

**SPECIFICATIONS FOR  
HARBOUR IMPROVEMENTS  
THICKET PORTAGE & WHISKEY JACK PORTAGE, MB**



Department of Fisheries & Oceans  
Small Craft Harbours Branch  
Winnipeg, Manitoba

**April 2016**

## TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
01 11 05 – General Instructions .....	3
01 35 29 – Health and Safety Requirements .....	9
01 35 43 – Environmental Procedures .....	12
01 45 00 – Quality Control .....	15
01 77 00 – Closeout Procedures.....	17
02 41 13 – Selective Site Demolition.....	19
03 20 00 – Concrete Reinforcing .....	21
03 41 02 – Precast Concrete Elements.....	24
05 55 00 – Metal Fabrications .....	27
06 05 73 – Wood Treatment .....	30
31 23 33 – Excavating, Trenching and Backfilling.....	32
31 53 13 – Timber Cribwork .....	35
35 59 14 - Ladders .....	39

**01 11 05 – GENERAL INSTRUCTIONS**

**Part 1        General**

**1.1            MEASUREMENT FOR PAYMENT**

- .1        No measurement will be made under this Section.

**1.2            DESCRIPTION OF WORK**

- .1        The work site described in this specification as located at Thicket Portage & Whiskey Jack Portage, Manitoba. Thicket Portage is located on the south side of Wintering Lake by approximately 70 km south west of Thompson, MB. Thicket Portage can be accessed by rail or winter road. Whiskey Jack Portage is located on the north east end of Kiskittogisu Lake and is accessible by road approximately 221 km from Thompson, MB.
- .2        The work under this contract covers launch ramp construction at Thicket Portage & Whiskey Jack Portage as follows:
  - .1        Thicket Portage (Landing Lake):
    - .1        Demolition and removal of existing timber crib and span wharf
    - .2        The supply and installation of a new timber crib and span wharf
  - .2        Thicket Portage (Wintering Lake):
    - .1        Demolition and removal of existing concrete launch ramp pads
    - .2        Supply and installation of concrete launch ramp pads
    - .3        Supply and installation of concrete anchor blocks
    - .4        Supply and installation of timber ladders
    - .5        Supply and installation of steel pipe sliders
    - .6        Supply and installation of steel anchor plates
  - .3        Whiskey Jack Portage:
    - .1        Supply and installation of concrete launch ramp pads
    - .2        Supply and installation of granular fill
- .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.

**1.3            DEFINITIONS**

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

**1.4            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 Interim reviews of work progress based on word schedule will be conducted as decided by Engineer and schedule updated by Contractor in conjunction with and to approval of Engineer.
- .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 complete by **March 18, 2017**.
- .4 Work sequence:
  - .1 Construction to launch ramps at both locations to be completed before **November 15, 2016**.
  - .2 Before work is undertaken, ensure that all materials and trades required are available to finish work in as short a period as possible.
  - .3 No area to be renovated shall be placed out of service until it is confirmed that there shall be no need to stop the work waiting for receipt of materials, equipment or labour.

#### **1.5 CERTIFICATES AND TRANSCRIPTS**

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

#### **1.6 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.

#### **1.7 MEASUREMENT FOR PAYMENT**

- .1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.
- .2 Submit to Engineer, at least 14 days before Information for first application for payment, cost breakdown, Progress Payment in detail as directed by Engineer, for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment. After approval by Engineer, cost breakdown will be used as basis for progress payments.

#### **1.8 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 Engineer 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.

### **1.9 CONTRACTOR'S USE OF SITE**

- .1 Co-ordinate use of premises under direction of the Engineer.
- .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 Engineer 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 construction operations to match existing or adjoining work, as directed by Engineer.
- .8 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

### **1.10 EXISTING SERVICES**

- .1 Notify Engineer and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Engineer 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 Engineer of findings.
- .4 Submit schedule to and obtain approval from Engineer for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Where unknown services are encountered, immediately advise Engineer 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.

### **1.11 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.

**1.12 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 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.

**1.14 PROJECT MEETINGS**

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

**1.15 SETTING OUT OF WORK**

- .1 Engineer 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 Engineer.
- .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 Engineer's inspection of work.
- .6 Supply stakes and other survey markers required for laying out work.

