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Number R.079830.001		2017-09-05

Project Title Tobermory SAR Station - Breakwater & Floating Dock Repairs

Project Number R.079830.001

Project Date 2017-09-05

Design Professionals:



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Structural Engineer

END OF SECTION

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END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF THE WORK

- .1 The principal elements of the work are in accordance with the following:
 - .1 Demolition, removal and disposal of the existing floating docks, access ramps, pedestals, lighting and associated hardware. Also includes removal and disposal of the existing concrete floating breakwater anchoring lines and connections as indicated on the drawings;
 - .2 Supply and installation of new steel pipe floating dock including access ramps and anchoring system;
 - .3 Supply and installation of new mooring lines and connecting hardware for the existing concrete floating breakwater; and
 - .4 Complete restoration of surrounding areas that are affected by the construction activities.

1.2 DESIGN

- .1 The drawings included in the contract documents relating to the floating docks are only intended to illustrate the general arrangement and overall dimensions. These drawings shall not be considered as complete design drawings, working drawings or shop drawings.
- .2 The contractor will engage the services of a qualified professional engineer licensed in the Province of Ontario to develop the detailed design of the floating docks based on the concepts shown on the contract drawings and requirements listed in the specifications.
- .3 Four sets of the design drawings prepared by the Contractor's Engineer, engaged to develop the detailed design of the floating docks will be submitted to the Departmental Representative for review and record. Each drawing submitted shall bear the signature and seal of the design engineer engaged by the contractor to undertake the design.
- .4 After review two sets of drawings will be returned to the contractor for his record and distribution.

1.3 MINIMUM STANDARDS

- .1 Execute work to meet or exceed:
 - .1 National Building Code of Canada 2015, National Fire Code of Canada 2015, Ontario Building Code 2012 and any other code of provincial or local application, including all amendments up to project date, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
 - .2 Rules and regulations of authorities having jurisdiction.
 - .3 Fire Commissioner of Canada, No. 301, Standard for Construction Operations, and No. 302, Standard for Welding and Cutting, June 1982 and Fire Protection Standard for Correctional Institutions - Treasury Board Personnel Management Manual, Occupational Safety and Health, Chapter 3-6, Feb. 1992.
 - .4 Observe and enforce construction safety measures required by National Building Code 2012, Part 8 Safety Measures at Construction and Demolition Sites, Occupational Health and Safety Act and Regulations for

Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, O. Reg. 213/91 as amended, Workplace Safety and Insurance Board and municipal statutes and authorities.

.5 Environmental Protection Act, O. Reg. 102/94 and O. Reg. 103/94.

1.4 TAXES

- .1 Pay applicable Federal, Provincial and Municipal taxes.

1.5 FEES, PERMITS AND CERTIFICATES

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits when requested.

1.6 EXAMINATION

- .1 Examine existing conditions and determine conditions affecting work.
- .2 Contractor is to perform above and below water inspections as required to confirm the condition and code compliance of all existing items that are to remain or that are to be re-used.

1.7 DOCUMENTS

- .1 Keep one copy of contract documents on the site.

1.8 ELECTRONIC SUBMITTALS

- .1 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files. Forward pdf, MS Word, MS Excel, MS Project and Autocad dwg files; on USB compatible with PWGSC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.

1.9 AS-BUILT RECORD DRAWINGS AND SPECIFICATIONS

- .1 As work progresses, record significant deviations from the Contract Drawings in red using AutoCAD, onto Contract Drawings.
- .2 Lettering and numbers in size to match original. Add at each title block and on each specification, note: "AS BUILT RECORD".
- .3 Provide table of contents and indicate each specification section number and title of specification sections marked with "AS-BUILT" information.
- .4 Indicate any deviations from the Contract Specifications in red using electronic means.
- .5 Record following significant deviations:
 - .1 Horizontal and vertical location of underground utilities and

- appurtenances referenced to permanent surface improvement.
- .2 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .3 Field changes of dimension.
 - .4 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.
 - .5 Alternative materials and systems installed replacing original materials and systems specified by trade name.
- .6 Submit two hard copies of as-built drawings and specifications to Departmental Representative and three copies to the Owner.
 - .7 Submit electronic copies to Departmental Representative and Owner.
 - .8 If project is completed without significant deviations from contract drawings and specifications declare this in writing and submit to Departmental Representative in lieu of As-Built Record Drawings and Specifications.

1.10 PRODUCT DATA

- .1 Prior to submission check and certify as correct, shop drawings and product data sheets. Issue to the Departmental Representative each submission at least 14 days before dates reviewed submission will be needed.
- .2 Submit 3 prints and 1 electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .3 Responsibility for errors, omissions or deviations from requirements of Contract Documents is not relieved by the Departmental Representative's review of submittals.

1.11 CONSTRUCTION PHOTOGRAPHS

- .1 Submit electronic and hard copy of colour digital photography in jpg format, fine resolution.
- .2 Identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints and location of viewpoints determined by Departmental Representative.
- .4 Frequency: as directed by Departmental Representative.

1.12 ADDITIONAL DRAWINGS

- .1 Departmental Representative may furnish additional drawings to clarify work.
- .2 Such drawings become part of Contract Documents.

1.13 PROTECTION

- .1 Protect existing work from damage.
- .2 Replace damaged existing work with material and finish to match original.
- .3 Protect existing trees and plants on site and adjacent properties.

1.14 EXISTING SERVICES

- .1 Establish location, protect and maintain existing utility lines.

1.15 TEMPORARY FACILITIES AND SERVICES

- .1 Provide and maintain temporary facilities and services required to carry out work.
- .2 Remove temporary facilities and services on completion of work.

1.16 WORK AND STORAGE AREA

- .1 Limits of the Storage Area are indicated on the drawings and are to be verified with Departmental Representative prior to commencement of work.
- .2 Do not conduct work, store materials or equipment or stockpile demolition waste outside of the designated zones without written approval from the Departmental representative.

1.17 MATERIAL AND EQUIPMENT

- .1 Use new products unless otherwise specified.
- .2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.
- .3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.18 CO-ORDINATION AND CO-OPERATION

- .1 Execute work with minimum disruption to normal use of site.
- .2 Provide necessary barriers, warning lights and signs.

1.19 INSPECTION AND TESTING

- .1 The Departmental Representative may employ an Inspection and Testing company to ensure work conforms with Contract Documents. Contractor to assist and provide access for such testing.
- .2 When initial tests and inspections reveal work not to contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.

1.20 COST BREAKDOWN

- .1 Before submission of first progress claim, submit detailed cost breakdown for all work included in lump sum items.

1.21 SCHEDULE

- .1 Commence work on notification of Contract and award.
- .2 On award of contract submit bar chart construction schedule for work, indicating anticipated progress stages within time of completion.
- .3 When schedule has been reviewed by the Departmental Representative take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.
- .4 Demolition and removal of existing structures is to be coordinated with the Departmental Representative.
- .5 Installation of new dock to be coordinated with Departmental Representative.
- .5 All work is to be completed by March 31st, 2018.
- .6 Contractor to meet with Departmental Representative's staff to coordinate activities daily.

1.22 CLEANING

- .1 Maintain project free of accumulated waste and rubbish.
- .2 Final cleaning:
 - .1 Remove temporary protection.
 - .2 Remove dust, dirt and foreign matter from surfaces.
 - .3 Broom clean floating dock and access ramp surfaces.

1.23 CONSTRUCTION & DEMOLITION WASTE

- .1 Carefully source separate materials/equipment and divert waste destined for landfill to maximum extent possible. Reuse, recycle or sell material off site for reuse except where indicated otherwise. On site sales are not permitted.
- .2 Submit a waste reduction workplan indicating the materials and quantities of material that will be recycled and diverted from landfill.
- .3 Indicate how material being removed from the site will be reused or recycled.
- .4 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to the Departmental Representative prior to removal of waste from the demolition site.

1.24 DESIGNATED SUBSTANCES

- .1 The work area has not been surveyed for the presence of designated substances referred to in the Occupational Health and Safety Act and Regulations for Construction Projects, O.Reg. 213/91 as amended.
- .2 If during execution of work existing asbestos, lead, PCBs, or other designated or hazardous material is discovered (e.g. fireproofing, acoustic or thermal insulation, pipe or tank covering) stop work and immediately notify Parks Canada Agency Representative. Do not remove any existing material containing asbestos fibres.

1.25 SPECIAL PROTECTION AND PRECAUTIONS

- .1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of material safety data sheets acceptable to HRSDC - Labour Program.

1.26 POLLUTION CONTROL

- .1 Spills of deleterious substances:
 - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
 - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
 - .3 Further information on dangerous goods emergency clean-up and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

PART 2 - PRODUCTS2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION3.1 NOT USED

- .1 Not used.

