

**SPECIFICATIONS FOR
HARBOUR REVITALIZATION
DAUPHIN RIVER, MB**

F2470-150017/A



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

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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 Dauphin River, Manitoba.. Dauphin River is located on the west side of Lake Winnipeg approximately 300 km by road north of Winnipeg. Road access to Dauphin River is by Provincial Road 513.
- .2 The work under this contract covers:
 - .1 Excavation inland for the basin expansion and excavation of the existing harbour.
 - .2 Supply and installation of rip-rap to side slopes of harbour excavation.
 - .3 Construction of an access road and turn around area.
 - .4 Construction of a boat launch ramp.
 - .5 The supply and installation of a float wharf system in the expanded harbour, including supply and installation of new timber cribs, supply and installation of new aluminum walkways, supply and installation of new floats, and relocation of existing float wharves.
 - .6 Relocation of existing MTS underground cable.
- .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 10, 2016**.
- .4 **Access to the site and offloading structures shall be maintained for commercial fishers until October 31, 2015.**

- .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.
 - .2 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 DR-1 Harbour Revitalization
 - .2 DR-2 Harbour Revitalization
 - .3 DR-3 Harbour Revitalization
 - .4 DR-4 Harbour Revitalization
 - .5 DR-5 Harbour Revitalization
 - .6 DR-6 Harbour Revitalization
 - .7 DR-7 Harbour Revitalization
 - .8 DR-8 Harbour Revitalization
 - .9 DR-9 Harbour Revitalization
 - .10 DR-10 Harbour Revitalization
 - .11 DR-11 Harbour Revitalization
 - .12 Appendix A: Geotechnical Report

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 SILT FENCE BARRIER

- .1 Supply and install silt barrier fence in area around the excavation in road ditches and toes of slopes. The silt fence fabric shall be AGES 600G or approved equivalent. Stakes to be as per manufacturer's recommendations.
- .2 The silt fence to be installed prior to excavation.
- .3 A trench measuring approximately 200 mm wide by 200 mm deep shall be excavated along the entire line of stakes. The trench shall be on the side of the stakes where the grading work is to be conducted.
- .4 The geotextile from the silt fence shall extend into the trench a minimum of 300 mm. The prefabricated silt fence shall be installed without sags and have an overlap of 450 mm wherever its length is extended.
- .5 The trench shall be backfilled and tamped to existing grade so as to hold the base of the geotextile firmly in place. The completed silt fence barrier shall have a minimum height of 600 mm above the ground surface.
- .6 Accumulated sediment shall be removed at direction of Engineer.
- .7 Silt fence to be removed at direction of Engineer in such a manner to prevent release of accumulated sediment and debris into any water course. Areas disturbed by the installation and removal of silt fence to be restored to original grade or to satisfaction of Engineer.

1.9 VERTICAL SILT CURTAIN

- .1 Contractor to isolate the work area for the launch ramp 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

01 82 01 – WEIGH SCALES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Weigh all stone placed in the Work and measured in tonnes at the quarry or project site on a scale approved and certified as correct. Prior to use, have weigh scale certified as meeting requirements of Statutes of Canada, Chapter 36, Weights and Measures Act 1971 and subsequent amendments. Provide the Departmental Representative with a copy of the certificate and display certificate in prominent location. Costs for maintenance and operation of scale shall be considered incidental to the work.
- .2 Provide the Departmental Representative with weigh tickets at time of delivery to site.

Part 2 Products

2.1 EQUIPMENT

- .1 Provide weigh scales of sufficient capacity to weigh loaded vehicles in a single operation.
- .2 Provide scale house to enclose mass indicator and in which Contractor's representative can perform work and maintain records.
- .3 Scale house to be waterproof and have one sliding window facing scale platform. Entrance door not face scale platform.

Part 3 Execution

3.1 INSTALLATION

- .1 Provide, install and maintain scale at quarry or project site at location approved by Engineer.
- .2 Remove scale and scale house when no longer required and level approach ramps.

