highway.

## 1.24 WORK COMMENCEMENT

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

## 1.25 PROTECTION OF SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .2 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .3 Provide temporary services when directed by Departmental Representative to maintain critical facility systems.
- .4 Where unknowns services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .5 The Contractor will immediately restore any existing services disrupted as a result of his operations at no extra cost under this contract.

## 1.26 HARBOUR AUTHORITY

- .1 Contractor to contact the Deer Island Harbour Authority prior to beginning of work. Contact information will be provided at the start-up meeting.

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**1.27 OWNER OCCUPANCY**

- .1 Harbour users will occupy premises during entire period for execution of normal operations.
- .2 Co-operate with Harbour Users in scheduling operations to minimize conflict and to facilitate Owner usage.

**1.28 EXISTING SERVICES**

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours' notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to Harbour Users.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .4 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .5 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .6 Record locations of maintained, re-routed and abandoned service lines.

**1.29 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Other documents as specified.

**1.30 FACILITY SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions.

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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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SUMMARY OF WORK

SECTION 01 11 00  
PAGE 9

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PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

## 1 GENERAL

### 1.01 GENERAL

- .1 The bid item prices are full compensation for the work necessary to complete each item in the Contract in the Form of Tender. The prices bid are complete and separate from other or related bid items.
- .2 In the case of conflict between the instructions for measurement and payment contained in Section 01 22 00 and another Section of the Specifications, the requirements of Section 01 22 00 shall govern.
- .3 No separate payment will be made for:
  - .1 Unauthorized work beyond the limits shown.
  - .2 Field engineering survey and layout of work.
  - .3 Erosion and Sediment Control.
  - .4 Water Management.
  - .5 Dust Control.
  - .6 Temporary Facilities.
  - .7 Temporary Barriers and Enclosures.
  - .8 Calibrated Weight Scales.
  - .9 Snow and ice removal as required to access the work site and for safety reasons.

### 1.02 DESCRIPTION OF WORK

- .1 The tendered price for work includes all items listed within the specification. Price includes all labour, materials, and equipment for complete supply and installation of the work.
- .2 Mobilization/Demobilization including all equipment, temporary facilities, security, maintenance, snow clearing, and cleaning of site and public access roads (as required), securing all necessary regulatory permits, insurance and bonding, establishing health and safety protocol, and the construction, maintenance and decommissioning of all necessary temporary access roads.
- .3 All demolition, material disposal (hazardous and non-hazardous), service disconnection/ reconnection, site excavation, construction, repairs and improvements and site restoration and landscaping, as contained in the specifications.

## 2 PRODUCT MEASUREMENT

### 2.01 GENERAL

- .1 This section details the measurement method to be used for payment

purposes. Incidental items covered in the various sections of the specification are to be allowed for in the pricing of each pay item.

## 2.02 MEASUREMENT FOR PAYMENT

.1 Measurements for payment will be as specified in the following sections:

### Section 02 41 16

- .1 Demolition and removal will consist of, but not necessarily be limited to, the following:
- .1 Mobilization and demobilization of all equipment necessary to make work progress for the entire contract.
  - .2 Submittal of an environmental mitigation plan and its Implementation.
  - .3 Submittal of a Health and Safety Plan, including provision for Covid-19 protection and its implementation (s).
  - .4 Removal of the existing aluminum gangway and store it at a secure Location on site. Entrance to the gangway is to be blocked completely for safety purposes, during construction.
  - .5 Removal and disposal of a steel beam presently located next to the gangway, on top of the wheelguard, as specified on the drawings
  - .6 Disconnect and dispose of existing electrical from the floating Wharves, by a registered electrician.
  - .7 Removal of existing floating wharves, which are to be hauled to shore, at a secure location agreed upon, between the Departmental Representative and the Harbour Authority.
  - .8 Cut off existing H piles, including ones that were previously cut short. Coordinates are included on the drawings.
- .2 Removal of all other items required for the progress of the work will not be measured separately for payment, it will be considered incidental to this contract.
- .3 All items specified under section will be paid in a lump sum.

### Section 03 30 00

- .1 Supply and Construction of concrete reinforced anchor blocks as specified on the drawings will be paid in a lump sum. Included in the unit price are all the necessary formwork, reinforcing, anchor chains, shackles and any other item required for their full installation at the locations and elevations shown on the drawings.
- .2 Heating of concrete and its components, and providing cold weather protection, will not be measured for payment, but will be considered incidental under this contract.
- .3 Cooling of concrete and providing hot weather protection will not be measured but will be considered incidental under this contract.
- .4 Installation of inserts, anchor bolts specified under various sections in this contract will not be measured separately.

Section 05 50 00

- .1 Supply and Installation of one (1) aluminum gangway as indicated on the drawings, including and any other associated components specified on the drawings for its complete installation will be paid by the lump sum.
- .2 Supply and installation of steel guide pile connections, including all associated parts, as indicated on the drawings will be paid by the unit.
- .3 No separate payment shall be made for all other required metal components indicated in order sections, but will be included in the unit bid prices under sections 06 08 99 and section 31 62 16.19.
- .4 Payment for the supply and installation of the tire fender system, including, truck tires, galvanized chains and its full installation, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.
  - .1 Contractor will be responsible to determine the required number of tires, and the lengths of chains required for each float.
- .5 Payment for the supply and installation of the inter float connections, as indicated on the drawings will be included in the lump sum bid price under section 06 08 99.
- .6 Payment for the supply and installation of internal yokes, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.
- .7 Payment for the supply and installation of checkered cover plates and neoprene mats, as indicated on the drawings, will be included in the lump sum payment under section 06 08 99.

Section 06 08 99

- .1 Supply and delivery of timber floats as specified on the drawings will be paid by the unit, included in this bid item are the marine pressure treated timber members, foam filled float containers, empty float containers, inter float connections, inter float checkered cover plates, neoprene mattes, carriage bolts, nuts, washers, safety chain connections, cleats, yokes, tire fender system, etc, as specified on the drawings.

Section 31 62 16.19

- .1 Preparation, and driving of steel pipe piles acceptably incorporated into work will be paid by the unit. Including in this work will be the supply and installation pile splices, pile shoes and guide pile connections as indicated on the drawings.
  - .1 Included in this bid item will be the Underwater placed Concrete specified under section 03 27 26
  - .2 Supply and Installation of Cathodic Protection will be included in The unit bid price under this section as indicated on the drawings.

Section 35 51 24

- .1 Payment for floating wharves installation on steel pipe piles and anchor blocks will be made by a lump sum payment. This will include the furnishing, all equipment necessary for the complete float installation, to the locations and elevations shown on the drawings.

3 EXECUTION



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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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MEASUREMENT & PAYMENT

SECTION 01 22 00

PAGE 4

3.01 NOT USED

.1 Not Used.

END OF SECTION

## **1 GENERAL**

### **1.01 APPLICATIONS FOR PROGRESS PAYMENT**

- .1 Make applications for payment upon confirmation that work stated has been verified by the Departmental Representative's findings, and approved by the Departmental Representative.
- .2 Date applications for payment, last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

### **1.02 PROGRESS PAYMENT**

- .1 Departmental Representative will issue to Owner, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Departmental Representative determines to be due. If Departmental Representative amends application, Departmental Representative will give notification in writing giving reasons for amendment.

### **1.03 SUBSTANTIAL PERFORMANCE OF WORK**

- .1 Prepare and submit to Departmental Representative comprehensive list of items to be completed or corrected and apply for a review by Departmental Representative to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.
- .2 No later than 10 days after receipt of list and application, Departmental Representative will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .3 Departmental Representative: state date of Substantial Performance of Work or designated portion of Work in certificate.
- .4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Departmental Representative, establish reasonable date for finishing Work.

### **1.04 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK**

- .1 After issuance of certificate of Substantial Performance of Work:
  - .1 Submit application for payment of holdback amount.
  - .2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might

in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

- .2 After receipt of application for payment and sworn statement, Departmental Representative will issue certificate for payment of holdback amount.

### 1.05 FINAL PAYMENT

- .1 Submit application for final payment when Work is completed.
- .2 Departmental Representative will issue final certificate for payment when application for final payment is found valid.

## 2 PRODUCTS

### 2.01 NOT USED

- .1 Not Used.

## 3 EXECUTION

### 3.01 NOT USED

- .1 Not Used.

END OF SECTION

## 1 GENERAL

### 1.01 ADMINISTRATIVE

Contractor is responsible to:

- .1 Schedule and administer project meetings throughout the progress of the work or at the call of Departmental Representative.
- .2 Prepare agenda for meetings. Include the following on every agenda:
  - .1 Review, approval of previous minutes.
  - .2 Review of work progress since previous meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction.
  - .5 Corrective measures and procedures to regain projected schedule.
  - .6 Revision to construction schedule.
  - .7 Progress schedule, during succeeding work period.
  - .8 Review submittal schedules: expedite as required.
  - .9 Review proposed changes for effect on construction schedule and on completion date.
  - .10 Any near misses, health and safety problems, how it was handled.
  - .11 Any concerns for environmental protection. Should anything be modified on site?
- .3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance, Departmental Representative.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

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**1.02 PRECONSTRUCTION MEETING**

- .1 Within 15 days after award of Contract, Departmental Representative will schedule a start-up meeting with the Contractor, and Small Craft Harbours. The Departmental Representative will take notes for this meeting only. All other construction meeting minutes will be recorded by the Contractor and distributed to all parties within 48 hours after each meeting.
- .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance for all meetings.
- .3 Bi-weekly meetings will be established by the Departmental Representative at the start of the Contract and will be respected by all parties. Location of the meetings will be determined by the Departmental Representative.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
  - .1 Appointment of official representative of participants in the Work.
  - .2 Schedule of Work: - Construction Progress Schedule - Critical Path Method (CPM) or - Construction Progress Schedules - Bar (GANTT) Chart.
  - .3 Schedule of submission of shop drawings, samples. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
  - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
  - .5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures .
  - .6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
  - .7 Owner provided products.
  - .8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
  - .9 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
  - .10 Monthly progress claims, administrative procedures, photographs, hold backs.
  - .11 Appointment of inspection and testing agencies or firms.
  - .12 Insurances, transcript of policies.

**2 PRODUCTS**

**2.01 NOT USED**

- .1 Not Used.

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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO. 723261

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PROJECT MEETINGS

SECTION 01 31 19  
PAGE 3

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

## **1 GENERAL**

### **1.01 ADMINISTRATIVE**

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
- .4 Where items or information is not produced in SI Metric units converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

### **1.02 SHOP DRAWINGS AND PRODUCT DATA**

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of New Brunswick, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross

- references to design drawings and specifications.
- .4 Allow ten days for Departmental Representative's review of each submission.
  - .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
  - .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
  - .7 Accompany submissions with transmittal letter, in duplicate, containing:
    - .1 Date.
    - .2 Project title and number.
    - .3 Contractor's name and address.
    - .4 Identification and quantity of each shop drawing, product data and sample.
    - .5 Other pertinent data.
  - .8 Submissions include:
    - .1 Date and revision dates.
    - .2 Project title and number.
    - .3 Name and address of:
      - .1 Subcontractor.
      - .2 Supplier.
      - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
    - .5 Details of appropriate portions of Work as applicable:
      - .1 Fabrication.
      - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
      - .3 Setting or erection details.
      - .4 Capacities.
      - .5 Performance characteristics.
      - .6 Standards.
      - .7 Operating weight.
      - .8 Wiring diagrams.
      - .9 Single line and schematic diagrams.
      - .10 Relationship to adjacent work.
  - .9 After Departmental Representative's review, distribute copies.
  - .10 Submit one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
  - .11 Submit one electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
  - .12 Supplement standard information to provide details applicable to project.



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

### 1.03 CERTIFICATES AND TRANSCRIPTS

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

## 2 PRODUCTS

### 2.01 NOT USED

- .1 Not Used.

## 3 EXECUTION

### 3.01 NOT USED

- .1 Not Used.

END OF SECTION

## 1 GENERAL

### 1.01 DEFINITIONS

- .1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.
- .2 Competent Person: means a person who is:
  - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
  - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
  - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .3 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .4 PPE: personal protective equipment including measures for protection against Covid-19.
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.

### 1.02 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan prior to commencement of Work.
  - .1 Submit within 10 work days of notification of Bid Acceptance. Provide 1 electronic copy.
  - .2 Departmental Representative will review Health and Safety Plan and provide comments.
  - .3 Revise the Plan as appropriate and resubmit within 5 work days after receipt of comments.
  - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
  - .5 Submit revisions and updates made to the Plan during the course of Work.
  - .6 Contractor to submit a site-specific Health and Safety Plan prior to commencement of Work. Contractor will be required to include Health and Safety Requirements to protect their workers and the project site including precautions and mitigation related to the hazard of contracting or spreading Covid-19 disease. A source of advice can be found in the Canadian Construction Association Covid-19

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Standardized Protocols for All Canadian Construction Sites.

- .3 Submit name of designated Health & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
  - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

### 1.03 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act for Province of New Brunswick, and Regulations made pursuant to the Act.
- .2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations (COSH) as well as any other regulations made pursuant to the Act.
  - .1 The Canada Labour Code can be viewed at:  
[www.http://laws.justice.gc.ca/en/L-2/](http://laws.justice.gc.ca/en/L-2/)
  - .2 COSH can be viewed at: [www.http://laws.justice.gc.ca/eng/SOR-86-304/ne.html](http://laws.justice.gc.ca/eng/SOR-86-304/ne.html)
- .3 Observe construction safety measures of:
  - .1 Part 8 of National Building Code
  - .2 Municipal by-laws and ordinances.
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

### 1.04 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.

- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

#### 1.05 SITE CONTROL AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
  - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
  - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 51 00 for minimum acceptable requirements.
  - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
  - .3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.
- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

#### 1.06 PROTECTION

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

### 1.07 FILING OF NOTICE

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

### 1.08 PERMITS

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

### 1.09 HAZARD ASSESSMENTS

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

### 1.10 PROJECT/SITE CONDITIONS

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
  - .1 Known latent site and environmental conditions:
    - .1 Working in Traffic (marine and vehicular).
    - .2 Working adverse Weather Conditions.
    - .3 Working near wildlife.
    - .4 Working on uneven surfaces
    - .5 Working with tides
  - .2 Covid-19 measures to protect contractor, employees, consultants, Departmental Representative and harbor users. Update these measures as required. Discuss any concerns throughout the contract with the Departmental Representative.
    - .1 Include measures put in place for physical distancing to and from site, during breaks, lunch, supper and hotels.
  - .3 Facility on-going operations:
    - .1 The Contractor will co-operate with users of existing facilities. Maintain access to the existing Wharf structure, and consult with the Departmental Representative for site access limitations.

