

**SPECIFICATIONS FOR
WHARF CONSTRUCTION
STEVENSON ISLAND, MANITOBA**



Fisheries and Oceans Canada
Small Craft Harbours
Winnipeg, Manitoba

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Part 1 General

1.1 DESCRIPTION OF WORK

- .1 The work site described in this specification is located at Stevenson Island, Manitoba. Stevenson Island is located on Island Lake, approximately 1 km South of Garden Hill and approximately 500km Northeast of Winnipeg, Manitoba. See Drawing C-1 for location. Stevenson Island is accessible by plane and the Province of Manitoba winter road network.
- .2 The work under this contract covers:
 - .1 The demolition and removal of the existing timber wharf to lines and grades designated on Drawings.
 - .2 The supply and installation of a new timber wharf as shown on Drawings.
- .3 The work to be done by the Contractor under this Contract shall include the furnishing of all superintendence, overhead, labour, materials, equipment, tools, supplies, insurance, and all things necessary for and incidental to the satisfactory performance and completion of all work as specified herein. All work to be done in accordance with details shown on the accompanying plans and as specified herein.

1.2 DEFINITIONS

- .1 The word "provide" is defined as "supply and install".
- .2 For purposes of this contract, "Departmental Representative", "Architect/Engineer" and "Engineer" shall have the same meaning.

1.3 WORK SCHEDULE

- .1 Provide within 10 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period required by contract documents.
- .2 Provide sufficient details in schedule to illustrate entire plan, and permit effective monitoring of work progress in relation to established milestones.
- .3 Work under this contract is to be performed in a timely manner. Commence planning and preparatory work immediately upon receipt of official notification of acceptance of Contract and schedule the work so that the project will be substantially complete by **March 27, 2020**.
- .4 Submit schedule updates on a minimum monthly basis and when requested by Department Representative. Provide a narrative explanation of necessary changes and schedule revisions at each update. Take all necessary measures to complete work within approved time.
- .5 Work sequence:
 - .1 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.

1.4 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.

1.5 **FEES, PERMITS AND CERTIFICATES**

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

1.6 **MEASUREMENT FOR PAYMENT**

- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment.
- .2 Provide Lump Sum breakdown for approval by Department Representative.
- .3 Submit to Departmental Representative, at least 14 days before first application for payment, cost breakdown, in detail as directed by Departmental Representative, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by Departmental Representative, cost breakdown will be used as basis for progress payments.
- .4 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.7 **INTERPRETATION OF DOCUMENTS**

- .1 In the event of discrepancies or conflicts in interpreting the Plans (drawings) and Specifications, Specifications take precedence over drawings bound with specifications.
- .2 Drawings and specifications are complementary. When work is shown or mentioned on the drawings but is not indicated in the specifications, or when work is indicated in the specifications but is not shown or mentioned on the drawings, it shall nevertheless be included in the Contract.
- .3 The sub-division of the Specification into sections, identified by title and number, is for convenience only and does not modify the singularity of the document, nor does it operate to make or imply that the Departmental Representative is an arbiter to establish the limits or extent of contract between Contractor and Subcontractors or to determine the limits or extents of work that may be decided by trade unions or contractors' organizations. Extras to the Contract will not be considered on the grounds of differences in interpretation of the Specification and/or Drawings as to which trade performs the work.
- .4 Do not scale off drawings.

1.8 **CONTRACTOR'S USE OF SITE**

- .1 Co-ordinate use of premises under direction of the Departmental Representative.
- .2 Do not unreasonably encumber the site with materials and equipment.
- .3 Assume full responsibility for protection and safekeeping of products under this Contract.
- .4 Move stored products or equipment which interfere with operations of Departmental Representative or other harbour users.
- .5 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

- .6 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .7 Repair or replace portions of existing work which have been altered during Work to match existing or adjoining work, as directed by Departmental Representative.
- .8 At completion of Work, condition of existing work: equal to or better than that which existed before new work started.

1.9 **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 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .4 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved shut-down schedule and provide notice to affected parties.
- .5 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .7 Record locations of maintained, re-routed and abandoned service lines.

1.10 **DOCUMENTS REQUIRED**

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

1.11 **CODES AND STANDARDS**

- .1 Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Work to meet or exceed requirements of contract documents, specified standards, codes and referenced documents.

1.12 **CONTRACT METHOD**

- .1 Construct Work under a combined price contract. All costs for work not specifically identified as a unit price item shall be included in the lump sum arrangement.