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GENERAL INSTRUCTIONS CIVIL

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END OF SECTION

PART 1 - GENERAL

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to the Coastguard Search and Rescue Base and provide for personnel and vehicle access.
- .3 Where security is reduced by work, provide temporary means to maintain security.
- .4 Contractor is responsible for providing their own sanitary facilities.
- .6 Closures: protect work temporarily until permanent enclosures are completed.
- .7 Confine construction operations within limits of the designated working areas. Access to and egress from working areas are subject to approval and direction of the Departmental Representative.
- .8 Do not carry out noise generating Work Monday to Friday from 18:00 to 07:00 hours and on weekends and statutory holidays.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to Coastguard operations and the public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 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 of notice and provide correct notice to utility companies for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, to be verified with Departmental Representative.
- .3 Provide for pedestrian, vessel and vehicular traffic at the Coastguard Search and Rescue Station.

1.5 SPECIAL REQUIREMENTS

- .1 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.
- .3 Ingress and egress of Contractor vehicles at site is limited to as directed by Departmental Representative.
- .4 Deliver materials during operational hours, 08:00 to 16:00 Monday to Friday.
- .5 Carry out Work with accordance to Ministry of Labour work hour requirements. Confirm with Departmental Representative prior to execution of work.
- .6 All work to be carried out within the water lot boundary.

1.6 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

1.7 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not permitted.

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WORK RESTRICTIONS

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PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 The method of measurement for the categories of labour, plant, equipment, materials, supervision and services which constitute the work is described in the following sentences.
- .2 All items of Work listed in the Schedule of Values will be measured by the Contractor and submitted to the Departmental Representative for review prior to the Contractor's application for progress payment of each item of Work.
- .3 Methods of measurement and computation to determine quantities of materials furnished and Work performed under the Contract will be as described herein unless otherwise specified in the relevant individual sections. The SI system of units shall be used for weights, measurements, and computations unless noted otherwise.
- .4 When a complete structure or structural unit or piece of equipment is specified as the unit of measurement, the unit shall include all necessary fittings and accessories.
- .5 No measurement will be made for:
 - .1 Work performed or materials placed outside of the lines indicated on the Drawings or established by the Departmental Representative.
 - .2 Materials wasted, used, or disposed of in a manner not called for under the Contract.
 - .3 Materials rejected after installation that are found not to conform to the provisions of the Contract.
 - .4 Hauling and disposing of rejected materials.
 - .5 Materials remaining on hand after completion of the Work.
 - .6 Shop drawings and modifications.

1.2 MOBILIZATION AND DEMOBILIZATION

- .1 Shall include mobilizing all equipment and provision of all construction facilities and controls required for the Work and bonds and insurance. Shall also include removal of all Construction Equipment and facilities, restoration and cleaning up the Site of all Contractor's debris to the satisfaction of the Departmental Representative. Payment will be made as a lump sum item.

1.3 DEMOLITION

- .1 Includes the demolition and disposal of the existing floating dock structures and gangways including all associated hardware, will be measured as a lump sum item.

- .2 Includes the removal, including disposal of the existing concrete floating breakwater mooring system, excluding concrete anchor blocks which are to remain. Includes all associated hardware, will be measured as a lump sum item.

1.4 FLOATING DOCK

- .1 Includes the design, supply, fabrication, storage, transportation, unloading and site installation of the floating dock, including additional flotation required for support of the access ramps, survey for final position and returning on two separate occasions to instruct the Departmental Representative on how to winterize and relocate the floating docks at the start and end of winter season. This item includes the gangway support floats. This item will be measured as a lump sum item.

1.5 ACCESS RAMPS

- .1 Includes all labour, equipment, and materials required to design, fabricate, supply, and install three (3) 1.8m wide aluminum access ramps and all associated hardware and fittings installed between the shore to the landing floats in three locations. The exact length of the ramps is to be confirmed by the Contractor onsite, approximate length is 9.3m. This item will be measured as a lump sum item.

1.6 NEW FLOATING DOCK FLOAT HARDWARE

- .1 Roller Guide Plates: shall include the supply and installation of all plates and hardware used between floatation units, transitions, and beneath access ramp rollers. Payment will be made as a lump sum item.
- .2 Transition and Rub Plates: shall include the supply and installation of all plates and hardware used between floatation units, walkway transitions, and beneath access ramp rollers. This item will be measured as a lump sum item.
- .3 Mooring Cleats: shall include all necessary materials, equipment, and labour to fabricate, supply, and install 3 tonne capacity cleats with a safety factor of 1.5; spaced as per Contract Drawings. This item will be measured as a lump sum item.
- .4 Life-Saving Equipment: shall include all life-saving equipment to meet all applicable codes and standards. This item will be measured as a lump sum item.
- .5 Handrails: shall include all handrails supplied and installed, including securing hardware. Extent of railings is as shown on the Contract Drawings. This item will be measured as a lump sum item.
- .6 Ladders: shall include ladders supplied and installed at maximum 30m intervals, including rungs, grab bars, top bracket, and miscellaneous securing hardware. Payment will be made as a lump sum item.

1.7 NEW FLOATING DOCK ANCHORAGE SYSTEM

- .1 Will be measured as a lump sum item and includes the design, labour, fabrication, supply and installation of the following:
 - .1 Anchor chain assembly including all coupling hardware.
 - .2 Pretension anchoring lines.
 - .3 Connection of anchoring system to new concrete anchor blocks.
 - .4 Connection of anchoring system to new floating docks.
 - .5 Existing concrete anchor blocks for the concrete floating breakwater are not to be used.

1.8 UTILITIES

- .1 Utility Pipelines: shall include all necessary materials, equipment, and labour to supply and install all utility pipelines in the floating docks and as required to connect to the existing shore based electrical supply. This item will be measured as a lump sum item.
- .2 New Power Pedestals shall include all necessary materials, equipment, and labour to supply and install all required pedestals. Payment will be made as a lump sum item.
- .3 Access Ramp lighting: shall include all necessary materials, equipment, and labour to supply and install new lighting on the access ramps. Payment will be made as a lump sum item.
- .4 Dock Lighting: shall include all necessary materials, equipment, and labour to supply and install new lighting on the new floating docks. Payment will be made as a lump sum item.
- .5 Electrical Wiring Installation: shall include all necessary permitting and approvals, engineering, materials, equipment, and labour to provide electrical power supply to the new lighting and utility pedestals. This will include wiring to the electrical components from a panel box located at the shore side of the access pier. Departmental Representative to supply connection between panel box and on Site transformer. This item will be measured as a lump sum item.
- .6 Water Supply Distribution Lines: The design, supply, fabrication, storage and site installation of new distribution supply lines on the new dock and shutoff valves are required at four locations along the dock and access ramps. Contractor to provide connections to existing shore based utilities. Exact locations are to be confirmed with the Departmental Representative. Item will be measured as a single sum item

1.9 EXISTING CONCRETE FLOATING BREAKWATER

- .1 Includes the design, supply, fabrication, storage and site installation of the new mooring system utilizing the existing concrete anchor blocks. Including connection of the new system to the existing anchor blocks, new shore anchor and floating breakwater and post-tensioning. Also includes Contractor to return is to return to site after 30 days once the new floating breakwater anchoring lines are installed to re-tension following stretch of the polypropylene lines This item will be measured as a lump sum item.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 TEMPORARY WORKS

.1 All necessary temporary works required to successfully complete the project shall be considered to be included in the cost of the individual items being provided in the Contract. No additional compensation shall be provided separately.

END OF SECTION

PART 1 - GENERAL1.1 GENERAL:

- .1 The Contractor will be responsible for the following:
 - .1 Verification of field measurements, field construction criteria, catalogue numbers, and similar data.
 - .2 Coordinate each submittal with requirements of the Work and the Contract Documents. Individual submittal will not be reviewed until all related information is available.
 - .3 Errors and omissions in submittal. The Departmental Representative's review of submittal does not relieve the Contractor of this responsibility.
 - .4 Notify the Departmental Representative in writing at the time of Bid submission, of any deviation in submittal from requirements of the Contract Documents.
- .2 Deliver submittals as required by the Specifications well in advance of schedule dates for fabrication, manufacture, erection, and installation to provide adequate time for reviews, securing necessary approvals, possible revisions and re-submittals, placing orders, securing delivery, and to avoid construction delays. Allow a minimum of five Working Days for Departmental Representative's review of each submittal.
- .3 Accompany each submittal with a letter of transmittal containing all pertinent information required for identification and checking of transmittals including date of submission, Project name, applicable specification section and article, Contractor's name and contact information, contact person's name and position, and subject identification such as colour, finish, material type, trade name, and texture.
- .4 When submittals are resubmitted for any reason, transmit under a new letter of transmittal and identify the number of the revision.
- .5 Do not carry out Work until submittals have been reviewed by the Departmental Representative. Work adjacent to or impacted by the submittal shall not proceed until the Departmental Representative's review of the submittal is complete and has been returned to the Contractor.
- .6 Provide the Departmental Representative with two (2) weeks notice for inspections.
- .7 Contractor is responsible for the distribution of submittals reviewed by the Departmental Representative to all trades necessary to complete the Work. Contractor shall maintain an up-to-date file of all submissions and revisions on Site at all times.
- .8 Shop Drawings, Product data, samples, and mock-ups shall be submitted

in SI metric units. Where items or information are not in SI metric units, provide converted values in brackets adjacent to imperial units.