- .2 Should interference occur, take directions from Departmental Representative.
  - .3 Do not unreasonably encumber site with materials.
  - .4 Move stored products or equipment which interfere with operations.
  - .5 Comply with all regulations and authorities having jurisdiction over the work.
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
  - .3 Include above items in the hazard assessment of the Work.
  - .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

#### 1.11 MEETINGS

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
  - .1 Superintendent of Work
  - .2 Designated Health & Safety Site Representative
  - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

#### 1.12 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop written Health and Safety Plan specific to the Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.
- .2 Health and Safety Plan shall include the following components:
  - .1 List of health risks and safety hazards identified by hazard assessment.
  - .2 Control measures used to mitigate risks and hazards identified.
  - .3 On-site Contingency and Emergency Response Plan as specified below.
  - .4 On-site Communication Plan as specified below.
  - .5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship in Contractor's company.
  - .6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.
- .3 On-site Contingency and Emergency Response Plan shall include:
  - .1 Operational procedures, evacuation measures and communication process

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

### 1.13 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
  - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work.
  - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
  - .3 Conduct site safety orientation session to persons granted access to Work Site.
  - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
  - .5 Stop the Work as deemed necessary for reasons of health and safety.

- .3 Health & Safety Site Representative must:
  - .1 Be qualified and a competent person in occupational health and safety.
  - .2 Have site-related working experience specific to activities of the Work.
  - .3 Be on Work Site at all times during execution of the Work.
- .4 All supervisory personnel assigned to the Work shall also be competent persons.
- .5 Inspections:
  - .1 Conduct regularly scheduled safety inspections of the Work on a minimum bi-weekly basis. Record deficiencies and remedial action taken.
  - .2 Conduct Formal Inspections on a minimum monthly basis. Use standardized safety inspection forms. Distribute to subcontractors.
  - .3 Follow-up and ensure corrective measures are taken.
- .6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.
- .7 Keep inspection reports and supervision related documentation on site.

#### **1.14 TRAINING**

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

#### **1.15 MINIMUM SITE SAFETY RULES**

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



rules on site.

#### **1.16 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.

#### **1.17 INCIDENT REPORTING**

- .1 Investigate and report the following incidents to Departmental Representative:
  - .1 Incidents requiring notification to Provincial WorkSafe NB, Workers Compensation Board or to other regulatory Agency.
  - .2 Medical aid injuries.
  - .3 Property damage in excess of \$10,000.00.
  - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5000.00.
- .2 Submit report in writing.

#### **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.
  - .1 Post on site.
  - .2 Submit copy to Departmental Representative.
  - .3 For interior work in an occupied Facility, post additional copy in one or more publicly accessible locations.

#### **1.19 BLASTING**

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

#### **1.20 POWDER ACTUATED DEVICES**

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

### 1.21 CONFINED SPACES

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

### 1.22 SITE RECORDS

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

### 1.23 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.
- .2 Post other documents as specified herein, including:
  - .1 Site specific Health and Safety Plan
  - .2 WHMIS data sheets
  - .3 Fire and Safety Requirements
  - .4 Special Procedures on Lockout Requirements

## 2 PRODUCTS

### 2.01 NOT USED

- .1 Not used.

## 3 EXECUTION

### 3.01 NOT USED

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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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HEALTH AND SAFETY  
REQUIREMENTS

SECTION 01 35 29.06  
PAGE 10

.1 Not used.

END OF SECTION

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 02 41 16 - Sitework, Demolition and Removal.
- .3 Section 03 30 00 - Cast-in-Place Concrete
- .4 Section 31 62 16.19 - Steel Pipe Piles

### 1.02 GENERAL

- .1 All Environmental Mitigation Measures are the Contractor's Responsibility under this contract. All measures to mitigate hazardous material from entering any watercourse, all acts and regulations and mitigation measures listed under this section are the Contractor's responsibility to follow for the duration of this contract.
  - .1 Construction work will be monitored daily and establish mitigation measures as required. Adjust and upgrade items as required to meet the Municipal, Provincial and Federal Acts as required.
  - .2 Contractor must include the provision and installation of a Silt Boom around the construction operation to prevent silt from entering the watercourse, at all times.

### 1.03 SUBMITTAL REQUIREMENTS

- .1 Develop written ENVIRONMENTAL MITIGATION Plan based on the project specific prior to beginning site Work and continue to implement, maintain, and enforce plan that will be used until demobilization from site.
- .2 Develop written SITE SPECIFIC EROSION CONTROL MEASURES based on the project specific plan under this contract.
  - .1 Contractor must include the provision and installation of a Silt Boom capable of containing any silt from escaping the dredging/construction zone, at all times.
    - .1 Contractor must provide the means of installation the Silt Boom to prevent trapping any living fish within dredging/construction zone.
- .3 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
  - .1 Departmental Representative may request an updated document at any time during the Construction period under this contract if measures on site do not meet acts and regulations specified under this contract.

### 1.04 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

### 1.05 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
  - .1 Possibility of High winds.
  - .2 Uneven work areas
  - .3 Adverse weather conditions
  - .4 Access restrictions
  - .5 Continuous Traffic, in water and on land
- .2 All Vessels are to be permitted safe access through the worksite at all times, and assisted as necessary, except during blasting operations.

### 1.06 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

### 1.07 REFERENCES

- .1 Canada Shipping Act, Transport Canada, (CSA) 2001, amended 2017-12-12 or latest edition.
- .2 Canadian Coast Guard Regulations, Fisheries and Oceans Canada.
- .3 Canadian Environmental Assessment Act, 2012, amended 2017-06-22.
- .4 Canadian Environmental Protection Act, 1999, amended 2018-04-04.
- .5 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2016-04-05.
- .6 Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, 1998.
- .7 Migratory Birds Convention Act, 1994, Environment Canada, amended 2017-12-12.
- .8 Navigation Protection Act, 1985. Transport Canada, amended 2017-06-22.
- .9 New Brunswick - Environmental Impact Assessment Regulation, Clean Environmental Act.
- .10 Species at Risk Act, 2002, amended 2018-05-30.
- .11 The Federal Policy on Wetland Conservation, 1991, Environment Canada.
- .12 Transportation of Dangerous Goods Act, 1992, Transport Canada, amended 2017-01-01.
- .13 New Brunswick *Heritage Conservation Act*.
- .14 New Brunswick Watercourse and Wetland Alteration Technical Guidelines.
- .15 Equipment and heavy machinery:
  - .1 On-road vehicles to: CEPA-SOR/2003-2, On-Road Vehicle and Engine Emission

- Regulations and CEPA-SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
- .2 Off-road vehicles to: EPA CFR 86.098-10 and EPA CFR 86.098-11.
- .16 Work activities must comply with all / any conditions of the Navigation Protection Act (NPA) permit issued by Transport Canada.
- .17 Ensure project activities comply with the NBDELG Coastal Areas Protection Policy. The policy identifies sensitive coastal areas as beaches, dunes, rock platforms, coastal marshes and dyked lands; which should be considered in regulatory plans/approvals. For more information contact the Manager, Surface Water Protection Section, at (506) 457-4850.

## 1.08 DEFINITIONS

- .1 Archaeological Resources: all tangible evidence of human activity that is of historical, cultural or scientific interest. Examples include features, structures, archaeological objects (artifacts) or remains at or from an archaeological site, or an object recorded as an isolated archaeological find. An "artifact" is any object manufactured, used, moved or otherwise modified by human beings, including all waste materials and by-products of these processes.
- .2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas.
- .3 Deleterious substance:
- (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water,
- Or
- (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
- .4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.
- .5 Hazardous material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .6 Invasive or alien species: refers to a species or subspecies introduced outside

its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.

- .7 Navigable water: a canal and any other body of water created or altered as a result of the construction of any work.
- .8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary or salt-water body that contains water for at least part of each year.
- .9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands", and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.

#### 1.09 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific In-Water Mitigation Protection Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work.
  - .1 Mitigation Measures to prevent sedimentation.
  - .2 Mitigation Measures to prevent hazardous material to cause water contamination.
  - .3 Location and type of materials used for temporary access roads and measures to restore the access to its original state or better, the Departmental Representative's will be the sole judge of what it deemed acceptable as a final product. .
- .3 Submit 1 digital copy of Contractor's In-Water Mitigation Measures to be submitted to the Departmental Representative 7 days before commencement of work, for review.
- .4 Submit copies of reports or directions issued by Municipal, Federal or Provincial health and safety inspectors.
- .5 Departmental Representative will review Contractor's In-Water Mitigation Measure Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .6 Departmental Representative's review of Contractor's final In-Water Mitigation plan should not be construed as approval and does not reduce the Contractor's overall responsibility for In-Water Environmental Mitigation Measures during the construction of this contract.
- .7 Advise the Canadian Coast Guard, Marine Communication and Traffic Services (MCTS) at (902)564-7751 or toll free at 1-800-686-8676 sufficiently in advance of commencement of work or when deploying or removing site markings in order to allow for appropriate Notices to Shipping/Mariners action.
- .8 Develop and submit to the Departmental Representative an Emergency Response Plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. Include Provincial Environmental Emergency Contact information, and Departmental Representative's contact information.

- .9 The contractor is required to provide a minimum of 48-hour notice to the Departmental representative before commencing dredging activities.
- .10 Before commencing construction activities or delivery of materials to site, the contractor must submit an Environmental Protection Plan (EPP) for review and approval by PSPC. The EPP must include a comprehensive overview of known or potential environmental issues to be addressed during construction/the project.

### 1.10 TRANSPORTATION

- .1 Transport hazardous materials and hazardous waste in compliance with the Transportation of Dangerous Goods Act.
- .2 All trucks transporting dredged material must have watertight boxes.
- .3 Maintain trucks clean and free of mud, dirt, and other foreign matter.
- .4 Secure contents against free board spillage when excavating, loading and hauling material, including dredge material. Do not overload trucks when hauling material and avoid potential release of contents, including dredge material, and of any foreign matter onto highways, roads and access routes used for the work. Immediately clean any ground spills and soils to extent as directed by authority having jurisdiction.
- .5 All materials and equipment used in construction must be marked in accordance with the Collision Regulations of the Canada Shipping Act, 2001 when located on the waterway.
- .6 Temporary causeways, upon approval from the departmental representative, shall be constructed in isolation from the waterbody using filter fabric/silt curtain or cofferdam.

### 1.11 TEMPORARY LAND-BASED ROADS

- .1 Prior to the start of construction, Contractor is responsible to submit for review;
  - .1 A plan indicating location of temporary roads and type of proposed material to be used;
  - .2 Contractor will describe how the temporary roads will be removed;
  - .3 Disposal location of temporary fill material upon completion of the project;
  - .4 Proposed method of restoring the areas disturbed for temporary accesses, to its original state or better.
  - .5 All materials used to construct temporary roads in water will be transported to an Environmental Facility registered to accept the material or at a location predetermined under this contract. It is the contractor's responsibility to dispose of the material at its approved location. Disposal slips are to be submitted to the Departmental Representative, before final payment is to be made under this contract. Note: sound rock, free or organics, does not have to be disposed of at a registered facility.
- .2 Construction material and debris is not to become waterborne.
- .3 Any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of building or placing a work in navigable



water are not to remain in place after the completion of the project.

- .4 Maintain a minimum distance of 300 m from all areas occupied by concentration of seabirds and waterbirds. Travel at steady speeds when close to seabird and waterbird colonies, moving parallel to the shore, rather than approaching the colony directly. Avoid any sharp or loud noises, do not blow horns or whistles, and maintain constant engine noise levels. Do not pursue seabirds or waterbirds swimming on the water surface and avoid concentration of these birds on the water.
- .5 The Contractor must use public right-of-ways when possible and must provide traffic control personnel, as per sections 01 51 00 - Temporary Utilities, 01 52 00 - Construction Facilities.
- .6 The Contractor must ensure that road surfaces remain free from dredge spoils, clay, mud, etc. throughout the disposal hauling activities.

#### 1.12 TEMPORARY CAUSEWAYS/ROADS

- .1 It will be the Contractor's responsibility to gain access to the work area. The construction and removal of temporary causeways and access roads will be as per the Contractor's submittal and removal and disposal of the access roads/causeways and add if temporary road is in salt water will be disposed of at a registered environmental facility registered to accept the type of proposed material, or at a pre-determined location specified under this contract.
- .2 All material used for construction of temporary causeways and access roads must be clean and free from excessive fines, organics, debris and non-toxic (i.e., free of fuel, oil, grease and/or any other contaminants), non-ore bearing and from a provincially approved non-water source.
- .3 Temporary causeways and access roads shall be constructed at an elevation such that machinery and equipment is operating completely out of the water at all stages of the tide. If tidal work is being carried out, machinery and equipment shall be relocated back to a suitable elevation to prevent operating in submerged waters. Bidders are advised to consult the Tide Tables issued by Fisheries and Oceans in order to make sure of the tidal conditions affecting work.
- .4 The Contractor is to maintain temporary buoys to mark the position of the access road including the outer toe as construction proceeds. All buoys are to meet requirements for the applicable Canadian Coast Guard standard and be equipped with radar reflectors.
- .5 Vegetation clearing required for access roads and disposal areas should be scheduled to avoid the regional migratory bird nesting period. In the Maritime Provinces, the regional nesting period is from mid-April to late August, with the exception of southwest Nova Scotia where it extends from early April to late August.
- .6 No construction or infill material may be obtained from any coastal feature, namely a beach, dune, or coastal wetland.
- .7 Temporary causeways shall be constructed, upon approval from the departmental representative, in isolation from the waterbody using filter fabric/silt curtain

or cofferdam.

### 1.13 OPERATION OF MACHINERY

- .1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds.
- .2 Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the water body.
- .3 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering any water.
- .4 Biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices.
- .5 All in-water activities should be conducted during low wind, wave and suitable weather conditions. Arrange for sufficient space adjacent to project site for conduct of operations. Exercise care so as not to obstruct or damage public or private property in area. Do not interfere with normal day-to-day operations in progress at site. All arrangements for space and access will be made by Contractor, and submitted for review to the Departmental Representative. Co-ordinate use of premises with the Harbour Authority and Departmental Representative.
- .6 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.
- .7 Do not perform cleaning and washdown within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area. Abide by requirements and recommendations from Fisheries and Oceans Canada - Fisheries Protection Program in cleaning and wash down of equipment.

### 1.14 TEMPORARY STORAGE

- .1 No staging of vehicles or equipment/material will take place on any beach, dune, wetland or other environmentally sensitive areas.

### 1.15 CONTAINMENT AND SPILL MANAGEMENT

- .1 Comply with Federal (CEPA *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*) and Provincial regulations, codes, standards and guidelines for the storage of fuel and allied petroleum products on site.
- .2 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.
- .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 contamination of the soil and water (both surface and subsurface) when

- handling petroleum products on site and during fuelling 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 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.
  - .8 Develop and submit to the *Departmental Representative* an Emergency Response Plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. Include Provincial Environmental Emergency Contact information, and Departmental Representative's contact information.
  - .9 Ensure that building material used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish.
  - .10 If an oiled seabird is encountered, methodology for the handling and release of marine and migratory birds outlined in Environment and Climate Change Canada (ECCC) - Canada Wildlife Service (CWS)'s Oiled Birds Protocol will be implemented. A permit application must be obtained from ECCC-CWS prior to implementation of this protocol.

#### 1.16 HAZARDOUS MATERIAL HANDLING

- .1 Store and handle hazardous materials in accordance with applicable federal and provincial regulations, codes, standards and guidelines. Store in location that will prevent spillage into the environment.
- .2 Label containers to WHMIS requirements and keep MSDS data sheets on site for all hazardous materials.
- .3 Maintain inventory of hazardous materials and hazardous waste stored on site. List items by product name, quantity and date when stored.
- .4 Store and handle flammable and combustible materials in accordance with National Fire Code.
- .5 Workers in contact with hazardous materials must be provided with, and use regulated personal protective equipment and must have the necessary training to know how to handle the different hazardous materials for Health and Safety and according to Environmental Regulations.