3.2 OPERATION

- .1 Contractor's representative will be responsible for weighing materials.

3.3 MAINTENANCE

- .1 Maintain scale platform and scale mechanism clean and free from gravel, snow, ice and debris.
- .2 Maintain approach roads in good condition free from sags and ruts.
- .3 Have scales retested and recertified if requested by Engineer.

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 Removal disposal of existing crib wharf in front of fish plant to be included in lump sum costs for project.
- .3 Existing float wharf system to be removed, salvaged on site and reinstalled in accordance with details shown on the accompanying plans and as specified herein. Cost for this item to be included in the lump sum costs for the project.
- .4 Relocation of MTS cable to be as per MTS standards and shall be included in the lump sum costs for the 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 Reinststate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work.

END OF SECTION

03 10 00 - CONCRETE FORMING AND ACCESSORIES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

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

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .3 CSA O121-M1978(R2003), Douglas Fir Plywood.
 - .4 CSA O151-04, Canadian Softwood Plywood.
 - .5 CSA O153-M1980(R2003), Poplar Plywood.
 - .6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.
 - .7 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.
 - .8 CSA S269.1[1975(R2003), Falsework for Construction Purposes.
 - .9 CAN/CSA-S269.3-M92(R2003), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit shop drawings for formwork and falsework.
- .2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, and locations of temporary embedded parts.
- .3 Indicate sequence of erection and removal of formwork/falsework as directed by Engineer.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features, use wood and wood product formwork materials to CAN/CSA-O86.
- .2 Form release agent: non-toxic.
- .3 Form stripping agent: colourless mineral oil, non-toxic, free of kerosene, with viscosity between 15 to 24 mm²/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.
- .4 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

- .1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.
- .2 Fabricate and erect falsework in accordance with CSA S269.1.
- .3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .4 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .5 Use 25 mm chamfer strips on external corners unless specified otherwise.
- .6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .7 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
 - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.
- .8 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.
- .9 Relative alignment between adjacent formed concrete surfaces shall be less than or equal to 5 mm.
- .10 Plumbness of slab edges shall be within 1:400 measured at any one surface.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 7 days for concrete elements.
- .2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

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 concrete anchor blocks for the aluminum walkways including reinforcing steel and related hardware to be paid for by the unit supplied and installed.
- .3 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 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 14 12 – ALUMINUM WALKWAY FABRICATION

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Supply and installation of new aluminum walkways and any required brackets and 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 the province having jurisdiction.
- .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

05 55 00 – METAL FABRICATIONS

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

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

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^2 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 AWP A M2-01, Standard for Inspection of Treated Wood Products.
 - .2 AWP A 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/m³ 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 11 00 – CLEARING AND GRUBBING

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Include costs for clearing, grubbing, sub-base compaction and proof rolling in lump sum costs for the project.

1.2 REFERENCES

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

1.3 DEFINITIONS

- .1 Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2 Grubbing consists of excavation and disposal of stumps and roots, boulders and rock fragments of specified size to not less than specified depth below existing ground surface.

1.4 SUBMITTALS

- .1 Submit to Engineer 2 weeks before clearing and grubbing, the proposed disposal area.

1.5 STORAGE AND PROTECTION

- .1 Prevent damage to existing roads which are to remain.
 - .1 Repair damaged items to approval of Engineer.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Dispose of any excavated or identified waste materials off-site at the contractors expense.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 PREPARATION

- .1 Inspect site and verify with Engineer, items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
 - .1 Notify Engineer immediately of damage to or when unknown existing utility lines are encountered.
 - .2 When utility lines which are to be removed are encountered within area of operations, notify Engineer in ample time to minimize interruption of service.
- .3 Notify utility authorities before starting clearing and grubbing.
- .4 Keep roads and walks free of dirt and debris.

3.3 CLEARING

- .1 Clearing includes trimming and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within cleared areas.
- .2 Cut off branches overhanging area cleared as directed by Engineer.

