



# **FISHERIES AND OCEANS CANADA**

## **Real Property Safety and Security**

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**CANADIAN COAST GUARD  
KITSILANO SEARCH AND RESCUE STATION – FLOAT UPGRADES**

**CONTRACT NO. F1700-164139**

**SPECIFICATIONS  
February 2017**



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## **PART 1 GENERAL**

### **1.1 CANADIAN STANDARDS ASSOCIATION (CSA):**

- .1 CAN3-B78.1-M83 (R2000), Technical Drawings – General Principles.
  - .1 CAN/CSA-B78.2-M91 (R2000), Dimensioning and Tolerance of Technical Drawings.
  - .2 CSA 269.1-1975 (R1998), Falsework for Construction Purposes
  - .3 CAN/CSA-269.2-M87 (R1998), Access Scaffolding for construction Purposes.
- .2 Fire Commissioner of Canada (FC):
  - .1 FC 301, Standard for Construction Operations, June 1982.
  - .2 FC 302, Standard for Welding and Cutting, June 1982.
- .3 National Research Council of Canada (NRC):
  - .1 National Building Code of Canada (NBC) 1995.
  - .2 National Fire code of Canada (NFC).

### **1.2 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 Fisheries and Oceans Canada has a requirement for a standard concrete float identified as a dual type II and a standard single float that will be fabricated at the contractor's designated facility and be delivered and installed to the Kitsilano Coast Guard Station near the entrance to False Creek in Vancouver.
- .2 Work of this Contract involves the construction advancements, alterations and expansions of the float system that will be used to support the operations of the Search and Rescue (SAR) Station.

The work involves:

  - .1 Mobilisation/Demobilisation;
  - .2 Temporarily decommission on-float services, inclusive of electrical and compressed air, for subsequent reinstallation;
  - .3 Remove and dispose ten single 14-inch steel piles together with booms as outlined on the drawings. Piles shall be extracted completely from the seabed;
  - .4 Remove, Transfer down, and Reinststate the two existing floats with existing piles already in place;
  - .5 Supply and Install the new 17.07m by 26.22m float complete as shown on the drawings, float module is called Dual Type II;
  - .6 Supply and Install the new 3.0m by 18.8m float with existing piles already in place complete as shown on the drawings;
  - .7 Reinststate utilities decommissioned at outset of work.
- .3 In the event the contractor decides to tow the float modules to the sites in clause 1.17.5, the contractor shall submit a towing plan for review by Fisheries and Oceans, Canada prior

to towing. The tow plan shall avoid towing the float modules in waves higher than 600 mm. The contractor shall include an allowance for temporary mooring of the float modules at the Kitsilano SAR Station.

- .4 The standard single float drawing set has a module 18.8 metres x 3.0 metres x 1.696 metres deep on design sheet 26 that provides 56.4 m<sup>2</sup> of deck area. The standard single float drawing set has a module called the Dual type II that is 26.22 metres x 17.074 metres x 1.696 metres deep on design sheet 24 that provides 447.68 m<sup>2</sup> of deck area. The dual will be constructed from two singles side by side. The total quantities and completion dates or the units are outlined in clause 1.4 of this section. The floats are to be constructed with the following materials; marine quality expanded polystyrene foam billets, steel fabrications with marine coatings and some with hot dip galvanizing, 40 MPa concrete with silica fume and fly ash, uncoated reinforcing steel and urethane coatings on the exposed foam surfaces in the mooring wells and pipe pile steel guides.
- .5 The float modules shall have a freeboard of 600 mm minimum, no tolerance is allowed for freeboard less than 600 mm. Acceptable trim is a difference in freeboard between any two adjacent corners or diagonals, not greater than 50 mm. The manufacturer shall adjust the pitch and list with trim weights. Trim weights must not interfere with moored vessels. The floats shall have a sloped deck, float level and have square corners and straight untwisted walls to allow end to end and side to end float connections if required. In the event a barge is used for fabrication, the float shall not have a camber or sag over its length due to barge flexing.
- .6 The marine quality foam billets shall be bonded in a staggered manner vertically and horizontally and bonded as shown on the drawings and specifications.
- .7 The concrete walls and deck shall be cast in one pour to promote concrete shrink wrap onto the marine foam with no construction joints.
- .8 The silica fume concrete float shall be water pond cured for seven days immediately after the concrete deck and walls have been placed and the deck has been float finished.
- .9 The concrete deck shall have traction grooves saw cut into it after water pond curing and sealed with two coats of Silane sealer applied no earlier than 14 days after casting concrete.
- .10 Complete independent professional inspections and certifications as fabrication progresses with strict adherence to the submittal check off prescribed in the specifications and copy the Owner regularly with the latest entries. See submittal section 01 33 00.
- .11 Connecting the floats to their mooring piles is a part of this contract.

### **1.3 CONTRACT METHOD**

- .1 Construct Work under Unit Price contract.
- .2 The contract price for the Work will be the total of actual quantities of Work listed in the attached "*Schedule of Quantities*" that is to be submitted by each individual bidder.

#### **1.4 WORK SEQUENCE/CONSTRUCTION SCHEDULE**

- .1 Within five (5) working days after contract award, provide a schedule showing anticipated progress stages and final completion of the work within the time period required by the Contract documents.
- .2 This contract must be completed by October 31, 2017.
- .3 Coordinate Progress Schedule with Owners' timeline.
- .4 Required Stages:
  - .1 One Single unit. At least 30 percent completed by May 31, 2017 and Final Completion and delivered before September 30, 2017.
  - .2 Dual type II unit. Final Completion and delivered before September 30, 2017.
- .5 Complete Performance and Acceptance - Refer to clause 1.16.

#### **1.5 WORK BY OTHERS**

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Engineer.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Engineer, in writing, any defects which may interfere with proper execution of work.

#### **1.6 PRECEDENCE**

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Document.

#### **1.7 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Contract Specifications.
  - .3 Addenda to Contract documents.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Professional Compliance test reports
  - .9 Product data sheets.
  - .10 Supplier / Manufacturer's instructions / directions / application information.
  - .11 Material / Product Warranty information / agreements.
  - .12 Copy of Approved Work Schedule.
  - .13 Health and Safety Plan and Other Safety Related Documents.
  - .14 Other documents as specified.

## **1.8 Setting Out of Work**

- .1 The Contractor shall provide survey control points and set such stakes as necessary to layout the alignment and elevations of work at his facility.
- .2 The Contractor shall set elevations and lay out work in detail from control points.
- .3 In the event the Contractor employs a barge, the contractor shall provide survey control from shore to demonstrate for the professional compliance inspection that the barge is level for casting concrete and that the barge is not twisted, sagged or hogged in the middle. The professional compliance inspection must be copied to the owner before casting concrete. The Contractor shall provide a base of clean river sand to the barge deck to allow for twist, sag or hogging in the barge deck to provide a level foundation for the foam blocks and formwork. Casting of concrete shall be controlled by the shore survey to prevent barge twisting, sagging or hogging as explained in section 03 05 10.
- .4 The Contractor shall assume full responsibility for and to execute complete layout of work.

## **1.9 Measurement for Payment**

- .1 General:
  - .1 Payment for work will be made at the Prices Per Unit as tendered for the various classifications of the work appearing in the "Unit Price Table" of the Form of Tender.
  - .2 Any work called for in the specifications or shown on the plans, or which is necessary for the completion of the work called for in the specifications and is not specifically listed as a separate item in the "Unit Price Table", shall be deemed incidental to the general purpose of the Contract and no separate payment will be made on account of any such work, but the cost of any such incidental work shall be included in the Price Per Unit values as tendered for the various items appearing in the "Unit Price Table".
  - .3 The metric system of measurement (SI) will be employed on this Contract.
- .2 Mobilisation/Demobilisation - Pay Item #1
- .3 Remove and dispose ten single 14-inch steel piles together with booms as outlined on the drawings. Piles shall be extracted completely from the seabed - Pay Item #2
- .4 Temporarily decommission on-float services, inclusive of electrical and compressed air, for subsequent reinstallation. Move and reinstall, to existing piles, the existing floats - Pay Item #3
- .5 Fabrication and Supply of Dual Type II Concrete Float Unit (Sheet 24 of Contract Drawings) - Pay Item #4:
  - .1 The unit of measurement will be each Dual Type II unit fabricated.

- .2 This will include all labour, material and equipment to fabricate all of the following:  
40 MPa silica Fume Concrete; Reinforcing steel; Expanded polystyrene foam billets; Steel fabrications; Embed Metal with Marine Coatings; Utility chases and Metal Hatch Covers with marine coatings; Fender Chain Metal Stops also marine coated; Concrete curing and finishing; Timber Bull Rails, Sawcut deck grooves; Deck Drain Holes complete with PVC piping; Silane sealing of concrete deck and walls; urethane coating and providing float joining parts
- .6 Fabricate and Supply Single 18.8m Concrete Float Unit (Sheet 26 of the Contract Drawings) – pay Item # 5:
  - .1 The unit of measurement will be each Single unit fabricated.
  - .2 This will include all labour, material and equipment to fabricate all of the following:  
40 MPa silica Fume Concrete; Reinforcing steel; Expanded polystyrene foam billets; Steel fabrications; Embed Metal with Marine Coatings; Utility chases and Metal Hatch Covers with marine coatings; Fender Chain Metal Stops also marine coated; Concrete curing and finishing; Timber Bull Rails, Sawcut deck grooves; Deck Drain Holes complete with PVC piping; Silane sealing of concrete deck and walls; urethane coating and providing float joining parts; Connectors plates on both sides of float (Sheet 27 of the Contract Drawings)
- .7 Delivery of the completed Dual Type II and Standard Single Concrete Float Units – Pay Item #6
  - .1 The unit of measurement will be a single pay item to deliver both float types to the location outlined in Clause 1.17.5 of this section.
- .8 Install of the completed Dual Type II Units – Pay Item #7
  - .1 The unit of measurement will be a single pay item to install the 4 piles that hold the Dual Type II.
- .9 Install of the completed single Concrete Float – Pay Item #8
  - .1 The unit of measurement will be a single pay item to install the single Concrete Float to the existing 4 piles.

