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SPECIFICATIONS

Botsford Harbour Boat Ramp Replacement Project No. C2-00315

Murray Corner
Westmorland County, NB

Re-Issued For Tender – May 15th, 2023



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1. List of Drawings

DWG. No. TITLE

Botsford Harbour Boat Ramp Replacement

C1	Key Plan and Existing Site Plan
C2	Existing Plan View
C3	Existing Sections and Removals
C4	Plan View of New Boat Ramp
C5	New Boat Ramp Sections and Details (1/4)
C6	New Boat Ramp Sections and Details (1/4)
C7	New Boat Ramp Sections and Details (1/4)
C8	New Boat Ramp Details (1/4)

Part 1 General

1.1 PROJECT LOCATION

- .1 This project is located at the Botsford Harbour in Murray Corner, Westmorland County, New Brunswick.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Fisheries and Oceans, Small Craft Harbours Branch is preparing the construction of a new reinforced concrete boat ramp to replace the existing deteriorating boat ramp.
- .2 The work includes but is not limited to:
 - .1 Mobilization to site.
 - .2 Installation and maintenance of environmental controls required to complete the work.
 - .3 Removal and disposal of the existing concrete boat ramp and partial removal of the existing timber crib supporting the ramp.
 - .4 Excavation and grading as required to facilitate construction of the new boat ramp.
 - .5 Placement of rock fill and sub-base material for installation of the new boat ramp.
 - .6 Fabrication and placement of precast panels and connections.
 - .7 Pouring and curing new reinforced concrete boat ramp and curbs.
 - .8 Installation of random riprap around the perimeter of the new ramp for scour protection.
 - .9 Placement of new asphalt around the top of the new ramp.
 - .10 Disposal of excess fills offsite.
 - .11 Site cleanup.
 - .12 Removal of environmental controls.
 - .13 Demobilization from the site.
- .3 The above listed work is subject to the following constraints during construction:
 - .1 Construction activities shall not detrimentally impact the surrounding environment or waterway, shall respect allowable windows for in-water work, and shall respect the requirements of cultural resources.
- .4 The Contractor is responsible for the delineation of the construction zones.
- .5 All work to be carried out in accordance with applicable federal, provincial regulations for those agencies having jurisdiction for the work.
- .6 The Contractor must be aware that other construction work or on-going fishery activity may potentially be underway at other locations near the project site during the time frame of this contract. No claims shall be accepted due to failure to co-ordinate this work with other construction or fishery efforts in the area.

1.3 CONTRACT METHOD

- .1 Construct Work under Unit Price and Lump Sum items contract.

1.4 CODES AND STANDARDS

- .1 Perform work in accordance with any code of federal, provincial, or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.
- .2 Materials and workmanship must conform to or exceed applicable standards of Canadian General Standards Board (CGSB), Canadian Standards Association (CSA), American Society for Testing and Materials (ASTM), National Building Code - FCS Standard 373 (Piers and Wharves) and other standards organizations.
- .3 Conform to latest revision at the date of Tender of any referenced standard as re-affirmed or revised to date of specification. Standards or codes not dated shall be deemed editions in force on date of tender advertisement.

1.5 SITE CONDITIONS

- .1 Prior to submitting their bids, bidders are recommended to visit the site to review and verify the form, nature and extent of the work, materials needed, the means of access and the temporary facilities required to perform the Work.
- .2 Obtain prior permission from the Departmental Representative before completing a site inspection.
- .3 Contractors, bidders, or those they invite to site are to review specification Section 01 35 29.06 – Health and Safety Requirements before visiting site. Take all appropriate safety measures for any visit to site, either before or after acceptance of bid.
- .4 Details of the existing structure are for the Contractor to determine in considering use with over-weight and non-conforming vehicles in carrying out work on this project and in the demolition of the structure.
- .5 For as-built information, refer to the Drawings.

1.6 INTERPRETATION OF DOCUMENTS

- .1 Supplementary to the Order of Precedence article of the General Conditions of the Contract, the Division 01 Sections take precedence over the technical specification sections in other Divisions of the Specifications Manual.