#### 1.17 DISPOSAL OF WASTE

- .1 Do not bury rubbish, construction and demolition debris (i.e., concrete, creosote timbers, steel, impacted soil materials etc.) and waste materials on site.
- .2 Dispose and recycle construction and demolition debris and waste materials in accordance with Provincial Waste Management Regulations and the project waste management requirements specified in sections 02 41 16 - Sitework, Demolition

- and Removal.
- .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, regulations, codes, standards and guidelines.
  - .5 Dispose of construction related debris, including demolished cribwork materials and cut timber at an approved landfill that is licensed to dispose of creosote timber or in a manner approved by the province.
  - .6 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.
  - .7 Chipped vegetation may be used as mulch but must not be spread into a waterbody or wetland.
  - .8 All salvageable stockpiles of creosote timbers must be situated a minimum of 500 meters from any dwelling or water well and a minimum of 100 meters from any watercourse/wetland or environmentally sensitive area. Any stockpile must be contained, off the ground and must be contained on federal land, unless approved by Departmental Representative.
  - .9 Debris entering the marine environment should be immediately retrieved when it is safe to do so.
  - .10 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.
  - .11 The contractor must provide the Waste manifest of the deconstruction material, to the Departmental Representative with the progress claim.

### 1.18 WATER QUALITY

- .1 Conduct work in or near a watercourse 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 excavation equipment and haul vehicles to avoid over the water swings of finer material dredged material whenever possible.
- .2 Contractor is required to:

- .1 Employ suitable operational and engineering controls (e.g., silt curtain), as approved by the *Departmental Representative*, around the work area, or as specified by the *Departmental Representative*. Contractor must specify the means of installation in their Environmental Mitigation Plan.
- .3 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 Small Craft Harbour, Harbour Authority, Plant owners as directed by *Departmental Representative* to minimize interference and impact to harbour users.
- .4 Do not wash down equipment within a 30 meter buffer zone of a wetland, watercourse or other identified environmentally sensitive area.
- .5 Where required, install effective sediment control measures before starting work to prevent the entry or re-suspension of sediment in the water body. Inspect sediment control measures regularly to ensure they are functioning properly, and make all necessary repairs if any damage occurs. Upon completion of use, remove these control measures in a way that prevents the escape of settled sediment.

## 1.19 AIR QUALITY

- .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
- .2 Dust suppression by the application of water must be employed, when required. 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 To reduce emissions of air contaminants and Greenhouse Gas, implement an idling policy which includes:
  - .1 Diesel construction equipment will be turned off when not in active use.
  - .2 Vehicles idling more than 5 minutes will be turned off. Morning vehicle warm-ups will be restricted to 3-5 minutes. A staging zone will be established for trucks that are waiting to load/unload to minimize public exposure to emissions. Idling restrictions will not apply when:
    - .1 The engine is required to power auxiliary equipment (e.g., hoist, lift, computers, safety lights, etc);
    - .2 Extreme weather conditions (-10 degrees Celsius or below / +30 degrees Celsius or above) or any other circumstance where heating or air conditioning is required for worker's health and safety;

- .3 The original equipment manufacturer specifically recommends a longer idling period for normal and efficient operation of the motor vehicle in which case such recommended period shall not be exceeded;
- .4 Vehicle/equipment maintenance and diagnostic purposes;

## 1.20 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 Minimize disturbance to all birds on site and adjacent areas during the entire course of the work.
- .3 Ensure that no litter (including food wastes) is left in coastal areas.
- .4 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves or ferrying supplies.
- .5 Do not use beaches, dunes, coastal wetlands and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the *Departmental Representative*.
- .6 To avoid the risk of nest destruction, the proponent shall avoid vegetation clearing during the most critical period of the migratory bird breeding season, which is May 1st through August 31st.
  - .1 In the event that vegetation clearing is to take place inside the May 1st to August 31st window, a qualified biologist must inspect the area prior to potential disturbance or loss of habitat activities to ensure there will be no adverse impacts to birds and wildlife.
- .7 Should nests or chicks of migratory birds or raptors be encountered during work, immediately stop work in that area and notify *Departmental Representative* for directives to be followed.
  - .1 Do not disturb nest site and neighbouring vegetation until nesting is completed.
  - .2 Minimize work immediately adjacent to such areas until nesting is completed.
  - .3 The proponent shall ensure that if a nest or chick of a migratory bird is detected within the project area, work in the area shall be halted and Canadian Wildlife Service shall be consulted at (902) 426- 9152.
  - .4 Should a migratory bird or raptor nest be encountered during work, activity in the vicinity of the nest should be halted. The nest location should be protected until chicks have naturally fledged from the area, with a buffer zone appropriate to the species as determined in consultation with the appropriate regulators (ECCC-CWS for species protected under the MBCA; provincial department of natural resources for raptors). As a general guideline, for small

landbirds, an appropriate buffer for clearing activities may be 10 to 50 m, or even more depending on the level of activity and on the species. The buffer shall stay in place until August 31st or the time when chicks have naturally fledged from the area. A nest shall not be marked, or the tree/shrub in which it is situated, using flagging tape or other similar material; this increases the visibility of the nest and the risk of predation.

- .5 Protect these areas by following recommendations of Canadian Wildlife Service.
- .6 Vessel movement in the vicinity of nesting islands for seabirds and waterbirds should take place at steady speeds, moving parallel to the shore, rather than approaching the island directly.
- .7 Dredge disposal sites may provide habitat suitable for ground-nesting and burrowing birds, including species of conservation concern such as the Common Nighthawk and Bank Swallow. During the breeding season, it is important that nests not be disturbed by erosion prevention and control measures or by excavation and construction activities. If stockpiles are on-site or will be on-site any disturbance to such dredge stockpiles is to be undertaken during the regional nesting period for migratory birds, nest searches must be undertaken by an experienced observer prior to construction activities, and any nests that are discovered must be protected with an appropriate buffer for the species.
- .8 Intrusive work conducted in potential migratory bird nesting habitat should be scheduled to avoid the regional migratory bird nesting period. In the Maritime Provinces, the regional nesting period is from mid-April to late August.

### 1.21 FISH PROTECTION

- .1 Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- .2 Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
- .3 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to *Departmental Representative* for review.
- .4 Do not perform cleaning and washdown within a 30 metre buffer zone of a wetland, watercourse or other identified environmentally sensitive area. Abide by requirements and recommendations from Fisheries and Oceans Canada - Fisheries Protection Program in cleaning and wash down of equipment.

- .5 The introduction of deleterious substances into the watercourse is not permitted.
- .6 Conduct in-stream work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat or to allow work in water to be isolated from flows.
- .7 Work activities must comply with all/any conditions of the Fisheries Act Authorization, or Letter of Advice issued by Fisheries and Oceans Canada. A copy of the Fisheries Act Authorization must be kept on site at all times.

## 1.22 INVASIVE SPECIES

- .1 To minimize the possibility of fish habitat contamination and the spread of aquatic invasive species, all construction equipment which will be immersed into the water of a watercourse, or has the possibility of 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 prior to mobilization to the site.
  - .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.
  - .2 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
- .2 Conduct cleaning and washing operations as follows:
  - .1 Scrape and remove heavy accumulation of mud and dispose appropriately.
  - .2 Wash all surfaces of equipment by use of a pressurized fresh water supply.
  - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals and sediments.
  - .4 Check and remove all plant, animal and sediment matter from all bilges and filters.
  - .5 Drain standing water from equipment and let fully dry before use.
  - .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
- .3 Record of Assurance Logbook:
  - .1 Maintain an on-going log of past and present usage and washdowns of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
  - .2 Write data in a hard cover bound logbook to include the following:
    - .1 Date and location where equipment was previously used in a watercourse or wetland;
      - .1 Type of work performed.
      - .2 Dates of wash down for each piece of equipment;



- .3 Cleaning method and cleaning agent(s) used.  
Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to *Departmental Representative* for review.
- .3 The Departmental representative has the right to request a video inspection of the equipment, including hulls, to ensure that they are free of marine growth and alien species prior to mobilization to the site.

### 1.23 ARCHEOLOGIST

- .1 All construction personnel are responsible for reporting any cultural materials, which may be archaeological resources, unearthed during construction to the Construction Supervisor. If the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work in the vicinity of the find and notify the *Departmental Representative*.
- .2 If an archaeological and / or historically significant item (an archaeological resource) is discovered during the work activities, Work in the area will be stopped immediately and the *Departmental Representative* will be contacted as well as the provincial Archaeological Services unit.
  - .1 New Brunswick Archaeological Services Branch contact, Tricia Jarratt, can be reached at (506) 238-3512.
- .3 Work can only resume in the vicinity of the archaeological find when authorized by the *Departmental Representative*, after approval has been granted by the provincial authority.
- .4 In the event of the discovery of possible human remains or possible evidence of human burials, the work will immediately cease. If the discovery is potential, but not positively human remains, contact the *Departmental Representative* as well as the provincial Archaeological Services unit. If the materials discovered are undoubtedly human remains, the nearest law enforcement agency will be contacted immediately by the *Departmental Representative* and/or the Construction Supervisor. Until determined otherwise, the possible human remains should be treated as evidence in a criminal investigation. If the possible human remains are found in the bucket of heavy equipment, the bucket should not be emptied as physical evidence may be destroyed by that action. The area should immediately be designated as "Out of Bounds" to all personnel and the public. Depending on the weather and other conditions, the potential human remains should be provided with non-intrusive protection, such as covering with a cloth or canvas tarp (non-plastic preferred).

### 1.24 SITE SPECIFIC EROSION AND SEDIMENT CONTROL PLAN

- .1 Contractor is responsible to develop a Site Specific Erosion and Sediment

Control Plan that minimizes risk of sediment of the water body during all phases of the work. Plan is to be submitted as per section 01 33 00, for review by the Departmental Representative. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the water body or settling basin and runoff water is clear. The plan should, where applicable, include:

- .1 Where required, effective sediment control measures (e.g. silt fencing, check dams) must be an initial step in the construction sequence to prevent the entry or re-suspension of sediment in the water body. Notes on inspection, repairs, and removals are outlined below.
- .2 Inspect sediment control measures regularly to ensure they are functioning properly, and make all necessary repairs if any damage occurs. Upon completion of use, remove these control measures in a way that prevents the escape of settled sediment.
- .3 Measures for managing water flowing onto the site, as well as water being pumped / diverted from the site such that sediment is filtered out prior to the water entering a water body. For example, pumping /diversion of water to a vegetated area, construction of a settling basin or other filtration system. The water will be pumped to a sediment pond or into a filter bag to ensure that the concentration of sediment is below regulated discharged criteria before it reaches a water body.
- .4 Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment. This should include measures for material stockpiles (e.g. tarps).
- .5 Measures for containing and stabilizing waste material (e.g., dredged material, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby water bodies to prevent re-entry.
- .6 Description of approach for managing potential impacts to the local environment including silt curtains, sediment fence, hay bales, treatment, etc.
- .7 Methodology for monitoring weather, specifically rainfall and storms and altering work plan for inclement weather.

#### **1.25 MITIGATION MEASURES DURING CONCRETE POURS**

- .1 Concrete pours should stop in moderate to heavy rain 2.6-7.6 mm/hr or more to prevent leaching contaminants into aquatic environment.
- .2 When concrete replacement work is necessary on structures, timber staging will be placed next to the face to prevent concrete from falling into the water, or a cofferdam will be constructed to enclose the work area.
- .3 During underwater concrete abutment and pier repairs, concrete shall be fully cured before forms are removed and the repair exposed to current.
- .4 Forms will have caulked corners to prevent leakage.

- .5 Splash panels will be used during the pour to prevent material from entering the aquatic environment.
- .6 Any accidental release of concrete will be removed prior to solidification.
- .7 Work will cease until the spill is contained and the source of the leak can be identified.
- .8 Contractor must inform the Departmental Representative of all accidental spills of concrete into fish bearing waters and contact Federal, Provincial Regulators immediately.

#### 1.26 MITIGATION MEASURES PRIOR AND DURING BLASTING

- .1 Unless required under this contract, avoid using explosives in or near water. Use of explosives in or near water produces shock waves that can damage a fish swim bladder and rupture internal organs. Blasting vibrations may also kill or damage fish eggs or larvae.
- .2 If explosives are required as part of a project (e.g., removal of structures such as piers, pilings, footing; class "A" dredging; removal of obstructions such as beaver dams; or water intake), the potential for impacts to fish and fish habitat should be minimized by implementing the following measures:
  - .1 Place blasting mats over top of holes to minimize scattering of blast debris around the area.
  - .2 Do not use ammonium nitrate based explosives in or near water due to the production of toxic by-products.
  - .3 Remove all blasting debris and other associated equipment / products from the blast area.
  - .4 Blasting activities to be conducted in accordance with federal Explosives Act and regulations. For additional guidance refer to: Wright, D.G., and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Can. Tech. Rep. Fish. Aquat. Sci. 2107: iv + 34p.
  - .5 Where possible, store blasting agents off-site at an approved facility, bringing only the amount on-site that is needed for one day of work.
  - .6 There shall be no diving birds within 100 m of open water during blasting. Blasting shall not occur when any SARA species listed as Endangered by COSEWIC or avian species listed as Threatened or Special Concern are within 250 m of the work site. Blasting may resume when avian species of risk have naturally left the area. The area will be inspected prior to blasting to ensure there are no bird nests present on the rock before blasting. If nests are identified blasting must not commence until all birds have fledged and left the nest.
  - .7 Contractor will retain Specialist Company to carry out seismographic survey before rock excavation is started, to determine maximum charges that can be used at different locations in area of rock excavation, or dredging. Following survey, full report detailing control

- requirement throughout Project will be forwarded to the Departmental Representative prior to the start of blasting. Report or any part of it will not over-rule requirements of local authority having jurisdiction unless report requirements are more conservative.
- .8 Pre-blast surveys must be conducted on all surrounding residential wells within 250m prior to any blasting at the harbour. Prior to blasting baseline water quality data (equivalent to NB DENV \*I package and bacterial analysis) will be collected from all wells within 600 m of any areas where blasting will occur. A water quality monitoring program will be implemented adjacent to the lobster cars in the adjacent basin during dredging and possibly during blasting. Turbidity levels should not exceed 25mg/L above background levels.
- .3 Blasting or other use of explosives is not permitted prior to submitting a Blasting Plan and Seismographic Survey for review by the Departmental Representative.

#### 1.27 SOCIOECONOMIC RESTRICTIONS

- .1 Abide by municipal and provincial regulations for any restrictions on work performed during the night time and on flood lighting of the site. Obtain applicable permits.
- .2 Place flood lights in opposite direction of adjacent residential and business areas.
- .3 Work equipment and machinery must be equipped with purposely designed mufflers to reduce noise on site to lowest possible level. Maintain mufflers in good operating condition at all times.
- .4 The use of solid-burning or slow pulsing warning lights at night must be avoided. The use of strobe lights at night, at the minimum intensity and minimum number of flashes per minute (longest duration between flashes) allowable by Transport Canada, is recommended. Lights should completely turn off between flashes.
- .5 LED lights must be used instead of other types of lights where possible. LED light fixtures are less prone to light trespass (i.e., are better at directing light where it needs to be, and do not bleed light into the surrounding area).
- .6 Sounds such as whistle blasts and horns will be limited or replaced, to the extent possible, with radio communication.