**1.16 ADDITIONAL DRAWINGS**

- .1 Engineer 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 Engineer in advance of the date they are required.

**1.17 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.

**1.18 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.

**1.19 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.

**1.20 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.

**1.21 VEHICLE AND PEDESTRIAN PROTECTION**

- .1 Provide snow fencing, wooden barriers, or other approved barriers to prevent vehicles and pedestrians from accessing the site during construction.
- .2 Contractor shall provide appropriate signage for vehicle and pedestrian protection.
- .3 All barriers shall include delineation and reflectors to stand out at nightfall.

**1.22 DRAWINGS**

- .1 The following drawings are to be read in conjunction with this specification:
  - .1 C-1 Plan and Construction Details (Thicket Portage – Landing Lake)
  - .2 C-2 Plan and Construction Details (Thicket Portage – Wintering Lake)
  - .3 C-3 Construction Details (Thicket Portage – Wintering Lake and Landing Lake)
  - .4 C-4 Plan and Construction Details (Whiskey Jack Portage)

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**



**01 35 29 – HEALTH AND SAFETY REQUIREMENTS**

**Part 1        General**

**1.1            MEASUREMENT FOR PAYMENT**

- .1        No measurement will be made under this Section.

**1.2            REFERENCES**

- .1        Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .3        Province of Manitoba
  - .1        The Workers Compensation Act RSM 1987 - Updated 2006.

**1.3            SUBMITTALS**

- .1        Submit site-specific Health and Safety Plan: Within 10 days after date of Notice to Proceed and prior to commencement of Work.
- .2        Submit copies of incident and accident reports to Engineer.
- .3        Submit WHMIS MSDS – Material Safety Data Sheets to Engineer.
- .4        Engineer 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 Engineer within 5 days after receipt of comments from Engineer.
- .5        Engineer'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.
- .6        On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**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 UNFORSEEN HAZARDS**

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province having jurisdiction and advise Engineer verbally and in writing.

## **1.9 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with dock reconstruction at an active harbour site.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work.

## **1.10 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.

## **1.11 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**

**01 35 43 – ENVIRONMENTAL PROCEDURES**

**Part 1      General**

**1.1            MEASUREMENT FOR PAYMENT**

- .1      No separate measurement will be for work of this section. Work is to be included in lump sum costs for project.

**1.2            FIRES**

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

**1.3            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.

**1.4            WORK ADJACENT TO WATERWAYS**

- .1      Construction equipment will enter and leave the lake at such a location and in such a manner that disturbance to the lakeshore.
- .2      No construction debris from work activities will be allowed to enter the lake. The work site must be cleaned daily. Every effort will be made to minimize the introduction of sediment to the lake during work activities.
- .3      Do not use waterway beds for borrow material.
- .4      Waterways to be free of excavated fill, waste material and debris.
- .5      Design and construct temporary crossings to minimize erosion to waterways.
- .6      Do not skid logs or construction materials across waterways.
- .7      Avoid damage to shoreline.
- .8      Supply, install, and maintain approved erosion control blankets to unprotected slopes until revegetation is established.
- .9      Any impacts below ordinary high water mark that are not shown on the site plan are not permitted without written approval from the Engineer. Up to 30 days may be required for approval.
- .10     Reclaim and restore disturbed areas to previous or better condition.
- .11     Areas used for stockpiling construction materials, including fill or other 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.
- .12     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 with the capacity to contain any spills of deleterious substances that

may be reasonably expected to occur. Contractors should ensure that all personnel are familiar with the spill kits.

- .13 The Contractor shall report spills of fuels or other contaminants to the Engineer.
- .14 The Contractor shall not remove, destroy or disturb species pursuant to Provincial Threatened Endangered and Extirpated Species regulation, or species listed in the federal Species at Risk Act.
- .15 The Contractor shall not disturb migratory bird nests.

## **1.5 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 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 Contractor to contain all oil leaks from equipment working adjacent to waterways.
- .7 No maintenance of vehicles or equipment in construction areas.
- .8 Use drip pans to catch leaking oil from compressors, pumps, etc.
- .9 Keep an emergency spill kit for in-water use on site during construction.

## **1.6 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.
- .4 Do not allow debris of any type to enter waterway.

## **1.7 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.
- .3 The Contractor shall revegetate soil in areas exposed by construction with vegetation species native to the area. These areas shall be revegetated as quickly as possible following construction to prevent soil erosion and establishment of noxious weeds.