#### **1.10 Project Meetings**

- .1 The Owner or manufacturer may arrange for project meetings, from time to time.
- .2 The Owner may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only, and will have the same meaning and intent as if they were included with drawings referred to in the Contract documents.



**1.11 Record Documents**

- .1 The manufacturer shall be responsible for compliance test reports by independent professional testing companies to inspect the work in accordance with the technical specifications that form a part of this contract document.
- .2 The compliance inspections must be carried out regularly, both before and after parts are covered up or embedded. The inspection reports and certificates must be copied to the owner regularly and must be readily available for the owners' review from time to time at the manufacturers' facility.
- .3 At completion, supply one complete set of as-built drawings and specifications with all deviations clearly marked and a complete document of professional certifications.
- .4 At completion provide all product, material and equipment warranties by the suppliers and manufacturers.

**1.12 Codes and Standards**

- .1 Perform work in accordance with the Standards and codes identified in the technical specifications. Related Codes are CSA, National Building Code, and the National Fire Code.
- .2 The manufacturer must have good standing with the Work Safe B.C. and all federal, provincial and local regulators.
- .3 In any case of conflict or discrepancy between referenced codes, standards and regulations, the most stringent requirements shall apply.
- .4 Meet or exceed the requirements of specified standard, codes and referenced documents.

**1.13 Environmental Protection**

- .1 Comply with federal, provincial and municipal laws, orders and regulations concerning protection of the environment and the control and abatement of soil, water and air pollution at the manufacturers' facility during execution of this contract.
- .2 Do not dispose of debris, contaminated water or volatile materials such as oil, paint thinner or mineral spirits into waterways, storm or sanitary sewers, or the sea. Comply with all environmental regulations concerning the proper disposal of these materials and products.
- .3 Fires and burning of rubbish on site are not permitted unless proper permission by regulators has been granted to the manufacturer at his site.
- .4 Do not bury or dispose of rubbish and waste materials on site unless approved by the appropriate regulators.

**1.14 Permits and Notifications**

- .1 Obtain and pay for all permits including the launching of each float and temporary storage.
- .2 Conform to the noise by-laws and requirements of local authorities impacted by the fabrication of these floats.
- .3 Notify Environmental Protection Service and the local Fisheries Officer at least five days before launching the each float.

**1.15 Site Security**

- .1 Assume responsibility for the following:
  - .1 All personnel, vessels and vehicles requiring access to the fabrication site.
  - .2 Temporary safe moorage until the owner hauls the floats away.

**1.16 Complete Performance**

- .1 Provide a minimum of 5 days' notice to the Owner of the date of completion.
- .2 Provide marine vessel for the Owner's visit upon completion.
- .3 All Compliance inspection reports must be contained in an organized binder referenced to samples that have been properly stored and labelled for easy review by the owner and his representatives.
- .4 Substantial Performance:
  - .1 Upon securing the floats for temporary storage that the manufacturer has arranged the manufacturer shall request the Owner to accept the floats and compliance records and samples to allow the manufacturer to apply for Substantial Completion in accordance with General Conditions.
- .5 Final Acceptance:
  - .1 All work shall have been completed including deficiencies and compliance inspected by the manufacturer's professional inspection agencies prior to requesting complete performance (Final) inspection in writing to the Owner a minimum of 5 working days before the requested date of inspection pursuant to the General Conditions. Real Properties and Technical Support and their representatives require time and effort to pre-plan acceptance. Incurred costs resulting from cancellation or delay notice by the manufacturer may be assessed against the contract.

**1.17 Material and Equipment**

- .1 General:
  - .1 Use new material unless otherwise specified.

- .2 Record the following information for any or all materials and products proposed for supply:
    - .1 Name and address of manufacturer.
    - .2 Trade name, model and catalogue number.
    - .3 Performance, descriptive and test data.
    - .4 Manufacturer's installation/application instructions.
    - .5 Evidence of arrangements to procure.
  - .3 Provide equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
  - .4 Use products of one manufacturer for equipment or material of the same type of classification unless otherwise specified.
- .2 Metric sized products:
- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for the project.
  - .2 The manufacturer is required to provide metric products where specified in the sizes called for in the contract documents, except where a valid claim can be made that a particular product is not available on the Canadian market.
  - .3 Difficulties caused by the manufacturer's lack of planning and effort to obtain modular metric sized products which are available on the Canadian market will not be considered sufficient reason for claiming they cannot be provided.
  - .4 Claims for additional costs due to provision of specified modular metric sized products will not be considered.
- .3 Substitution after Contract award:
- .1 No substitutions will be permitted without prior written approval of the Owner.
  - .2 Proposals for substitution may only be submitted after Contract award. Such request must include statements of respective costs of items originally specified and the proposed substitution.
  - .3 Proposals will be considered by the Owner if:
    - .1 Materials selected by tenderer from those specified are not available;
    - .2 Delivery date of materials selected from those materials specified would unduly delay completion of Contract, or
    - .3 Alternative materials to that specified, which is brought to the attention of and considered by the Owner as equivalent to the material specified, and will result in a credit to the Contract amount.
    - .4 Should the proposed substitution be accepted whether in part or in whole, assume full responsibility and costs when substitution affects other work on the project. Pay for design or drawing changes required as a result of substitution.
    - .5 Amounts of all credits arising from approval of substitutions will be determined by Engineer and the Contract price will be reduced accordingly.

- .4 Manufacturer's instructions:
  - .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
  - .2 Notify Owner in writing of any conflict between these specifications and the manufacturer's instructions. The Owner will designate which document is to be followed.
- .5 Delivery and storage
  - .1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.
  - .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
  - .3 Store material and equipment in accordance with suppliers' instructions.
  - .4 Touch-up damaged factory finished surfaces to comply with the specifications. Use coatings in accordance with the specifications. Do not paint over nameplates.
  - .5 Maintain fabrication equipment and plant in good operating order.
  - .6 Deliver two (2) float units to the **Kitsilano Canadian Coast Guard SAR Station located at 1661 Whyte Ave, Vancouver, BC, V6J 1A9**

**PART 2 PRODUCTS**

**2.1 NOT USED**

**PART 3 EXECUTION**

**3.1 NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                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 building and provide for personnel and vehicle access.
- .3        Where security is reduced by work provide temporary means to maintain security.
- .4        Closures: protect work temporarily until permanent enclosures are completed.

**1.2                ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING SYSTEMS**

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

**1.3                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 Consultant 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3        Provide for personnel and pedestrian and vehicular traffic.

**1.4                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.

**Part 2            Products**

**2.1                NOT USED**

- .1        Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1            Section 01 33 00            Submittal Procedures

**1.2                DEFINITIONS**

- .1            Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
- .2            Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
- .3            Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4            Construction Work Week: Monday to Friday or Saturday, inclusive, will provide five to six day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
- .5            Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element: usually expressed as workdays or work weeks.
- .6            Master Plan: summary-level schedule that identifies major activities and key milestones.
- .7            Milestone: significant event in project, usually completion of major deliverable.
- .8            Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
- .9            Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

**1.3                REQUIREMENTS**

- .1            Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate, as defined times of completion, are of essence of this contract.

**1.4 SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit to Departmental Representative within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 10 working days of receipt of acceptance of Master Plan.

**1.5 PROJECT MILESTONES**

- .1 Project milestones form interim targets for Project Schedule.
  - .1 Project completed before **October 31, 2017**.

**1.6 MASTER PLAN**

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

**1.7 PROJECT SCHEDULE**

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
  - .1 Award.
  - .2 Shop Drawings, Samples.
  - .3 Permits.
  - .4 Mobilization.
  - .5 Pile Driving
  - .6 Project Completion

**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                Section Includes**

- .1    Shop drawings and product data.
- .2    Samples.
- .3    Certificates and transcripts.

**1.2                Precedence**

- .1    For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Document.

**1.3                Related Sections**

- .1    Section 01 35 30 – Health and Safety Requirements.

**1.4                ADMINISTRATIVE**

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

- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
- .10 Keep one reviewed copy of each submission on site.

**1.5 SHOP DRAWINGS AND PRODUCT DATA**

- .1 Refer to CCDC 2 GC 3.11.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of BC, Canada.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .5 Allow 2 days for Departmental Representative's review of each submission.
- .6 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .7 Make changes in shop drawings as Departmental Representative require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions, other than those requested.
- .8 Accompany submissions with transmittal letter, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .9 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.

- .2 Supplier.
- .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.
- .10 After Departmental Representative's review, distribute copies.
- .11 Submit electronic copies of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .12 Submit electronic copies 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.
- .13 Submit electronic copies 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.
- .14 Submit electronic copies 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.
- .15 Submit electronic copies 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.
- .16 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
  - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic copies 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 Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
  - .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings. Responsibility for which shall remain with Contractor submitting, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
  - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

**1.6 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 the Owner.
- .3 Notify the Owner 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 the Owner are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Owner prior to proceeding with Work.
- .6 Make changes in samples, which the Engineer 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 MOCK-UPS**

- .1 Not used.