- .9 Contractor to revise submittals as indicated by the Departmental Representative's written mark-ups or comments and resubmit as required. Fabrication, selection or purchase of components described in the submittal prior to review by the Departmental Representative is at the Contractor's own risk.
- .10 Allow 7 working days for Departmental Representative's review of each submission

1.2 PROCEDURES:

- .1 Review by Departmental Representative of Contractor's technical methods, procedures, installation, and erection sequences, is for general concept only and in no way relieves or mitigates the Contractor's obligation for the safe execution and completion of the Work in accordance with the Specifications and Drawings and all applicable codes and ordinances.

1.3 TAXES:

- .1 The Contractor shall submit details of the amount of taxes applicable to the Work if so requested by the Departmental Representative.

1.4 SHOP DRAWINGS:

- .1 Shop Drawings are defined as original Drawings, or modified standard Drawings, catalogue information, illustrations, schedules, performance charts, brochures, and other Product data provided by the Contractor, to illustrate details of portions of Work, which are specific to Project requirements.
- .2 Adjustments made on Shop Drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Departmental Representative. Do not proceed with Work until such time a Change Order has been issued.
- .3 Cross reference Shop Drawing information to applicable portions of Contract Documents.
- .4 All Shop Drawings shall be submitted to the Departmental Representative for review no later than 30 days prior to construction.
- .6 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Amount. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .7 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.
- .8 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.
- .9 Submissions shall include:
- .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Specification Section and article.
 - .4 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .5 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .6 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .10 After Departmental Representative's review, distribute copies.
- .11 Submit three (3) hard copies and one (1) 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 Submit three (3) hard copies and one (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award

for project.

- .13 Submit three (3) hard copies and one (1) electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit three (3) hard copies and one (1) electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit three (3) hard copies and one (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit three (3) hard copies and one (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .21 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental Representative 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.
- .22 Reviewed and Modified shop drawings returned to the Contractor must be revised as noted using the appropriate software and provided to the Departmental Representative.

1.5 SUBMITTAL REQUIREMENTS:

- .1 All Shop Drawings shall be signed and sealed by a Professional Engineer registered in Ontario.
- .2 Shop Drawings shall include, but are not limited to, the following information:
- .1 Fabrication details.
 - .2 Layout showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent Work.
 - .11 Materials.
 - .12 Finishes.
- .3 Should the Contractor feel it is necessary to deviate from the details to fully meet the intended requirements of the Project, they are to provide written documentation and rationale for the deviation to the Departmental Representative at the time of submission.

1.6 SAMPLES

- .1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.

- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Amount. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.7 FEES, PERMITS AND CERTIFICATES

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits.

1.8 SUBSTANTIAL COMPLETION

- .1 Final shop drawings and as-built drawings shall be considered a necessary component in determining substantial completion.
- .2 Cannot be issued until as-built drawings and final shop drawings are approved by the Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality:
 - .1 Canadian Standards Association (CSA): Canada
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code 2015 (NBC):
 - .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 National Fire Code 2015 (NFC):
 - .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
 - .4 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 O. Reg. 490/09, Designated Substances.
 - .3 Workplace Safety and Insurance Act, 1997.
 - .4 Municipal statutes and authorities.
 - .5 Treasury Board of Canada Secretariat (TBS):
 - .1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316§ion=text.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .3 Measures and controls to be implemented to address identified safety hazards and risks.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after

- receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 working days after receipt of comments from Departmental Representative.
- .4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
 - .5 Submit names of personnel and alternates responsible for site safety and health.
 - .6 Submit records of Contractor's Health and Safety meetings [when requested].
 - .7 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authorities having jurisdiction.
 - .8 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
 - .9 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
 - .10 Submit copies of incident and accident reports.
 - .11 Submit Material Safety Data Sheets (MSDS).
 - .12 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Comply with the Acts and regulations of the Province of Ontario.
- .2 Comply with specified standards and regulations to ensure safe operations at site.

1.7 PROJECT/SITE CONDITIONS

- .1 Work at site will involve:
 - .1 Above water, underwater, and near water work;
 - .2 Operation of cranes, excavators, tug boats, and other large equipment;
 - .3 Contact with silica in concrete.

1.8 GENERAL REQUIREMENTS

- .1 Complete Departmental Health and Safety attestation form prior to commencement of work.
- .2 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .3 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .4 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

1.10 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 The Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.

1.11 UNFORESEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop

- work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

1.12 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 of Ontario, and in consultation with Departmental Representative.
 - .1 Contractor's Safety Policy.
 - .2 Constructor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written Emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid certificate of first aider on duty.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.

1.13 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 may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

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

1.15 POWDER ACTUATED DEVICES

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

1.16 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.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS2.1 NOT USED

- .1 Not Used

PART 3 - EXECUTION3.1 NOT USED

- .1 Not Used

END OF SECTION

PART 1 - GENERAL1.1 RELATED REQUIREMENTS

- .1 Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
- .2 Section 02 41 99 - Structure Demolition for Minor works.
- .3 Section 35 49 25 - Turbidity Curtain.

1.2 DEFINITIONS

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for all products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 Develop an environmental management plan that includes, but is not limited to, identification of environmental management practices, water management requirements, erosion control measures, waste disposal requirements and emergency response procedures, including spill response.

- .7 Include in Environmental Protection Plan:
- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations and EPA 832/R-92-005, Chapter 3.
 - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .8 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
 - .9 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
 - .10 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .11 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .12 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
 - .13 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
 - .14 Waste Water Management Plan identifying methods and procedures for management [and] [or] discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
 - .15 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
 - .16 Pesticide treatment plan to be included and updated, as required.

1.4 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 All waste materials including containers and waste fluids associated with vehicle maintenance should be disposed of in a legal manner at a site approved by Local Authorities.

1.5 FIRES

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

1.6 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.7 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2m minimum.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Contractor is to verify with Departmental Representative the location of designated trees.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.

1.8 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this contract.

- .2 Control emissions from equipment and plant to local authority's emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Do not allow any debris, fill, deleterious material or other foreign material to enter the waterway.
- .5 Prevent spillage of gasoline, diesel fuel and other oil products into the waterways and on land. Clean up spills promptly at own cost in accordance with Provincial regulatory requirements. Report any fuel spills immediately to Departmental Representative and to the Ontario Ministry of Environment and Energy Spills Action Centre (1-800-268-6060).
- .6 Fueling of machinery must take place at least 10m away from the waterway.
- .7 Have emergency spill response equipment and rapid clean-up kit, appropriate to work on site. Located adjacent to work and where hazardous materials are stored. Provide personal protective equipment as required for clean-up.
- .8 Provide a turbidity curtain around the existing structures that are to be removed. The turbidity curtain shall be extended to the shoreline such that the zone contained within the turbidity curtain is isolated from the remainder of the waterway.
- .9 Provide a floating debris containment boom whenever any work operations could potentially result in creation of floating debris.
- .10 Abide by local noise by-laws.

1.9 EROSION AND SEDIMENT CONTROL PLAN

- .1 Submit erosion and sediment control plan for review and record of Departmental Representative.
- .2 Contractor shall take steps necessary to avoid and eliminate the possibility of shore-based rocks from entering the watercourse.

1.10 HISTORICAL / ARCHAEOLOGICAL CONTROL

- .1 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.11 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

- .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.12 CLEANING

- 1 Maintain project free of accumulated water and rubbish.

1.13 SPECIAL PROTECTION AND PROCEDURES

- .1 Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labelling and the provision of material safety data sheets acceptable to Labour Canada.

1.14 WILDLIFE PROTECTION

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

1.15 REGULATORY APPROVALS

- .1 The work is subject to approval by various regulatory agencies.
- .2 The contractor will execute the work in compliance with all conditions stipulated in the permits issued by the regulatory agencies.
- .3 Work shall not commence until all permits and approvals are in place.
- .4 Contractor is to provide all required information to the Departmental Representative for permitting process.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used

END OF SECTION

PART 1 - GENERAL

1.1 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 may order any 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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing 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 re-inspection.

1.3 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.

1.4 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 an orderly sequence so as not to cause delay 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.