1.13 **PROJECT MEETINGS**

- .1 Departmental Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes.

1.14 **SETTING OUT OF WORK**

- .1 Departmental Representative will provide only those survey control points and set such stakes as necessary to define general location, alignment and elevations of work. Give Engineer reasonable notice of requirements for such control points and stakes.
- .2 Set grades and lay out work in detail from control points and grades established by Departmental Representative.
- .3 Provide devices needed to lay out and construct work.
- .4 Supply such devices needed to lay out and construct work.
- .5 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .6 Supply stakes and other survey markers required for laying out work.

1.15 **ADDITIONAL DRAWINGS**

- .1 Departmental Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.
- .2 When additional drawings and instructions are required by the Contractor, provide reasonable notice in writing to the Departmental Representative in advance of the date they are required.

1.16 **EXAMINATION**

- .1 Before submitting tender, examine existing conditions and determine conditions affecting work.
- .2 Obtain all information which may be necessary for proper execution of Contract.

1.17 **SITE INSPECTION**

- .1 The submission of a tender is deemed to be a confirmation of the fact that the Tenderer has inspected the site and is fully conversant with all the conditions under which the work is to be carried out.

1.18 **MATERIAL AND EQUIPMENT**

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

laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.19 SECURING WORK AREA

- .1 Secure the work areas in each stage in an approved manner. This includes fencing or barricades to prevent public access to any areas where construction activities occur and construction materials are stored.

1.20 VEHICLE AND PEDESTRIAN PROTECTION

- .1 Provide snow fencing, wooden barriers, and or other approved barriers to prevent vehicles and pedestrians from accessing the site during construction. Note: Due to the winter road adjacent to the work area/site, extra care must be taken to prevent public access to the worksite. The local Community may request that trees/deadfall/additional fencing be placed along the edge of the winter road to prevent unintended public access to the site.

1.21 DRAWINGS

- .1 The following drawings are to be read in conjunction with this specification:
 - .1 C-1 Site Plan and Demolition
 - .2 C-2 Plan, Profile, and Section Views
 - .3 C-3 Section Views
 - .4 C-4 Float Connection Details
 - .5 C-5 3.048m x 7.315m Float Wharf with Skids
 - .6 C-6 Connection Details
 - .7 C-7 1.385m x 3.658m Aluminum Gangway
 - .8 C-8 Aluminum Ramp Construction Details

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 Province of Manitoba
 - .1 The Workers Compensation Act (latest edition)

1.2 MEASUREMENT FOR PAYMENT

- .1 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.3 SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within 10 days after date of Notice of Award and prior to commencement of Work.
- .2 Submit copies of incident and accident reports to Departmental Representative within 24 hours of incident or accident. Notify Departmental Representative of incident or accident immediately/as soon as safely possible.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.
- .4 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of work.

1.5 SAFETY ASSESSMENT

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

1.6 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Provincial Government, Worker's Compensation Board and municipal statutes and authorities.
- .3 In the event of a conflict between any provisions of above authorities having the most stringent provision will apply.

1.7 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative verbally and in writing.

1.9 CORRECTION OF NON-COMPLIANCE

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 02 41 13 - Selective Site Demolition

1.2 MEASUREMENT FOR PAYMENT

- .1 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.3 FIRES

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

1.4 DRAINAGE

- .1 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .2 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 WORK ADJACENT TO WATERWAYS

- .1 No in-water work or shoreline work is permitted between April 15 and June 30.
- .2 Construction equipment may not enter the lake unless the lake is frozen. If construction equipment will be located on the frozen surface of the lake, it will be removed from the lake each night if the on-ice component of the projects spans more than one day.
- .3 Construction equipment will enter and leave the lake at such a location and in such a manner that no disturbance to the lakeshore occurs.
- .4 Every effort will be made to minimize the introduction of sediment to the lake during work activities. Any sediment tracked onto the ice during the project must be cleaned off at the end of the project. This includes any ice that needs to be removed from the shoreline to accommodate stabilization works. All material used for shoreline stabilization will be clean and free of silt and clay.
- .5 Do not use waterway beds for borrow material.
- .6 Waterways to be free of excavated fill, waste material and debris.
- .7 Design and construct temporary crossings to minimize erosion to waterways.
- .8 Do not skid logs or construction materials across waterways.
- .9 Avoid damage to shoreline.
- .10 Supply, install, and maintain approved erosion control blankets to unprotected slopes until revegetation is established.
- .11 Any impacts below ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Departmental Representative. Up to 30 days may be required for approval.
- .12 Protect shoreline with a build up of snow.