**1.8 PROGRESS PHOTOGRAPHS**

- .1 Submit progress photographs in accordance as requested by the Departmental Representative

**1.9 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.
- .3 Compliance certificates, material and product certificates shall be maintained in the document of compliance records.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 Professional Inspection and Submittal Check off List**

The following list of certified items shall be deemed as fulfilling an obligation of providing evidence of compliance with the specifications and design to the Owner and the design engineer:

- .1 Submit Letter's of Good Standing from Compensation Board of BC and from Federal, Provincial and Local Authorities regulating the manufacturers' operations and facilities in accordance with the terms and conditions;
- .2 Submit Health and Safety Plan and the associated components in accordance with section 01 35 30 clauses 1.5 and 1.10 in accordance with the terms and conditions;

- .3 Certify that the lay out of the float module dimensions complies with the drawings and specifications as prescribed in section 01 11 00 clause 1.8;
- .4 In the event a barge is employed professional certification is required that setting out of the work and concrete casting has complied with Section 01 11 00 clause 1.16.3 and section 03 05 10;
- .5 Certify Trim Weight Adjustment Method is in accordance Section 03 05 10;
- .6 Certify Concrete Mix conforms to Section 03 05 10;
- .7 Document all Concrete Test Reports certifying supplied mix conforms to Design Mix; strength; air content; silica fume content; slump and plastic density. Each of these components must comply for the mix to be certified in compliance;
- .8 Certify Concrete water pond curing complied with section 03 05 10 clause 3.3;
- .9 Certify Traction Grooves complied with section 03 05 10 clause 3.4;
- .10 Certify formwork complied with section 03 10 00 clause 2.1.2 and Part 3;
- .11 Certify shop drawings of the concrete reinforcing steel bars bend and cut sheets comply with the design drawings and specifications;
- .12 Certify concrete clear cover for steel reinforcing steel bars complies with Section 03 05 10 clause 3.1.7 and section 03 20 00 and that the reinforcing bar placement and splices comply with the design drawings and shop drawings;
- .13 Certify that concrete deck float finish, traction grooves and silane sealer work complied with section 03 35 00;
- .14 Certify that the concrete deck slope complies with the drawings;
- .15 Certify that metal fabrications have complied with the drawings and specifications;
- .16 Certify that metal fabrication coatings are in compliance with the specifications;
- .17 Certify samples of Expanded Polystyrene Foam billets are in compliance with section 35 51 23 Part 2 before any cutting, bonding or placement of foam billets or built up blocks take place;
- .18 Certify bonding method, application and adhesive are in compliance with the design drawings and specifications;
- .19 Certify that bonded foam is in compliance section 35 51 23 and the reviewed bonding method;
- .20 Certify that launch of the float module complied with Section 35 51 23 clause 3.2
- .21 Certify that all coatings are in compliance with the drawings and specifications;

**END OF SECTION**





- .2 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

## **1.5 SUBMITTALS**

- .1 Perform submittals, if required in accordance with Section 01 33 00
- .2 The following shall be in the Records Document:
  - .1 Health and Safety Plan.
  - .2 Copies of reports or directions issued by federal and provincial health and safety inspectors.
  - .3 Copies of incident and accident reports.
  - .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements.
  - .5 Emergency Procedures.
- .3 Records of Health and Safety Plan, and any revised version, to the Owner is to be a part of the Records Document and It shall not:
  - .1 Be construed to imply approval by the Owner.
  - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
  - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

## **1.6 Responsibility**

- .1 Be responsible for:
  - .1 The safety of persons and property on site; and
  - .2 The protection of persons off site, and the environment to the extent that they may be affected by the conduct of the work.

## **1.7 General Protection**

- .1 Provide safety barricades and lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.
- .2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.
- .3 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.
- .4 Secure site at night time or provide security guard as deemed necessary to protect site against entry.

## **1.8 Regulatory Requirements**

- .1 Comply with specified codes, acts, bylaws, standards and regulations to ensure safe operations at site.
- .2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Engineer will advise on the course of action to be followed.

## **1.9 Work Permits**

- .1 Obtain all necessary permits related to the project before start of work.

## **1.10 Health and Safety Plan**

- .1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.
- .2 Prepare and comply with a job-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
  - .1 Primary requirements:
    - .1 Contractor's safety policy.
    - .2 Identification of applicable compliance obligations
    - .3 Definition of responsibilities for project safety/organization chart for project.
    - .4 General safety rules for project.
    - .5 Job-specific safe work procedures.
    - .6 Inspection policy and procedures
    - .7 Incident reporting and investigation policy and procedures
    - .8 Occupational Health and Safety Committee/Representative procedures.
    - .9 Occupational Health and Safety meetings
    - .10 Occupational Health and Safety communications and record keeping procedures.
  - .2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
  - .3 List hazardous materials to be brought on site as required by work.
  - .4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.
  - .5 Identify personal protective equipment (PPE) to be used by workers.
  - .6 Identify personnel and alternates responsible for site safety and health.
  - .7 Identify personnel training requirements and training plan, including site orientation for new workers.

- .3 Develop the plan in collaboration with all sub-contractors. Ensure that work/activities of sub-contractors are included in the hazard assessment and are reflected in the plan.
- .4 Revise and update Health and Safety Plan as required, and re-submit to the Engineer.

### **1.11 Emergency Procedures**

- .1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. names/telephone numbers) of:
  - .1 Designated personnel from own company.
  - .2 Regulatory agencies applicable to work and as per legislated regulations.
  - .3 Local emergency resources.
  - .4 Engineer and site staff.
- .2 Include the following provisions in the emergency procedures:
  - .1 Notify workers and the first aid attendant, of the nature and location of the emergency.
  - .2 Evacuate all workers safely
  - .3 Check and confirm the safe evacuation of all workers.
  - .4 Notify adjacent workplaces or residences which may be affected if the risk extends beyond the workplace.
  - .5 Notify Engineer and staff.
- .3 Provide written rescue/evacuation procedures as required for, but not limited to:
  - .1 Work at high angles.
  - .2 Work in confined spaces or where there is a risk of entrapment.
  - .3 Work with hazardous substances.
  - .4 Underground work.
  - .5 Work on, over, under and adjacent to water.
  - .6 Workplaces where there are persons who require physical assistance to be moved.
- .4 Design and mark emergency exit routes to provide quick and unimpeded exit.
- .5 At least once each year, emergency drills must be held to ensure awareness and effectiveness of emergency exit routes and procedures, and a record of the drills must be kept.
- .6 Revise and update emergency procedures as required, and re-submit to the Engineer.

### **1.12 Meetings**

- .1 Contractor to hold health and safety meetings related to execution of the work for the float module on his designated facility.

**1.13 Health and Safety Officer**

- .1 The Health and Safety Officer must:
  - .1 Be responsible for completing all health and safety training, and ensuring that personnel that do not successfully complete the required training are not permitted to enter the site to perform work.
  - .2 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
  - .3 Be on site during execution of work.

**1.14 Hazardous Products**

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to the Engineer and in accordance with the Canada Labour Code.
- .2 Where use of hazardous and toxic products cannot be avoided:
  - .1 Obtain appropriate permission beforehand of the product(s) intended for use.
  - .2 Submit applicable MSDS and WHMIS documents as per Section 01 33 00.
  - .3 Provide adequate means of ventilation in accordance with WCB of British Columbia.

**1.15 Removal of Lead-Containing Paints**

- .1 All paints containing TCLP lead concentrations above 5 ppm are classified as hazardous.

**1.16 Electrical Safety Requirements**

- .1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.
- .2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

**1.17 Electrical Lock-out**

- .1 Develop, implement and enforce use of established procedures to provide electrical lock-out and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.
- .2 Prepare the lock-out procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have the procedures available for review upon request by the Owner.
- .3 Keep the documents and lock-out tags at the site and list in a log book for the full duration of the Contract. Upon request, make such data available for viewing by Owner or by any authorized safety representative.

**1.18 Overloading**

- .1 Ensure no part of work is subjected to a load, which will endanger its safety or will cause permanent deformation.

**1.19 Falsework**

- .1 Design and construct falsework in accordance with CSA S269.1.

**1.20 Scaffolding**

- .1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CAN/CSA-S269.2.

**1.21 Confined Spaces**

- .1 Carry out work in confined spaces in compliance with provincial regulations.

**1.22 Blasting**

- .1 Not Required.

**1.23 Powder-Actuated Devices**

- .1 Use powder-actuated devices in accordance with ANSI A10.3 only after receipt of written permission from the Engineer.

**1.24 Fire Safety Requirements**

- .1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

**1.25 Fire Protection and Alarm Systems**

- .1 Fire protection and alarm systems shall not be:
  - .1 Obstructed.
  - .2 Shut off.
  - .3 Left Inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than firefighting.
- .3 Be responsible/liable for costs incurred from the fire department and the building owner and tenants, resulting from false alarms.

**1.26 Posted Documents**

- .1 Post legible versions of the following documents on site:
  - .1 Health and Safety Plan.
  - .2 Sequence of work.
  - .3 Emergency procedures.
  - .4 Drawing showing project layout, locations of the first aid station, evacuation route and marshalling station, and the emergency transportation provisions.
  - .5 Floor plans
  - .6 Notice as to where a copy of the workers' Compensations Act and Regulations are available on the work site for review by employees and workers.
  - .7 Workplace Hazardous Materials Information System (WHMIS) documents.
  - .9 Material Safety Data Sheets (MSDS).
  - .10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.
- .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

**1.27 Correction of Non-Compliance**

- .1 Immediately address health and safety non-compliance issues as directed by the appropriate regulators.
- .2 Record action taken to correct non-compliance with health and safety issues identified by the appropriate regulators.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

Approved: 2012-06-30

## **Part 1           General**

### **1.1               REFERENCES**

#### **.1               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.

#### **.2               Reference Standards:**

- .1       Canada Green Building Council (CaGBC)
  - .1       LEED Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package for New Construction and Major Renovations (including Addendum [2007]).
  - .2       Rating System Addenda for New Construction and Major Renovations LEED Canada-NC Version 1.0-[Addendum 2007].
  - .3       LEED Canada-CI Version 1.0-[2007], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide for Commercial Interiors.
  - .4       LEED Canada 2009 for Design and Construction-[2010], LEED Canada 2009 for Design and Construction Leadership in Energy and Environmental Design Green Building Rating System Reference Guide
  - .5       LEED Canada for Existing Buildings, Operations and Maintenance-[2009], LEED Canada 2009 Leadership In Energy and Environmental Design Green Building Rating System Reference Guide.
- .2       Canadian Construction Documents Committee (CCDC)
  - .1       CCDC 2-2008 Stipulated Price Contract.
- .3       U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1       EPA 832/R-92-005-[92], Storm Water Management for Construction Activities, Chapter 3.
  - .2       EPA General Construction Permit (GCP) [2012].