1.5 REJECTED WORK

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

1.6 REPORTS

- .1 Submit three (3) copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.7 MILL TESTS

- .1 Submit mill test certificates as requested and required of specification Sections.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative or other Contractors.
- .2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .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 clearly marked separate bins for recycling. Refer to Section 01 74 20.
- .6 Remove waste material and debris from site and deposit in waste container at end of each working day.
- .7 Dispose of waste materials and debris at designated dumping areas if required by applicable laws and regulations.
- .8 Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
- .9 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .11 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 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 Departmental Representative 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.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Wax, seal, shampoo or prepare deck finishes, as recommended by manufacturer.
- .11 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .13 Remove dirt and other disfiguration from exterior surfaces.
- .14 Sweep and wash clean paved areas.
- .15 Clean equipment and fixtures to a sanitary condition; clean or replace filters of mechanical equipment.
- .16 Clean drainage systems.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

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PART 1 - GENERAL

1.1 CONSTRUCTION & DEMOLITION WASTE

- .1 Carefully deconstruct and source separate materials/equipment and divert waste destined for landfill to maximum extent possible. Target for this project is 60% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.
- .2 Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.
 - .1 Provide facilities for collection, handling and storage of source separated wastes.
 - .2 Source separate the following waste:
 - .1 portland cement concrete.
 - .2 Corrugated cardboard.
 - .3 Wood, not including painted or treated wood or laminated wood.
 - .4 Steel.
 - .5 Aluminium.
- .3 Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

1.2 WASTE PROCESSING SITES INFORMATION

- .1 Province of: Ontario.
 - .1 Ministry of Environment and Energy, 135 St. Clair Avenue West, Toronto, ON, M4V 1P5.
 - .2 Telephone: 800-565-4923 or 416-323-4321.
 - .3 Fax: 416-323-4682.
- .2 Recycling Council of Ontario: 215 Spadina Avenue, #225, Toronto, ON, M5T 2C7.
 - .1 Telephone: 416-657-2797.
 - .2 Fax: 416-960-8053.
 - .3 Email: rco@rco.on.ca.
 - .4 Internet: <http://www.rco.on.ca/>.

PART 2 - PRODUCTS

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2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Government Chief Responsibility for the Environment.

<u>Province</u>	<u>Address</u>	<u>General</u>	<u>Fax Inquiries</u>
Ontario	Ministry of Environment and Energy 135 St Clair Avenue West Toronto, ON M4V 1P5	(416) 323-4321 (800) 565-4923	(416) 323-4682
	Environment Canada Toronto, ON	(416) 734-4494	

END OF SECTION

PART 1 - GENERAL1.1 RELATED SECTIONS

- .1 Section 01 74 11 - Cleaning.
- .2 Section 01 74 20 - Construction /Demolition Waste Management and Disposal.

1.2 REFERENCES

- .1 CSA International
 - .1 CSA S350-[M1980(R2003)], Code of Practice for Safety in Demolition of Structures.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for re-use and recycling in accordance with Section 01 74 20.

1.4 WORK AND STORAGE AREA

- .1 The contractor's work and storage area for materials, equipment and demolition waste is limited to zones that will be designated by the Departmental Representative.
- .2 Do not conduct work, store materials or equipment or stockpile demolition waste outside of the designated zones without written approval from the Departmental Representative.
- .3 If material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
 - .1 Proceed only after receipt of written instructions have been received from Departmental Representative.
- .4 Notify Departmental Representative before disrupting access or services.

PART 2 - PRODUCTS2.1 NOT USED

- .1 Not used.

PART 3 - EXECUTION3.1 EXAMINATION

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
 - .1 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
 - .2 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to occupants to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.

3.3 DEMOLITION

- .1 Prior to start of demolition work, install turbidity curtain in the work area that extends to the shoreline such that the zone within the turbidity curtain is isolated from the remainder of the waterway prior to conducting any activities that are likely to cause sediment discharge into the waterway.
- .2 Demolish and remove offsite the existing floating docks, access ramps and associated hardware.
- .3 Disposal of materials to be in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.

3.4 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.

- .3 Refer to demolition drawings and specifications for items to be salvaged for reuse.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 - GENERAL1.1 RELATED SECTIONS

- .1 Section 35 51 15 - Floating Docks.

1.2 REFERENCE STANDARDS

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality:
 - .1 Canadian Standards Association (CSA)
 - .1 CSA W47.1-09 Certification of Companies for Fusion Welding.
 - .2 CSA W59-13, Welded Construction, (Metal Arc Welding).

1.3 CERTIFICATION

- .1 Welding will be undertaken only by a company approved by the Canadian Welding Bureau to the requirements of CSA Standard W47.1-09.

1.4 WELDING PROCEDURES

- .1 Upon request provide Departmental Representative with copies of welding procedures specifications, welding procedure data sheets and welding procedure qualification report for all welding work.

1.5 WELDING QUALIFICATIONS

- .1 Use only welders qualified under CSA W47.1.
- .2 Upon request, provide Departmental Representative currently valid Canadian Welding Bureau Qualification Certificate for each welder employed on the work.

1.6 TESTING

- .1 All welds will be subject to visual inspection requirements of CSA W59.
- .2 Welds which fail the visual inspection will be subject to further non-destructive testing. The full length of the weld will be examined.
- .3 If more than 50% of the welds fail the visual inspection requirements all welds will be tested by non-destructive testing methods.
- .4 The contractor shall be responsible for all costs for non-destructive testing resulting from visual inspection failure.

1.6 ACCEPTANCE REQUIREMENTS

- .1 In accordance with CSA W59.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Welding materials to CSA W59.

PART 3 - EXECUTION

3.1 WELDING

- .1 Welding to be in accordance with CSA W59.
- .2 Do not deviate the type, size, length and location of welds from the engineer stamped floating dock design drawings or from details shown on approved shop drawings.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .4 Weld in a manner to avoid distortion or damage to the members.

END OF SECTION

PART 1 - GENERAL1.1 REFERENCES

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality:
 - .1 ASTM International
 - .1 ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - .2 ASTM A123/A123M-13, Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A269/A269M-14e1, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .4 ASTM A307-14, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
 - .2 CSA International
 - .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S16-14, Design of Steel Structures.
 - .3 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
 - .4 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .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).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS.
 - .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 Ontario, Canada.
 - .2 Indicate grades, dimensions, materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
- .4 Prior to commencing the Work of this section, if required by the Engineer, submit two certified copies of mill reports covering chemical and physical properties of steel to be used in the Work

1.3 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.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CSA G40.20/ G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A53/A53M extra strong, galvanized finish.
- .3 Welding materials and electrodes - refer to Section 05 12 35.
- .4 Bolts and anchor bolts: to ASTM A307.
- .5 Stainless steel tubing: to ASTM A269/A269M, commercial grade.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.
- .7 Bolts for anchor bolts, unless noted otherwise: to ASTM A307 galvanized.
- .8 Stainless Steel: to ASTM A167 Type 316.

2.2 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 headed screws on items requiring assembly by screws or as indicated.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Close all hollow sections and pipe with end plates and seal airtight with welds.

2.3 FINISHES

- .1 Unless noted otherwise, all metal fabrications including embedded concrete hardware, ladders, anchor bolts, connection bolts, braces, and any other items as indicated on the Drawings, shall be hot-dip galvanized after fabrication in accordance with CAN / CSA G164. Minimum thickness of zinc shall be 110 microns.
- .2 Paint:
 - .1 Two component, high solids, polyester-aliphatic urethane suitable for marine environment, volume of solids 65%.
 - .2 Exterior Protective Two Coat System:
 - .1 Primer coat: zinc rich epoxy primer
Suitable for severe weather condition.
 - .1 VOC: less than 301 g/L when mixed.
 - .2 Coats: 1

- .3 Dry film thickness (DFT): 50-100microns.
- .4 Theoretical coverage: 9.2 m²/ L at 75 microns DFT or greater.
- .5 Volume of solid: 70% ± 3% or greater, to ASTM D2697.
- .2 Top coat: Engineered siloxane.
 - .1 VOC: 275 g/L or less.
 - .2 Coats: 1
 - .3 Dry film thickness: 75-175 microns.
 - .4 Theoretical coverage: 30 m /L at 25 microns DFT or greater.
 - .5 Volume of solids: 75% or greater, to ASTM D2697.
- .3 Primer: rust inhibiting, low VOC, organic or inorganic zinc primer, compatible with specified paint.

2.4 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 Wood.

2.5 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

2.6 RAILINGS

- .1 Railings to meet applicable codes, standards and regulations.
- .2 Galvanize exterior railings after fabrication.