#### 1.28 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.
- .2 Ensure Dredging Permit is kept on site at all times.

#### 1.29 DISPOSAL OF DREDGE MATERIAL ON LAND

- .1 Items such as rubber tires, bottles, cans and other debris or litter must be removed from the disposal site following regrading. Failure to remove such debris may constitute a littering offence under applicable regulations.
  
- .2 Control runoff of water containing suspended materials or other harmful substances in accordance with requirements of all federal, provincial and municipal authorities having jurisdiction.

**END OF SECTION**

**1 GENERAL**

**1.01 REFERENCES AND CODES**

- .1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.
- .2 Meet or exceed requirements of:
  - .1 Contract documents.
  - .2 Specified standards, codes and referenced documents.

**1.02 BUILDING SMOKING ENVIRONMENT**

- .1 Comply with smoking restrictions and municipal by-laws.

**2 PRODUCTS**

**2.01 NOT USED**

- .1 Not Used.

**3 EXECUTION**

**3.01 NOT USED**

- .1 Not Used.

**END OF SECTION**

## 1 GENERAL

### 1.01 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-94, Stipulated Price Contract.

### 1.02 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

### 1.03 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.

### 1.04 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

### 1.05 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

### 1.06 REJECTED WORK

- .1 Refer to CCDC, GC 2.4.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

## 2 PRODUCTS

### 2.01 NOT USED

- .1 Not Used.

## 3 EXECUTION

### 3.01 NOT USED

- .1 Not Used.

END OF SECTION



## **1 GENERAL**

### **1.01 REFERENCES**

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### **1.02 ACTION AND INFORMATIONAL SUBMITTALS**

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

### **1.03 INSTALLATION AND REMOVAL**

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

### **1.04 DEWATERING**

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

### **1.05 WATER SUPPLY**

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Pay for utility charges at prevailing rates.

### **1.06 TEMPORARY POWER AND LIGHT**

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and pay for Temporary power for electric cranes and other equipment requiring in excess of above.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

### **1.07 TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary telephone, fax, data hook up, lines, and equipment

necessary for own use and use of Departmental Representative.

### **1.08 FIRE PROTECTION**

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

## **2 PRODUCTS**

### **2.01 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL**

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

**END OF SECTION**

## 1 GENERAL

### 1.01 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
  - .1 CCDC 2-1994, Stipulated Price Contract.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
  - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
  - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
  - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .4 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .5 U.S. Environmental Protection Agency (EPA) / Office of Water
  - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

### 1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

### 1.03 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.

### 1.04 HOISTING

- .1 Provide, operate and maintain hoists/ cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists/cranes to be operated by qualified operator.

### 1.05 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

### 1.06 CONSTRUCTION PARKING

- .1 Parking on site is limited. Contractor will find alternative location for his workers parking.
- .2 Provide and maintain adequate access to project site.

### 1.07 SECURITY

- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

### 1.08 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to provide their own offices as necessary. Make own arrangements for locations of these offices.
- .4 Departmental Representative's Site office.
  - .1 Provide temporary office for Departmental Representative.
  - .2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4, 50% opening windows and one lockable door.
  - .3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
  - .4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.
  - .5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10% upward light component.
  - .6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
  - .7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
  - .8 Maintain in clean condition.

### 1.09 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

#### **1.10 SANITARY FACILITIES**

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building.

#### **1.11 CONSTRUCTION SIGNAGE**

- .1 Provide and erect project sign, within three weeks of signing Contract, in a location approved by Departmental Representative.
- .2 Construction signs as per New Brunswick Department of Transportation and Infrastructure Work Area Traffic Control Manual.
- .3 No other signs or advertisements, other than warning signs, are permitted on site.
- .4 Direct requests for approval to erect Consultant/Contractor signboard to Departmental Representative. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording in both official languages.
- .5 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .6 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.

#### **1.12 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Provide access to maintain traffic.
- .2 Maintain and protect traffic on affected wharf entrance and around the work area during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads as required.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operations at all times.
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove any temporary haul roads, upon completion of work.

### 1.13 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

## 2 PRODUCTS

### 2.01 NOT USED

- .1 Not Used.

## 3 EXECUTION

### 3.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

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REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723761

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CONSTRUCTION FACILITIES

SECTION 01 52 00

PAGE 5

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

**END OF SECTION**

## **1 GENERAL**

### **1.01 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
  - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

### **1.02 INSTALLATION AND REMOVAL**

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

### **1.03 HOARDING**

- .1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- .2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

### **1.04 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around deep excavations.
- .2 Provide as required by governing authorities.

### **1.05 WEATHER ENCLOSURES**

- .1 Design enclosures to withstand wind pressure and snow loading.

### **1.06 ACCESS TO SITE**

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

### **1.07 PUBLIC TRAFFIC FLOW**

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

### **1.08 FIRE ROUTES**

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



response vehicles.

### **1.09 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY**

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

### **1.10 PROTECTION OF BUILDING FINISHES**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.

### **1.11 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **2 PRODUCTS**

### **2.01 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.01 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1 GENERAL**

### **1.01 REFERENCES**

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

### **1.02 QUALITY**

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .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.

### **1.03 AVAILABILITY**

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at the start of Work and should it subsequently appear that Work may be delayed for such reason,

Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

#### 1.04 STORAGE, HANDLING AND PROTECTION

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

#### 1.05 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

#### 1.06 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

#### 1.07 QUALITY OF WORK

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

to produce required results.

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

#### **1.08 CO-ORDINATION**

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

#### **1.09 REMEDIAL WORK**

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

#### **1.10 LOCATION OF FIXTURES**

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

#### **1.11 FASTENINGS**

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

made are not acceptable.

### **1.12 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or Wharf occupants and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

## **2 PRODUCTS**

### **2.01 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.01 NOT USED**

- .1 Not Used.

**END OF SECTION**

## **1 GENERAL**

### **1.01 PROJECT CLEANLINESS**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .6 Dispose of waste materials and debris off site.
- .7 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

### **1.02 FINAL CLEANING**

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

### **1.03 WASTE MANAGEMENT AND DISPOSAL**

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

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REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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CLEANING

SECTION 01 74 11  
PAGE 2

**2 PRODUCTS**

**2.01 NOT USED**

.1 Not Used.

**3 EXECUTION**

**3.01 NOT USED**

.1 Not Used.

**END OF SECTION**

## 1 GENERAL

### 1.01 WASTE MANAGEMENT GOALS

- .1 Accomplish maximum control of solid construction waste.
- .2 Preserve environment and prevent pollution and environment damage.

### 1.02 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.



### **1.03 STORAGE, HANDLING AND PROTECTION**

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

### **1.04 DISPOSAL OF WASTES**

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner into waterways, storm, or sanitary sewers.

### **1.05 USE OF SITE AND FACILITIES**

- .1 Execute work with least possible interference or disturbance to normal use of premises.

## **2 PRODUCTS**

### **2.01 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.01 APPLICATION**

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

### **3.02 CLEANING**

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

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SCH	CONSTRUCTION/DEMOLITION	SECTION 01 74 21
FLOATING WHARVES	WASTE MANAGEMENT AND	PAGE 3
REPLACEMENT AND INSTALLATION	DISPOSAL	
STUART TOWN WHARF		
DEER ISLAND		
CHARLOTTE COUNTY, N.B.		
PROJECT NO.723261		

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**3.03 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT**

.1 Schedule E - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
New Brunswick	Department of the Environment 364 Argyle Street, Box 6000 Fredericton NB E3B 5H1	506-453-37 00	506-453-38 43

**END OF SECTION**

## 1 GENERAL

### 1.01 ADMINISTRATIVE REQUIREMENTS

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

### 1.02 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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CLOSEOUT PROCEDURES

SECTION 01 77 00

PAGE 2

**2 PRODUCTS**

**2.01 NOT USED**

.1 Not Used.

**3 EXECUTION**

**3.01 NOT USED**

.1 Not Used.

**END OF SECTION**

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section includes:  
Project Record Documents as follows:
  - .1 As-built drawings;
  - .2 As-built specifications;
  - .3 Reviewed shop drawings.Note: All items listed in 1.01.1 have to be submitted to the Departmental Representative prior to a final being issued.

### 1.02 REFERENCES

- .1 Canadian Environmental Protection Act (CEPA)
  - .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

### 1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

### 1.04 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders and other modifications to Contract.
  - .5 Reviewed shop drawings, product data, and samples.
  - .6 Field test records.
  - .7 Inspection certificates.
  - .8 Manufacturer's certificates.

### 1.05 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of opaque drawings, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colors for each major system, for recording information.
- .3 Record information concurrently with construction progress.
  - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
  - .1 Field changes of dimension and detail.

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STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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CLOSEOUT SUBMITTALS

SECTION 01 78 00

PAGE 2

- .2 Changes made by change orders.
- .3 Details not on original Contract Drawings.
- .4 References to related shop drawings and modifications.

#### **1.06 FINAL SURVEY**

- .1 Submit final dredging survey certificate in accordance with Section 01 33 00 - Submittal Procedures, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

#### **2 PRODUCTS**

##### **2.01 NOT USED**

- .1 Not Used.

#### **3 EXECUTION**

##### **3.01 NOT USED**

- .1 Not Used.

**END OF SECTION**

## 1 GENERAL

### 1.01 DESCRIPTION

- .1 Removal and Reinstallation or disposal for construction operations will include:
  - .1 This section specifies requirements for demolishing and removing wholly or in part various items designated to be removed or partially removed:
    - .1 Mobilization and demobilization of all equipment necessary to make work progress for the entire contract.
    - .2 Submittal of an environmental mitigation plan and its Implementation.
    - .3 Submittal of a Health and Safety Plan, including provision for Covid-19 protection and its implementation (s).
    - .4 Removal of the existing aluminum gangway and store it at a secure Location on site. Entrance to the gangway is to be blocked completely for safety purposes, during construction.
    - .5 Removal and disposal of a steel beam presently located next to the gangway, on top of the wheelguard, as specified on the drawings
    - .6 Disconnect and dispose of existing electrical from the floating Wharves, by a registered electrician.
    - .7 Removal of existing floating wharves, which are to be hauled to shore, at a secure location agreed upon, between the Departmental Representative and the Harbour Authority.
    - .8 Cut off existing H piles, including ones that were previously cut short. Coordinates are included on the drawings.

### 1.02 GENERAL REQUIREMENTS

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

### 1.03 PROTECTION

- .1 Protect existing objects designated to remain. In event of damage, immediately replace or make repairs to approval of and at no additional cost to Canada.
- .2 Remove all floating debris from water on a routine and timely basis.

### 1.04 MEASUREMENT FOR PAYMENT

- .1 Demolition and removal will consist of, but not necessarily be limited to, the following:

- .1 Mobilization and demobilization of all equipment necessary to make work progress for the entire contract.
  - .2 Submittal of an environmental mitigation plan and its Implementation.
  - .3 Submittal of a Health and Safety Plan, including provision for Covid-19 protection and its implementation (s).
  - .4 Removal of the existing aluminum gangway and store it at a secure Location on site. Entrance to the gangway is to be blocked completely for safety purposes, during construction.
  - .5 Removal and disposal of an H pile presently located next to the gangway, on top of the wheelguard, as specified on the drawings
  - .6 Disconnect and dispose of existing electrical from the floating Wharves, by a registered electrician.
  - .7 Removal of existing floating wharves, which are to be hauled to shore, at a secure location agreed upon, between the Departmental Representative and the Harbour Authority.
  - .8 Cut off existing H piles, including ones that were previously cut short. Coordinates are included on the drawings.
- .2 Removal of all other items required for the progress of the work will not be measured separately for payment, it will be considered incidental to this contract.
- .3 All items specified under section will be paid in a lump sum.

## 2 PRODUCTS

### 2.02 NOT USED

- .1 Not used.

## 3 EXECUTION

### 3.01 EXECUTION

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

### 3.02 REMOVAL

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



### 3.03 DISPOSAL OF MATERIAL

- .1 All demolished materials, except materials designated to be reused, will become property of contractor and will be removed from site and disposed of to satisfaction of Departmental Representative and in accordance with environmental guidelines. It is the sole responsibility of the contractor to dispose of all demolished materials at an approved disposal site. Ensure that disposal site is approved and willing to accommodate any materials disposed of from work site.
- .2 Contractor shall obtain and pay for all necessary permits and disposal fees for use of an approved waste disposal site.

### 3.04 RESTORATION

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

**THE END**

## 1 GENERAL

### 1.01 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 03 10 00 - Concrete Forming and Accessories.
- .3 Section 03 30 00 - Cast-in-place Concrete.
- .4 Section 03 27 36 - Underwater Placed Concrete.
- .5 Section 31 62 16.19 - Steel Pipe Piles.

### 1.02 REFERENCES

- .1 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
  - .2 CAN/CSA-A23.2-00, Methods of Test for Concrete.
  - .3 CAN/CSA-A3000-98-A5-98, Portland Cement.
  - .4 CAN/CSA-G30.18-M92(R1998), Billet-Steel Bars for Concrete Reinforcement.

### 1.03 SUBMITTALS

- .1 Shop Drawings
  - .1 Submit placing drawings prepared in accordance with plans to clearly show size, shape, location and all necessary details of reinforcing.
  - .2 Submit drawings showing formwork and falsework design to: CAN/CSA-A23.1.
  - .3 Drawings to bear stamp and signature of qualified professional engineer registered or licensed in Province of New Brunswick, Canada.

### 1.04 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.
- .5 Use trigger operated spray nozzles for water hoses.
- .6 Designate cleaning area for tools to limit water use and runoff.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Portland cement: to CAN/CSA-A3000-A5, Type 10.
- .2 Reinforcing bars: to CAN/CSA-G30.18, Grade 400W.
- .3 Water: to CAN/CSA-A23.1
- .4 Aggregates: to CAN/CSA-A23.1. Coarse aggregate to be normal density.
- .5 Air Entraining Admixture: to ASTM C 260.
- .6 Chemical admixtures: to ASTM C 494. Departmental Representative to approve accelerating or set retarding admixtures during cold weather placing.
- .7 Concrete Retarders: to ASTM C 494, low VOC, solvent free. Do not allow moisture of any kind to come in contact with the retarder film
- .8 Joint sealer/filler: grey, to CAN/CGSB-19.24, Type 1, Class B.
- .9 Sealer: proprietary poly-siloxane resin blend.
- .10 Other concrete materials: to CAN/CSA-A23.1.

### 2.02 MIXES

- .1 Proportion concrete in accordance with CAN/CSA-A23.1.
- .2 Minimum compressive strength at 35 MPa as specified by Departmental Representative.
- .3 Nominal maximum size of coarse aggregate: to CAN/CSA-A23.1.
- .4 Slump: to CAN/CSA-A23.1.
- .5 Air content: concrete to contain purposely entrained air in accordance with CAN/CSA-A23.1, Table 10.
- .6 Admixtures: to CAN/CSA-A23.1.
- .7 Do not use calcium chloride or compounds containing calcium chloride.
- .8 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. Tests certificates to be submitted to Departmental Representative upon request.
- .9 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1-00.