3.4 GRUBBING

- .1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.
- .2 Grub out stumps and roots to not less than 100 mm below ground surface.
- .3 Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension.
- .4 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

3.5 COMPACTION

- .1 Level and compact the top 150 mm of existing ground above the water line prior to placing geotextile or granular base.
- .2 Obtain Engineer approval of compacted existing ground prior to placement of geotextile or granular base. Allow time for compaction testing as part of Engineers approval.

3.6 PROOF ROLLING

- .1 Exposed sub-grade should be proof-rolled prior to placement of the next layer of fill.
- .2 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.
- .3 Obtain written approval from Engineer to use non-standard proof rolling equipment.
- .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.

3.7 REMOVAL AND DISPOSAL

- .1 Remove cleared and grubbed materials off site to disposal area approved by Engineer.

3.8 FINISHED SURFACE

- .1 Leave ground surface in condition suitable for immediate grading operations to approval of Engineer.

3.9 CLEANING

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

END OF SECTION

31 23 33 – EXCAVATING, TRENCHING AND BACKFILLING

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Excavated materials including common excavation (not including excavation required for new road and turn around area), and rock excavation will be measured in cubic meters in their original location.
- .2 Excavation for installation of new access road and turn around area shall be included in the lump sum costs for the project.
- .3 Quantities for all excavated material, not including excavation required for new access road and turn around area, will be measured from cross sections taken before and after excavations.
- .4 Dewatering works if used are considered incidental to unit costs for excavation.
- .5 Supply and installation of new granular 20 mm down base material for the launch ramp, backfill, turn around area and access road will be paid for by the tonne supplied, installed, compacted and remaining in work.
- .6 Supply and installation of new granular 100 mm down sub-base material for the launch ramp, backfill, turn around area and access road will be paid for by the tonne supplied, installed, compacted and remaining in work.
- .7 The relocation of services will be included in lump sum costs for project.
- .8 Relocation of existing boulders will be included in lump sum costs for the project.
- .9 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, this includes the excavation work required for the new access road.
- .2 Rock excavation: solid material in excess of 1.00 cu. M. and which cannot be removed by means of heavy duty mechanical/hydraulic excavation equipment having a bucket size of 0.95 to 1.15 cu. M. Frozen material is not classified as rock. Rock excavation requires pre-approval from Engineer prior to starting excavation to confirm the class of excavation.

- .3 Excavate suitable portion of material from common excavation and place and compact this material as required on the new access road and turn around area construction in accordance with details shown on the accompanying plans and as specified herein.
- .4 Grade: plane above which material is to be excavated.
- .5 Estimated quantity:
 - .1 Volume of material calculated to be above grade and within specified side slopes unless otherwise specified.
- .6 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 Use suitable backfill from common excavation from the basin expansion area to build up subgrade to underside of limestone layer of the new access road and turn around area construction in accordance with details shown on the accompanying plans and as specified herein.
- .2 100 mm Granular sub-base material in accordance with following requirements:
 - .1 Crushed, pit run or screened stone, or gravel.
 - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.
 - .3 The gradation and physical requirements to be as follows:

Sieve Designation	% Passing
100 mm	75-100
4.75 mm	22-85
0.425 mm	5-30
0.074 mm	0-10

- .3 Base Course: use 20 mm crushed limestone backfill as shown on the drawings.
 - .1 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.
 - .2 The gradation and physical requirements to be as follows:

Sieve Designation	% Passing
20 mm	100

Sieve Designation	% Passing
10 mm	35-85
5 mm	15-65
0.08 mm	0-12

Part 3 Execution

3.1 EXCAVATION

- .1 Temporarily remove boulders along west edge of existing basin. Boulders to be relocated along southwest edge of expanded basin as directed by Engineer.
- .2 Contractor to strip all excavated and roadway area of existing topsoil and stockpile as directed by Engineer for later re-use in seeding operations.
- .3 Implement specified erosion and sediment control measures to prevent sediment release off construction boundaries and into water boundaries.
- .4 Excavate to lines, grades, elevations and dimensions as directed by Engineer.
- .5 Excavation must not interfere with bearing capacity of adjacent foundations.
- .6 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Engineer.
- .7 Restrict vehicle operations directly adjacent to open trenches.
- .8 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.
- .9 Do not obstruct flow of surface drainage or natural watercourses.
- .10 Notify Engineer when bottom of excavation is reached.
- .11 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 Compact sub-grade of the new access road, turn around area and launch ramp prior to commencement of backfilling work.
- .4 Place material only on clean unfrozen surface, free from snow or ice.
- .5 Place and compact the backfilled materials shown in the drawings in lifts not exceeding 150 mm.
- .7 Place granular materials using methods which do not lead to segregation or degradation.
- .9 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.
- .10 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

- .11 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 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 at level in granular base 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 granular surface to be within 10 mm of elevation as indicated but not uniformly high or low.

3.6 PROTECTION

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

END OF SECTION

31 32 19 – GEOTEXTILES

Part 1 General

1.1 MEASUREMENT AND PAYMENT

- .1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams or overlaps.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-[2004], Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).
 - .2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
 - .1 No.2-M85 Methods of Testing Geosynthetics - Mass per Unit Area.
 - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.
 - .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.
 - .4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.
 - .5 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.
- .2 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS 1860-November 2010, Material Specification for Geotextiles.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Test and Evaluation Reports:
 - .1 If requested, submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

1.4 SAMPLES

- .1 Submit to the Engineer the following samples at least 1 week prior to commencing work:
 - .1 Minimum of 1 m of roll width of geotextile

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 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 Store and protect geotextiles from direct sunlight and UV rays.
- .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
 - .1 Width: 3.8 m. minimum.
 - .2 Length: 110 m. minimum.
 - .3 Composed of minimum 85% by mass of polypropylene with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 30 days.
- .2 Mass per Unit Area, ASTM D5261 Test Method: 225 g/ m²
- .3 Grab Tensile Strength, ASTM D4632 Test Method: 900 N.
- .4 Grab Elongation, ASTM D4632 Test Method: 50%.
- .5 Puncture Strength, ASTM D4833 Test Method: 490 N.
- .6 Trapezoidal Tear Strength, ASTM D4533 Test Method: 356 N.
- .7 Apparent Opening Size, ASTM D4751 Test Method: 0.180 mm.
- .8 Permittivity, ASTM D4491 Test Method: 1.5 s⁻¹.
- .9 Water Flow Rate, ASTM D4491 Test Method: 3255 l/min/m²
- .10 UV Resistance, ASTM D4355: 70% retained after 500 hours.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Engineer.
 - .2 Inform Engineer of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with securing pins and washers. Place on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Overlap each successive strip of geotextile 600 mm over previously laid strip.

- .4 Pin successive strips of geotextile with securing pins at 2000 mm interval at midpoint of lap as indicated.
- .5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .6 Do not use heavy equipment or vehicular traffic on geotextile without approved protection.
- .7 After installation, cover with overlying layer within 4 hours of placement.
- .8 Replace damaged or deteriorated geotextile to approval of Engineer.
- .9 Place and compact soil layers in accordance with relevant specification sections.

3.3 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.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

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 for the construction of the timber cribs. 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, fenders, posts and all cribwork timbers required for the construction of the timber cribs.
- .3 Ballast rock will be paid for by the cubic metre supplied, installed and remaining in the work.
- .4 Costs for excavation to install cribs, including levelling of crib base to grade indicated on drawings to be included in lump sum costs for the project.
- .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”.

1.2 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 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 CCA 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.
- .4 Crushed stone mattress: Stone, consisting of hard durable particles free from clay lumps, organic material and other deleterious materials with size to be 100 mm minus.

Part 3 Execution

3.1 PREPARATION

- .1 Excavate area of crib base and place as indicated.
- .2 Before construction, stockpile sufficient ballast to completely fill cribs.
- .3 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 as per drawing.