- .13 Reclaim and restore disturbed areas to previous or better condition.
- .14 Areas used for stockpiling construction materials, including fill or equipment storage, will be well back from the edge of the water body, and if possible, in areas which have already been disturbed or are devoid of vegetation.

1.6 **POLLUTION CONTROL**

- .1 Control emissions from equipment and plant to local authorities' emission requirements.
- .2 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.
- .4 Locate temporary fuel storage 100 metres from shore and comply with all Provincial Environmental Legislation.
- .5 Refueling, servicing, or cleaning of equipment on ice or within 100 metres of shore is prohibited. Contractor to ensure all equipment operating on project is free of external fluid leaks, grease, oil, and mud.
- .6 No maintenance of vehicles or equipment in construction areas.
- .7 All required machinery should be supplied with appropriate spill containment kits as a precaution in the event of accidental fuel spills or hydraulic leaks. Additional kits should be available on site. Contractor shall ensure that all personnel are familiar with spill kit use.
- .8 The Contractor shall report spills of fuels or other contaminants to the Engineer immediately and follow all Provincial Environment Legislation regarding spills.

1.7 **DISPOSAL OF WASTES**

- .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways. Hazardous wastes including fuels, oils and lubricants to be disposed of by a licensed hazardous waste carrier/handler in accordance with Provincial Environment Legislation.
- .3 Collect all rubbish and waste material and dispose of in accordance with applicable governing authorities. Department Representative may request to see proof of proper disposal.
- .4 Do not allow debris of any type to enter waterway.

1.8 **PLANT PROTECTION**

- .1 Protect trees and plants on site and adjacent properties.
- .2 Avoid disturbance of topsoil and vegetation unless otherwise specified. Contractor is responsible to restore all impacted areas to original state.

1.9 **VERTICAL UNDER ICE SILT CURTAIN**

- .1 Contractor to isolate the work area from the lake with an approved silt curtain to prevent the drift of sediment from the work area into the lake as required. The silt curtain must extend from the top of the ice/water to within 300mm of the lake bottom. The silt curtain

must be left in place until all suspended sediments are settled out. On completion of the project carefully remove silt curtain to ensure settled sediment is not disturbed. Costs for supply, installation, maintenance, and removal to be considered incidental to the lump sum price for demolition and removal. **Note: Due to the possibility of inadvertently introducing an evasive species to the region, the silt curtain to be used for this project is to be purchased new by the Contractor. The newly purchased silt curtain is to arrive at site in new/unused condition.**

1.10 **INVASIVE SPECIES**

- .1 Contractor to follow all Provincial and Federal regulations to prevent the spread of aquatic invasive species (zebra mussels, etc.) during the course of the Work.

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 MEASUREMENT FOR PAYMENT

- .1 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.2 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give minimum 72 hours notice for requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative.
- .3 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.3 INDEPENDENT INSPECTION AGENCIES

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

1.4 ACCESS TO WORK

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

1.5 PROCEDURES

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

1.6 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

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 MEASUREMENT FOR PAYMENT

- .1 No separate measurement will be for work of this section. Work is incidental to the project cost.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative inspection.
 - .2 Departmental Representative Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit in writing that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.
 - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Final Payment:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

1.3 FINAL CLEANING

- .1 When Work is Substantially Complete remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

1.4 RECORD DRAWINGS

- .1 Maintain project “as-built” record drawings and record accurately significant deviations from Contract documents caused by site conditions and changes ordered by Departmental Representative.
- .2 Mark “as-built” changes in red coloured ink, sign and date the final copy.
- .3 Record the following information:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by Change Order or Field Order.
- .4 At completion of project and prior to final inspection, transfer “as-built” notations to second set and submit both sets to Departmental Representative.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 All materials and work required for the demolition and removal of the existing timber wharf including the stringers, ballast rock, misc. timbers, and all associated fasteners will be measured for payment as a lump sum.
- .2 Mobilization and Demobilization
 - .1 Payment for mobilization and demobilization shall be lump sum and shall include all works required to:
 - .1 Mobilize equipment, materials, tools, supplies, labour and supervision.
 - .2 Insurance(s) required for the duration of construction.
 - .3 Fees, certificates and work permits.
 - .4 Temporary construction facilities.
 - .5 Signage.
 - .6 Securing work and storage areas.
 - .7 Vehicle and pedestrian protection.
 - .8 Daily site cleaning
 - .9 Demobilization of aforementioned items upon completion of construction.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Storage and Protection.
 - .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Departmental Representative and at no cost to the Crown.
 - .2 Remove and store materials to be salvaged, in manner to prevent damage.
 - .3 Store and protect in accordance with requirements for maximum preservation of material.
 - .4 Handle salvaged materials as new materials. **Note: All timber from the existing wharf is to be salvaged and stored at the proposed construction laydown area for Community use at a later time.**

1.3 SITE CONDITIONS

- .1 Site Environmental Requirements:
 - .1 Perform work in accordance with Section 01 35 43 – Environmental Procedures.
 - .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Ensure proper disposal procedures are maintained throughout the project.