1.7 TERM ENGINEER

- .1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Departmental Representative as defined in the General Conditions of the Contract.

1.8 SITE SURVEY AND SETTING OUT WORK

- .1 The Contractor shall carry out all layout. The Contractor is responsible for the layout of the new structures as per the contract drawings. For vertical geometry, a project specific datum is available and is defined on the contract drawings. Refer to the contract drawings for more details.
- .2 The Contractor shall assume full responsibility for and execute complete layout of work locations, lines and elevations indicated.

- .3 The Contractor shall supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.
- .4 The Contractor shall provide coordinates, elevations and dimensions in the field, as required by the Departmental Representative.

1.9 WORK WITHIN SITE BOUNDARIES

- .1 The project is within a working fishing harbour. It is essential that DFO lands remain as undisturbed as possible. The Contractor will be expected to use standards and methods beyond those for normal construction in order to protect the environment and ensure minimal impact from the work. Contract limits shall be strictly adhered to and every precaution shall be taken to minimize environmental damage and disruption to vegetation, wildlife habitat, adjacent properties, structures or existing services, on construction and storage sites and on access routes/roads to the worksite.
 - .1 If any damage occurs during construction, the Contractor is responsible to bear the expense to immediately restore such damaged areas to the satisfaction of Departmental Representative.
 - .2 If Contractor fails to repair damage to the satisfaction of the Departmental Representative, the Departmental Representative may have repairs completed by others at the Contractor's expense.
 - .3 The Contractor shall ensure that contracted work meets the standards outlined in the contract specification and drawings.
 - .4 The Contractor shall ensure that no damage will be done to any existing utilities.
 - .5 All sources of aggregate must be submitted to the Departmental Representative for approval at least two weeks prior to the start of any work.
 - .6 The Contractor will make arrangements with authorities or owners of private properties for quarrying and transporting materials and machinery over their properties and be responsible for obtaining and paying of fees as required.
 - .7 Special move permits for any over-weight and over-dimensional vehicles required to travel provincial highways must be secured by the Contractor and submitted to the Departmental Representative for review and approval prior to movement within Site boundaries.

1.10 MEASUREMENT FOR PAYMENT

- .1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment.
- .2 Items included under "Measurement for payment". All lump sum and all unit price items shall include all materials, labour, equipment, and all other items necessary to complete the work. See also Section 01 29 10.
- .3 All items under this list represent one (1) lump sum price:

Item 1: Mobilization and Demobilization:

- 1. Mobilization and demobilization shall constitute a lump sum price for measurement purposes. Final payment for this item will only be made when all work is complete and all materials, equipment and other facilities are removed, the site cleaned and left in a condition satisfactory to the Departmental Representative.

Item 2: Site Works

1. Site works shall constitute a lump sum price for measurement purposes. This work shall include demolition and disposal of the existing concrete boat ramp, partial removal and disposal of the existing timber crib and ballast stone, and all excavation and trenching required to complete the work. All costs associated with the work shall be included in this item. This item excludes costs associated with disposal of all timber.

Item 3: Cast-In-Place and Precast Reinforced Concrete:

1. Cast-in-place and precast concrete for the boat ramp and curb shall constitute a lump sum price for measurement purposes. This item shall include the supply and installation of the cast-in-place and precast concrete, connection plates, formwork, and internal steel reinforcing, as required to complete the work.

Item 4: Asphalt Paving:

1. Asphalt paving shall constitute a lump sum price for measurement purposes. This work shall include the saw cutting and milling of adjacent asphalt surfaces, supply, placement, and compaction of new asphalt to the indicated thickness, lines, and grades identified on the Drawings. This item shall include all materials and equipment required to construct the specified asphalt structure including necessary prime coat, asphalt base (mix "B"), and asphalt seal (mix "D").