**1.8 VERTICAL 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. An acceptable product is "Tough Guy" Type 1E Turbidity Barrier or approved equivalent. Costs for supply, installation, maintenance, and removal to be included in lump sum costs.
- .2 Construction shall be monitored to ensure that the mitigation measures are effective at containing the sediment to the launch ramp construction area. Adjustments may have to be made to get the containment to function properly.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**01 45 00 – QUALITY CONTROL**

**Part 1            General**

**1.1                MEASUREMENT FOR PAYMENT**

- .1            No measurement will be made under this Section.

**1.2                INSPECTION**

- .1            Allow 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.
- .2            Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Engineer.
- .3            Engineer 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 Engineer 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 Engineer at no cost to. Pay costs for retesting and reinspection.

**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 Engineer 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.

**1.6 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 Engineer 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 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 Engineer.

**1.7 TESTS AND MIX DESIGNS**

- .1 Furnish test results and mix designs as requested.

**1.8 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**



**01 77 00 – CLOSEOUT PROCEDURES**

**Part 1            General**

**1.1                MEASUREMENT FOR PAYMENT**

- .1            No measurement will be made under this Section.

**1.2                ADMINISTRATIVE REQUIREMENTS**

- .1            Acceptance of Work Procedures:
  - .1            Contractor's Inspection: Contractor to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .2            Final Inspection:
    - .1            When completion tasks are done, request final inspection of Work by Engineer.
    - .2            When Work incomplete according to Engineer, complete outstanding items and request re-inspection.
  - .3            Final Payment:
    - .1            When Engineer considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
  - .4            Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

**1.3                FINAL CLEANING**

- .1            Remove surplus materials, excess materials, rubbish, tools and equipment.

**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 Engineer.
- .2            Mark “as-built” changes in red coloured ink.
- .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, neatly transfer “as-built” notations to second set and submit both sets to Engineer.

**Part 2            Products**

**2.1                NOT USED**

- .1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

**02 41 13 – SELECTIVE SITE DEMOLITION**

**Part 1 General**

**1.1 MEASUREMENT FOR PAYMENT**

- .1 Mobilization and demobilization is to be included in lump sum costs for project.
- .2 Existing concrete launch ramp pads at Thicket Portage (Wintering Lake) to be demolished and disposed of at an approved dump site. Cost for this item to be per unit demolished and disposed of offsite.
- .3 Demolition and removal of existing crib and span wharf at Thicket Portage (Landing Lake) to be included in lump sum costs for project.

**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 Engineer and at no cost to Engineer.
  - .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.

**1.3 SITE CONDITIONS**

- .1 Site Environmental Requirements:
  - .1 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  - .2 Ensure proper disposal procedures are maintained throughout the project.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**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 OPERATIONS**

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.

### **3.3 REMOVAL FROM SITE**

- .1 Dispose of materials not designated for salvage or re-use in work, off-site at location acceptable to Engineer.

### **3.4 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**

**03 20 00 – CONCRETE REINFORCING**

**Part 1            General**

**1.1                MEASUREMENT FOR PAYMENT**

- .1        No measurement will be made under this Section.
- .2        Include reinforcement costs in items of concrete work in costs for supply and installation of concrete elements as per Section 03 41 02.

**1.2                REFERENCES**

- .1        American Concrete Institute (ACI)
  - .1        SP-66-04, ACI Detailing Manual 2004.
- .2        CSA International
  - .1        CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  - .2        CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
  - .3        CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
  - .4        CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .5        CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .3        Reinforcing Steel Institute of Canada (RSIC)
  - .1        RSIC-2004, Reinforcing Steel Manual of Standard Practice.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1        Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice SP-66.
- .2        Shop Drawings:
  - .1        Submit drawings with the following:
    - .1        Indicate placing of reinforcement and:
      - .1        Bar bending details.
      - .2        Lists.
      - .3        Quantities of reinforcement.
      - .4        Sizes, spacings, locations of reinforcement and mechanical splices if approved by Engineer, with identifying code marks to permit correct placement without reference to structural drawings.
    - .2        Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
      - .1        Provide Type B unless otherwise indicated.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials 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 Substitute different size bars only if permitted in writing by Engineer.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .5 Mechanical splices: subject to approval of Engineer.
- .6 Plain round bars: to CSA-G40.20/G40.21.