Part 2 Products

2.1 EQUIPMENT

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

3.2 REMOVAL OF HAZARDOUS WASTES

- .1 All treated timber encountered is to be disposed of at an approved waste disposal facility with a license to dispose of such material. Contractor to provide documentation that this material is disposed of as specified.

3.3 REMOVAL OPERATIONS

- .1 Remove items as indicated.

3.4 REMOVAL FROM SITE

- .1 Dispose of materials not designated for salvage or re-use in work, off-site at location acceptable to Departmental Representative, and in accordance with the Authority having Jurisdiction.

3.5 RESTORATION

- .1 Remove debris, trim surfaces and leave work site clean, upon completion of Work.
- .2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Supply and installation of new metal bollards for the wharf shall be included in lump sum costs for the project. Quantity of new metal bollards required is 8.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM A53/A53M-18, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A269-15a, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - .3 ASTM A307-14e1, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181-99, Ready-Mixed, Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-14 (R2019), Design of Steel Structures.
 - .4 CSA W48-18, Filler Metals and Allied Materials for Metal Arc Welding
 - .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding) Metric.
- .4 The Environmental Choice Program
 - .1 CCD-047-98(R2005), Architectural Surface Coatings.
 - .2 CCD-048-98(R2006), Surface Coatings - Recycled Water-borne.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20-13/G40.21-13 (R2018), Grade 300.

- .2 Steel pipe: to ASTM A53/A53M-18 standard weight, painted finish.
- .3 Welding materials: to CSA W59-13.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307-14e1.

2.2 **FABRICATION**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Where possible, fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 **FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m² to CAN/CSA-G164-18.
- .2 Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.
- .3 Shop coat primer: to CAN/CGSB-1.40-97.
- .4 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181-99.

2.4 **ISOLATION COATING**

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

2.5 **SHOP PAINTING**

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

Part 3 Execution

3.1 **ERECTION**

- .1 Do welding work in accordance with CSA W59-13 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Provide components for building by other sections in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CAN/CSA-S16-14 (R2019), or weld.
- .7 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .8 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2

CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 New aluminum gangway and any required fasteners will be paid for per unit supplied and installed.

1.2 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .1 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .2 ASTM A325-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .3 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength.
 - .4 ASTM A490-09, Standard Specification for Structural Bolts Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
 - .5 ASTM A490M-09a, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints.
 - .6 ASTM B209M-07, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .7 ASTM B210M-05, Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
 - .8 ASTM B211M-03, Standard Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire.
 - .9 ASTM F593-02(2008), Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
- .3 CSA International
 - .1 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .2 CAN/CSA-S157/S157.1-05, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.
 - .3 CSA W47.2-M1987(R2008), Certification of Companies for Fusion Welding of Aluminum.
 - .4 CSA W59.2-M1991(R2008), Welded Aluminum Construction.
- .4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 Master Painters Institute (MPI)
 - .1 MPI - EXT 5.5D, Bituminous Finish.

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

- .1 Submit 1 copy of mill test reports showing chemical and physical properties and other details of aluminum to be incorporated into work, at least 4 weeks prior to fabrication of structural aluminum. Mill test reports to be certified by metallurgists qualified to practice in Province of Manitoba, Canada.
- .2 Fabricator of structural aluminum to provide an affidavit stating that materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect structural aluminum from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Aluminum bar, rod, wire: to ASTM B211M.
- .2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B221M.
- .3 Aluminum sheet or plate: to ASTM B209M.
- .4 Aluminum drawn tubes: to ASTM B210M.
- .5 Aluminum bolts and rivets: to ASTM B316M.
- .6 Aluminum welding wire: to AWS - A5.10/A5.10M.
- .7 Stainless steel bolts: to ASTM F593.
- .8 Steel bolts: to ASTM A307.
- .9 Bituminous paint: MPI - EXT 5.5D, without thinner.
- .10 Galvanizing: hot dip galvanize steel bolts to CAN/CSA-G164, minimum zinc coating of 600 g/m².