Item 5: Geotextile:

1. Geotextile shall constitute a lump sum price for measurement purposes. This item shall include the supply and installation of all geotextile required to complete the work.

- .4 All items under this list represent individually paid items based on their specified unit price:

Item 1: Disposal of Crib Timbers

1. The disposal cost of all demolished crib timbers shall constitute a price per metric tonne for measurement purposes. This item includes the cost associated with sorting, loading, trucking and tipping fee to dispose of these timbers.

Item 2: Rock Fill:

1. Rock fill shall constitute a price per tonne for measurement purposes. This item shall include the supply, installation, and grading of all rock fills required to complete the work.

Item 3: Sub-Base Material:

1. Sub-base material shall constitute a price per tonne for measurement purposes. This item shall include the supply, installation, and grading of all sub-base material required to complete the work.

Item 4: Gravel:

1. Gravel shall constitute a price per tonne for measurement purposes. This item shall include the supply, installation, and grading of all gravel fills required to complete the work.

Item 5: Riprap:

1. Riprap shall constitute a price per tonne for measurement purposes. This item shall include the supply, installation, and grading of all random riprap required to complete the work.

1.11 MAINTENANCE OF WORK DURING CONSTRUCTION

- .1 Maintain work during construction. Undertake continuous and effective maintenance daily, with adequate equipment and forces so that the roadway or structures are continuously kept in a condition satisfactory to Departmental Representative.

1.12 WORK SCHEDULE

- .1 Provide to the Departmental Representative in writing and within 7 working days after Contract award, a detailed construction schedule. The schedule as a minimum shall show the anticipated start and completion dates for all key work required to complete the project.
- .2 “Completely Accessible” as noted below shall be defined as providing berthage space for vessels, access to and from the structures and the boat ramp clear and ready for service.
- .3 Work shall be in accordance with work restrictions further described and as follow:
 - .1 Construction must be completed within the property boundaries of the facility unless otherwise approved by the Departmental Representative.
 - .2 The Contractor must setup their onsite office and laydown all materials within the laydown area approved by a Departmental Representative.
- .4 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.
- .5 No work will begin until the pre-construction and site safety meeting is held.
- .6 Following the pre-construction meeting and approval of the schedule, traffic control plan, environmental protection plan and site-specific health and safety plan, the work will be so scheduled to meet the time restraints and have the project completed on time.

1.13 CONTRACTOR’S USE OF SITE

- .1 Use of site: for execution of work within proximity of the wharf and those areas specified by the Departmental Representative.
- .2 Contractor’s use of site is to be coordinated with a Departmental Representative and the Harbour Authority.

1.14 SANITARY SERVICES

- .1 The Contractor shall provide and maintain sanitary facilities for the use of workers at locations specified by the Departmental Representative. Provision of sanitary facilities shall meet requirements of provincial government and municipal statutes and authorities.

1.15 PROJECT MEETINGS

- .1 A pre-construction meeting and regular progress meetings shall be held by the contractor throughout the project. Refer to Section 01 31 19 Project Meetings for details.

1.16 DEPARTMENTAL REPRESENTATIVE

- .1 Departmental Representative will be assigned after contract award.

1.17 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each of following:
 - .1 Contract drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed drawings.
 - .5 Change orders.
 - .6 Other modifications to Contract.
 - .7 Copy of approved work schedule.
 - .8 Field test reports
 - .9 Manufacturer's installation and application instructions.
 - .10 Site specific Hazard Assessment, Health and Safety Plan and other safety related documents.
 - .11 Other documents as stipulated elsewhere in the Contract Documents.

1.18 ADDITIONAL DRAWINGS

- .1 Departmental Representative may furnish additional drawings for clarification. These additional drawings have same meaning and intent as if they were included with plans referred to in Contract documents.

1.19 CUTTING AND PATCHING

- .1 Cut and patch as required to make work fit.
- .2 Where new work connects with existing and where existing work is altered, cut, patch, and make good to match existing work.