#### **2.2 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Engineer's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Engineer's, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

### **Part 3 Execution**

#### **3.1 FIELD BENDING**

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

**3.2 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.
- .2 Prior to placing concrete, obtain Engineer's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

**3.3 CLEANING**

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

**END OF SECTION**

## **03 41 02 – PRECAST CONCRETE ELEMENTS**

### **Part 1      General**

#### **1.1            MEASUREMENT PROCEDURES**

- .1      Costs for supply and installation of the float wharf anchor blocks including chains, reinforcing steel, and related hardware to be measured for payment by the unit supplied and installed.
- .2      Costs for supply and installation of the launch ramp pads to be measured for payment by the unit supplied and installed. Price to include costs of galvanized steel cable, galvanized shackles, galvanized saddle clamps, galvanized pipe spacers, excavation, levelling, and miscellaneous fittings.

#### **1.2            REFERENCES**

- .1      Canadian Standards Association (CSA International)
  - .1      CSA-A23.1/A23.2-2004, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2      CSA-A23.3-04, Design of Concrete Structures.
  - .3      CSA-A23.4-05, Precast Concrete - Materials and Construction.
  - .4      CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1      CSA-A3001-03, Cementitious Materials for Use in Concrete.
  - .5      CAN/CSA-G30.18-M92(R2002), Billet-Steel Bars for Concrete Reinforcement.
  - .6      CSA-W59-03, Welded Steel Construction (Metal Arc Welding) (Metric version).

#### **1.3            PERFORMANCE REQUIREMENTS**

- .1      Concrete anchor blocks:
  - .1      Length of precast elements not to vary from design length by more than plus or minus 50 mm.
  - .2      Cross sectional dimensions of precast elements not to vary from design dimensions by more than plus or minus 50 mm.
  - .3      Precast elements not to vary by more than plus or minus 50 mm from true overall cross sectional shape as measured by difference in diagonal dimensions.
- .2      Concrete launch ramp pads:
  - .1      Long dimensions of launch ramp pads not to vary from design length by more than +/- 25mm.
  - .2      Cross sectional dimensions of launch ramp pads not to vary from design lengths by more than +/- 25mm.
  - .3      Deviations from straight lines in long sections not to exceed 10mm in 3m throughout length.



#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Transport concrete blocks with points of support and direction of reactions approximately same as when they will be in final position in work.
- .2 Handle, store and protect concrete base in order to avoid damage to concrete.
- .3 Identify lifting points by inserting hooks during manufacture.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Cement to CAN/CSA-A3001, Type GU.
- .2 Water: to CSA-A23.1/A23.2.
- .3 Reinforcing steel: to CAN/CSA-G30.18.
- .4 Hardware and miscellaneous materials: to CSA-A23.1/A23.2.
- .5 Anchors and supports: to CAN/CSA-G40.21 Type 300 W.
- .6 Welding materials: to CSA W48.
- .7 Air entrainment admixtures: to ASTM C260.

#### **2.2 MIXES**

- .1 Concrete:
  - .1 Alternative 1 - Performance Method for specifying concrete: to meet Engineer performance criteria in accordance with CAN/CSA-A23.1/A23.2.
    - .1 Provide concrete mix to meet following hard state requirements:
      - .1 Durability and class of exposure: C-1.
      - .2 Minimum compressive strength at 28 days: 30 MPa.
      - .3 Surface texture:
        - .1 Concrete anchor blocks: steel trowel finish.
        - .2 Concrete launch ramp pads: Traction surfaces of slabs to be serrated dandelion rake finish with approximately 10mm ribs.
    - .2 Provide quality management plan to ensure verification of concrete quality to specified performance.
    - .3 Concrete supplier's certification.

#### **2.3 MANUFACTURED UNITS**

- .1 Manufacture units in accordance with CSA-A23.4.
- .2 Provide hardware suitable for handling elements.

#### **2.4 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Engineer with certified copies of quality control tests related to this project as specified in CSA-A23.4.

- .2 Upon request, provide Engineer with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.