2.2 FABRICATION

- .1 Fabricate to CAN/CSA-S157 and in accordance with approved shop drawings.

2.3 FINISHES

- .1 Finish: plain mill as indicated on drawings.

Part 3 Execution

3.1 INSTALLATION

- .1 Do structural aluminum work: to CAN/CSA-S157.
- .2 Do welding: to CSA W59.2.

3.2 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before starting fabrication.

3.3 ERECTION

- .1 Erect structural aluminum as indicated and to CAN/CSA-S157 and approved erection drawings.
- .2 No field cutting or altering structural members.

3.4 JOINT SEALING AND PAINTING

- .1 Surface preparation of aluminum in contact with or embedded in dissimilar materials: to CAN/CSA-S157. Treat locations as if there is moisture present.
- .2 Paint to CAN/CSA-S157.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Excavation required for the demolition of existing wharf and installation of the new crib shall be incidental to the cost of demolition and removal. Excavated material is considered Class B material.
- .2 Supply and installation of new granular base material for the approach shall be included in lump sum costs for the project. Approximate quantity of granular base material required is 10.0 m³.
- .3 Regrading and compaction of existing suitable granular material to be included in lump sum costs for project.
- .4 Contractor to make own arrangements with Provincial authorities, municipalities, local communities, and owners of private properties, for the quarrying and transportation of rock materials and machinery for work over their property, roads or streets.

1.2 SUBMITTALS

- .1 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, and location plan of relocated and abandoned services, as required.

1.3 DEFINITIONS

- .1 Class A material: solid rock requiring drilling and blasting to loosen, which cannot be removed by means of heavy duty mechanical excavating equipment, and boulders or rock fragments of individual volumes 1.5 m³ or more.
- .2 Class B material: loose or shale rock, layered limestone rock, silt, sand, quick sand, mud, shingle, gravel, clay, sand, gumbo, boulders, hardpan and debris of individual volumes less than 1.5 m³.

1.4 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .3 Where utility lines or structures exist in area of excavation, obtain direction of Engineer before removing or re-routing.
 - .4 Record location of maintained, re-routed and abandoned underground lines.
- .2 Existing buildings and surface features:
 - .1 Conduct, with Engineer, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Engineer.

Part 2 Products

2.1 MATERIALS

- .1 Granular base: material in accordance with the following requirements:
 - .1 Type 'A' rock
 - .2 Gradations to be within limits specified when tested to ASTM C136 ASTM C117. Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
 - .1 Gradation Method #1 to:

% Passing	
Sieve Designation	Type 'A'
19 mm	100
4.75 mm	35-70
0.425 mm	10-30
0.075 mm	8-17

Part 3 Execution

3.1 PREPARATION/PROTECTION

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Protect buried services that are required to remain undisturbed.

3.2 EXCAVATION

- .1 Excavate to allow for demolition of existing timber crib wharf and installation of new timber crib wharf.
- .2 Excavation must not damage or interfere with adjacent foundations.
- .3 Keep excavated and stockpiled materials safe distance away from edge of excavation.
- .4 Dispose of surplus and unsuitable excavated material off site.
- .5 Do not obstruct flow of surface drainage or natural watercourses.
- .6 Notify Engineer when bottom of excavation is reached.
- .7 Obtain Engineer approval of completed excavation.

3.3 PLACEMENT AND INSTALLATION

- .1 Proof roll subgrade and compact to 95% SPD.
- .2 Place granular base after sub-grade surface is inspected and approved in writing by Engineer.
- .3 Placing:
 - .1 Construct granular base to depth and grade in areas indicated.
 - .2 Ensure no frozen material is placed.
 - .3 Place material only on clean unfrozen surface, free from snow and ice.
 - .4 Begin spreading base material on crown line.

- .5 Place material using methods which do not lead to segregation or degradation of aggregate.
 - .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
 - .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
 - .8 Remove and replace that portion of layer in which material becomes segregated during spreading.
- .4 Compacting:
- .1 Ensure compaction equipment is capable of obtaining required material densities.
 - .2 Compact to density not less than 95% corrected maximum dry density.
 - .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
 - .4 Apply water as necessary during compacting to obtain specified density.
 - .5 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer.
 - .6 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.
 - .7 For underwater compaction provide adequate compaction by means of backhoe bucket or other approved method.