### **1.2               ACTION AND INFORMATIONAL SUBMITTALS**

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

#### **.2               Product Data:**

- .1       Submit [2] copies of WHMIS MSDS in accordance with Section [01 35 29.06 - Health and Safety Requirements] [01 35 43 - Environmental Procedures].



- .3 Sustainable Design Submittals:
  - .1 LEED Canada submittals: in accordance with [Section 01 35 21 - LEED Requirements].
- .4 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Consultant.
- .5 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .6 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .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.
    - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.
  - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
    - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
  - .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
  - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
  - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
  - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal,

Provincial, and Municipal laws and regulations for storage and handling of these materials.

- .13 Waste Water Management Plan identifying methods and procedures for managing 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.
- .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

### **1.3 SITE CLEARING AND PLANT PROTECTION**

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

### **1.4 WORK ADJACENT TO WATERWAYS**

- .1 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
- .2 Waterways to be kept free of excavated fill, waste material, and debris.
- .3 Do not skid logs or construction materials across waterways.
- .4 Avoid indicated spawning beds when constructing temporary crossings of waterways.

### **1.5 POLLUTION CONTROL**

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

### **1.6 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.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section [01 74 11 - Cleaning].
  - .1 Leave Work area clean at end of each day.
- .2 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 11 - Cleaning].

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

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

**1.2                INSPECTION**

- .1        Refer to CCDC 2, GC 2.3.
- .2        Allow Departmental Representative or Consultant Engineer 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.
- .3        Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative or Consultant Engineer instructions, or law of Place of Work.
- .4        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.
- .5        Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

**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 Departmental Representative or Consultant Engineer 5 days in advance of requirement for tests, in order that attendance arrangements can be made.
- .2        Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

**1.5 REJECTED WORK**

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

**1.6 MILL TESTS**

- .1 Submit mill test certificates as requested.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

Approved: 2006-03-31

**Part 1            General**

**1.1                REFERENCES**

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

**1.2                PROJECT CLEANLINESS**

- .1        Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2        Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .3        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4        Dispose of waste materials and debris off site.
- .5        Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .6        Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .7        Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

**1.3                FINAL CLEANING**

- .1        Refer to CCDC 2, GC 3.14.
- .2        When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3        Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .4        Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5        Remove waste products and debris including that caused by Owner or other Contractors.

- .6 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors.
- .9 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

Approved: 2006-03-31

**Part 1            General**

**1.1                REFERENCES**

- .1        Canadian Construction Documents Committee (CCDC)
  - .1        CCDC 2-[94], Stipulated Price Contract.
  - .2        DOC 14-[2000], Design-Build Stipulated Price Contract.
  - .3        DOC 15-[2000], Design-Builder/ Consultant Contract.

**1.2                INSPECTION AND DECLARATION**

- .1        Contractor's Inspection: Contractor conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1        Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
  - .2        Request Departmental Representative Inspection.
- .2        Departmental Representative Inspection: Departmental Representative, Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3        Completion: submit written certificate that following have been performed:
  - .1        Work has been completed and inspected for compliance with Contract Documents.
  - .2        Defects have been corrected and deficiencies have been completed.
  - .3        Equipment and systems have been tested, adjusted and are fully operational.
  - .4        Operation of systems have been demonstrated to Owner's personnel.
  - .5        Work is complete and ready for final inspection.
- .4        Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative and Engineer Consultant. If Work is deemed incomplete by Departmental Representative and Engineer Consultant, complete outstanding items and request re-inspection.
- .5        Declaration of Substantial Performance: when Owner and Departmental Representative and Engineer consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article DOC 14 DOC 15 for specifics to application.
- .6        Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be dated for commencement for warranty



period and commencement of lien period unless required otherwise by lien statute of Place of Work.

- .7 Final Payment: when Owner and Departmental Representative consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2. If Work is deemed incomplete by Owner, Departmental Representative, and Consultant, complete outstanding items and request re-inspection.
- .8 Payment of Holdback: after issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2

**1.3 CLEANING**

- .1 In accordance with Section 01 74 11 - Cleaning.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

# Standard Concrete Float Modules

## FISHERIES AND OCEANS CANADA

## REAL PROPERTIES AND SECURITY AND SAFETY

PRESENTED TO

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**Fisheries and Oceans Canada  
Real Properties and Security and  
Safety**

PRESENTED BY

---

**Tetra Tech  
For Divisions 03, 05, 06,  
09 and 35**



**PART 1      General**

**1.1          Related Sections**

- .1      Section 03 10 00 - Concrete Forming and Accessories
- .2      Section 03 20 00 - Concrete Reinforcing.
- .3      Section 05 50 00 - Metal Fabrications
- .4      Section 09 97 19 - Painting Exterior Metal
- .5      Section 35 51 23 - Floats

**1.2          Measurement Procedures**

- .1      No measurement will be made for concrete under this section. Include all costs for concrete forming, supply, placing, reinforcing, curing, and finishing in the measurement for payment procedures for concrete floats in section 01 11 00.

**1.3          References**

- .1      Canadian Standards Association (CSA)
  - .1      CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
  - .2      CAN/CSA-A23.2-14, Methods of Test for Concrete.
  - .3      CAN/CSA-A5-98, Portland cement.
  - .4      CSA A363-98, Cementitious Hydraulic Slag
  - .5      CAN/CSA-G30.18-M92(R1998), Billet-Steel Bars for Concrete Reinforcement.

**1.4          Inspection**

- .1      Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

**1.5          Submittals**

- .1      Shop Drawings
  - .1      Certify drawings of Trim Weights complies with adjustment specification and does not interfere with moored vessels.
  - .2      Submittals, if required to be in accordance with Section 01 33 00.
  - .3      Provide certification that:
    - .1 Mix proportions selected will produce concrete of specified quality and yield.
    - .2 Strength will comply with CAN/CSA- A23.1.
    - .3 Mix design is adjusted to prevent alkali aggregate reactivity problems.

## **PART 2 Products**

### **2.1 Materials**

- .1 Portland cement with 30% fly ash replacement: to CAN/CSA-A5.
- .2 Reinforcing bars: to CAN/CSA-G30.18, Grade 400.
- .3 Water, fine aggregates and normal density coarse aggregates: to CAN/CSA-A23.1-14
- .4 Mineral admixtures: type N (natural Pozzolan) to CAN/CSA-A23.1 and CSA A23.5.
- .5 Air entraining admixtures to CAN/CSA-A23.1-14 and ASTM C260.
- .6 Chemical admixtures to CAN/CSA-A23.1-14 and ASTM C494/C494M, as approved by the engineer.
- .7 Curing compound to ASTM C309, type 1, Class A

### **2.2 Mix**

- .1 Proportion concrete in accordance with CAN/CSA-A23.1.
- .2 Minimum compressive strength at 56 days shall be 40 Mpa.
- .3 Type 10 cement, 380 kg
- .4 Silica Fume 30 kg
- .5 Fly Ash 115 kg
- .6 Coarse Aggregate 14 mm minus pit run SSD 1000 kg
- .7 Fine aggregate: SSD 750 kg
- .8 Estimated water 145L
- .9 High Range water reducer (Rheobuild 1000) (L) 4.000
- .10 Air-Entraining Admixture as Required
- .11 Air content 6.5% minimum
- .12 Total Weight 2,107 kg
- .13 Slump: 80+30 mm
- .14 Sand content % 42.9
- .15 Calculated Plastic Density 2,217 kg/m<sup>3</sup>
- .14 Calcium Chloride is NOT Permitted.

## **PART 3 Execution**

### **3.1 Construction**

- .1 Perform cast-in-place concrete work in accordance with CAN/CSA-A23.1-14 & A23.2.-14

- .2 Cast the concrete directly onto the foam billets to ensure a sound bond develops between the foam billets and cured concrete and take care to prevent movement of the foam billets. Maintain square and true walls and corners to accommodate future float to float connections. Refer to section 03 10 00 on Formwork.
- .3 Place concrete in a manner to prevent twisting and warping of the floats, particularly so if a barge is employed to construct the floats.
- .4 Hot and cold weather concrete shall comply with all requirements of CAN/CSA-A23.1-14 & A23.2.-14
- .5 Obtain approval of compliance from the professional testing agency, before placing concrete, that concrete mix and reinforcing steel are in accordance with the specifications and drawings.
- .6 Maintain accurate records of poured concrete. Records to include date, batch time, placement time, pour location, plastic density, air temperature, slump, air content and test samples taken.
- .7 Concrete Clear Cover:
  - .1 - 50 mm to top of concrete deck;
  - .2 - 50 mm to exterior walls;
  - .3 - 50 mm to submerged surfaces;
  - .4 - 20 mm to foam billets

### **3.2 Inserts**

- .1 Embed plates with headed anchors shall be secured sufficiently to prevent movement during concrete placing and vibration.

### **3.3 Curing**

- .1 Cure and protect concrete in accordance with CAN/CSA-A23.1-14 & A23.2-14. Type 3 using water pond curing for the deck and continuous sprinkling on the walls for as follows:
  - .1 Do not use curing compounds where bond is required by subsequent topping or coating.
  - .2 Pond Cure the deck with a minimum of 25 mm deep pond and sprinkler the walls 24 hours a day, commencing immediately after finishing the float deck.
  - .3 Fresh water only, shall be used.
  - .4 Cure for 7 days at a minimum temperature of 10 °C.
  - .5 Curing compound shall be applied at the rate recommended by the manufacturer to achieve ASTM C309 water retention limits.

### **3.4 Traction Grooves on the Deck**

- .1 Saw cut traction grooves latitudinally the full width of the float 4.8 mm deep at 300 mm center to center the full length of the float module after curing is complete.