- .10 Provide certification from independent testing and inspection company that mix proportions selected will produce concrete specified quality and can be effectively placed and finished for all work under this contract.

### 3 EXECUTION

#### 3.01 PREPARATION

- .1 Obtain Departmental Representative's approval before placing concrete. Provide 24 hours' notice to placing concrete.
- .2 Pumping of concrete is permitted only after approval of equipment mixture.

#### 3.02 CONSTRUCTION

- .1 Do concrete work in accordance with CAN/CSA-A23.1.
- .2 If allowable by Departmental Representative, pump concrete to following requirements.
- .1 Arrange equipment so that no vibrations result which might damage freshly placed concrete.
  - .2 Where concrete is conveyed and placed by mechanically applied pressure, provide suitable equipment.
  - .3 Operate pump so that concrete, without air pockets, is produced.
  - .4 When pumping is discontinued and concrete remaining in pipe line is to be used, void pipe line in a manner that prevents contamination of concrete or separation of ingredients.
- .3 Concrete will be deposited in all cases as neatly as practical, directly in its final position, and will not be caused to flow in a manner to permit or cause segregation.

#### 3.03 INSERTS

- .1 Cast in sleeves, ties, slots, anchors, reinforcement, frames, conduit, bolts, waterstops, joint fillers and other inserts required to be built-in. Sleeves and openings greater than 100 mm x 100 mm not indicated, must be approved by Departmental Representative.

#### 3.04 CURING

- .1 Cure and protect concrete in accordance with CAN/CSA-A23.1.
- .1 Do not use curing compounds where bond is required by subsequent topping or coating.

#### 3.05 SEALING

- .1 Following curing, apply poly-siloxane resin blend sealer at 4 m<sup>2</sup>/L.

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REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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CONCRETE GENERAL

SECTION 03 05 10  
PAGE 4

### 3.06 FIELD QUALITY CONTROL

- .1 Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by Departmental Representative.

**END OF SECTION**

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 03 20 00 - Concrete Reinforcing.
- .2 Section 03 30 00 - Cast-in-place Concrete.

### 1.02 REFERENCE STANDARDS

- .1 CSA Group (CSA)
  - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CAN/CSA O86-14, Engineering Design in Wood.
  - .3 CSA O121-08(R2013), Douglas Fir Plywood.
  - .4 CSA O151-09(2014), Canadian Softwood Plywood.
  - .5 CSA O153-13, Poplar Plywood.
  - .6 CAN/CSA O325.0-16, Construction Sheathing.
  - .7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.
  - .8 CSA S269.1-16, Falsework and Formwork.
  - .9 CAN/CSA S269.3-M92(R2003), Concrete Formwork.
- .2 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

### 1.03 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in formwork liners and coatings and include product characteristics, performance criteria, physical size, finish, and limitations.
  - .2 Submit 1 (one) electronic copy of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements, 01 35 44 - Environmental Mitigation Requirements.
- .3 All shop drawings and material lists are to contain a blank area measuring 70mm x 100mm long located near the bottom right hand corner of the drawing page. This area is to be reserved for the Departmental Representative's review stamp.

### 1.04 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Contractor must retain a professional engineer registered or licensed in Province of New Brunswick, Canada, with experience in formwork and falsework design of

comparable complexity and scope, to perform following services as part of Work of this Section:

- .1 Design of formwork and falsework:
- .2 Review, stamp, and sign fabrication and erection Shop Drawings, design calculations and amendments.

### 1.05 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect formwork from damages.
  - .3 Replace defective or damaged materials with new.

### 1.06 REQUIREMENTS OF REGULATORY AGENCIES

- .1 Construction shall conform to requirements of jurisdictional authorities; and New Brunswick Occupational Health and Safety Act and Regulations.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Formwork materials:
  - .1 For concrete, use wood and wood product formwork materials to CSA O121, finished one side, fabricated specially for use as concrete form panels, with sealed edges.
    - .1 Use only new materials.
    - .2 Plywood form panels: Douglas Fir, minimum thickness, 19mm.
    - .3 Exposed Concrete: Use panels that are smooth and free of defects which would be reproduced as concrete blemishes.
- .2 Form ties:
  - .1 For concrete: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes minimum 25 mm diameter in concrete surface.
- .3 Form release agent: Proprietary, nonvolatile material not to stain concrete or impair subsequent application of finishes or coatings to surface of concrete, derived from agricultural sources, non-petroleum containing, non-toxic, biodegradable, low VOC,.
- .4 Chamfers: Wood, 45°, cut from 25mm x 25mm nominal material, or plastic type, unless specified differently on Contract Drawings.
- .5 All thread Rebar:

- .1 Hot rolled threaded bar, 517MPa minimum yield, complete with connectors and nuts by the same manufacturer.
- .2 Anti-corrosive Paste: Denso or an approved alternative.
- .3 Exposed steel plate washers, jam nuts and paste caps to be hot dip galvanized to CSA G164.

### 3 EXECUTION

#### 3.01 FABRICATION AND ERECTION

- .1 Verify lines, levels, and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Fabricate and erect formwork in accordance with CAN/CSA S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1/A23.2.
- .3 Construct concrete formwork and provide sufficient ties and bracing to safely resist concrete pressures and other construction loadings without excessive bulging, distortion or displacement.
- .4 Construction of formwork shall permit easy dismantling and stripping in order to avoid damage to concrete during formwork removal.
- .5 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
  - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes.
- .6 Clean formwork in accordance with CSA A23.1/A23.2, before placing concrete.
- .7 Coat formwork with form release agent before reinforcement, anchors or other accessories are placed. Do not coat plywood forms, precoated with a chemical release agent.

#### 3.02 REMOVAL AND RESHORING

- .1 Remove formwork when concrete has reached 80 % of its 28 day design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.
- .2 Re-use formwork subject to requirements of CSA A23.1.

#### 3.03 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**



## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 03 10 00 - Concrete forming and accessories.
- .2 Section 03 30 00 - Cast-in-place concrete.
- .3 Section 01 33 00 - Submittal Procedures.

### 1.02 PRICE AND PAYMENT PROCEDURES

- .1 No measurement made under this Section.
  - .1 Include reinforcement costs in items of concrete work in Section 03 30 00 - Cast-In-Place Concrete.

### 1.03 REFERENCE STANDARDS

- .1 American Concrete Institute (ACI)
  - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International (ASTM)
  - .1 ASTM A 123/A 123M - 15 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A 143/A 143M-07(2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
  - .3 ASTM A 641/A 641M-09a(2014), Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
  - .4 ASTM A 775/A 775M-17, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
  - .5 ASTM A 884/A 884M-14 Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement.
  - .6 ASTM A 1064/A 1064M-17, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- .3 CSA Group (CSA)
  - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2 CAN/CSA A23.3-14, Design of Concrete Structures.
  - .3 CSA G30.18-09(R2014), Carbon Steel Bars for Concrete Reinforcement.
  - .4 CSA G40.20/G40.21-13(R2014), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .5 CSA W186-M1990(R2016), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

### 1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish, and limitations.
  - .2 Submit 1 (one) electronic copy of WHMIS Safety Data Sheet (SDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 44 - Environmental Mitigation Requirements.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
    - .1 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and SP-66.
    - .2 Indicate placing of reinforcement and:
      - .1 Bar bending details.
      - .2 Lists.
      - .3 Quantities of reinforcement.
      - .4 Sizes, spacings, locations of reinforcement, and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
      - .5 Indicate sizes, mesh, spacings and locations of chairs, spacers and hangers with identifying code markers to permit correct placement without reference to structural drawing; to CSA A23.3, to Reinforcing Steel Manual of Standard Practice - 2004 by Reinforcing Steel Institute of Canada.
    - .3 Detail lap lengths and bar development lengths to CAN/CSA A23.3, unless otherwise indicated.
      - .1 Provide type A, B, C tension lap splices unless otherwise indicated.
      - .2 Detail placement of reinforcing where special conditions occur.
      - .3 Use minimum lap lengths indicated on the drawings.
    - .4 All shop drawings and material lists are to contain a blank area measuring 70mm high by 100mm long located near the bottom right hand corner of the drawing or page. This area is to be reserved for the Departmental Representative's review stamp.
    - .5 Substitution of different size bars permitted only upon written approval from the Departmental Representative.
- .4 Quality Assurance Submittals:
  - .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
  - .2 Mill Test Report: to be submitted to Departmental Representative certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
  - .3 Upon request, submit in writing to Departmental Representative proposed source of reinforcement material.

- .4 Upon request, submit to Departmental Representative epoxy coating applicator certificates identified in Quality Assurance.

## 1.06 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .4 Handle, transport, store and install epoxy coated reinforcing steel bars to prevent damage to coating. Prevent bar-to-bar abrasion and excessive sagging. Do not drop or drag bars. Store on suitable non-metallic supports. For lifting use nylon lifting slings, padded slings, separators or other means recommended by epoxy coated reinforcing steel supplier.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Reinforcing steel: billet steel, grade 400, deformed bars to CSA G30.18, unless indicated otherwise.
- .2 Cold-drawn annealed steel wire ties: to ASTM A 1064/A 1064M.
- .3 Deformed steel wire for concrete reinforcement: to ASTM A 1064/A 1064M.
- .4 Welded steel wire fabric:
  - .1 Plain in accordance ASTM A 1064, fabricated from as drawn steel wire into flat sheets; sizes as indicated on Drawings.
  - .2 Finish:
    - .1 Galvanized: Fabricated from galvanized wire, Hot dip galvanized after welding having Class A coating in accordance with ASTM A 641/A 641M.
    - .2 Epoxy Coated: Epoxy coated after welding in accordance with ASTM A 884/A 884M, Class A coated <175 µm, Type 1 intended for use in concrete. or masonry, colour contrasting with rust.
- .5 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.
- .6 Tie wire: 1.5 mm diameter annealed wire ties, epoxy coated, to ASTM A82.

## 2.02 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA A23.1, SP-66 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
  - .1 SP-66 unless indicated otherwise.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
- .5 Fabricate reinforcing steel within following tolerances:
  - .1 Sheared length:  $\pm 25\text{mm}$
  - .2 Depth of truss bar: plus 0, minus 12mm
  - .3 Stirrups, ties and spirals:  $\pm 12\text{mm}$
  - .4 Other bends:  $\pm 25\text{mm}$

## 2.03 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of supplied material.

## 3 EXECUTION

### 3.01 PREPARATION

- .1 Galvanizing to include chromate treatment.
  - .1 Duration of treatment 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A 143/A 143M.

### 3.02 FIELD BENDING

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

### 3.03 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA A23.1.
- .2 Do not cut reinforcement either before or after concrete is placed, to permit Incorporation of other work.
- .3 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .4 Maintain cover to reinforcement during concrete pour.
  - .1 Do not relocate bars without Departmental Representative's review.
  - .2 Remove and replace any damaged bars, or as directed by the Departmental Representative.
  - .3 Clean reinforcing bars prior to concrete placement.

### 3.04 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

### 3.05 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
  - .1 Epoxy coating.
  - .2 Reinforcing steel and welded wire fabric.
- .2 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .3 Inspection or testing by Consultant not to augment or replace Contractor quality control nor relieve Contractor of contractual responsibility.

### 3.06 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

**1 GENERAL**

**1.01 RELATED REQUIREMENTS**

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 03 20 00 - Concrete Reinforcing
- .3 Section 05 50 00 - Metal Fabrications
- .4 Section 31 62 16.19 - Steel Pipe Piles

**1.02 GENERAL**

- .1 The requirements under this section is the construction and installation of new reinforced concrete anchor blocks as specified on the drawings.

**1.03 PRICE AND PAYMENT PROCEDURES**

- .1 Measurement and Payment:
  - .1 Supply and Construction of concrete reinforced anchor blocks as specified on the drawings will be paid in a lump sum. Included in the unit price are all the necessary formwork, reinforcing, anchor chains, shackles and any other item required for their full installation at the locations and elevations shown on the drawings.
  - .2 Heating of concrete and its components, and providing cold weather protection, will not be measured for payment, but will be considered incidental under this contract.
  - .3 Cooling of concrete and providing hot weather protection will not be measured but will be considered incidental under this contract.
  - .4 Installation of inserts, anchor bolts specified under various sections in this contract will not be measured separately.

**1.04 REFERENCE STANDARDS**

- .1 ASTM International (ASTM)
  - .1 ASTM C 260/C 260M-10a(2016), Standard Specification for Air-Entraining Admixtures for Concrete.
  - .2 ASTM C 309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - .3 ASTM C 494/C 494M-16, Standard Specification for Chemical Admixtures for Concrete.
  - .4 ASTM C 881/C 881M-15, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
  - .5 ASTM C 1017/C 1017M-13e1, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
  - .6 ASTM C C1059/C1059M-13, Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
  - .7 ASTM D 412-16, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
  - .8 ASTM D 624-2012, Standard Test Method for Tear Strength of Conventional

- Vulcanized Rubber and Thermoplastic Elastomer.
- .9 ASTM D 1751-04(2013)e1, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  - .10 ASTM D 1752-04a(2013), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .2 CSA Group (CSA)
- .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA A283-06-R2016, Qualification Code for Concrete Testing Laboratories.
  - .3 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005),

#### 1.05 ABBREVIATIONS AND ACRONYMS

- .1 Portland Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement types:
- .1 GU, GUb and GUL - General use cement.
  - .2 MS and MSb - Moderate sulphate-resistant cement.
  - .3 MH, MHb and MHL - Moderate heat of hydration cement.
  - .4 HE, HEb and HEL - High early-strength cement.
  - .5 LH, LHb and LHL - Low heat of hydration cement.
  - .6 HS and HSb - High sulphate-resistant cement.
- .2 Fly ash types:
- .1 F - with CaO content maximum 8%.
  - .2 CI - with CaO content 15 to 20%.
  - .3 CH - with CaO minimum 20%.
- .3 GGBFS - Ground, granulated blast-furnace slag.

#### 1.06 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and additives and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit one electronic copy of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 44 - Environmental Mitigation Requirements.

#### 1.07 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Provide Departmental Representative, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

- .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.

### 1.08 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
  - .2 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
    - .1 Modifying maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2 is prohibited.
    - .2 Deviations submitted for review by Departmental Representative.
    - .3 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
  - .3 Packaging Waste Management: in accordance with Section 01 74 21 - Waste Management and Disposal.

### 1.09 SITE CONDITIONS

- .1 Placing concrete during rain or weather events that could damage concrete is prohibited.
- .2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.
- .3 Cold weather protection:
  - .1 Maintain protection equipment, in readiness on Site.
  - .2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.
  - .3 Placing concrete upon or against surface at temperature below 5°C is prohibited.
- .4 Hot weather protection:
  - .1 Protect concrete from direct sunlight when ambient temperature above 27°C.
  - .2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.
- .5 Protect from drying.