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 in one length.
- .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

32 92 19 – SEEDING

Part 1 General

1.1 MEASUREMENT PROCEDURES

- .1 Supply and placement of Permanent Seed, Cover Crop Annual Ryegrass, and related work specified herein will be included in lump sum costs for project.
- .2 Seeding required for restoration of any vegetated areas disturbed by the Contractor during construction, which are not designated for construction of items to be permanently incorporated into the work, including but not limited to access points, on site roads, areas beyond excavation and disposal, lay-down areas or any other areas requiring new seeding as a result of the Contractor's activity to be carried out as per this section at no additional cost.
- .3 Irrigation is considered incidental to seeding and no separate measurement for payment will be made.

1.2 REFERENCES

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

1.3 SUBMITTALS

- .1 Submit to Engineer 2 weeks before seeding, a plan of proposed seeding area.

1.4 STORAGE AND PROTECTION

- .1 Prevent damage to existing areas which are to remain.
 - .1 Repair damaged items to approval of Engineer.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Dispose of any excavated or identified waste materials off-site at the contractors expense.

Part 2 Products

2.1 SEED

- .1 The permanent seed mix includes:
 - .1 .1 Hard Fescue 40%.
 - .2 .2 Sheeps Fescue 40%.
 - .3 .3 Brooklawn Canada Blue Grass 20%.
- .2 Diploid Annual Ryegrass will be overseeded as a cover crop.

Part 3 Execution

3.1 CONSTRUCTION METHODS

- .1 The Contractor shall supply the seed, deliver to site, and apply in accordance with this Specification.
- .2 Seeding of cover crop shall commence immediately upon completion of trimming operations and shall take place no later than September 15. Depending on atmospheric and site conditions seeding may continue at a later date, as determined by the Department Representative.
- .3 Seeding that is not completed in the year of construction shall be completed in the spring of the following year, as soon as atmospheric and site conditions allow for seeding operations to commence, as determined by the Department Representative.
- .4 All weed growth in areas to be seeded shall be destroyed so that proper seeding can be done, If herbicide applications are used to destroy weed growth then all work shall be conducted so that no adjacent vegetation areas are affected by overspray and water bodies remain uncontaminated.
- .5 The seed bed shall be prepared by harrowing the ground to a depth of 100 to 150 mm.
- .6 Cover crop Ryegrass shall be sown according to supplier recommendations.
- .7 Seed varieties may be mixed and sown together or they may be sown separately.
- .8 Seed may be shallow seeded by broadcast methods or applied by press-drill no greater than 7 mm depth and packed to prevent cover soil erosion and to provide suitable seed to soil contact for germination.
- .9 Permanent Seed and cover crop Ryegrass shall be sown uniformly at the rate of:
 - .1 Permanent Seed 4 lbs/1000ft or 195 kg/hectare.
 - .2 Cover Crop Annual Ryegrass 1.3 lbs/1000ft or 63.6 kg/hectare.
- .10 Blend applications 150 mm into adjacent vegetation areas and previous application to form uniform surfaces.
- .11 Harrowing and seeding operation will be carried out parallel to the contour and perpendicular to the slope to discourage down-slope erosion.
- .12 Harrowing after seeding operation may be undertaken as a separate operation or in conjunction with the seeding operation.
- .13 No seeding shall be done on frozen soils, or when any other conditions unfavourable to the successful planting of seed exist, as determined by the Departmental Representative.
- .14 Rutting or damage caused during seeding and fertilizing operations shall be repaired to the satisfaction of the Departmental Representative.
- .15 Irrigation of seeded areas will be required to augment seasonal rainfall to a total depth of 25 mm per week until vegetation is established to the satisfaction of the Departmental Representative.