**3.5 Sealing**

- .1 After saw cutting, apply two even coats of silane sealer in accordance with the supplier's directions.
- .2 Apply low modulus epoxy caulking around perimeters of steel embed plates after curing to seal the grooves.

**3.6 Field Quality Control**

- .1 Concrete testing: to CAN/CSA-A23.2 by testing laboratory designated and paid for by the contractor using his compliance professional testing agency.
- .2 Cure Cylinders near the float under same curing conditions as the float.
- .3 Non-destructive testing methods shall be in accordance with CAN/CSA-A23.1-14 & A23.2-14.

**END OF SECTION**

**PART 1 General**

**1.1 Related Sections**

- .1 Section 03 05 10 – Cast-in-Place Concrete

**1.2 Measurement Procedures**

- .1 No measurement will be made under this Section. Include costs in Section 01 11 00 Measurement of Payments

**1.3**

- .1 Canadian Standards Association (CSA)
  - .1 CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
  - .2 CAN/CSA-O86.1-10, Engineering Design in Wood (Limit States Design).
  - .3 CSA O121-M1978, Douglas Fir Plywood.
  - .4 CSA O151-M1978, Canadian Softwood Plywood.
  - .5 CSA S269.1-1975, Falsework for Construction Purposes.
  - .6 CAN/CSA-S269.3-M92, Concrete Formwork.
- .2 Council of Forest Industries of British Columbia (COFI)
  - .1 COFI Exterior Plywood for Concrete Formwork.

**1.4 Inspection**

- .1 Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

**PART 2 Products**

**2.1 Materials**

- .1 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121, CAN/CSA-O86.1, CSA O437 Series and CSA-O153.
- .2 Exterior- Wall Forms:
  - .1 **Do not use removable or snap-off metal ties, brace the wall forms from the outside at the top and bottoms to maintain poured concrete clear cover, patched snap tie holes are NOT permitted. Fix the embed steel plates to the forms without drilled holes in the steel. Coatings of embed plates must be repaired if disturbed or damaged when fixing the steel plates into the formwork.**

- .2 Plywood: Douglas Fir to CSA O121
- .3 Form release agent: non-toxic, biodegradable, low VOC.
- .4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm<sup>2</sup>/s at 40EC, flashpoint minimum 150EC, open cup.
- .5 Falsework materials: to CSA-S269.1.

### **PART 3 Execution**

#### **3.1 Fabrication and Erection**

- .1 Manufacturer's Professional Compliance testing agency shall verify lines, levels and centers before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork. All formwork to be braced with screw jack type forming accessories and anchored at the base of the wall form, snug to the foam billets to prevent bowing of the formwork. The screw brace shall be anchored to provide wall straightness and resist vibrated concrete.
- .3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-14 & A23.2-14 and a tolerance of plus or minus of 6 mm.
- .4 Align wall forms to maintain a square corner and provide straight walls to a tolerance of 12.7 mm maximum over the 26.22 metre wall and 6 mm over the 8.537 metre wall. Top of wall shall deviate no more than 3 mm from the vertical at the base of the concrete wall.
- .5 Form the chamfers with chamfer strips as shown on the drawings.
- .6 Form block outs, chases, slots, openings, recesses, expansion and control joints to comply with the drawings and specifications.
- .7 Secure embed anchors, assemblies, and other inserts required to accommodate the Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .8 Clean formwork in accordance with CAN/CSA-A23.1-14 & A23.2-14, before placing concrete.
- .9 If floats are to be constructed on a barge, the contractor to ensure that concrete placement and forms do not create a permanent twist in the floats and that a base lift of clean river sand shall be placed on the barge deck to ensure a level base for the erection of the formwork and foam billets.
- .10 Fabricator to ensure side and end walls are square and true to facilitate float-to-float connections.



**3.2 Removal and Reshoring**

- .1 Sequence formwork removal with concrete curing specified in sections 03 35 00.
- .2 All formwork and accessories must be removed from the concrete floats before launching. This includes all wood, plywood, steel components and plastic beneath the floats.

**END OF SECTION**

**PART 1      General**

**1.1          Related Sections**

- .1      Section 03 05 10 - Cast-in-Place Concrete
- .2      Section 05 50 00 - Metal Fabrications
- .3      Section 35 51 23 - Floats

**1.2          Measurement Procedures**

- .1      Reinforcing steel added by the Engineer during shop drawing review to be negotiated for payment with the owner as part of the call-up contract.
- .2      No measurement will be made for reinforcing steel shown on the drawings under this section. Include costs for reinforcement shown on the drawings in the measurement for payment procedures for concrete floats for which reinforcement is required.

**1.3          References**

- .1      American Concrete Institute (ACI)
  - .1      ACI 315R-80, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .2      American National Standards Institute/American Concrete Institute (ANSI/ACI)
  - .1      ANSI/ACI 315-80, Details and Detailing of Concrete Reinforcement.
- .3      Canadian Standards Association (CSA)
  - .1      CAN/CSA-A23.1-14, Concrete Materials and Methods of Concrete Construction.
  - .2      CAN3-A23.3-14, Design of Concrete Structures for Buildings.
  - .3      CSA G30.3-M1983 (R1991), Cold Drawn Steel Wire for Concrete Reinforcement.
  - .4      CSA G30.5-M1983 (R1991), Welded Steel Wire Fabric for Concrete Reinforcement.
  - .5      CSA G30.14-M1983 (R1991), Deformed Steel Wire for Concrete Reinforcement.
  - .6      CSA G30.15-M1983 (R1991), Welded Deformed Steel Wire Fabric for Concrete Reinforcement.
  - .7      CAN/CSA-G30.18-M92, Billet-Steel Bars for Concrete Reinforcement.
  - .8      CAN/CSA-G40.21-M92, Structural Quality Steels.
  - .9      CSA W186-M1990, Welding of Reinforcing Bars in Reinforced Concrete Construction.

## **1.4 Shop Drawings**

- .1 Certification to be provided that shop drawings of the cut and bend sheets comply with the design drawings and specifications. and the placement of reinforcing steel is in accordance with the drawings and specifications and complies with Section 01 33 00.
- .2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices, if approved by Engineer, with identifying code marks to permit correct placement without reference to structural drawings. Indicate sizes, spacings and locations of chairs, spacers and hangers. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice - by Reinforcing Steel Institute of Canada. ANSI/ACI 315 and ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structure.
- .3 Detail lap lengths and bar development lengths to CAN3-A23.3, unless otherwise indicated. Provide type staggered tension lap splices on the deck and wall bars.

## **1.5 Inspection**

- .1 Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

## **PART 2 Products**

### **2.1 Materials**

- .1 Substitute different size bars only if permitted in writing by Engineer.
- .2 Reinforcing steel: billet steel, bare grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-30.18.
- .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
- .5 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1-14. All chairs to be plastic style and be supported on 20 mm or 25 mm thick cement fibre board squares approximately 150 mm by 150 mm for adequate support on the expanded polystyrene foam for concrete deck reinforcing.
- .6 Plain round bars: to CAN/CSA-G40.21.
- .7 Cast in place Nelson anchors 16 mm diameter x 150 long c/w nuts and galvanized for the timber bull rail HSS stubs on the quad floats.

### **2.2 Fabrication**

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1-14, ANSI/ACI 315, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada. ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures unless indicated otherwise.

- .2 Obtain Engineer's approval for locations of reinforcement splices other than those shown on reinforcing steel placement drawings.
- .3 In the event reinforcement is to be welded, it shall be certified that it is in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

### **2.3 Source Quality Control**

- .1 Provide certification that mill test reports and certificates of reinforcing steel show all physical and chemical analyses and comply with the design and specifications.

## **PART 3 Execution**

### **3.1 Field Bending**

- .1 Do not field bend or field weld reinforcement except as allowed by the professional certification agency confirming it is in accordance with the specified codes and standards.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

### **3.2 Placing Reinforcement**

- .1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1-14.
- .2 Only plastic chairs are to be used to support the steel bars.
- .3 Prior to placing concrete, obtain certification that reinforcing steel and embed assemblies comply with the drawings and specifications.
- .4 Ensure cover to reinforcement is maintained during concrete pour.
- .5 Place the 16 mm diameter Nelson stud anchors to suit the locations for the HSS stubs that are to be used on the quad floats in lieu of the embed plates for the single and duals. Both embeds and HSS stubs are to be located as shown on drawing sheet 15.

**END OF SECTION**

**PART 1      General**

**1.1          Related Sections**

- .1      Section 03 05 10 - Cast-in-Place Concrete
- .2      Section 03 10 00 - Concrete Forming and Accessories

**1.2          References**

- .1      Canadian Standards Association (CSA)
  - .1      CSA-A23.1-14& A23.2-14, Concrete Materials and Methods of Concrete Construction.

**1.3          Inspection**

- .1      Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

**PART 2      Execution**

**2.1          Execution**

- .1      Concrete deck to receive a Float Finish in accordance with CAN/CSA-A23.1-14 & A23.2-14. Float finish to have sufficient roughness only to assist with traction. No depressions or bird baths are allowed as they will allow ice to form during winter nights.
- .2      Deck surface shall be struck off and power floated and edger finished before curing.
- .3      Saw cut grooves 4.8 mm deep as shown on drawings for traction, crack control and drainage after pond curing for seven days at 24 hours a day.
- .4      Apply silane sealer to deck and grooves after the pond curing no earlier than 14 days after curing period.

**END OF SECTION**

## **PART 1      General**

### **1.1      Related Sections**

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 03 05 10 - Cast-in-Place Concrete
- .3 Section 03 20 00 - Concrete Reinforcing
- .4 Section 09 97 19 - Painting Exterior Metal Surfaces
- .5 Section 35 51 23 - Floats

### **1.2      References**

- .1 American Society for Testing and Materials, (ASTM)
  - .1 ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2 ASTM A490, Specification for Carbon Steel Bolts and Studs, 1040 Mpa Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
  - .2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel.
  - .2 CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
  - .3 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .4 CSA W59-1989(R2001), Welded Steel Construction (Metal Arc Welding) (Imperial Version).