## 2 PRODUCTS

### 2.01 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.



## 2.02 MATERIALS

- .1 Portland Cement: Type GU Sulphate Resisting Portland Cement in accordance with CSA A3001.
- .2 Machine bolts, washers to section 05 50 00 - Metal Fabrications.
- .3 Water: to CSA A23.1.
- .4 Aggregates: to CSA A23.1.
  - .1 Fine aggregate: table 10, FA1.
  - .2 Coarse aggregate: Table 11, Group 1, nominal size 20-5.
  - .3 Alkali-aggregate reactivity to meet requirements of CSA A23.2, clause 4.2.3.6.
- .5 Anchorage Adhesive for Above Water: to ASTM C881/C881M, Type IV, Grade 3, Class A, B and C.
  - .1 Acceptable products, or an approved alternative that must be submitted for review during the tender process.
    - .1 Epcon Agrilic 7 by ITM, Ramset/Red Head
    - .2 HIT HY200 Injection Adhesive System by Hilti.
    - .3 Acrylique-Tie Anchoring System by Simpson Strong-tie.

## 2.03 MIXES

- .1 The Contractor is responsible for the concrete mix design.
- .2 The Contractor must ensure that the mixture proportions are properly batched, mixed, placed and cured such that the concrete conforms to the specifications.
- .3 All other concrete shall follow a mix design as follows:
  - .1 Cement: General use Portland Cement, Type GU Sulphate Resisting Portland Cement in accordance with CSA A3001.
  - .2 Minimum compressive strength at 28 days: 35MPa
  - .3 Class of exposure: C-1 exposure from Table 2, CSA A23.1.
  - .4 Maximum water cement ratio by mass: 0.40.
  - .5 Minimum cement content: 420kg/m<sup>3</sup>.
  - .6 Curing Type: to CSA A23.1.
  - .7 Slump at time of point of discharge: 50 to 100mm.
  - .8 Air Content: 5 to 8%
  - .9 Comply with additional requirements of CSA A23.1, Clause 4.1.1.5, for concrete exposure to seawater environment (S-3).
- .4 Do not use calcium chloride or compounds containing calcium chloride.

### 3 EXECUTION

#### 3.01 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
  - .1 Provide 24 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 Place concrete in accordance with CSA A23.1. All concrete to be vibrated using high frequency vibrators.
- .4 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.
  - .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .5 Preparation prior to placing any concrete shall include:
  - .1 Formwork completed and rechecked prior to each pour.
  - .2 Ice and excess water removed
  - .3 Reinforcement is completely secure and in the correct locations. An additional check is to be done prior to each pour.
  - .4 All anchors and other embedded items, accurately located and held in position.
  - .5 Equipment and materials necessary for curing and protection of concrete shall be ready for use, before actual placement starts.
- .6 All concrete shall be placed in a space free of standing water, unless specified otherwise under this contract.
  - .1 New concrete shall be defined as concrete that has not attained its minimum specified compressive strength.
- .7 Pumping of concrete permitted only after approval of equipment and mix.
- .8 Disturbing reinforcement and inserts during concrete placement is prohibited.
- .9 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather .
- .10 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, and temperature and test samples taken.
- .11 In locations where new concrete dowelled to existing work, drill holes in existing concrete.
  - .1 Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout to anchor and hold dowels in positions as indicated.

### 3.02 INSTALLATION/ APPLICATION

- .1 Do cast-in-place concrete work to CSA A23.1.
  - .1 Do not place concrete against frozen material.
  - .2 Arrange equipment so that no any vibrations won't damage freshly placed concrete.
  - .3 If concrete is conveyed and placed by mechanically applied pressure, provide suitable equipment.
  - .4 Operate pump with a continuous stream of concrete to minimize air pockets.
- .2 Concrete temperatures during placement shall be maintained between 10°C and 25°C.
- .3 Cold Weather Requirements:
  - .1 As a minimum, the requirements of Clause 7.1.2 of CSA A23.1 shall be followed for cold weather protection.
  - .2 All materials and equipment needed for the protection and curing of the concrete in cold weather, as defined by CSA A23.1 shall be available, on site, before the concrete placement starts, on any concrete pours.
- .4 Hot Weather Requirements:
  - .1 Hot weather curing and protection shall conform to the requirements of Clause 7.1.1 of CSA A23.1.
- .5 Anchor bolts:
  - .1 All embedded items and anchor bolts shall be supplied under section 05 50 00, to the site unless noted otherwise on the drawing.
  - .2 Set anchor bolts to templates in coordination with appropriate trade prior to placing concrete.
  - .3 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.
    - .1 Formed holes: 100 mm minimum diameter.
    - .2 Drilled holes: 25 mm minimum diameter larger than bolts used to manufacturers' recommendations.
  - .4 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
  - .5 Set bolts and fill holes with shrinkage compensating grout.
  - .6 No sleeves, pipe or other openings shall pass through beams, pile caps or piers unless specified in the drawings.
- .6 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.
- .7 Finishing/protection/curing:
  - .1 Finish concrete to CSA A23.1.
  - .2 Formwork removal as specified in section 03 10 00.
    - .1 Any defects revealed after the formwork is removed are to be shown to the Departmental Representative immediately after the forms are

removed.

- .1 Contractor will submit a repair method stamped by an Engineer Registered to work in the Province of New Brunswick for review.

### 3.03 FIELD QUALITY CONTROL

- .1 Inspection, sampling, testing and reporting of concrete and concrete materials will be carried out by a registered testing consultant hired and paid by the Departmental Representative. All tests will be done as per CSA A23.2.
- .2 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .3 Alkali-aggregate reaction tests are to be performed by the concrete supplier, or certification reports must be supplied to attest the quality of the aggregates to be used. Testing and reporting cost will be paid by the Departmental Representative.
- .4 CSA A23.1 shall for the basis for acceptance, strengthening or replacement of concrete not meeting specified quality.
- .5 The Contractor is responsible to assist the inspection and testing company, by providing access to all parts of the work, as required.
- .6 If tests don't meet CSA A23.1, contractor will pay for any additional costs.
- .7 Inspection or testing by Consultant not to augment or replace Contractor quality control nor relieve Contractor of contractual responsibility.

### 3.04 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

**END OF SECTION**

## 1 GENERAL

### 1.01 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Section 05 50 00 - Metal Fabrication
- .3 Section 03 30 00 - Cast-in-Place Concrete.
- .4 Section 31 62 16.19 - Steel Pipe Piles

### 1.02 MEASUREMENT PROCEDURES

- .1 No measurement for payment will be made under this section for supply and placement of concrete to fill the steel pipe piles, but will be included in the unit bid price under section 31 62 16.19 - Steel Pipe Piles.

### 1.03 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A23.1/A23.2-00 (August 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

### 1.04 DEFINITIONS

- .1 Tremie concrete is placed underwater through tube called tremie pipe.
  - .1 Tremie pipe has a hopper at upper end and may be open ended or may have foot valve, plug or travelling plug to control flow of concrete.
  - .2 Concrete is placed in hopper and sufficient head of concrete is maintained in tremie pipe to provide desired rate of flow.
- .2 Pumped concrete method of placing concrete underwater uses concrete pump with discharge line used in similar manner to a tremie pipe.
- .3 Bottom-dump bucket method of placing concrete underwater requires use of bucket designed to discharge from bottom after it has contacted foundation or surface of previously placed concrete.
- .4 Bagged concrete method of placing underwater concrete consists of diver placing bags partially filled with dry concrete mix.

### 1.05 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Divert unused concrete materials from landfill to local facility approved by Departmental Representative.
- .4 Divert chemical additive materials from landfill to official hazardous material collections site approved by Departmental Representative.
- .5 Do not dispose of unused chemical additive materials into sewer systems, into lakes, streams, onto ground or in any other location where it will pose health or environmental hazard.
- .6 Fold up metal banding, flatten and place in designated area for recycling.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Concrete materials: to Section 03 30 00 - Cast-in-Place Concrete.

### 2.02 MIXES

- .1 Use type 50 cement.
- .2 Minimum compressive strength at 28 days: 30MPa.
- .3 Class of exposure: C-XL.
- .4 Maximum water cement ratio by mass: 0.45.
- .5 Nominal size of coarse aggregate: 20 mm.
- .6 Fine aggregate content: 45 % of total aggregate mass.
- .7 Slump at point and time of submergence: 170mm placed with tremie pipes, 100 to 125mm for pumped and bottom dumped concrete.
- .8 Admixtures: to approval of Departmental Representative. Use admixtures to correct deficiencies in mix or to improve placement of concrete.
  - .1 Departmental Representative may withdraw prior approval of admixture if conditions encountered during course of work indicate unsatisfactory results.
  - .2 Do not use calcium chloride or materials containing calcium chloride.

### 3 EXECUTION

#### 3.01 PREPARATION

- .1 Where concrete must bond to existing surfaces, clean surfaces just prior to starting concrete placement.
  - .1 Use water jets, mechanical scrapers or other means, and when quantities of mud or rock cuttings are present, remove by air lift.

#### 3.02 INSTALLATION

- .1 Do concrete work in accordance with Section 03 30 00 - Cast-in-Place Concrete to CAN/CSA-A23.1/A23.2. Testing for concrete to CAN/CSA-A23.1/A23.2, except where specified otherwise.
- .2 Where concrete placement extends above water surface, protect concrete from direct contact with air at temperature below 5 degrees C for 21 days.
- .3 Place concrete in one continuous operation to full depth required.
  - .1 Supply complete equipment for every phase of operation.
  - .2 Provide sufficient supply of concrete to complete pour without interruption.
- .4 Tremie method.
  - .1 Provide water-tight tremie pipe sized to allow free flow of concrete. Diameter of tremie pipe to be minimum 200 mm and minimum eight times maximum size of coarse aggregate.
  - .2 Provide hopper at top of tremie pipe and means to raise and lower tremie pipe.
  - .3 Provide plug or foot valve at bottom of tremie pipe to permit filling pipe with concrete initially.
  - .4 Provide minimum of one tremie pipe for every 30 m<sup>2</sup> of plan area and to maximum spacing of 6 m centre to centre. Do not move tremie pipes laterally through concrete.
  - .5 Start placement with tremie pipe full of concrete. Keep bottom of pipe buried minimum 300 mm in freshly placed concrete. Control rate of flow by varying depth of pipe bottom in concrete.
  - .6 If seal is lost, allowing water to enter pipe, withdraw pipe immediately. Refill pipe, and continue placing as specified.
  - .7 If tremie operation is interrupted so that horizontal construction joint has to be made, cut surface laitance by jetting, within 24 to 36 hours and remove loose material by pumping or air lifting before placing next lift.
  - .8 Do not place concrete in flowing water having current exceeding 3 m/min. Do not vibrate, disturb or puddle concrete after placement.
- .5 Pumped concrete method.
  - .1 Follow procedures as for tremie method in placing concrete using discharge line from concrete pump as tremie pipe.
  - .2 Pump discharge line to have minimum diameter of 125 mm.

- .6 Bottom-dump bucket method.
  - .1 Fill bucket with concrete, cover top surface and lower slowly through water to prevent backwash.
  - .2 Discharge concrete only when bucket is in contact with surface on which concrete is to be deposited.
  - .3 Withdraw bucket until it is above concrete to maintain still water at point of discharge to approval of Departmental Representative.
  - .4 Do not place concrete in flowing water having current exceeding 3 m/min. Do not vibrate, disturb or puddle concrete after placement.

**END OF SECTION**



## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Section 06 08 99 - Rough Carpentry for Minor Works.
- .4 Section 35 51 24 - Floating Wharves Installation.

### 1.02 DESCRIPTION

- .1 The work under this section will include:
  - .1 The fabrication, supply and installation of anchor bolts, machine bolts, lags crews, and all other miscellaneous bolts, nuts, washers, plates and metal parts required for the completion of the work.
  - .2 Supply and installation of inter float connections, cover plates and all associated items, as indicated on the drawings.
  - .3 Supply and installation of tire fender systems as indicated on the drawings, or as specified by the Departmental Representative.
  - .4 Supply and installation of yokes as indicated on the drawings.
  - .5 Supply and installation of an aluminum gangway.

### 1.03 MEASUREMENT FOR PAYMENT

- .1 Supply and Installation of one (1) aluminum gangway as indicated on the drawings, including and any other associated components specified on the drawings for its complete installation will be paid by the lump sum.
- .2 Supply and installation of guide piles, including all associated parts, as indicated on the drawings will be paid by the unit.
- .3 No separate payment shall be made for all other required metal components indicated in order sections, but will be included in the unit bid prices under sections 06 08 99 and section 31 62 16.19.
- .4 Payment for the supply and installation of the tire fender system, including, truck tires, galvanized chains and its full installation, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.
  - .1 Contractor will be responsible to determine the required number of tires, and the lengths of chains required for each float.
- .5 Payment for the supply and installation of the inter float connections, as indicated on the drawings will be included in the lump sum bid price under section 06 08 99.

- .6 Payment for the supply and installation of internal yokes, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.
- .7 Payment for the supply and installation of checkered cover plates and neoprene mats, as indicated on the drawings, will be included in the unit bid price under section 06 08 99.

#### 1.04 REFERENCES

- .1 ASTM International
  - .1 ASTM A 53/A 53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A 269-08, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .3 ASTM A 307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .4 ASTM B928/B928-07, Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
  - .5 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.
  - .6 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
  - .7 CSA CAN3-S16.1-M78, Steel Structures for Building-Limit States Design.
  - .8 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.
- .2 CSA International
  - .1 CSA G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3 CSA S16-09, Design of Steel Structures.
  - .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5 CSA W59-M03 (R2008), Welded Steel Construction (Metal Arc Welding) Metric. CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.
  - .6 CAN3-S157-M83, Strength Design in Aluminum.
  - .7 CSA W59.2-M1991, Welded Aluminum Construction.
  - .8 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
  - .9 CAN3-S157, Surface preparation of aluminum in contact with dissimilar materials.
- .3 Environmental Choice Program
  - .1 CCD-047-98 (R2005), Architectural Surface Coatings.
  - .2 CCD-048-98 (R2006), Surface Coatings - Recycled Water-borne.
- .4 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).

- .6 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.
- .7 CSA HA Series-M1980, CSA Standards for Aluminum and Aluminum Alloys.
- .8 CAN3-S157-M83, Strength Design in Aluminum.
- .9 CSA W59.2-M1991, Welded Aluminum Construction.
- .10 CSA W57.2-M1987, Certification of Companies for Fusion Welding of Aluminum.
- .11 CAN3-S157, Surface preparation of aluminum in contact with dissimilar materials.
- .12 ASTM B928/B928-07 Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service and Similar Environment.
- .13 CSA CAN3-S16.1-M78, Steel Structures for Building-Limit States Design.
- .14 Do welding work to CSA W59-M1989 unless specified otherwise. Submit welder's certificate for review by Departmental Representative.
- .15 ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.

#### 1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for sections, plates, pipe, tubing, bolts and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 44 - Environmental Mitigation Requirements.
    - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
  - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

#### 1.06 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying

materials comply with specified performance characteristics and criteria and physical requirements.

### 1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.
  - .1 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Bolts and anchor bolts: to ASTM A 307.
- .3 Wire nails and spikes shall conform to B111-1974.
- .4 Stainless Steel bolts: To AISI Steel Products Manual No. 13.
- .5 Cast iron: to ASTM A48-74.
- .6 Lag crews and Machine Bolts:
  - .1 Lags crews shall meet the requirements of B18.23-8-M1979.
  - .2 Machine bolts will have standard heads, nuts, and threads and when in position will be of sufficient length to permit a full nut and two washers. Threads shall be the Coarse Thread Series as specified in the latest issue of ANSI B1-1 having a Class 2A tolerance.
  - .3 Standard cast iron washers suitable for the sizes of bolts specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces unless noted otherwise on drawings. Ogee washers to Timber Institute of Canada and as follows: ogee washers to be cast iron free from injuries, defects or impurities.
  - .4 As an alternative to ogee washers, standard plate washers can be used.