2.7 ACCESS LADDERS

- .1 Galvanize ladders after fabrication.
- .2 Ladders shall be designed with a working loading capacity (WCB) of 230 kg. Ladders are to extend a minimum of 1.0 m below the waterline.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION

- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Deliver items over for casting into concrete with setting templates to appropriate location and construction personnel.
- .7 Touch-up galvanized surfaces with zinc rich primer where burned by field

welding.

3.3 PIPE RAILINGS

- .1 Install railings as per Section 35 51 15.

3.4 ACCESS LADDERS

- .1 Ladders are to be placed as indicated on the Contract Drawings.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11.
 - .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.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

PART 1 - GENERAL1.1 GENERAL

- .1 This section covers the electrical general requirements of the floating docks, access ramp and shore lighting. This Work consists of the design, fabrication, and installation of the electrical components for this Project. This includes:
 - .1 Routing power for the power receptacles, lights, and gangway lighting to an existing panel box located on the shore side of the floating dock.
 - .2 Four (4) new utility pedestals at approximate locations as indicated on the Contract Drawings, exact location to be confirmed with Departmental Representative.
 - .3 installation of a new power receptacle on the new floating docks. Also includes the installation of lighting along the access ramp.
 - .4 A total of nineteen (19) new lights:
 - .1 Ten (10) new Lights on the floating docks
 - .3 Three (3) new lights on each gangway.

1.2 RELATED SECTIONS

- .1 Section 35 51 15 Floating Docks
- .2 Section 33 11 17 Water Services

1.3 REFERENCES

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality.
- .4 Electrical equipment, cable supports, conduits, ducts, and grounding supplied and installed by the Contractor shall comply with the last adopted revision, including amendments, of the following standards, codes, and regulations:
 - .1 Canadian Standards Association (CSA).
 - .1 All electrical equipment shall bear the CSA label.
 - .2 Canadian Electrical Code as adopted by the Province of Ontario (CEC).
 - .3 Institute of Electrical and Electronics Engineers (IEEE).
 - .4 Electrical and Electronic Manufacturers of Canada (EEMAC).

- .5 National Electrical Manufacturers Association (NEMA).
- .6 Occupational Health and Safety Act, ON

- .2 Perform complete installation including material and equipment provided by the Engineer in accordance with the latest edition of Canadian Electrical Code (CEC) CSA C22.1 2002 as adopted by the Province of Ontario except where specified otherwise.

- .3 Abbreviations for Electrical Terms: to CSA Z85 1983.

1.4 QUALITY ASSURANCE

- .1 .1 All equipment shall bear CSA acceptance labels. Where special inspection is required to provide CSA acceptance, all costs to arrange for and obtain this acceptance shall be the responsibility of the Contractor.

1.5 SUBMITTALS

- .1 Contractor shall submit Shop Drawings showing the design stamped by a professional electrical Engineer who is registered with the Professional Engineers Association of Ontario. Shop Drawings shall show design loads, design codes, components, connection details, dimensions, materials, and finishes.

1.6 DESIGN CRITERIA

- .1 All materials used shall be rated for marine use.
- .2 Receptacles and fixtures mounted on the dock shall be able to withstand the strong motions of the dock under storm events.
- .3 All power and controls shall be routed through conduit located either under or within any fixed structure or within the float utility corridors.
- .4 All marina electrical connections will be routed to a control panel located at the land side of the central gangway. The Departmental Representative will provide electrical supply from the transformer located near the Site to the control panel.
- .5 Contractor shall provide tie-in point between outdoor light fixtures and new photocell control system that allows for all light to be turned on and off from the shore and from the dock manually. Locations of switches to be determined with the Departmental Representative.

- .6 Minimum average maintained illumination level is to be 10 Lux on all surfaces of the floating dock and access ramps.
- .7 All lighting must have a service life equal or greater than that of the new floating docks.
- .8 All connections shall be designed so that they can be easily detached for winter storage and subsequent installation prior to each operational season.
- .9 Each light fixture to produce 1600 lumens.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 All fixtures shall be suitable for use outdoors in marine environment.
- .2 Fixtures chosen shall be suitable for the location and have shielding to prevent glare onboard of ships, or glare to residences near the terminal.
- .3 All lighting is to be dark sky compliant. For more information refer to <http://www.northbrucepeninsula.ca/content/dark-sky>. Contractor is to verify with Departmental Representative exact requirements.

2.2 MATERIALS

- .1 Power Receptacles: Contractor shall provide recommendation for power receptacles with a single outlet.
- .2 Access Ramp Contractor shall provide lighting to all of the access ramps.
- .3 All lighting is to be approved by the Departmental Representative.

2.3 UTILITY PEDESTALS

- .1 Three (3) pedestals shall have the following:
 - .1 One (1) outlet 30A, 120V
 - .2 Two (2) hose valves, 13mm (1/2") diameter.
- .2 One (1) pedestal shall have the following:
 - .1 One (1) outlet 30A, 120V
 - .2 One (1) Outlet 100A, 240V
 - .3 Two (2) hose valves, 13mm (1/2")

- .4 This pedestal is to have own breaker.
- .3 Pedestals shall have both power and water supply combined. Water supply for all pedestals in accordance with section 33 11 17.
- .4 All fixtures shall be suitable for use outdoors in marine environment.
- .5 Shall be tested and certified to be in compliance with ANSI/UL 231, power outlets.
- .6 Shall be certified to meet all sections of NFPA 303, Fire Protection Standards for Marinas and Boatyards.
- .7 Housing enclosure shall be constructed of 6.35mm (1/4") thick injection molded resin material and coated with UV-resistant polyurethane. Enclosure to be weatherproof type 3R.
- .8 All exposed metallic parts must have an integral ground that is part of the equipment grounding system.
- .9 All receptacles shall be the corrosion resistant type conforming to NEMA L-5 and or NEMA L-6 requirements and are rated for marine use.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 General:
- .1 Workmanship shall be of the best quality, executed by workers experienced and skilled in the respective duties for which they are employed. Immediately notify the Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ any unfit person or anyone unskilled in their required duties. ONLY qualified persons are to perform electrical Work as defined under Part 4 of the Electrical Safety Act. The Departmental Representative reserves the right to require the dismissal from the Work Site of workers deemed incompetent, careless, insubordinate, or otherwise objectionable.
- .3 Decisions as to the quality of workmanship in cases of dispute rest solely with the Departmental Representative, whose decision is final.
- .2 Engineering:
- .1 Electrical engineering required under this Contract shall be certified by a professional electrical Engineer who is registered with the Professional Engineers of Ontario.
- .2 Design shall be appropriate for a marine installation and comply with all local, provincial, and federal requirements.
- .3 Location of Luminaires:
- .1 Consider the location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform the Departmental Representative of a conflicting

installation.

3.2 PROTECTION

- .1 During construction ensure that personnel are protected from exposed live equipment.
- .2 Ensure that personnel are protected from exposed live equipment during manufacture, testing, and installation. Installation protection is required where equipment is preinstalled by the Contractor into an overall assembly.
- .3 Shield, and mark in English, live parts with LIVE 120 VOLTS, or with appropriate voltage.

3.3 PERMIT, FEES AND INSPECTION

- .1 Submit to provincial Electrical Inspection Department the required number of Drawings and Specifications for examination and approval prior to commencement of Work.
- .2 Pay any associated permit and inspection fees.
- .3 The cost to produce any Drawings and Specifications required by the Electrical Inspection Department shall be incurred by the Contractor.
- .4 Furnish to the Departmental Representative Certificates of Acceptance from authorities having jurisdiction upon completion of the Work.

3.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials to Site in original factory packaging labelled with manufacturer's name and address.
- .2 Notwithstanding pre-shipping inspections, the Departmental Representative reserves the right to reject materials on Site that do not meet Specifications.
- .3 Store materials off the ground and in accordance with manufacturer's recommendations.
- .4 Replace defective or damaged materials with new.

3.4 EXISTING UTILITIES

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.1 When interrupting the existing services or utilities or connecting to them, the Work shall be executed at the times and through direction of the local governing authorities. There shall be a minimum of disturbance to the Work, residents, and pedestrian and vehicular traffic.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

- .1 This section covers the water service requirements for the new floating dock.

1.2 RELATED SECTIONS

- .1 Section 35 51 15 Floating Docks
- .2 Section 26 00 00 General Electrical Requirements

1.3 REFERENCES

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced in this Section shall apply to the Work.

1.4 QUALITY ASSURANCE

- .1 All equipment shall bear CSA acceptance labels. Where special inspection is required to provide CSA acceptance, all costs to arrange for and obtain this acceptance shall be the responsibility of the Contractor.

1.5 SUBMITTALS

- .1 Contractor shall submit Shop Drawings showing the design stamped by a professional Engineer who is registered with the Professional Engineers Association of Ontario. Shop Drawings shall show design loads, design codes, components, connection details, dimensions, materials, and finishes.
- .2 Submit manufacturer's test data and certification that pipe materials meet requirements of this section at least 4 weeks prior to beginning work. Include manufacturer's drawings, information and shop drawings where pertinent.