3.4 **PROOF ROLLING**

- .1 For proof rolling use standard roller of 45400 kg gross mass with four pneumatic tires each carrying 11350 kg and inflated to 620 kPa. Four tires arranged abreast with centre to centre spacing of 730 mm maximum.
- .2 Obtain written approval from Engineer to use non-standard proof rolling equipment.
- .3 Proof roll subgrade as indicated.
- .4 Make sufficient passes with proof roller to subject every point on surface to three separate passes of loaded tire.
- .5 Where proof rolling reveals areas of defective subgrade:
 - .1 Remove sub-base material and compact to depth and extent as directed by Departmental representative.
 - .2 Replace sub-base material and compact.
- .6 Where proof rolling reveals areas of defective sub-base, remove and replace in accordance with this section at no extra cost.

3.5 **SITE TOLERANCES**

- .1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.6 **CLEANING**

- .1 Progress Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.7 **PROTECTION**

- .1 Maintain finished granular surface in condition conforming to this section until granular surfacing is accepted by Engineer.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 45 00 – Quality Control

1.2 MEASUREMENT PROCEDURES

- .1 Untreated square sawn sized decking will be paid for by the square metre of decking supplied, installed and remaining in the work. This item includes all fastenings.
- .2 Untreated square sawn timber to be measured in cubic metres of timber supplied, installed and remaining in the work, including all fastenings. This item to include curb, stringers, cribwork timbers, posts, and all timber material required for the construction of the new wharf. This item includes all fastenings.
- .3 Ballast rock will be paid for by the cubic metre supplied, installed and remaining in the work.
- .4 Installation of crib stone mattress including any excavation required for base preparation will not constitute a measurement for payment. Include costs in item 1.1.2 above.
- .5 Cubic measure of timber to be determined by product of actual cross-sections and length dimensions in place. The cross-section dimensions will be obtained from Table N-9 in “Metric Handbook for Canadian Softwood Lumber”.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A307-14e1, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
 - .2 CSA-O80 Series-15, Wood Preservation.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2017 edition (with 2019 supplements).

1.4 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00- Quality Control.
- .2 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .3 Site inspection by Departmental Representative is required, but not limited to:
 - .1 After demolition is complete.
 - .2 During crib installation (sinking into water).

1.5 WASTE MANAGEMENT

- .1 Do not dispose of preservative treated wood through incineration.
- .2 Do not dispose of preservative treated wood with other materials destined for recycling or reuse.

- .3 Dispose of preservative treated wood, end pieces, wood scraps and sawdust at an approved waste disposal facility.

Part 2 Products

2.1 MATERIALS

- .1 Timber: use timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Accreditation Board of CSA.
 - .1 Species: Group A (Douglas Fir).
 - .2 Grade: Structural, No 2 or better.
 - .3 Grading authority: BCLMA
 - .4 All timber to be rough sawn.
 - .5 All decking to be square sawn sized lumber.
 - .6 All timber and planks to be untreated.**
 - .7 All end cuts to be placed above high water line where possible.
- .2 Miscellaneous steel:
 - .1 Hot dip galvanized: to CAN/CSA-G164-18.
 - .2 Wire nails, spikes, staples: to CSA-B111.
 - .3 Bolts, nuts, washers: to ASTM A307.
 - .4 Steel straps and plates: to CAN/CSA-G40.21, Grade 300.
 - .5 Machine bolts used are to be of sufficient length to accept two washers and one fully threaded hexagonal headed nut. Bore holes for machine bolts to the same diameter as the bolt.
 - .6 Drift bolts to have countersunk, tapered head and chisel point. Bore holes for drift bolts to be 1.5mm smaller diameter than bolt and 52mm short of the length of the bolt.
- .3 Ballast for filling cribs to following requirements:
 - .1 Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials. Ballast stone supplied to be maximum size not exceeding 300 mm and minimum size to be not less than 200 mm. Appropriately sized clean ballast rock from the existing wharf may be used for ballast rock.
- .4 Crushed stone mattress:
 - .1 Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials with size to be 150 mm minus.

Part 3 Execution

3.1 PREPARATION

- .1 Dredge area of crib base as indicated.
- .2 Place and level crushed rock mattress as indicated.
- .3 Before construction, stockpile sufficient ballast to completely fill cribs.

- .4 Take closely spaced accurate soundings, precisely located by template, to surface of mattress, to determine actual configuration of base area of crib.

- .1 Construct crib bottom to match base configuration.