### **1.3      Submittals**

- .1 Product Data:
  - .1 Record all manufacturer's printed product literature, specifications and data sheets for periodic review by the owner and in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings
  - .1 Provide certification that shop drawings are in accordance with the drawings and specifications and comply with Section 01 33 00 - Submittal Procedures.
  - .2 Indicate materials, core thicknesses, finish, connections, joints, and method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

#### **1.4 Delivery, Storage, and Handling**

- .1 Packing, Shipping, Handling and Unloading:
  - .1 Deliver, store, handle and protect materials in accordance with Section 01 11 00.

#### **1.5 Inspection**

- .1 Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

### **PART 2 Products**

#### **2.1 Materials**

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 300W.
- .2 HSS sections to G40.21 350W.
- .3 Pipe to A252 grade 3.
- .4 Threaded rod to grade C1008.
- .5 Welding materials: to CSA W59.
- .6 Welded cast in place anchors to be Nelson studs.
- .7 Timber bolts to ASTM standard A307.
- .8 Welding electrodes: to CSA W48 Series.

#### **.9 Embed Assemblies to Support Timber Bull Rails on the Single and Duals**

Contractor to supply and fabricate the assemblies as depicted on the drawings made with a U-head plate; 114.3 OD x 6 wall pipe, embed plate 200 x 200 x 12.7 and three embed Nelson studs 16 diameter. Shall be coated in accordance with section 09 97 19 except for embed anchors and the plate surface contacting concrete. The contractor shall supply M20 or 19 diameter A307 timber bolts galvanized and the splice plates for timber corners using plate 6 thick plate 250 x 76, galvanized.

#### **.10 Deck Plates**

Contractor to supply and fabricate from 25.4 mm steel plate as shown on the drawings for mooring wells, deck pockets and covers for utility raceways. The deck plates shall be coated in accordance with section 09 97 19.

#### **.11 Chain Stops**

Contractor to supply and fabricate the chain stops as depicted on the drawings made from 127 OD x 6.3 wall pipe, 25 x 25 square bar, stiffeners from 6 thick plate and hand grip from 6 diameter rod. Coated in accordance with section 09 97 19.

**.12 Float Joining Transfer Plate**

Contractor to supply and fabricate the transfer plate as depicted on the drawings made from plate 20 thick either bent or cut and welded in two segments. Coated in accordance with section 09 97 19.

**.13 Float Joining Tension Plate Links**

Contractor to supply and fabricate the transfer plate as depicted on the drawings made from plate 20 x 150 x 1200, pipe 101.6 OD x 8 wall and HSS 102 x 102 x 9.5. Coated in accordance with section 09 97 19.

**.14 Float Joining Threaded End Rod Bars**

Contractor to supply and fabricate the 50 diameter rod by 2150 long with threaded ends c/w thread pitch of 4.23 (6 per inch), lock nuts and 6 x 100 x 100 steel washers as depicted on the drawings. To be galvanized in accordance with the requirements of CSA G164-M.

**.16 Float Joining HSS Beams**

Contractor to supply and fabricate the HSS beams with sealed ends from 152 x 152x 13 by 1200 long c/w steel plate capped ends with 6 thick plate as depicted on the drawings. To be galvanized in accordance with the requirements of CSA G164-M.

**.17 HSS Stub Assemblies for the Quad Timber Bull rails**

Contractor to supply and fabricate the HSS stubs 203 x 203 x 16 in both 300 long and 150 lengths to suit the timber bull rail butt joint and continuous locations. The contractor to supply the cast in place 16 diameter by 150 long Nelson studs galvanized. The contractor shall supply the 19 diameter timber bolts galvanized in lengths depicted on the drawings and galvanized in accordance with the requirements of CSA G164-M.

**PART 3 Execution**

**3.1 Fabrication and Installation**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .3 Perform welding work in accordance with CSA W59.
- .4 Erect metal work square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .5 Secure embed plate assemblies firmly for casting into concrete together with setting templates.
- .6 Touch-up field welds, bolts and damaged surfaces after completion in accordance with section 09 97 19.
- .7 Repair damaged galvanized surfaces in the field with galvanizing repair sticks.



- .8 One set of parts for joining two floats only shall be supplied, fabricated, coated and packaged for shipment to site with the floats, care shall be taken to prevent damage in transit. To be installed by others at site.
- .9 Install the embeds / HSS stubs in the locations shown on drawing sheet 15.

### **3.2 Cleaning**

- .1 Upon completion of float module, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**PART 1      General**

**1.1          RELATED REQUIREMENTS**

- .1      Section 05 50 00 Metal Fabrications

**1.2          REFERENCES**

- .1      ASTM International
  - .1      ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2      ASTM A653/A653M-11,
  - .3      ASTM D1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
  - .4      ASTM D5055-11, ASTM D5456-11, Standard Specification for Evaluation of Structural Composite Lumber Products.
- .2      Canada Green Building Council (CaGBC)
  - .1      LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations (including Addendum 2007).
  - .2      LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations 2009.
  - .3      LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors.
  - .4      LEED Canada-EB: O M-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Existing Buildings: Operations and Maintenance 2009.
- .3      CSA International
  - .1      CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2      CSA O112.9-10, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
  - .3      CSA O121-08, Douglas Fir Plywood.
  - .4      CAN/CSA O122-06(R2011), Structural Glued-Laminated Timber.
  - .5      CSA O141-05(R2009), Softwood Lumber.
  - .6      CSA O151-09, Canadian Softwood Plywood.
  - .7      CSA O153-M1980(R2008), Poplar Plywood.
  - .8      CSA O325-07, Construction Sheathing.
  - .9      CAN/CSA-Z809-08, Sustainable Forest Management.
- .4      Forest Stewardship Council (FSC)
  - .1      FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

- .5 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2010.
- .6 Sustainable Forestry Initiative (SFI)
  - .1 SFI-2010-2014 Standard.
- .7 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S706-09, Standard for Wood Fibre Insulating Boards for Buildings.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
  - .1 Submit drawings for timber bull rail cuts and verification of Douglas Fir number one or better and preservative treatment verification of 0.2 pound ACZA salt treatment.

### **1.4 QUALITY ASSURANCE**

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

### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials with care to prevent damage prior to installation.
- .2 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location.
  - .2 Replace defective or damaged materials with new.

## **PART 2 Products**

### **2.1 FRAMING STRUCTURAL MATERIALS**

- .1 203 x 203 Douglas Fir timber bull rails using Number 1 or better with ACZA 0.2 pound Salt Treatment in accordance with following standards:
  - .1 CSA O86.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.

**PART 3 Execution**

**3.1 PREPARATION**

- .1 Treat cut and drilled timber surfaces with ACZA salt treatment wood preservative, before installation with field size containers from the supplier of the preservative.
- .2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on timber.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

**3.2 INSTALLATION**

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Install timber butt joints and continuous timber connections to embeds or HSS stubs at the locations shown on drawing sheet 15.
- .3 Install the timber bull rails on the embeds or HSS stubs and corner timber splices as shown on drawing sheet 6.

**3.3 CLEANING**

- .1 Progress Cleaning:
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment and dispose of in approved sites approved by regulatory agencies.

**3.4 PROTECTION**

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

**END OF SECTION**

## **PART 1      General**

### **1.1          Related Sections**

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

### **1.2          References**

- .1      American Society for Testing and Materials, (ASTM).
  - .1      ASTM D610-01, Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces.
  - .2      ASTM D2369-03, Test Method for Volatile Content of Coatings.
  - .3      ASTM D2832-92(R1999), Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.
  - .4      ASTM D5326-94a(2002), MPI-9 Test Method for Color Development in Tinted Latex Paints.
- .2      Master Painters' Institute (MPI), Exterior Structural Steel and Metal Fabrications;
  - .1      EXT 5.1, Alkyd.
  - .2      EXT 5.1G, Zinc Rich/Aliphatic Polyurethane.
- .3      Environmental Choice Program (ECP).
  - .1      CCD-048-95, Recycled Water-borne Surface Coatings.
  - .2      CCD-047a-98, Paints - Surface Coatings.
- .4      Federal Standard (FS).
  - .1      FS-595B-89, Paint Colours.
- .5      Steel Structures Painting Council (SSPC).
  - .1      SSPC-SP-1-82, Solvent Cleaning.
  - .2      SSPC-SP-2-00, Hand Tool Cleaning.
  - .3      SSPC-SP-3-00, Power Tool Cleaning.
  - .4      SSPC-SP-6/NACE No. 3-00, Commercial Blast Cleaning.
  - .5      SSPC-SP-7/NACE No 4-00, Brush-off Blast Cleaning.
  - .6      SSPC-Vis-1-89, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Specs.).
  - .7      SSPC-SP-10/NACE No. 2-00, Near White Blast Cleaning.
  - .8      SSPC-PA-02, Measurement of Dry Coat Thickness with Magnetic Gauges.
  - .9      SSPC Good Painting Practices, Volume 1, 4th Edition.
  - .10     SSPC –SP-11, power Tool cleaning to Bare Metal

- .11 SSPC-Guide 6, Debris Containment
- .6 British Columbia Waste Management Act (SWEP)

### **1.3 Measurement Procedures**

- .1 Cleaning of structural steel and components, shop painting and field painting will be included in lump sum bid for the floats and all associated work.

### **1.4 Submittals**

- .1 Product Data.
  - .1 Record manufacturer's printed product literature, specifications and data sheets in accordance with Section 01 33 00 - Submittal Procedures and for the owners periodic review.
  - .2 Record copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's for paint.
- .2 Samples.
  - .1 Certify samples are in accordance with the drawings and specifications and record as per Section 01 33 00 - Submittal Procedures.
- .3 Paints that do not appear on Approved Products List must be approved by the Engineer before use on project. When it is proposed to use non-qualified paint, submit one 2 L sample of paint to the Engineer at least 2 weeks prior to commencement of painting for analysis and acceptance. Mark samples with name of project, its location, paint manufacturer's name and address, name of paint, MPI standard number and manufacturer's paint code number.
- .4 Provide certification that paints used comply with the design and specifications and maintain two 2 L samples of each paint delivered to site for Owners review.
- .5 Test Reports.
  - .1 Record all test reports in accordance with Section 01 33 00.
- .6 Manufacturer's Instructions:
  - .1 Record manufacturer's installation instructions.