- .3 Pipe certification to be on pipe

1.6 DESIGN CRITERIA

- .1 All materials used shall be rated for marine use.
- .2 All fixtures mounted on the dock shall be able to withstand the strong motions of the dock under storm events.
- .3 Pedestals shall have both power and water supply combined.
- .4 All marina electrical connections will be routed to a control panel located at the land side of the central gangway. The Departmental Representative will provide electrical supply from the transformer located near the Site to the control panel.
- .5 All lighting must have a service life equal or greater than that of the new floating docks.
- .6 All connections shall be designed so that they can be easily detached for winter storage and subsequent installation prior to each operational season.

PART 2 - PRODUCTS

2.1 UTILITY PEDESTALS

- .1 Pedestals shall have both power and water supply combined.
- .2 Shall be tested and certified to be in compliance with ANSI/UL 231, power

outlets.

- .3 Shall be certified to meet all sections of NFPA 303, Fire Protection Standards for Marinas and Boatyards.
- .4 Housing enclosure: shall be constructed of 6.35 mm (1/4") thick injection molded resin material and coated with a UV-resistant polyurethane. Enclosure to be weatherproof type 3R.
- .5 All exposed metallic parts must have an integral ground that is part of the equipment grounding system.
- .6 All receptacles shall be the corrosion resistant type conforming to NEMA L-5 and or NEMA L-6 requirements and are rated for marine use.
- .8 The water connection shall be one 19.05 mm (3/4") inlet, and shall divide into two hose valves 13mm (1/2"). Gate valve shall be 25 mm (1") inside diameter. Reinforced PVC clear braided flexible hose 19.05 mm (3/4") inside diameter and 915 mm (36") long section.
- .9 Fresh water line, polyethylene pipe (series 75), 25 mm (1") inside diameter.

2.2 PIPE JOINTS, VALVES & FITTINGS:

- .1 Polyethylene pressure pipe: to CSA B137.1 type PE 3408, series 160.
- .2 End cap, joint fittings and service connections: brass compression type fitting male or female as required and suitable for pipe working pressure rating.
- .3 Valves to open counter clockwise, verify direction of opening with local authorities.
- .4 Ball valves: brass valve with straight handle and spherical disc, suitable for pipe pressure rating.

2.3 PIPE DISINFECTION:

- .1 Undertake disinfection of water pipes in accordance with local municipal practices and procedures.

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Clean pipes, fittings, valves, and appurtenances of accumulated debris and water before installation.
- .1 Inspect materials for defects to approval of Departmental Representative.

- .3 Remove defective materials from site as directed by Departmental Representative.

3.2 PIPE INSTALLATION

- .1 Connect pipe and compression fitting to existing service pipe line in accordance with manufacturer's recommendations.
- .2 Provide compression fittings and valves at locations indicated on drawings.
- .3 Join pipes in accordance with manufacturer's recommendations.
- .4 Cut pipes in approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
- .5 Ensure completed joints are restrained by securing joints and pipe with bracket connection to timber cable tray or as otherwise approved by Departmental Representative to minimize deflection of pipes and joints.

3.3 VALVE INSTALLATION

- .1 Install valves to manufacturer's recommendations at locations as indicated.

3.4 HYDROSTATIC AND LEAKAGE TESTING

- .1 Do hydrostatic and leakage test to local municipal practices and procedures and have results approved by Departmental Representative.
- .2 Notify Departmental Representative at least 5 days in advance of proposed tests.
 - .1 Perform tests in presence of Departmental Representative.

3.5 FLUSHING AND DISINFECTING

- .1 Do flushing and disinfecting operations to local municipal practices and procedures.
- .2 Flushing and disinfecting operations to be witnessed by Departmental Representative.
- .3 Notify Departmental Representative at least 5 days in advance of proposed date when disinfecting operations will begin.

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PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00: Submittal Procedures.
- .2 Section 26 00 00: General Electrical Requirements
- .3 Section 05 12 35: Welding.

1.2 REFERENCE STANDARDS

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Engineer's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality:
 - .1 American Society for Testing and Materials (ASTM).
 - .1 ASTM A252-10 Welded and Seamless Steel Pipe Piles.
 - .2 ASTM F3125/F3125M-15a, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.
 - .3 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 Canadian Standards Association (CSA).
 - .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA O80 Series-15, Wood Preservation.
 - .3 CAN/CSA S6-14, Canadian Highway Bridge Design Code.
 - .4 CSA S16-14, Limit States Design of Steel Structures.
 - .5 CSA Z245.1-14 Steel Pipe.
 - .3 CAN/CSA O86-14, Engineering Design in Wood.
 - .4 National Building Code of Canada 2015 (NBCC).

- .5 NLGA Standard Grading Rules for Canadian Lumber.
- .6 All other applicable national, provincial and local codes

1.3 SERVICE LIFE

- .1 The minimum service life of the floating dock assembly is 25 years.

1.4 DESIGN CRITERIA

- .1 The Contractor is responsible for verifying the stability and structural integrity of the floating docks due to any singular or realistic combination of loading conditions given herein.
- .2 Design Vessel:
 - .1 Cape Commodore:
 - .1 Further details are given in Appendix 1
 - .2 Length 14.6m
 - .3 Beam 4.3m
 - .4 Draft 1.4m
 - .3 Environmental Conditions:
 - .1 All float units and anchoring systems shall be designed to withstand the unfactored forces and displacements from the environmental conditions given below:
 - .1 Wave Loading:
 - .1 Significant wave height, H_s : 1.6m
 - .2 Peak period, T_p : 7.2s
 - .3 Peak direction: ESE (East-Southeast)
 - .4 Wave length, L : 70 m
 - .5 Historical analysis period from March 15th to December 15th)
 - .2 Wind Loading (All Direction):
 - .1 Design wind speed: 28m/s (60s gust on 85km/h wind speed)
 - .2 Design wind pressure: 0.5kPa
 - .3 Ice Loading:
 - .1 The floating docks will be relocated to little tub harbour where they remain in the water for the winter. Floating docks are to be designed for static ice loading typical of little tub harbour.
 - .4 Water Level Elevation:
 - .1 Daily Mean water levels at the site can vary from elevation 175.6 m to 177.6 m IGLD85.
- .2 The following definitions for wave loading apply:
 - .1 Significant wave height, H_s , is defined as the average of the highest 33% of the waves in a sea state.
 - .2 Wave height is the vertical distance from trough to crest of a wave.

- .3 Peak wave period, T_p , is defined as the wave period of the most energetic waves in a sea state.
- .4 Wave period is defined as the time between successive wave crests as measured from a stationary point.
- .4 Flotation and stability:
- .1 Provide sufficient flotation to support dead load of the floats and a super imposed uniformly distributed load of 1.44kPa acting over the entire surface area. Also for a concentrated live load of 1.8kN acting over an area of 0.4m by 0.4m.
- .2 Provide additional flotation required to support the dead load reaction and 50% of the live load reaction from the access ramp.
- .3 The floating docks shall be designed such that the "freeboard" i.e. distance from the top of the deck to the still water level is 610mm (+/-25 mm) without super imposed live load and not less than 400 mm (+/-25 mm) under full live load conditions.
- .4 Provide removable watertight plug at the top of each float pipe.
- .5 Floating docks shall be designed to resist the berthing and mooring loads from the design vessel moving at 1.0 m/s and striking the float from any direction. Berthing velocity to be confirmed with Departmental Representative.
- .6 The deck shall sit level with a maximum cross slope of 2% and maximum longitudinal slope of 2.0%, under the influence of dead, live load and concentrated loads, and less than 100 mm deviation between highest and lowest deck elevations throughout the system of floats.
- .7 The differential elevation between adjacent float units, in place, shall be no more than 13 mm. Changes in level between 6 mm and 13 mm shall be beveled with a slope not steeper than 1:2.
- .8 Gaps between adjacent float units shall not be wider than 25 mm. Where this is unavoidable, cover plates shall be provided.
- .9 The deck and framing to support dead load plus a uniformly distributed live load of 2.5kPa.
- .5 Floating Dock Connections:
- .1 Connect all floating dock sections with clamped dampened hinge system.
- .2 Connections between float units shall be designed to carry the loads specified in this Section with consideration given to the cyclic nature of the wave loads and the resulting effect of fatigue and wear on connecting surfaces. Provision shall be made for energy and shock absorption at the connection.
- .3 Docks and related furnishings must be modular to easily accommodate assembly and disassembly, handling, transport, storage and winter storage.
- .6 Anchoring Systems:
- .1 The anchors and connections shall be designed to resist effects from loads due to vessel impacts, passing vessel effects and wind pressure for steady state conditions acting on the above water profile of moored vessels and the dock system.
- .2 The new floating dock shall be anchored with galvanized steel

chains or approved equivalent and galvanized steel fittings connected to pre-cast concrete anchors submerged in the water. Existing shore struts may be used however Contractor is to verify mooring system meets the requirements of this section.