3.2 **DECKING AND CURB**

- .1 Decking planks: 76 mm square sawn sized lumber laid heart side down. Planks spaced 6 mm apart and secured with two 200 mm galvanized spiral spikes per timber contact. Plank widths to be not less than 240 mm and not more than 310 mm wide. Deck planks to cross width of wharf in one length.
- .2 Planks to be cut flush with outer faces of work.
- .3 All planks to be pre-drilled for spikes to prevent splitting.
- .4 In cases where thickness of deck planks vary due to shrinkage or swelling, planks are to be sorted and installed so that changes in elevations are kept to a minimum. Chamfer edges of plank where changes cannot be avoided.
- .5 Place curb on risers and secure with countersunk 19 mm diameter machine bolts as shown on Drawing C-3.
- .6 Riser blocks are to be secured to the deck with two 200 mm galvanized spiral spikes.

3.3 **CRIB CONSTRUCTION**

- .1 All longitudinal and cross timbers shall be of sufficient length to span crib in one length or as noted on drawing. Longitudinal and cross timbers to be drifted to each other at each contact points with 20 mm x 355 drift bolts. Each longitudinal and cross timber to be fastened to vertical binder post with 19 mm machine bolt complete with nut and 2 washers. All machine bolts used to be of sufficient length to accept 2 washers and have room for fully threading a hexagonal nut. All machine bolts to be countersunk on exterior faces.
- .2 Place ballast floor on bottom or second course from bottom timbers. Secure each ballast floor timber to bottom timbers with 19 mm x 305 drift bolts.
- .3 Vertical binder posts to be in one length from bottom of cribwork to top of cribwork.
- .4 Stringers to be installed in lengths as shown on drawings. Stringers to be fastened to crib timbers with 19 mm x 406 drift bolts at each contact.
- .5 Maximum spacing between cross timbers and longitudinal not to exceed 215mm.
- .6 Bore holes for drift bolts 1.5 mm smaller diameter than bolt 52 mm short of length of bolt. Bore holes for machine bolts to same diameter as bolts.
- .7 Cribs placed on bedrock to be levelled with timber blocking. Blocking to be securely fastened to bottom of cribs.

3.4 **BALLAST**

- .1 Place ballast to avoid damage to timber cribwork.
- .2 Place ballast so that differential height of fill between adjacent cells, at any time, will be less than 1 m.
- .3 Cribs to be fully ballasted from ballast floor to bottom of stringers.

3.5 **TOLERANCES**

- .1 1 in 300 in overall dimensions.

3.6 **CLEANING**

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

END OF SECTION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Timber float wharves to be paid for per unit supplied and installed.
- .2 Connections between float wharves, fastenings, and hardware shall not be measured separately for payment, but considered incidental to the work.

Part 2 Products

2.1 MATERIALS

- .1 Lumber and timber: except as otherwise specified, use lumber and timber graded and stamped in accordance with applicable grading rules and standards of associations or agencies approved to grade lumber by Canadian Lumber Standards Administration Board of CSA.
 - .1 Species: Douglas Fir Group 1b.
 - .2 Grade: structural or better
 - .3 Grading authority: BCLMA
 - .4 All timber to be S4S.
 - .5 Galvanized bolts and nuts: to ASTM A307-07b.
 - .6 Countersunk head bolts to CSA B34-67(R1972).
 - .7 Washers: pressed steel.
 - .8 Galvanized spikes and nails: spiral type to CSA B111-1974(R2003).
 - .9 Hot-dip galvanized, stainless steel, silicone, bronze or copper wood screws and fasteners: to ASTM Standards: ASTM-A153 (for hot-dip fastener products), and ASTM-A653 (coating designation G-185 for hot-dip connector and sheet products) and Type 305 and 316 for stainless steel.
 - .10 Plastic bushings: ultra-high molecular weight polyethylene (UHMWPE), density 0.94, black.
 - .11 Shapes, plates: fabricated from steel conforming to CAN/CSA-G40.20-04 and CAN/CSA-G40.20-04, Grade 300W.
 - .12 Primer: CAN\CGSB-1.40-M80 primer, structural steel, oil alkyd type.
 - .13 Preservative:
 - .1 All timber and planks to be untreated.
 - .14 Machine bolts used are to be of sufficient length to accept two washers and one fully threaded hexagonal headed nut.
 - .15 Mooring Cleats: galvanized grey iron ship or dock cleat (two hole type) indicated on drawings.
 - .16 Floatation units:
 - .1 Dimensions/Capacity:
 - .1 Floatation units for principal float wharves and finger float wharves shall be of size 600 mm x 1200 mm x 300 mm deep with a minimum buoyancy of 196 kg each.