END OF SECTION

35 31 22 – RIP-RAP

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Supply and installation of rip-rap to be measured in tonnes of material supplied and installed.
- .2 Maintenance of haul roads to be incidental to this work.
- .3 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 SOURCE SAMPLING

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

Part 2 Products

2.1 MATERIALS

- .1 Rock materials:
 - .1 Rip-rap:
 - .1 Greatest dimension of each stone not to exceed two times least dimension.
 - .2 Clean stone sizes to be in range of 100 mm to 300 mm. Rip-rap to be fractured and angular. Field stone not acceptable.
 - .3 Material to be free of roots and other deleterious material.
 - .4 Free from cracks, seams and other defects which may impair durability. The Los Angeles abrasion loss determined using ASTM procedures shall not exceed 35%.

Part 3 Execution

3.1 RIP-RAP

- .1 Place rip-rap to lines, grades and dimensions as indicated.
- .2 Place rip-rap to thickness as indicated on drawings.
- .3 Place stones in manner approved by Engineer to secure surface and create a stable mass. Place larger stones at bottom of slopes.
- .4 Finish surface evenly, free of large openings and neat in appearance.

3.2 TOLERANCES

- .1 Completed component layers to be within following tolerances of lines and grades as indicated:

- .1 Rip-rap: plus or minus 100 mm.

3.3 HAUL ROADS

- .1 Be solely responsible for construction and maintenance of haul roads. Remove haul roads from site upon completion of project. No separate payment to be made for construction, maintenance and removal of haul roads.
- .2 Contractor to be responsible for obtaining approval from applicable agencies for using access roads to site. Contractor is not to use existing launch ramp as a haul road.
- .3 Contractor to repair any damage caused to roads or property as a result of hauling operations.

END OF SECTION

35 59 11 – FLOAT WHARVES

Part 1 General

1.1 MEASUREMENT FOR PAYMENT

- .1 Supply and installation of new timber float wharves including any required fasteners, hardware and bollards specified will be paid for by the unit supplied and installed.
- .2 The cost for fabrication and installation of pipe sliders, float to pipe slider attachments, hinges, steel plates, walkway brackets, relocation of existing hinges and any related hardware or fasteners required for the installation of the float wharf system as indicated on the construction drawings shall be included in lump sum costs for the project.
- .3 The relocation of and modification to install existing float wharves to be paid for as a single lump sum unit.

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 no. 2 or better
 - .3 Grading authority: BCLMA
 - .4 All timber to be S4S.
 - .5 Galvanized bolts and nuts: to ASTM A307-07b. Countersunk head bolts to CSA B34-67(R1972).
 - .6 Washers: pressed steel.
 - .7 Galvanized spikes and nails: spiral type to CSA B111-1974(R2003).
 - .8 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.
 - .9 Plastic bushings: ultra high molecular weight polyethylene (UHMWPE), density 0.94, black.
 - .10 Shapes, plates: fabricated from steel confirming to CAN/CSA-G40.20-04 and CAN/CSA-G40.20-04, Grade 300W.
 - .11 Preservative:
 - .1 Pressure Treatment: all specified treated timber and planks to be pressure treated with CCA or ASA preservative salts to 0.64 g/cu. cm. (0.40 lbs/cu. ft.) retention.
 - .12 Machine bolts used are to be of sufficient length to accept two washers and one fully threaded hexagonal headed nut.

- .13 Mooring Cleats: galvanized grey iron ship or dock cleat (two hole type) indicated on drawings.
- .14 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 Floatation units for whitefish float wharves shall be of size 1219mm x 1829mm x 610 mm deep with a buoyancy of approximately 1225 kg each.
 - .3 Alternate size 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
 - .3 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.
- .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 lag 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) Robertson no. 2 wood screws to a minimum penetration of 50 mm. Drill all screws 1 mm below deck surface. Space planks 10 mm apart.
- .11 Curbing: If specified on drawings, nail timber curb along edges of deck with spiral nails 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 2 spiral spikes.
- .12 Fabricate and install all connection hardware as indicated.
- .13 Paint all float connectors, shapes and plates with one coat of primer.

END OF SECTION