.3 The design of the anchoring system for the floating dock units may consist of a combination of:

.1 anchor struts attached to the shore at the existing and/or new concrete head blocks

.2 anchor chain attached to the float units and to anchor blocks on the lake bottom.

.4 The number of anchors and configuration of the anchorage system shall be designed to maintain the position with minimum movement during all load and water level conditions.

.5 Mooring chain and fittings shall be sized to resist the unfactored (working) loads specified in this Section. The required chain / fitting breaking strength load shall be based on the governing load case forces multiplied by a safety factor of 3.

.6 Required anchor holding capacity (resistance to sliding and/or pullout) shall be calculated on the basis of the governing load case forces multiplied by a safety factor of 2 with a coefficient of friction of the harbor bed of 0.3. Anchor shall be of a type proven to be resistant to sliding and/or pullout.

.7 Access Ramp:

.1 Three (3) access ramps are required.

.2 Design Live load - 2.4 kPa uniformly distributed load

.3 Width - 1.8 m

.4 Length - as indicated on drawings

.5 Maximum slope is 1V:4H.

.6 Handrails - hand rails are to be provided on each side of the access ramp at least 1.07m high as measured from the top of the handrails to the top of the walking surface.

.7 Transition Plates - provide transition plates at each end of the access ramp.

.8 Access ramp to be aluminum frame with non-slip surface.

.9 The access ramp shall be connected to the concrete support on the shore with a hinged swivel mount connected to embedded elements in the concrete block. Roller wheels and guide pin assembly shall be provided on the floating dock. An ultra-high molecular weight polyethylene wearing surface connected to the float deck shall be provided under the roller and guide pin assembly.

.10 Rollers are to be UHMW polyethylene with black ultra-violet light inhibitor added.

.11 Deflection is not to exceed L/180 under Dead + Live Load conditions.

.8 Utilities:

.1 A utility corridor to house PVC conduit pipes for electrical wiring shall be provided within the design of the floating docks. No permanent utility lines should be located on or attached to the deck surface of the marina float. Care should be taken when placing the utility corridor that access panels will not create a tripping hazard.

- .2 Access panels with removable covers shall be provided to give access to the utility corridor at regular intervals along the full length of the marina float.
- .3 The utility corridor shall be constructed with regular drainage holes and moderate slopes so that there is no standing water within the corridor.
- .4 No utility lines shall have less than 150mm clearance above the water surface under dead load only and not less than 50mm clearance under dead load, environmental, uniform live loads, and point loads.
- .5 The holes where utility lines pass through structural members shall be chamfered 6 mm to 13 mm to reduce wear on the conduit. Alternatives shall be approved by the Departmental Representative.
- .6 Utility connections must be designed so that they easily accommodate assembly and disassembly, handling, transport, storage and winter storage.
- .7 All existing pedestals and electrical wiring are to be used if they still meet all relevant codes and standards. If they do not meet all relevant codes and standards, new wiring and equipment must be provided by the Contractor.
- .8 Utility pedestals to be re-used if they meet all relevant codes and standards with the exception of a new separate 100A service and own breaker for the cape commodore vessel at a location to be determined with the Departmental Representative. If existing pedestals do not meet all relevant codes and standards then new pedestals shall be provided by the Contractor.
- .9 There is an existing fresh water supply line along the shore adjacent to the docks. New distribution lines and shutoff valves are required at five (5) locations along the dock. Existing equipment and hardware shall only be used if it meets all relevant codes and standards otherwise Contractor is to provide new.
- .9 Float Hardware:
- .1 Handrails: Sectional railing to be provided on the North face of the dock, as per drawing M-02 at least 1.07m high as measured from the top of the handrails to the top of the walking surface.
- .2 Ladders to be provided as per Section 05 50 00, locations as per drawing M-02.
- .1 Supply and installation of following miscellaneous float components:
- .1 Mooring Cleats: 3 tonne capacity with a safety factor of 1.5; spacing as per drawing M-03.
- .2 All connections between floats.
- .3 Transition and rub plates.
- .4 Sectional railing on North face of dock as per drawing M-02.
- .5 Life Preservers.
- .6 Rub strips along full length of front (South) face of dock and along North face - extent to be confirmed with Departmental Representative.
- .7 Deck surface to be pressure treated timber with non-slip pad in front of the Cape Commodore berth. Location and extent of the area required is to be confirmed with the Departmental

Representative.

.8 Existing storage containers to be relocated from existing dock to new dock at locations to be confirmed with Departmental Representative.

1.3 DELIVERY AND STORAGE

- .1 Ensure safe delivery and storage of floats in area designated by Departmental Representative.
- .2 Provide Departmental Representative with 5 days' notice prior to shipping.
- .3 Provide protective blocking for lifting, transportation and storing.
- .4 Exercise care during fabrication, transportation, loading and unloading, and installation so as not to damage floating docks or access ramp.
- .5 Ensure that no portion of fabricated elements comes into contact with ground.

1.4 SHOP DRAWINGS

- .1 Shop drawings prepared for the fabrication and installation of the floating docks, anchorage system and access ramp shall be signed and sealed by the engineer engaged by the contractor for the design of the floating docks.
- .2 After shop drawings have been reviewed, signed, sealed and approved by the design engineer engaged by the contractor, submit four copies of shop drawings in accordance with Section 01 33 00 - Submittal Procedures to the Departmental Representative for review and record.
- .3 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, and welds. Indicate welds by CSA W59 welding symbols.

1.5 WELDING CERTIFICATION

- .1 Welding will be undertaken only by companies approved by the Canadian Welding Bureau to the requirements of CSA W47.1-09 Division 1 or 2.1, Certification of Companies for Fusion Welding of Steel.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel Pipe: provide full length pipe sections with straight longitudinal seams or spiral butt in accordance with the following:
 - .1 Material: to ASTM A252, Grade III (310 MPa yield), with chemical

- composition in accordance with CSA Z245.1.
- .2 Close off pipe float ends with steel plate fully welded all around. Install plugs on top section of pipe floats to permit pressure testing for air tightness.
 - .3 Pipe Wall Thickness: minimum 6.4mm.
- .2 Material: to ASTM A252, Grade III (310 MPa yield), with chemical composition in accordance with CSA Z245.1.
 - .3 Structural steel framing: to CAN/CSA G40.20/G40.21, grade 350W.
 - .4 High strength bolts, nuts and washers: to ASTM A325M.
 - .5 Anchor bolts: to CAN/CSA G40.20/G40.21, grade 300W hot dip galvanized in accordance with ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .6 Welding electrodes: to CSA W48 series.
 - .7 Timber Decking: use timber decking and rubbing boards graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board of CSA.
 - .1 Species: Spruce-Pine-Fir.
 - .2 Grade: select structural.
 - .3 Grading Authority: NLGA.
 - .4 Preservative Treatment: Alkaline Copper Quaternary (ACQ) Type C preservative treatment in accordance with CAN/CSA O80 Series.
 - .5 Forest Stewardship Council (FSC) certified.
 - .7 Deck Screws: ACQ rated with triple zinc co-polymer finish.
 - .8 Paint:
 - .1 Primer: inorganic zinc primer to CAN/CGSB 1.171 Inorganic Zinc Coating.
 - .2 Paint: high build marine epoxy paint to CAN/CGSB 1.193.
 - .9 Pre-cast Concrete Anchors:
 - .1 Concrete mix for Pre-cast concrete anchors shall be proportioned in accordance with CAN/CSA A-23.1/A23.2 Table 5, Alternative 1 Performance Method for Specifying concrete and the following:
 - .1 Compressive Strength: 35 MPa at 28 days
 - .2 Cement Content: 375 kg/m³ of concrete
 - .3 Maximum Water/Cement Ratio: .4
 - .4 Class of Exposure: C-1
 - .5 Air Content: 4 to 7%
 - .10 Anchor Chains and Hardware:
 - .1 All anchor chains and connecting hardware to be hot dip galvanized in accordance with ASTM A123/A123M-13, Standard

Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 Steel Anchor bars to be in accordance with to CAN/CSA G40.20/G40.21, grade 300W hot dip galvanized in accordance with ASTM A123/A123M Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 Grout for anchor bars to be non-metallic, capable of developing a minimum compressive strength of 50Mpa at 28 days.