- .2 Alternate floatation units shall be used only with written approval of engineer.
- .2 Materials:
 - .1 One piece, seamless rotational moulded outer shell.
 - .2 Manufactured from linear polyethylene resin with UV inhibitors and carbon black pigment.
 - .3 Nominal shell thickness minimum 3.8 mm.
 - .4 Heavy duty, reinforced moulded in mounting slots.
 - .5 Built in vent.
 - .6 Foam filled to 1.0-1.5 lbs/ft³
- .17 Warranty:
 - .1 Manufacturer to warrant floats for a period of ten (10) years from date of purchase against cracking, peeling, sloughing and ultraviolet deterioration. Floatation units shall retain their resiliency against being frozen in or other abrasions from normal usage.
 - .2 Contractor will submit to engineer manufacturer's documentation indicating date of purchase.
 - .3 Alternate floatation units meeting or exceeding the above specification may be used only upon written approval of the engineer.

Part 3 Execution

3.1 CONSTRUCTION

- .1 Construct timber floats as indicated on drawings.
- .2 Build work square, true, straight and accurate to the required size, with all joints closely fitted and properly secured.
- .3 Except where specified, use of shims, wedges, or short pieces of timber not permitted.
- .4 Drill holes for bolts the same size as bolt diameter.
- .5 Lay deck planks, stringers and headers in one piece.
- .6 Project all bolts at least 6 mm beyond nut.
- .7 Place a washer under the head of each bolt and under nuts in contact with wood.
- .8 Connect floatation units with bolts c/w rubber and stainless steel washer as indicated on drawings.
- .9 Install stringers as designated.
- .10 Decking: Screw planks to each stringer contact with two (2) wood screws to a minimum penetration of 50 mm. Holes in decking are to be pre-drilled. Drill all screws 2 mm below deck surface. Space planks maximum 10 mm apart.
- .11 Curbing: Attach timber curb along edges of deck with 12mm x 203mm galvanized lag screw c/w galvanized washer at 600 mm centers. Chamfer exposed sides of curb 12 mm along upper edges. Curbing in minimum lengths of 4 m. Nail riser blocks to deck with two (2) galvanized spiral nails prior to installing lag screw.
- .12 Fabricate and install all connection hardware as indicated.

- .13 Paint all float connectors, shapes and plates with one coat of primer prior to installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 31 53 13 – Timber Cribwork

1.2 MEASUREMENT FOR PAYMENT

- .1 Supply and installation of two (2) new timber ladder to be included in the lump sum costs for the project. This item includes all grab bars, holdfasts, rungs, plate washers, and fasteners. **Note: Timber for ladders is included in the unit rate timber quantities.**

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM):
 - .1 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A307-14e Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Divert unused metal materials from waste disposal facility to metal recycling facility as approved by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Plates, shapes, and bars: to CSA-G40.20-13/G40.21-13 (R2018), Grade 300W.
 - .1 Weld materials: to Section 05 50 00.
- .2 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m² to ASTM A123/A123M-17.
- .3 Timber: to National Lumber Grades Authority Standard Rules for Canadian Lumber effective August 1, 2017, species and grade category as follows:
 - .1 Species: Group A (Douglas Fir).
 - .2 Grade: Structural, No.2 or better.
 - .3 Materials to be new. 100% of lumber to be grade specified.
 - .4 Grading authority: BCLMA.
 - .5 Timber to be rough sawn.

Part 3 Execution

3.1 FABRICATION

- .1 Complete fabrication to details indicated in drawings.
- .2 Finish: Neatly finish portions of work. Finish members true to line, free from twists, bends, open joints, and sharp corners and edges. Grind all sharp edges smooth.

3.2 GALVANIZING

- .1 Galvanized the following timber ladder components to ASTM A123/A123M:
 - .1 Ladder rungs, grab bar, holdfast, and plate washers.

3.3 LADDERS

- .1 Fabricate ladder as specified on drawings
- .2 Attach ladder to wharf with 19 mm dia. x 355 countersunk galvanized lag bolt at each contact.
- .3 Through bolt grab bar 100 mm into top of curb.
- .4 All machine bolts are to be complete with a nut and two washers and be of sufficient length to accept 2 washers and have room for fully threading a hexagonal nut. All machine bolts to be countersunk on exterior ladder face. Bore holes for machine bolts to same diameter as bolts.

END OF SECTION