### **Part 3 Execution**

#### **3.1 VERIFICATION**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria and provide verification of compliance.
- .2 Launch ramp pads and anchor blocks not to be forced into position or to be subjected to stresses or overloads which could cause damage.
- .3 Replace launch ramp pads and anchor blocks damaged during installation to satisfaction of Engineer at no additional cost.
- .4 Extend granular base to 1 metre beyond both sides of launch ramp
- .5 Launch ramp pads to be spaced 75mm apart with galvanized pipe spacers.
- .6 After placing launch ramp pads in final position, fill spaces between pads with granular surfacing.
- .7 Launch ramp pads to be joined by a continuous 12mm dia. Galvanized steel cable fastened at the upper end of the launch ramp with three (3) galvanized cable clamps.

**END OF SECTION**

**05 55 00 – METAL FABRICATIONS**

**Part 1      General**

**1.1          MEASUREMENT FOR PAYMENT**

- .1      Costs for supply and installation of the steel anchor plates and related hardware to be measured for payment by the unit supplied and installed.
- .2      Costs for supply and installation of the steel pipe sliders and related hardware to be measured for payment by the unit supplied and installed.
- .3      Pick up and installation of steel transition plate and hinge bolts to be included in the lump sum cost for the project.

**1.2          REFERENCES**

- .1      American Society for Testing and Materials International, (ASTM)
  - .1      ASTM A53/A53M-02, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - .2      ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
  - .3      ASTM A307-02, 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-1.181-92, 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-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3      CAN/CSA-S16.1-01, Limit States Design of Steel Structures.
  - .4      CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).
  - .5      CSA W59-1989(R2001), Welded Steel Construction (Metal Arc Welding) (Imperial Version).
- .4      The Environmental Choice Program
  - .1      CCD-047a-98, Paints, Surface Coatings.
  - .2      CCD-048-98, Surface Coatings - Recycled Water-borne.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A53/A53M standard weight, painted finish.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

### **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/m<sup>2</sup> to CAN/CSA-G164.
- .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.
- .4 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

### **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 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 Engineer 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-S16.1, 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**

## **06 05 73 – WOOD TREATMENT**

### **Part 1 General**

#### **1.1 MEASUREMENT FOR PAYMENT**

- .1 No measurement will be made under this Section.

#### **1.2 REFERENCES**

- .1 American Wood-Preservers' Association (AWPA)
  - .1 AWPA M2-01, Standard for Inspection of Treated Wood Products.
  - .2 AWPA M4-06, Standard for the Care of Preservative-Treated Wood Products.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA O80 Series-97(R2002) - O80S2-05, Wood Preservation.
  - .2 CSA O80.20-1.1-M97(R2002), This Standard applies to the fire-retardant treatment of lumber by pressure processes..
  - .3 CSA O80.27-1.1-M97(R2002), This Standard covers the fire-retardant treatment of Douglas Fir, hardwood, softwood, and Poplar plywood by pressure processes.
  - .4 CSA O80.201-M89, This Standard covers hydrocarbon solvents for preparing solutions of preservatives.
  - .5 CSA O322-02, Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Preservative treatment by a pressure process to CSA O80 Series.

### **Part 3 Execution**

#### **3.1 APPLICATION: PRESERVATIVE**

- .1 Treat timber to CSA O80 Series preservative to obtain minimum net retention of 6.4 kg/m<sup>3</sup> of wood.

#### **3.2 CARE OF PRESSURE-TREATED WOOD PRODUCTS**

- .1 Apply the recommended and accepted practices followed in the care and handling of all wood products to pressure-treated wood products.
- .2 Avoid damage of field fabrication causing alteration of the original pressure-treated surface.
- .3 Thoroughly saturate all cuts or injuries occurring subsequent to pressure treatment by liberal brushing, spraying, dipping, soaking or coating with preservative solution.

- .4 Fill holes necessarily bored after pressure treatment with preservative solution to allow ample soaking time for penetration of solution.
- .5 Use in any of the above the same preservative solution as that used in the original pressure treatment or a field treating solution of colour to match original treatment.