The washer is to be three times bolt diameter and a minimum thickness of 6mm unless noted otherwise.

- .7 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610g/m<sup>2</sup> to CSA G164-M1981. All anchor bolts, machine bolts, spikes, lags crews, nuts, washers, to be galvanized.
- .8 Galvanized primer: to CSB 1-GP-183M.
- .9 Steel sections, bars, tie rods, anchor dowels, plates and washers: to CSA G40.21-M1981, Type 300W.
- .10 Steel Pipe: to ASTM-A53.
- .11 13mm diameter galvanized steel mooring chain for tire fender assemblies: Crosby Spectrum 3, 13mm diameter, working load Limit, 4500 Kilograms.
- .12 Safety Chain between floats: Crosby Trawlex long link 19mm, minimum breaking load of 45 tonne or an approved equivalent.
- .13 Shackles to fit as required: grade 30.
- .14 Mooring Cleats: cast iron cleats to ASTM A48, 508mm B1 style with a capacity of 13kg as per the type shown on the drawings.
- .15 Mooring Cleat Paint:
  - .1 Primer coat: Inorganic zinc to CGSB standard 1-GP-171M (min. 85% zinc in dry film);
  - .2 Intermediate coat: High build epoxy polyamide to CGSB standard 1-GP-193Ma;
  - .3 Top coat: High build epoxy polyamide to CGSB standard 1-GP-193Ma;
  - .4 All paint material to be compatible with surface to which it is being applied.
  - .5 Colour of intermediate and top coat of mooring cleats to be orange.
- .16 Rubber Units for Inter Float Connections: 178 mm x 254 mm x 200 mm marine engineered rubber. Weight: 57.3 kg/m. Reaction: 119 tonne/m. Energy: 4.5 tonne/m.
- .17 Adhesive anchoring system to be HVA Capsule Adhesive Anchor System by Hilti or approved equal.
- .18 Welding materials: to CSA W59, latest edition.
- .19 Welding electrodes: to CSA W48 Series.
- .20 Aluminum chequered cover plates and inter float cover plates: Alloy 5052 - H321, or an approved alternative.
- .21 Neoprene mat: ASTM D2000-90 type BG

## 2.02 FABRICATION

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Use self-tapping shake-proof flat, round headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 All steel members and assembled units shall be hot dip galvanized to CSA G164-M81 (610g/m<sup>2</sup>) unless specified otherwise. All welded units are to be completed, including punching of connection bolt holds, prior to the units being hot dip galvanized.
- .6 Checkered Cover Plates: fabricate in accordance with ASTM B928/B928-07.
- .7 Pre-assembly of the framework shall be carried out to ensure no cutting, welding, or other fabrication will be necessary subsequent to hot dip galvanizing.
- .8 The fabrication of all structural steel shall conform to the requirements of CSA CAN3-S16.1-M78 unless specified otherwise.

## 2.03 ISOLATION COATING

- .1 Isolate aluminum from following components, by means of bituminous paint:
  - .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
  - .2 Concrete, mortar and masonry.
  - .3 Wood.

## 2.04 FINISHES

- .1 Galvanizing: hot dipped galvanizing with zinc coating 610 g/m<sup>2</sup> to CAN/CSA-M81.
- .2 Shop coat primer: to CAN/CGSB-1.40.
- .3 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

## 3 EXECUTION

### 3.01 ERECTION

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
  - .1 Do not deviate the size, length and location of welds from details shown on reviewed shop drawings.
  - .2 Use qualified fabricators and welders in accordance with CSA W47.2.

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**REPLACEMENT AND INSTALLATION**  
**STUART TOWN WHARF**  
**DEER ISLAND**  
**CHARLOTTE COUNTY, N.B.**  
**PROJECT NO. R.112435.001**

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**METAL FABRICATIONS**

**SECTION 05 50 00**  
**PAGE 7**

- .3 All welds will be subject to visual inspection requirements of CSA W59.
- .4 Welds which fail the visual inspection will be Subject to further non-destructive testing. This testing may be radiographic, magnetic particle investigation, ultrasonic, or other appropriate testing. The full length of the weld will be examine of the weld.
- .5 If more than 50% of the welds fail the visual inspection requirements, all welds will be tested by non-destructive testing methods.
- .6 The Contractor will be responsible for all costs for non-destructive testing, resulting from visual inspection failure.
- .7 The Contractor will be responsible for all costs for welding repairs as a result of faulty workmanship or materials as determined from visual inspection and or subsequent non-destructive testing.
- .8 Departmental Representative will not approve any weld until all required inspection is completed, found acceptable and marked as such.
  
- .2 Inspection and testing of materials and workmanship may be carried out by testing laboratory designated by Departmental Representative.
- .3 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .4 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .5 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .6 Provide components by other sections in accordance with shop drawings and schedule.
- .7 Make field connections with bolts to CAN/CSA-S16.1, or weld.
- .8 Hand items over for casting into concrete to appropriate trades together with setting templates.
- .9 Touch-up field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .10 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
- .11 Surface preparation of aluminum in contact with dissimilar materials to CAN3-S157. All locations to be treated as if they were in presence of moisture.
- .12 Obtain written permission from Departmental Representative prior to field cutting or altering of structural members.
- .13 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight

- joints and intersections.
- .14 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
  - .15 Exposed fastening devices to match finish and be compatible with material through which they pass.
  - .16 Supply components for work by other trades in accordance with shop drawings and schedule.
  - .17 Make field connections with bolts to CSA S16 or Weld field connection.
  - .18 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of:
    - .1 Primer: maximum VOC limit 250 g/L to GS-11.
  - .19 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.
    - .1 Primer: maximum VOC limit 250 g/L to GS-11.
  - .20 Predrill holes for lags crews in accordance with CSA 086-M84.
  - .21 Machine bolts will have standard heads, nuts and threads and when in position will be of sufficient length to permit a full nut and two washers. Holes for machine bolts will be bored to the same diameter as that of the bolts.
  - .22 Machine bolts will be placed in the work with their heads on the outside. The heads of the machine bolts that interfere with succeeding parts of the work being placed, or where directed by the Departmental Representative or shown on the drawings will be countersunk.
  - .23 Standard cast iron washers or steel washers of the sizes indicated will be placed under the heads and nuts of all machine bolts bearing on timber surfaces, except where specified otherwise.
  - .24 Where indicated, use steel washers of size shown.
  - .25 Holes for spikes will be bored 1.5mm smaller than diameter of spike and 50mm less than the length of spike.
  - .26 Provide suitable and acceptable means of anchorage, such as dowels, anchor clips, bar anchors, bolts and washers, etc. as indicated on the drawings.
  - .27 Erect gangway as indicated on the drawings and in accordance with CANS157 and reviewed shop drawings.
    - .1 Gangway hinge plate to be secured to the existing concrete landing with four M24 x 290 adhesive anchors using an approved resin anchorage system.
    - .2 45 mm diameter hole to be drilled for bronze bushing to be pressed into place.
  - .28 New Aluminum checkered inter float connection cover plates will be secured to



the new neoprene matt with 13mm diameter x 25.4mm long carriage bolts c/w washer and nut as indicated on the drawings.

- .1 Neoprene matte will be secured to the existing stringers and top and middle longitudinal with a 13mm diameter x 150mm long lags crews as indicated on the detail.

### 3.02 STEEL TO STEEL CONNECTIONS

- .1 All steel to steel bolted connections to have high strength steel bolts.
- .2 All high strength bolts to be 19 mm minimum diameter unless noted otherwise on the drawings.

### 3.03 PAINTING OF MOORING CLEATS

- .1 Surface preparation:
  - .1 Sand or grit blast in accordance with SSPC-SP5.
  - .2 When sandblasting is completed remove dust by brush or vacuum prior to painting.
  - .3 Apply first coating of paint same day as sand or grit blasting is completed.
  - .4 Remove oil, grease or organic matter, with approved solvents or detergents prior to painting.
- .2 Application:
  - .1 Apply three coatings, each in accordance with manufacturer's recommendations.
  - .2 First coat, inorganic zinc primer applied to average .075 mm dry-film thickness and minimum .065 mm thickness.
  - .3 Second and third coatings, to an average single coat dry-film thickness of .18 mm. Ensure adhesion between coats.
  - .4 Coatings to be free from sags and runs.

### 3.04 PROTECTION

- .1 Take necessary care in handling, packing and shipping of all galvanized steel members to prevent damage to the galvanized coating. Evidence of damage to the galvanized members due to mishandling or lack of adequate protection shall be cause for rejection of the members.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by metal fabrications installation.

### 3.05 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.

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FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO. R.112435.001

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METAL FABRICATIONS

SECTION 05 50 00

PAGE 10

- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

**END OF SECTION**

## 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 01 33 00 - Submittal Procedures.

### 1.02 REFERENCE STANDARDS

- .1 CSA Group (CSA)
  - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .2 American Society for Testing and Materials (ASTM International)
  - .1 ASTM A 307-00, Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
- .4 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.28-98, Exterior, Alkyd, House Paint.
  - .2 CAN/CGSB-1.40-M97, Anti-corrosive, Structural Steel Alkyd Primer.
  - .3 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
  - .4 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
  - .5 CGSB 31-GP-107Ma-90, Non-inhibited, Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .5 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-080 Series-97 (February 2000), Wood Preservation.
  - .2 CAN/CSA-G164-M92 (R1998), Hot Dip Galvanizing of Irregular Shaped Articles.
  - .3 CAN/CSA-O141-91 (R2004), Softwood Lumber.
- .6 National Research Council Canada (NRC)
  - .1 National Building Code of Canada 2015 (NBC).
- .7 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2017.
  - .2 CSA International

### 1.03 MEASUREMENT FOR PAYMENT

- .1 Supply and delivery of timber floats as specified on the drawings will be paid by the unit, included in this bid item are the marine pressure treated timber members, foam filled float containers, empty float containers, inter float connections, inter float checkered cover plates, neoprene mattes, carriage bolts, nuts, washers, safety chain connections, cleats, yokes, tire fender system, etc, as specified on the drawings.

Note: Inter yokes are being constructed for future use, therefore decking will be installed over them, as indicated on the drawings.

### 1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for rough carpentry work and include product characteristics, performance criteria, physical size, finish and limitations.

### 1.05 SUSTAINABLE DESIGN SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures to confirm that products and procedures conform to specified sustainability requirements.
- .2 Submit manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809.

### 1.06 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Sustainable Standards Certification:
  - .1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809.

### 1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect wood from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Use timber graded and stamped in accordance with applicable grading rules and standards of Associations or Agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA in accordance with following standards:
  - .1 Species to CAN3-086-M84 and CAN/CSA-0141.
    - .1 Dimension Timber (treated): Douglas Fir, Pacific Coast Hemlock, or Eastern Hemlock.
    - .2 Grade: No. 1 Structural.
    - .3 Grading Authority: NLGA Standard Grading Rules for Canadian Lumber.
    - .4 Preservative Treatment to section 06 30 00 - Wood Treatment.

- .2 Miscellaneous Metals
  - .1 Miscellaneous Metals to section 05 50 00.

## 2.02 ACCESSORIES

- .1 Fasteners: to CAN/CSA-G164, for pressure-preservative treated lumber.
- .2 Nails, spikes and staples: to CSA B111.
- .3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fiber plugs, recommended for purpose by manufacturer.
- .5 Float containers: sizes as indicated on the drawings, wall thickness 4mm, Roto Molded - one piece construction, EPS Foam, Virgin Grade LLD polyethylene with UV inhibitors, buoyancy 30+lbs/ft, sizes as indicated on the drawings, as sold by Marine Systems International Inc, or an approved alternative.
  - .1 Empty containers are the same, minus the EPS Foam, sizes as indicated on the drawings. Holes in the empty containers are to be carefully made as not to affect the integrity of the container
- .6 Wood preservatives in accordance with section 06 30 00.
- .7 Metal items in accordance with section 05 50 00.

## 3 EXECUTION

### 3.01 INSTALLATION

- .1 Comply with requirements of National Building Code of Canada (NBC), supplemented by the following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 Install fasteners in accordance with section 05 50 00 - Metal Fabrications.
- .6 Do Installation of dimension timber to CSA 086-M84.
- .7 Pre-cut timber prior to preservative treatment.
- .8 Ensure that all timber, including any blocking fillers, are straight, true, square and fit neatly to abutting surfaces.
- .9 Standard Plate Steel Washers suitable for the sizes of the bolts specified will be placed under the heads and nuts of all machine bolts bearing on timber surfaces, except where specified otherwise.

**SCH  
FLOATING WHARVES  
REPLACEMENT AND INSTALLATION  
STUART TOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO. 723261**

**ROUGH CARPENTRY FOR MINOR  
WORKS**

**SECTION 06 08 99  
PAGE 4**

- .10 Secure 200mm x 200mm crossties and 200mm x 200mm longitudinal to 200mm x 200mm binder posts with 22mm diameter machine bolts.
- .11 Secure 38mm x 184mm strappings to longitudinal with 12.7mm diameter x 150mm long spikes as indicated.
- .12 Secure 75mm x 100mm timber ballast supports with 150mm long spikes as indicated.
- .13 Install 100mm x 200mm stringers spaced and spliced as shown on the plans. Secure each stringer to its supporting 200mm x 200mm with a 19mm diameter x 350mm long lagscrew at the top.
- .14 The decking will be placed in the direction shown on the Plan. A 5mm gap will be left between adjacent planks to allow water to run off. The planks will be secured to the stringers with #12 x 150mm long stainless steel screws, two at each end and one at each crossing. Pre-drill holes in decking and install screws to be head flush with top of deck.
- .15 Chocks to be secured with two (2) 200mm spikes to the guard to prevent rotation.
- .16 The timber wheelguards will rest on 50mm x 200mm x 300mm chocks at approximately 1500mm intervals. They will be secured through every chock and top longitudinal with a 19mm diameter machine bolt countersunk in the wheelguard.
- .17 The exact location of the mooring cleats will be as indicated on the details for the various floats. The cleats will be fastened to the float with two (2) - 19mm diameter machine bolts, through the decking and longitudinal.
- .18 Float Containers as indicated on the drawings.

**3.02 FIELD CUTTING TREATED MEMBERS**

- .1 Field cuts are not permitted.
- .2 Treat, in field, cuts and damage to surface of treated material with an appropriate preservative as described in CSA O80 Series-97. Ensure that damaged areas such as abrasions, nail, bolt and spike holes are thoroughly saturated with field treatment solutions as per CSA O80 Series-97.

**3.03 DELIVERY OF FLOATS**

- .1 Contractor will submit for review the means of delivery and offloading the floats onsite.
- .2 Any damages that may occur during delivery and offloading will be repaired by the Contractor at no additional cost under this contract.
- .3 Contractor to make arrangements with the Departmental Representative prior to delivery, to have the floats verified at construction location and then organize the time and date of the delivery to have the Departmental Representative on site.