### **1.5 Quality Assurance**

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements with contractor's professional certifying agencies.

## 1.6 Inspection

- .1 Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports in accordance with specification section 01 33 00 clause 3.1.

## 1.7 Waste Management and Disposal

- .1 Separate and recycle waste materials in accordance with Federal and Provincial regulations.
- .2 Divert unused coating materials from landfill through disposal at a special wastes depot.

## PART 2 Products

### 2.1 Materials

- .1 Paint.
  - .1 Primer: MPI EXT 5.1C, primer, marine for steel.
    - .1 Primer for second coat: tinted sufficiently off finish colour of first coat to show where second coat is applied.
    - .2 Tinting material: compatible with primer and not detrimental to its service life.
  - .2 Paint Systems Approved

	Supplier	Paint System	Coat	Dry Film Thickness
.1	Ameron Canada	Amerlocck 2	2	8-10 mils DFT/coat
.2	Westcoast Industrial Coatings	Jotomastic 87	2	8-10 mils DFT/coat
.3	Camcoat Industries	Interseal 670HS	2	8-10 mils DFT/coat
.4	Devoe Coatings	Bar-Rust 236H	2	8-10 mils DFT/coat
.5	Stonecor Group	Carbogard 890	2	8-10 mils DFT/coat
.6	Minimum DFT of finished paint system to be 18 mils at any location.			
- .3 Sand for sandblasting: to SSPC (Steel Structures Painting Council).
- .4 Dry film thickness shall be stated in mils where 1 mil = 1/1000 inch.

## PART 3 Execution

### 3.1 Manufacturer's Instructions

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

### 3.2 Preparation

- .1 New metal surfaces
  - .1 Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances in accordance with the following:
    - .1 Commercial blast cleaning: SSPC-SP-6 (Steel Structures Painting Council).
    - .2 Solvent cleaning: SSPC-SP-1.
    - .3 Hand tool cleaning: SSPC-SP-2.
    - .4 Power tool cleaning: SSPC-SP-3.
    - .5 Brush-off blast cleaning: SSPC-SP-7.
    - .6 Near White Blast Cleaning: SSPC-SP10/NACE No. 2.
- .2 Metal surfaces to be repainted
  - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following.
    - .1 Commercial blast cleaning: SSPC-SP-6.
    - .2 Brush-off blast cleaning: SSPC-SP-7.
    - .3 Solvent cleaning: SSPC-SP-1.
    - .4 Hand tool cleaning: SSPC-SP-2.
    - .5 Power tool cleaning: SSPC-SP-3.
  - .2 Commercial blast clean rusted and bares metal surfaces where existing paint system has failed.
  - .3 Brush-off blast clean remaining metal surfaces to be painted.
  - .4 Scrape edges of old paint back to sound material where remaining paint is thick and sound, feather exposed edges.
- .3 Touch-Up Work
  - .1 All field welds shall be cleaned of slag, debris and burnt paint and painted as specified.
  - .2 All steel surfaces to receive paint material shall be fresh water power washed at a minimum of 3,500 psi to remove all dirt, soluble salts or other foreign matter. Soluble salt contamination shall be less than 20 PPM prior to any coating material application. Remove all grease and oil by washing with solvents / degreaser to SSP-SP1.
  - .3 All steel surfaces to receive coating shall be prepared in accordance with SSPC-SP11 (Power Tool Cleaning to Bare Metal).
  - .4 Only tightly adhering coating material can remain on the substrate prior to recoating. All rough welds or protruding miscellaneous attachments in the areas to be coated shall be ground smooth prior coating material application.
  - .5 All surfaces to be coated shall be accepted by the engineer prior to application



- .4 Compressed air to be free of water and oil before reaching nozzle.
- .5 Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.
- .6 Do not apply paint until prepared surfaces have been accepted by the professional testing agency.
- .7 Prior to commencing paint application the degree of cleanliness of surfaces to be in accordance with SSPC-Volume 1.
- .8 Abrasives to be acceptable to the Worker' Compensation Board of B.C., Fisheries and Oceans Canada, Environment Canada and BC Environment. Minimum profile depth shall be 2 mils. Maximum depth shall not exceed one third of dry film thickness of total system.
- .9 Prior to blast cleaning, all weld splatter and slag on welds to be removed. All sharp edges to be rounded to 3mm radius.
- .10 Any blast cleaning left longer than 8 hours (under a strictly controlled environment) shall be re-blasted in accordance with SSP-SP10 to remove any subsequent surface corrosion.
- .11 All surfaces to be coated shall be inspected and approved by the professional testing agency prior to coating application.
- .12 Protection of surfaces
  - .1 Protect surfaces not to be painted and if damaged, clean and restore such surfaces as directed by the Engineer.
  - .2 Apply primer, paint, or pre-treatment after surface has been cleaned and before deterioration of surface occurs.
  - .3 Clean surfaces again if rusting occurs after completion of surface preparation.
  - .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.
  - .5 Protect cleaned and freshly painted surfaces from dust to approval of the Engineer.
- .13 Mixing paint
  - .1 Do not dilute or thin paint for brush application; use as received from manufacturer.
  - .2 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.
  - .3 Do not mix or keep paint in suspension by means of air bubbling through paint.
  - .4 Thin paint for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to the Engineer.
- .14 Number of primer coats

- .15 New metal surfaces
  - .1 Shop: Two primer coats to minimum dry film thickness of 200 microns (8 mils) per coat.
  - .2 Field: Two primer coats to minimum dry film thickness of 225 microns (9 mils) per coat.
- .16 Repainting existing metal surfaces
  - .3 One primer coat to minimum dry film thickness of 200 microns (8 mils) to bare and commercial sand blasted areas.

### 3.3 Application

- .1 Apply paint by spraying, brushing, or combination of both. Use sheepskins or daubers when no other method is practical in places of difficult access. All specified painting systems to be applied in accordance with this specification and the manufacturer's data sheets. In the event of a conflict between the technical specifications and manufacturer's data sheets, the technical specifications shall take precedence.
- .2 Use dipping or roller coating method of application when specifically authorized by the Engineer in writing.
- .3 Caulk open seams at contact surfaces of built up members with material approved by the Engineer, before second undercoat of primer is applied.
- .4 Where surface to be painted is not under cover, do not apply paint when:
  - .1 Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.
  - .2 Temperature of surface is over 50 degrees C unless paint is specifically formulated for application at high temperatures.
  - .3 Fog or mist occurs at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
  - .4 Surface to be painted is wet, damp or frosted.
  - .5 Previous coat is not dry.
  - .6 Substrate temperature shall not be less than 3° C above dew point during all coating applications.
- .5 All high solid paint shall be applied by Conventional or Airless Spray. Spray painting equipment shall be of ample capacity and shall be kept clean and in good working order at all times. Spray guns shall be suited to the type of paint used and shall be operated with orifices, nozzles and air pressure suited to type of paint and consistency. If conventional paint pots are used they shall be of ample capacity and shall be equipped with means of controlling air pressure at the gun.
- .6 Air lines shall be equipped with water traps to positively remove condensed moisture.
- .7 Provide cover when paint must be applied in damp or cold weather. Protect, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied. Each coat of paint shall have a definite colour difference from the preceding and subsequent coats of paints.
- .10 Brush application of paints to be thinned approximately 10% shall be applied to all welds, corners, crevices, etc., prior to the first spray application of the paint.
- .11 Brush application
  - .1 Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
  - .2 Brush out runs and sags.
  - .3 Remove runs, sags and brush marks from finished work and repaint.
- .12 Spray application
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
  - .3 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .4 Apply paint in uniform layer, with overlapping at edges of spray pattern.
  - .5 Brush out immediately runs and sags.
  - .6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
  - .7 Remove runs, sags and brush marks from finished work and repaint.
- .13 Shop painting
  - .1 Do shop painting after fabrication and before damage to surface occurs from weather or other exposure.
  - .2 Spray paint contact surfaces of field assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.
  - .3 Do not paint metal surfaces, which are to be embedded in concrete.
  - .4 Paint metal surfaces to be in contact with wood with either full paint coats specified or three shop coats of specified primer.
  - .5 Do not paint metal within 50 mm of edge to be welded. Give unprotected steel one coat of approved primer after shop fabrication is completed.
  - .6 Remove weld spatter before painting. Remove weld slag and flux by methods as specified by manufacturer. Metal Surfaces to be repainted.

- .7 Protect machine finished or similar surfaces that are not to be painted but that do require protection, with coating of rust inhibitive petroleum, molybdenum disulphide, or other coating approved by Engineer.
  - .8 Copy previous erection marks and weight marks on areas that have been shop painted.
- .14 Field painting
- .1 Paint steel structures as soon as practical after erection.
  - .2 Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
  - .3 Field paint surfaces (other than joint contact surfaces), which are accessible before erection but which are not to be accessible after erection.
  - .4 Where painting does not meet with requirements of specifications, and when so directed by the professional certifying agency, remove defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.
- .15 Touch-Up Work
- .1 All specified painting systems to be applied in accordance with this specification and the manufacturer's data sheets. In the event of a conflict between the technical specifications and manufacturer's data sheets, the technical specifications shall take precedence. Where surface to be painted is not under cover, do not apply paint when:
    - .1 Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.
    - .2 Temperature of surface is over 50 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Fog or mist occurs at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
    - .4 Surface to be painted is wet, damp or frosted.
    - .5 Previous coat is not dry.
    - .6 Substrate temperature shall not be less than 3° C above dew point during all coating applications.
    - .7 All prepared steel surfaces to receive coating shall be brush or roller applied in two or more coats to provide the originally specified DFT for new work.
    - .8 Additions of paint thinner to be from same manufacturer as coating system and must not exceed manufacturer's recommendations.
    - .9 All work to be accepted by the engineer prior to and after painting.