**END OF SECTION**

### **31 23 33 – EXCAVATING, TRENCHING AND BACKFILLING**

#### **Part 1        General**

##### **1.1            MEASUREMENT PROCEDURES**

- .1        Supply and installation of granular material will be paid for by the cubic metre supplied, installed, compacted and remaining in work.
- .2        Costs for grading and excavating existing material at Thicket Portage (Wintering Lake) are to be included in lump sum costs for project.
- .3        Costs for any excavation required for crib installation at Thicket Portage (Landing Lake) are to be included in lump sum costs for project.
- .4        Contractor to make own arrangements with Provincial authorities, municipalities 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 to Engineer for approval, two weeks before excavation, the proposed location of spoil area for excavated material.

##### **1.3            SOURCE SAMPLING**

- .1        Inform Engineer of proposed source of materials and provide access for sampling at least 2 weeks prior to commencing work

##### **1.4            DEFINITIONS**

- .1        Common excavations: excavated material of whatever nature, which are not included under definitions of rock excavations.
- .2        Grade: plane above which material is to be excavated.
- .3        Estimated quantity:
  - .1        Volume of material calculated to be above grade and within specified side slopes unless otherwise specified.
- .4        Side slope: inclined surface or plane from grade at side limit of excavated area to intersect original ground line outside of side limit and to be expressed as ratio of horizontal to vertical.

##### **1.5            EXISTING CONDITIONS**

- .1        Examine soil report contained within this specification
- .2        Before commencing work verify location of buried services on and adjacent to site.
- .3        Arrange with appropriate authority for relocation of buried services that interfere with execution of work.



**Part 2 Products**

**2.1 MATERIALS**

- .1 Not Used.

**Part 3 Execution**

**3.1 EXCAVATION**

- .1 Excavate to lines, grades, elevations and dimensions as directed by Engineer.
- .2 Excavation must not interfere with bearing capacity of adjacent foundations.
- .3 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Engineer.
- .4 Restrict vehicle operations directly adjacent to open trenches.
- .5 Dispose of surplus and unsuitable excavated material off site. Any public roads used as haul roads between the excavation area and the spoil area shall be kept free and clean of debris. Maintenance of these roads is to be Contractor's responsibility.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Notify Engineer when bottom of excavation is reached.
- .8 Obtain Engineer approval of completed excavation.

**3.2 BACKFILLING**

- .1 Do not commence backfilling until areas of work have been inspected and approved by Engineer.
- .2 Ensure no frozen material is placed.
- .3 Place material only on clean unfrozen surface, free from snow or ice.
- .4 Place and compact the backfilled materials shown in the drawings in lifts not exceeding 150 mm.
- .6 Place granular materials using methods which do not lead to segregation or degradation.
- .8 Place material to full width in uniform layers not exceeding 150 mm compacted thickness. Engineer may authorize thicker lifts (layers) if specified compaction can be achieved.
- .9 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.
- .10 Remove and replace portion of layer in which material has become segregated during spreading.

**3.3 COMPACTION**

- .1 Compaction equipment to be capable of obtaining required material densities.
- .2 Each lift or layer to be thoroughly compacted by means of packers or mechanical tampers to a relative compaction of not less than 98% Standard Proctor Density for the backfill material at optimum moisture content.

- .3 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .4 Apply water as necessary during compaction 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.

**3.4 SITE TOLERANCES**

- .1 Finished granular surface to be within 10 mm of elevation as indicated but not uniformly high or low.

**3.5 PROTECTION**

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

**END OF SECTION**

## **31 53 13 – TIMBER CRIBWORK**

### **Part 1 General**

#### **1.1 MEASUREMENT PROCEDURES**

- .1 Treated decking will be paid for by the square metre of decking supplied, installed and remaining in the work. This item includes all fastenings.
- .2 Treated 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 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. This item to include ballast rock salvaged from existing wharf.
- .4 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”.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM A307-04, 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-97(R2002), Wood Preservation.
- .3 National Lumber Grades Authority (NLGA)
  - .1 Standard Grading Rules for Canadian Lumber 2003 edition.

#### **1.3 QUALITY ASSURANCE**

- .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
- .2 Worker protection:
  - .1 Workers must wear gloves, eye protection and protective clothing when handling, drilling, sawing or cutting preservative treated wood and applying preservative materials.
  - .2 Workers must not eat, drink or smoke while applying preservative material.
  - .3 Clean up spills of preservative materials immediately with absorbent material. Safely discard of absorbent material to approved landfill.

#### **1.4 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 treated wood, end pieces, wood scraps and sawdust at an approved landfill.