.11 Access Ramp

.1 To be fabricated from aluminum elements in accordance with the following:

.1 Aluminum Bar, Rod, Wire: to ASTM B211M

.2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B221M

.3 Aluminum Sheet or Plate: to ASTM B209M

.4 Aluminum Drawn Tubes: to ASTM B210M

.5 Aluminum Bolts and Rivets: to ASTM B316M

.6 Aluminum Welding Wire: to AWS-A5.10/A5.10M

.7 Stainless Steel Bolts: to ASTM F593

.2 Decking for access ramp to be non-slip, to be approved by Departmental Representative.

.12 Mooring Cleats

.1 To be low-profile design. Confirm acceptance of cleats with Departmental Representative prior to supply and install.

PART 3 - EXECUTION

3.1 FABRICATION OF FLOATING DOCK

.1 Do welding for steel float elements in accordance with CSA W59, Welded Steel Construction, (Metal Arc Welding).

.2 Secure stringers and rubbing boards to steel framing elements by bolting. Ensure that bolt heads are countersunk or located such that they will not interfere with deck boards or protrude on the rubbing board faces.

.3 Secure timber decking with 75 mm long ACQ rated deck screws.

.4 Cast aluminum mooring cleats shall be secured by bolting to steel frame elements of the floating dock.

.5 Pressure Testing of Pipes:

.1 All float pipes shall be pressure tested by air.

.2 Apply air pressure at 340kPa for 15 minutes. If leaks are found repair leaks and repeat testing.

3.2 PAINTING

.1 After fabrication is complete clean and paint all exposed steel

surfaces in the floating docks.

- .2 All primer and paint coats to be shop applied.
- .3 Surface Preparation:
 - .1 Commercial Blast Cleaning to SSPC-SP6/NACE No.3.
- .4 Painting:
 - .1 Apply one coat of Inorganic Zinc Primer, CAN/CGSB 1.171-98 to a dry film thickness within .05 to .08 mm.
 - .2 Apply two finish coats of a high build epoxy, CAN/CGSB 1.193-99 to a dry thickness of .10 to .15 mm per coat.
- .5 Field Touch-up Painting:
 - .1 All damaged paint areas including zones where field welding is undertaken shall be touched up.
 - .2 Thoroughly clean areas where paint coat has been damaged by wire brushing and/or grinding.
 - .3 Touch up affected areas with one coat of Zinc Rich Primer and two coats of high build epoxy paint.
 - .4 Ensure that areas to be touched up are dry and ambient temperature is warm enough to apply primer and paint coats.

3.3 INSTALLATION

- .1 Pre-Cast Concrete Anchor Blocks
 - .1 Place anchor blocks and chains as required.
 - .2 Place pre-cast concrete anchor blocks and chains such that the minimum distance from chart datum level to the anchor chains and/or pre-cast concrete anchors is at least 2.0 m
- .2 Assemble floating dock and secure to anchor chains. Tension anchor chains such that the floating dock will be maintained in position with minimum movement during all load and water level conditions expected at the site.

3.4 ACCESS RAMP

- .1 Install anchorage assembly into concrete to secure the access ramp at the shore end.
- .2 Set access ramp into position and secure to the shore anchorage system.
- .3 Adjust the anchor chains and floating dock such that the access ramp is correctly positioned over the ultra-high molecular weight polyethylene wearing surface on the floating dock.
- .4 Install transition plates at both ends of the access walkway.

PWGSC

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FOR FLOATING DOCKS

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END OF SECTION

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PART 1 - GENERAL

1.1 SUMMARY

- .1 These Specifications describe the technical requirements for a Contract to replace the existing concrete floating breakwater anchoring system with new elements, existing concrete anchor blocks are to remain. This contract includes the supply, fabrication, and installation of the breakwater float anchoring system which includes ropes, chains and all other accessories required for a complete anchoring system as indicated on the Drawings.
- .2 This Contract includes:
 - .1 Development of methodology for installation, float connection, and tensioning of 8.89kN (2,000 lbs) load per rope (to be confirmed with Departmental Representative).
 - .2 Installation of new polypropylene ropes, chains and all associated hardware including connection to concrete breakwater floats and connection to existing concrete anchor blocks.
 - .1 Contractor is to perform underwater inspection to verify existing concrete breakwater anchoring system prior to replacement.
 - .2 The anchoring system is connected to concrete anchor blocks (to remain) and is anticipated to be comprised of the following and requires replacing with new:
 - .1 Four (4) lengths of 20mm diameter hot dipped galvanized chain connecting the 38mm diameter polypropylene rope to the breakwater.
 - .2 Four (4) lengths of 38mm diameter polypropylene rope connecting the anchor blocks to chain.
 - .3 Two (2) lengths of 25mm diameter polypropylene rope connecting the anchor blocks to sleeper blocks.
 - .4 Two (2) lengths of 25mm diameter polypropylene rope connecting the sleeper blocks to a 14mm diameter chain.
 - .5 Two (2) lengths of 14mm diameter chain connecting the safety lines to the breakwater.
 - .6 Two (2) lengths of 38mm diameter polypropylene rope connecting the positioning block to the breakwater.
 - .3 Contractor is to perform an underwater dive inspection of the underwater chains and anchoring points, North of the existing concrete floating breakwater.
- .3 The Contractor shall arrange and pay for the delivery of all materials to the Site either by land or in the water. The delivery schedule shall be mutually agreed with the Departmental Representative.
- .4 The Contractor shall assume full responsibility for the construction and installation quality control of the anchoring assembly and ensure that it meets the structural strength requirement as established by these Specifications.
- .5 Contractor is to return to site after 30 days once the new floating

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breakwater anchoring lines are installed to re-tension following stretch of the polypropylene lines.

1.2 REFERENCE STANDARDS

- .1 Any conflict between this Specification and the referenced codes, standards, and regulations shall be immediately brought to the Departmental Representative's attention for resolution.
- .2 The latest edition of, and any standards referenced by, the following standards shall apply to the Work.
- .3 Contractor is expected to adhere to all applicable national, provincial and local codes, standards and regulations.
- .4 The following codes and standards shall be referenced and adhered to where appropriate for design, performance, materials, and quality:
 - .1 American Society of Mechanical Engineers (ASME):
 - .1 ASME Section V:2010 Non-Destructive Examination
 - .2 ASME Section IX:2010 Welding and Brazing Qualifications
 - .2 American Society for Testing of Materials International (ASTM):
 - .1 ASTM A148 / A148M-08 Standard Specification for Steel Castings, High Strength, for Structural Purposes
 - .3 Stiftelsen Det Norske Veritas (DNV):
 - .1 DNV-OS-E301:2010 Position Anchoring
 - .4 American Bureau of Shipping (ABS):
 - .1 ABS Guide for Certification of Offshore Anchoring Chain

1.3 SUBMITTALS

- .1 Submit three copies of Product data, procedure for assembly, deployment, and tensioning of all anchoring components to the Departmental Representative for review at least 21 days prior to commencing Work of this section.
- .2 Prepare checklist for material installation and submit for each anchor assembly.

1.4 QUALITY ASSURANCE

- .1 Provide certificates of conformance to the requirements of this section for all chains, anchors, and other components installed.
- .2 Certificates shall be furnished by manufacturer's testing laboratories or qualified independent testing agencies.

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PART 2 - PRODUCTS

2.1 GENERAL

- .1 General requirements for the anchoring system are described as follows:
 - .1 The anchoring equipment i.e., hooks, ropes, chain, swivels, shackles, plates, and all other connecting equipment, shall meet American Bureau of Shipping (ABS) standards.
 - .2 Contractor is responsible for fit compatibility of all chain, ropes, connecting hardware, and other related fittings.

2.2 ANCHORING HARDWARE

- .1 Select connecting hardware and fittings having a breaking strength of at least x 1.25 greater than that of the rope or chain to which they are attached. Ensure fit compatibility of all fittings.
- .2 All shackles shall be welded shut in accordance with ASME Section IX.
- .3 Shackles, Connecting Links, and Swivels: certified by Lloyd's Register of Shipping, sizes and grades as indicated on the Drawings.
- .4 Structural steel plates, shapes, bars: to CSA G40.20-13/ G40.21-13, Grade 300W, minimum 30% recycled content.
- .5 Anchoring system lengths as provided on the Drawings shall be considered approximate. Contractor is to verify exact lengths required.

PART 3 - EXECUTION

3.1 SITE PREPARATION

- .1 Contractor is responsible for verifying all field conditions prior to commencement of the Work. Contractor shall promptly notify the Departmental Representative of any discrepancy or condition that may affect the Work.

3.2 INSTALLATION

- .1 Assemble hardware and components in accordance with approved standards and procedures.
- .2 Install anchoring system in accordance with approved installation methodology submitted.

3.3 SUBMITTAL

- .1 Record installation anchoring system tensions and lake water elevation

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to be submitted to Departmental Representative for review prior to completion of work.

END OF SECTION