- .16 Do not handle painted metal until paint has dried, except for necessary handling for painting or stacking for drying.
- .17 Scrape off and touch up paint, which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

### **3.4 Field Quality Control**

- .1 Site Tests, Inspections.
  - .1 Upon completion of the painting procedures test for dry film reading and evaluate the results as per SSPC PA 2.
  - .2 Contractor shall take wet film thickness measurements or spreading rate checks at once every ten minutes or once per 4.5 square metres of coated surface. The engineer may require more frequent checks.
  - .3 Coating material shall be subject to high voltage Holiday Testing at 2000 volts at the discretion of the engineer.
  - .4 At the discretion of the engineer, occasional spot checks for coating material adhesion may be performed. Such test areas shall be repaired at the expense of the Contractor.
  - .5 Newly painted surfaces shall be inspected when the paint has thoroughly dried. The painted surfaces shall be considered to lack uniformity, continuity and soundness if any of the following defects are apparent upon inspection:
    - .1 runs and sags, hiding or shadowing caused by inefficient application methods;
    - .2 evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles;
    - .3 damage due to touching before paint is dry or any other contributory cause;
    - .4 damage due to application on moist surfaces or inadequate protection from weather;
    - .5 damage and / or contamination of the paint due to wind-blown contaminants (dust, sand blast materials, etc.)

### **3.5 Cleaning**

- .1 Upon completion of painting work, remove surplus materials, rubbish, tools and equipment barriers.

### **3.6 Containment**

- .1 Contractor to provide containment to prevent overspray damage to adjacent areas of float that is not a part of the painting zone, adjacent property, structures, vehicles or people.

### **3.7 Shipping and Handling**

- .1 After finish coating has dried use only synthetic ropes or rubber-covered devices to handle. Use wood softeners to prevent movement, strap smaller pieces into bundles for transportation.

**END OF SECTION**

**PART 1      PART 1      General**

**1.1            Related Sections**

- .1      Section 03 10 00 - Concrete Forming and accessories
- .2      Section 03 20 00 - Concrete Reinforcing
- .3      Section 03 05 10 - Cast- in-Place Concrete
- .4      Section 03 35 00 - Concrete Finishing
- .5      Section 05 50 00 - Metal Fabrications
- .6      Section 06 10 00 - Rough Carpentry
- .7      Section 09 97 19 - Painting Exterior Metal Surfaces

**1.2            Measurement for Payment**

- .1      Measurement for payment shall be made under section 01 11 00.
- .2      Substantial Performance Inspection in accordance with section 01 11 00.
- .3      Complete Performance in accordance with section 01 11 00.

**1.3            Dimensions**

- .1      Overall dimensions of finished concrete floats shall be in accordance with drawings and generally to the following:
  - .1      length 18.8 metres, breadth 3.0 metres and height 1.695 metres for single 18.8m Float Kitsilano Coast Guard.
  - .2      length 26.22 metres, breadth 17.074 metres and height 1.695 metres dual type II Kitsilano Coast Guard.

**1.4            Inspection**

- .1      Manufacturer to employ professional testing agency to provide compliance test reports and inspection reports as work progresses in accordance with specification section 01 33 00 clause 3.1
- .2      Floats fabricated in whole or in part without certification inspection shall not be accepted.
- .3      Initial acceptance of floats by Canada will be made at the area arranged by the manufacturer and final acceptance will take place in accordance with the Contract at destination.
- .4      One Recommended Testing Agency for Expanded Polystyrene Foam material is Intertek Testing of Vancouver, telephone 604-520-3321.

**1.5.           Waste Management and Disposal**

- .1      Separate and recycle waste materials in accordance with Federal and Provincial regulations.

- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Fold up metal banding, flatten and place in designated area for recycling.
- .4 Preservative treated wood must not be disposed of through incineration.
- .5 Preservative treated wood must not be disposed of with other materials destined for recycling or reuse.
- .6 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill as approved by the appropriate regulators.
- .7 Dispose of unused glue materials at municipally operated hazardous materials depot as approved by the appropriate regulators.

## **PART 2 Products**

### **2.1 Material**

- .1 Concrete to be in accordance with section 03 05 10.
- .2 Steel reinforcing to be in accordance with Section 03 20 00.
- .3 Metal Fabrications to be in accordance with Section 05 50 00.
- .4 Expanded Polystyrene Billets to be in accordance with the following;
  - .1 Professional certification of the material to be in accordance with Section 01 33 00;
  - .2 Provide professional certification that proposed method of bonding the Buoyancy Billets complies with all relevant parts of this section. The sample for bonding shall be 300 mm x 300 mm x 900 mm with at least one bond face of 900 x 300;
  - .3 Provide professional certification of tests confirming the conformance of polystyrene to specified physical properties, a minimum of 14 days before any cutting, bonding and installation of buoyancy billets in the float.
  - .4 The contractor shall have his shop drawings professionally certified at least 7 days before start of float fabrication that they comply with the design drawings and specifications. The shop drawings must show stock billet sizes, special block sizes, bonding, drain holes with PVC pipe sleeves, cuts or notches for concrete walls mooring wells, chamfers and utility raceways.



- .5 Expanded Polystyrene Billets shall be of a material that provides a Minimum density of  $16 \text{ kg / m}^3$ , Compressive Resistance of 50 kPa (7.3 psi) @ 1 % deformation in accordance with ASTM D 1621 and comply with the water absorption requirements of ASTM D 2842.
- .6 Contractor shall use Bakor 230-21 Adhesive to bond the lower 300 mm of each billet face, both vertical and horizontal and shall use Low Expansion Polyurethane Foam for bonding above the Bakor 230-21 Adhesive zone.
- .7 Polyurea Hybrid Elastomeric Protective Coating on Exposed Expanded Polystyrene surface inside the mooring wells.
  1. Coating shall be 6 mm thick and applied in accordance with the manufacturer's specifications. Coating shall be applied over a synthetic meshing bonded to the foam walls. Polyurea Coating shall be a chemical resistant class with ultra violet resistant colouring and shall be overlapped 50 mm onto the concrete wall.

5. Trim Weights

In the event the trim weights are required they shall be designed and fabricated from materials that provide the same service life as the concrete components to provide a system that will allow adjustments to the trim and provide a freeboard of 650 mm minimum with an overall difference in freeboard of 50 mm maximum between any two adjacent or diagonal corners. The weights shall not occupy deck space or interfere with moored vessels drafting up to 6 meters.

**PART 2      PART 3      Execution**

**3.1      Floats**

- .1 Contractor to provide a sound bond on all billet faces with Low Expansion Polyurethane Foam above the bottom 300 mm foam and shall bond the lower 300 mm of foam with Bakor 230-21 Synthetic rubber adhesive.
- .2 Deck to wall corners shall be chamfered.
- .3 Billets shall be set into place and secured sufficiently to resist movement from concrete pouring forces. The contractor shall take extreme care to place concrete in an even manner and brace the billets and exterior wall forms to resist vibratory concrete pressures.
- .4 Cast the concrete directly onto the foam billets to maintain design intent of developing a sound bond between the foam billets and concrete.
- .5 Apply the Polyurethane Coating to the foam in the mooring wells after synthetic meshing has been applied to the foam in the mooring wells to the thicknesses in Part 2 above. Apply the polyurethane to a hardness of 75 on the Shore D scale

with overlaps of 50 mm onto the concrete no earlier than 14 days after curing the concrete and after the silane sealer has been applied to the concrete walls.

- .6 All formwork to be in accordance with Section 03 10 00.
- .7 All reinforcing to be in accordance with section 03 20 00.
- .8 All embedded metal to be in accordance with Section 05 50 00 and set and secured against the concrete pour forces.
- .9 All concrete finishing including water pond curing, float finish, deck Sawcut grooves and silane sealer to be in accordance with sections 03 05 10 and 03 35 00.

### **3.2 Launch Floats**

- .1 Manufacturer to provide Marine Surveyor certificate that float launching was carried out with a maximum deck slope of 400 mm over the 26.22 metre length and that no damage above or below water line was caused by the launch.
- .2 Adjustable Trim weights shall be fabricated and attached to the float by the contractor to adjust the pitch and list so that a 600 mm minimum freeboard is achieved with no more than 50 mm difference between any two corners, diagonal or adjacent.
- .3 The trim weights shall be attached to the float by the contractor with all materials to have the same service life as the float module components and shall not occupy deck space or interfere with moored vessels drafting up to 6 meters. The contractor shall set the trim weights to provide a freeboard of 650 mm minimum with an overall difference in freeboard of 50 mm maximum between any two adjacent or diagonal corners. The contractor shall provide a professional certification that trim weight system complies with the design and specifications including service life and no obstruction with moored vessels.
- .4 The contractor is reminded that exercising tight control of the plastic density of the concrete and strict compliance to providing a sound bond between the foam billets shall ensure achievement of the freeboard and trim expectations. Lack of a sound bond in the foam billets permits the concrete vibrator to force cement paste and smaller aggregates into the bonds increasing the dead weight of the float.

### **3.3 Joining Floats on Site**

- .1 Joining of the floats shall be performed at the location for deployment under a separate construction contract for site work.

- .2 The site contractor shall supply and install the parts for joining in accordance with the drawings and specifications as agreed with Fisheries and Oceans, Canada.
- .3 The owner will design the mooring system and determine if the joining design details are adequate for the mooring forces on the joining details.

### **3.4 Cleanup**

- .1 Remove all waste and loose material on, around and under floats before launching.
- .2 Float decks to be cleaned of any cementitious material detrimental to marine waters prior to launching.

**END OF SECTION**