## **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 specified treated timber and planks to be pressure treated with CCA or ACA preservative, incision method, to 6.4 kg/cubic metre (0.40 lb/cubic foot) retention or refusal. Treatment to conform to the latest edition of CSA specification 080.
  - .7 All end cuts, abrasions and bolt holes to be well soaked with two coats of ACQ preservative acceptable to Engineer.
  - .8 Machine bolts used are to be of sufficient length to accept two washers and one fully threaded hexagonal headed nut.
  - .9 Drift bolts to have countersunk, tapered head and chisel point as manufactured by Dominion Bridge or equivalent.
  - .10 Bore holes for drift bolts 1.5 mm smaller diameter than bolt and 52 mm short of length of bolt. Bore holes for machine bolts to same diameter as bolt.
  - .11 All end cuts to be placed above high water line where possible.
- .2 Miscellaneous steel:
  - .1 Hot dip galvanized: to CAN/CSA-G164.
  - .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.
- .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 well graded with maximum size not exceeding 250 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.

## **Part 3 Execution**

### **3.1 PREPARATION**

- .1 Before construction, stockpile sufficient ballast to completely fill cribs.
- .2 Take closely spaced accurate soundings, precisely located by template, to determine actual configuration of base area of crib.

- .1 Construct crib bottom to match base configuration.

### **3.2 DECKING AND CURB**

- .1 Decking will be 76 mm square sawn sized lumber laid heart side down. Planks will be 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.
- .2 Planks to be cut flush with outer faces of work.
- .3 All planks to be pre-drilled for the spikes to prevent splitting.
- .4 In cases where the 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 20 mm diameter machine bolts as shown on the plan.
- .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. Longitudinals and cross timbers to be drifted to each other at each contact point with 20 mm x 355 drift bolts. Each longitudinal and cross timber to be fastened to vertical binder post with 20 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 pockets on bottom or second course from bottom timbers. Secure each ballast floor timber to bottom timbers with 20 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 20 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.

### **3.4 HANDLING TREATED TIMBER**

- .1 Handle treated material without damaging original treatment.
  - .1 Replace treated timber with major damage to original treatment, as instructed by Engineer.
- .2 Field treatment: apply and saturate cuts, minor surface damage, abrasions, and nail and spike holes with preservative to CAN/CSA-O80 Series.

### **3.5 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.

**3.6 TOLERANCES**

- .1 1 in 300 in overall dimensions.

**3.7 CLEANING**

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

**END OF SECTION**

## **35 59 14 - LADDERS**

### **Part 1 General**

#### **1.1 MEASUREMENT FOR PAYMENT**

- .1 Ladders will be measured by the each supplied and installed and shall include all labour, materials and equipment to fabricate and install.

#### **1.2 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM):
  - .1 ASTM A123/A123M-12, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A307-12 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.

#### **1.3 SUBMITTALS**

- .1 Product Data for each individual product:
  - .1 Submit manufacturer's printed product literature, specifications and data sheet.
  - .2 Submit two copies of WHMIS MSDS – Material Safety Data Sheets. Indicate VOC's content and composition for paint.

#### **1.4 SHOP DRAWINGS**

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province having jurisdiction.
- .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

#### **1.5 WASTE MANAGEMENT AND DISPOSAL**

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

### **Part 2 Products**

#### **2.1 MATERIALS**

- .1 Hollow structural sections to CSA-G40.20/G40.21, Grade 350W, Class H.
- .2 Plates, shapes, and bars: to CSA-G40.20/G40.21, Grade 350W.
- .3 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m<sup>2</sup> to ASTM A123/A123M.
- .4 Timber: to National Lumber Grades Authority Standard Rules for Canadian Lumber effective December 1, 2010, species and grade category as follows:
  - .1 Species: Douglas Fir

- .2 Grade: No.2 or better.
- .3 Materials to be new. 100% of lumber to be grade specified.
- .4 Preservative treatment: to be in accordance with Section 06 05 73.
- .5 Weld materials: to Section 05 50 00.

**Part 3 Execution**

**3.1 FABRICATION**

- .1 Complete fabrication to details indicated.
- .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 and hand grips

**3.3 LADDERS**

- .1 Fabricate and install ladders as specified and indicated.
- .2 Attach ladders as indicated.