**END OF SECTION**

## **1 GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 05 50 00 - Metal Fabrications.
- .3 Section 06 08 99 - Rough Carpentry for Minor Works: Incorporation of treated wood into wood frame construction and other carpentry work; sustainability requirements for wood products.

### **1.02 REFERENCE STANDARDS**

- .1 CSA Group (CSA)
  - .1 CSA O80 Series-2015, Wood Preservation.
  - .2 CSA O322-15, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.
  - .3 NLGA Standard grading rules for Canadian Lumber 1980 edition or most recent edition at time of tendering.

### **1.03 MEASUREMENT FOR PAYMENT**

- .1 No payment is to be made under this section. Include costs in the unit bid price specified in applicable sections where treatment is required.

### **1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality assurance submittals:
  - .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 AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
    - .2 Moisture content after drying following treatment with water-borne preservative.

### **1.05 SUSTAINABLE DESIGN SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures to confirm that products and procedures conform to specified sustainability requirements.

- .2 Submit evidence that work of this Section incorporates required percentage of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
- .3 Submit vendor's/manufacturer's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.

### 1.06 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 Inspection and testing of insert materials will be carried out by a Testing Laboratory designated by Departmental Representative.
- .3 Departmental Representative will pay for costs of tests as specified in Section 01 29 00 - Payment Procedures.

### 1.07 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and Section 06 08 99 - Rough Carpentry for Minor Works, with AWPA M4.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with product category, manufacturer's name and address.

## 2 PRODUCTS

### 2.01 SUSTAINABLE REQUIREMENTS

- .1 Wood preservation plants: certified by Canadian Wood Preservation Authority (CWPCA) to Environment Canada Technical Recommendation Document for the Design and Operation of Wood Preservation Facilities.

### 2.02 PRESERVATIVE TREATED WOOD MATERIALS AND APPLICATION

- .1 Provide preservative treated lumber in accordance with CSA O80 Series, table 1 and its references for coastal waters.

.1	CCA	ACA	kg/m <sup>3</sup>
	Douglas Fir	24	24
	Pacific Coast	24	24
	Eastern Hemlock	24	24



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STUARTTOWN WHARF  
DEER ISLAND  
CHARLOTTE COUNTY, N.B.  
PROJECT NO.723261

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WOOD TREATMENT

SECTION 06 30 00

PAGE 3

## 2.03 CORROSION PROTECTION FOR CONNECTORS AND FASTENERS FOR USE WITH TREATED WOOD

- .1 Connectors: Fabricated from steel sheet galvanized in accordance with ASTM A 653 to minimum G185 coating or galvanized post fabrication to ASTM A 123, Type 304/316 stainless steel sheet to ASTM A 480.
- .2 Fasteners: Hot dip galvanized to ASTM A 153/A 153M Class C.

## 3 EXECUTION

### 3.01 NOT USED

- .1 Not used.

END OF SECTION

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**1 GENERAL**

**1.01 Related Sections**

- .1 Section 03 37 26 - Underwater Placed Concrete.
- .2 Section 31 62 16.19 - Steel Pipe Piles.

**1.02 MEASUREMENT PROCEDURES**

- .1 Work under this Section will not be measured, but is to be included in the unit bid price under section 31 62 16.19.

**1.03 DELIVERY, STORAGE AND HANDLING**

- .1 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.
- .2 Replace damaged piles to satisfaction of Departmental Representative.

**1.04 EXISTING CONDITIONS**

- .1 Notify Departmental Representative immediately in writing if subsurface conditions at site differ from those indicated.

**1.05 SCHEDULING**

- .1 Submit schedule of planned sequence of driving to Departmental Representative for review, not less than 2 weeks prior to commencement of pile driving.

**1.06 SUBMISSIONS**

- .1 Methodology:
  - .1 Provide methodology including type of pile driving equipment to carry out the work.
- .2 Provide submissions in accordance with Section 01 33 00.

**2 PRODUCTS**

**2.01 MATERIALS**

- .1 Material requirements for piles are specified in Sections 31 62 26.19 - Steel Pipe Piles and Sections.
- .2 Piles that require splices: Provide details for Departmental Representative review. Design details of splice to bear dated signature stamp of professional engineer registered or licensed in province of New Brunswick, Canada.

- .3 Welding materials: to CSA W48.1.
- .4 Pile shoes to be ring type with same internal diameter as pipe piles. Provide details for Departmental Representative's approval.

### 3 EXECUTION

#### STEEL PILES

##### 3.01 EQUIPMENT

- .1 Prior to commencement of pile installation, submit to Departmental Representative, details of equipment for installation of piles.
  - .1 Impact hammers: give manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.
  - .2 Non-impact methods of installation such as augering, jacking, vibratory hammers or other means: give full details of characteristics necessary to evaluate performance.
- .2 Hammer: Supply a hammer of suitable size to advance the piles to achieve necessary end resistance. The hammer selected will be of sufficient energy so as not to damage the piles. Hammer(s) to be a variable energy type capable of delivering between 40 and 100 kJ of energy per blow on a sustained basis. All steel pipe piles to be driven to bedrock or as approved by Departmental Representative.
- .3 Leads:
  - .1 Construct pile driver leads to provide free movement of hammer. Hold leads in position at top and bottom, with guys, stiff braces, or other means reviewed by Departmental Representative, to ensure support to pile while being driven. Inclined leads to be used for battered piles.
  - .2 Length: except for piles driven through water, provide length of leads so that use of a follower is unnecessary.
  - .3 Swing leads:
    - .1 Firmly guy top and bottom to hold pile in position during driving operation. Method to be reviewed by Departmental Representative.
- .4 Followers:
  - .1 When permitted, provide followers of such size, shape, length and mass to permit driving pile in desired location to required depth and resistance. Provide followers with socket or hood carefully fitted to top of pile to minimize loss of energy and prevent damage to pile.
  - .2 Drive applicable load test piles using similar follower.
- .5 Other Equipment:
  - .1 Any other equipment necessary to advance the piles.

##### 3.02 PREPARATION

- .1 Ensure that conditions and equipment at pile locations are adequate to support

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pile driving operation and load testing operation. Make provision for access and support of piling equipment during performance of work.

### 3.03 FIELD MEASUREMENT

- .1 Maintain accurate records of driving for each pile, including:
  - .1 Type and make of hammer, stroke or related energy.
  - .2 Other driving equipment including water jet, driving cap, cushion.
  - .3 Pile size and length, location of pile in pile group, location or designation of pile group.
  - .4 Sequence of driving piles in group.
  - .5 Number of blows per meter for entire length of pile and set for last blows number of blows per 25 mm for last 300 mm.
  - .6 Final tip and cut-off elevations.
  - .7 Other pertinent information such as interruption of continuous driving, pile damage.
  - .8 Record elevation taken on adjacent piles before, during and after driving of each pile.
- .2 All measurements, observations and calculations associated with pile driving analyzer and wave equation analysis.
- .3 Provide Departmental Representative with one (1) electronic copy of records.

### 3.04 DRIVING

- .1 Use driving caps and cushions to protect piles. Reinforce pile heads if necessary. Piles with damaged heads as determined by 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 pile is not overstressed.
- .5 Piles that are to be socketed are to be driven into bedrock surface with only sufficient drive energy to obtain an adequate seal to allow cleanout and installation of sockets. Take special precaution to ensure no damage occurs to pile that would impair cleanout and socket installation.
- .6 Ensure no contact between pile and structure takes place when driving batter piles adjacent to existing structures.
- .7 Restrike already driven piles lifted during driving of adjacent piles to assure set.
- .8 Remove loose and displaced material from around piles after completion of driving, and leave clean, solid surfaces to receive foundation concrete.
- .9 Use of water jet:
  - .1 If permitted, provide details for Departmental Representative's review

- 
- approval.
- .2 Restriction: if, during operation, conditions are found to be unacceptable, as determined by Departmental Representative, stop using water jet.
- .10 Cut off piles neatly and squarely at elevations as indicated on the drawings. Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.
  - .11 Remove cut-off lengths from site on completion of work.

### 3.05 DRIVING TOLERANCES

- .1 Pile heads to be within 75 mm of locations as indicated.

### 3.06 OBSTRUCTIONS

- .1 Piles to be driven to bedrock. Piles driven to boulders not acceptable. Bedrock elevations to be determined from borehole data.

### 3.07 REPAIR/RESTORATION

- .1 Pull out rejected piles and replace with new piles.
- .2 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

### 3.08 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 such that no damage occurs to adjacent existing structures. If damaged, remedy damaged items to restore to original or better condition at own expense.

**END OF SECTION**

## 1 GENERAL

### 1.01 RELATED SECTIONS

- .1 35 51 24 - Floating Wharves Installation.
- .2 03 05 10 - Concrete General.
- .3 03 37 26 - Underwater Placed Concrete.
- .4 31 61 13 - Pile Foundations, General Requirements.

### 1.02 MEASUREMENT FOR PAYMENT

- .1 Preparation, and driving of steel pipe piles acceptably incorporated into work will be paid by the unit. Including in this work will be the supply and installation pile splices, pile shoes and guide pile connections.
  - .1 Included in this bid item will be the Underwater placed Concrete specified under section 03 27 26
  - .2 Supply and Installation of Cathodic Protection will be included in The unit bid price under this section as indicated on the drawings.

Note: Steel Pipe Piles are supplied by a third party and will be delivered on site. Sizes as indicated on the drawings, lengths specified in section 01 11 00.

### 1.03 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A 106/A 106M-04b, Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
  - .2 ASTM A 252-98(2002), Standard Specification for Welded and Seamless Steel Pipe Piles.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.171-98, Inorganic Zinc Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CSA-G40.20/G40.21-2004, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel Structures.
  - .3 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
  - .4 CSA W59-03, Welded Steel Construction Metal Arc Welding, metric version.
  - .5 CSA-Z245.1-02, Steel Pipe.

### 1.04 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data: submit manufacturer's printed product literature, specifications and datasheet.
- .3 Submit shop drawings and indicate: pile shoes, driving cap, tip reinforcement.
- .4 Quality Assurance: test reports:
  - .1 Prior to fabrication, and, if requested, provide Departmental Representative with two copies of steel producer's certificates in accordance with ASTM A 252.
  - .2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

## 2 PRODUCTS

### 2.01 MATERIALS

- .1 Steel pipe: seamless, of sizes and wall thicknesses indicated, bevelled cut ends to API SPEC 5L, grade 3.
- .2 Pipe material have the following minimum properties:
  - .1 Yield strength: 310MPa.
  - .2 Tensile strength: 450MPa.
  - .3 Elongation at rupture: 20%in 50mm.
  - .4 Weldable steel: to ASTM A 106/ASTM A106M carbon equivalent less than 0.55%.
- .3 Pipe chemical composition: to ASTM A 252.
- .4 Pipe allowable tolerances:
  - .1 Deviation from straight line, specified diameter, wall thickness and Out-of-roundness on body of pipe and at pipe ends to conform to API SPEC 5L.
  - .2 Pipe to be checked for deviations before leaving mill.
  - .3 Pile length: plus or minus 18m.
- .5 Pile tip reinforcement: to CSA-G40.20/G40.21, Grade 300W.
- .6 Pile driving shoes: to CSA-G40.20/G40.21, Grade 300W.
- .7 Pile driving caps: to CSA-G40.20/G40.21, Grade 300W.
- .8 Welding electrodes: to CSA W48 series.
- .9 Concrete: in accordance with Section 03 37 26 - Underwater Placed Concrete.
- .10 Anodes: Sacrificial Anodes to be Renode II Anode No. Rm 37 FM as manufactured by Reynolds Metal Co, or an approved alternative.

### 3 EXECUTION

#### 3.01 MANUFACTURER'S INSTRUCTIONS

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

#### 3.02 FABRICATION

- .1 Pipe pile splicing will be required.
- .2 Allowable tolerance on axial alignment to be 0.25% as measured by 3m straight edge.
- .3 Allowable deviation from straight line over total length of fabricated pile to be 50mm.
- .4 Remove piles which are not within required tolerances and replace at no additional cost to the contract.
- .5 Install pile tip reinforcement, driving shoes as indicated.
- .6 Repair defective welds as approved by Departmental Representative.
  - .1 Repairs: to CSA W59.
  - .2 Unauthorized weld repairs may be rejected.
- .7 Repair damaged exterior protective coating of piles.
- .8 The Contractor shall be responsible to remove all Foreign materials and water from within the entire length of the pile, at no cost to the Contract.

#### 3.03 INSTALLATION

- .1 Install piling in accordance with Section 31 61 13 - Pile Foundations, General Requirements.
- .2 If approved by Departmental Representative, splice piles in place during installation by welding.
  - .1 To prevent distortion, tack opposite points first and then weld opposite sections.
  - .2 Make splice by complete joint penetration groove welds as indicated on shop drawings.
- .3 Perform internal visual inspection of steel pipe, joints and base prior to placing of concrete.
  - .1 Ensure pipe inside is free from foreign matter.
- .4 Install concrete in accordance with Section 03 30 00 - Cast-in-Place



Concrete.

- .5 Fill steel pipe pile with concrete using methods to limit free fall and to prevent segregation.
  - .1 Ensure adequate vibration to completely fill cross section of pipe.
- .6 Install pile driving caps as indicated.
- .7 Install driving shoes as part of field work.

### 3.04 WELDING

- .1 Weld to CSA W59.
- .2 Welding certification of companies: to CSA W47.1.
- .3 Welding certification of companies welding steel reinforcing bars placed in reinforced concrete: in accordance with CSA W186.

**END OF SECTION**

## **1 GENERAL**

### **1.01 DESCRIPTION**

- .1 This section specifies the general requirements for the installation of Floating wharves to the newly placed steel pipe piles and concrete anchor blocks. Installation of the floating wharves as indicated on the plan.

### **1.02 RELATED WORK**

- .1 Section 03 30 00 - Cast-in-Place Concrete
- .2 Section 05 50 00 - Metal Fabrication
- .3 Section 31 62 16.19 - Steel Pipe Piles

### **1.03 MEASUREMENT FOR PAYMENT**

- .1 Payment for floating wharves installation on steel pipe piles and anchor blocks will be made by a lump sum payment. This will include the furnishing, all equipment necessary for the complete float installation, to the locations and elevations shown on the drawings.

### **1.04 DELIVERY AND HANDLING**

- .1 Protect floating wharves from damage due to excessive bending stresses, impact, or other causes during handling.
- .2 Protect public and construction personnel, adjacent structures and work of other sections from hazards attributable to handling and moving of new floating wharves.

## **2 PRODUCTS**

### **2.01 MATERIALS**

Not used.

## **3 EXECUTION**

### **3.01 INSTALLATION OF FLOATS**

- .1 Method of pickup and placing of floating wharves in water is to be submitted as per section 01 33 00, for the Departmental Representative's review.

- .2 Any damage during launching is to be repaired and paid by the Contractor, at no additional cost to the Crown.
- .3 Contractor will check for any excessive movement in the float installation over two full tides. Contractor will make any necessary adjustments, if any excessive movements is seen or indicated by the Harbour Authority or the Departmental Representative, to the approval of the Departmental Representative

### **3.02 FLOATING WHARVES ANCHORAGE**

- .1 Floating wharves are to be anchored as indicated on the plan.

**END OF SECTION**