1.20 RELICS, ANTIQUITIES AND WILDLIFE HABITAT

- .1 Protect relics, antiquities, wildlife habitat, items of historical or scientific interest such as animal nesting site or similar objects found during course of work.
- .2 Give immediate notice to Departmental Representative and await Departmental Representative's written instructions before proceeding with work in this area.
- .3 Relics, antiquities, and items of historical or scientific interest remain her Majesty's property.

1.21 PERMITS/AUTHORITIES

- .1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. They shall also comply with all pertinent regulations of all authorities having jurisdiction over the work. The Contractor shall provide copies of all permits to the Departmental Representative prior to starting the work. The Contractor shall be responsible for obtaining all applicable permits, inspections and approvals required and

shall pay all changes in connection therewith (including all permitting required to upgrade existing electrical services).

- .2 Advise the Canadian Coast Guard, Marine Communication, and traffic Services (MCTS) at (902) 564-7751 or toll free at 1-800-686-8676 sufficiently in advance of commencement of work or when deploying or removing site markings in order to allow for appropriate Notices to Shipping/Mariners action.

1.22 PROTECTION

- .1 Store all materials and equipment to be incorporated into work to prevent damage by any means.
- .2 Repair and replace all materials or equipment damaged in transit or storage to the satisfaction of the Departmental Representative and at no cost to Crown.
- .3 Contractor will take adequate precautions to protect existing structures when operating tracked equipment. Contractor shall also take care as to not detrimentally surcharge new and existing structures during construction activities.
- .4 Exercise care so as not to obstruct or damage public or private property in the area.
- .5 At completion of work, restore area to its original condition. Damage to ground and property will be repaired by Contractor. Remove all construction materials, residue, excess, etc., and leave site in a condition acceptable to Departmental Representative.

1.23 EXISTING SERVICES

- .1 Carry out work at times directed by authorities having jurisdiction, with minimum of disturbance to pedestrian and vehicular traffic.
- .2 Before commencing work, establish location and extent of service lines in area of work and notify Departmental Representative of findings.
- .3 Submit Schedule to and obtain approval from Departmental Representative for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered, immediately advise Departmental Representative, and confirm findings in writing.
- .5 Record locations of maintained re-routed, and abandoned service lines.
- .6 Verify locations of any underground utilities.
- .7 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrians, vehicular traffic, and user operations.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Provide for personnel and vehicle access, including snow removal as required.
- .3 Where safety and/or security is reduced by the work, provide temporary means to maintain safety and/or security.
- .4 See Section 01 10 10 for schedule restrictions.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS

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

1.4 EXISTING SERVICES

- .1 Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Provide services for personnel, pedestrian, and vehicular traffic where such services have been interrupted due to construction.

1.5 SPECIAL REQUIREMENTS

- .1 Maintenance to vehicles and equipment is prohibited on Harbour Authority property.
- .2 Blasting is not permitted.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic, and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.

END OF SECTION

Part 1 General

1.1 WORK SCHEDULE

- .1 Upon acceptance of bid, submit:
 - .1 Work schedule within 7 calendar days of contract award.
- .2 Schedule to indicate all calendar dates from commencement to completion of all work within the time stated in the accepted bid.
- .3 Provide sufficient details in schedule to clearly illustrate entire implementation plan, depicting efficient coordination of tasks and resources, to achieve completion of work on time and permit effective monitoring of work progress in relation to established milestones.
- .4 Work schedule content to include as a minimum the following:
 - .1 Bar (GANTT) Charts, indicating all work activities, tasks and other project elements, their anticipated durations, planned dates for achieving key activities and major project milestones.
 - .2 Written narrative on key elements of work illustrated in bar chart, providing sufficient details to demonstrate a reasonable implementation plan for completion of project within designated time.
- .5 Work schedule must take into consideration and reflect the work phasing, required sequence of work, special conditions and operational restrictions as specified elsewhere and below and indicated on drawings.
- .6 Schedule work in cooperation with the Departmental Representative. Incorporate within Work Schedule, items identified by Departmental Representative during review of schedule.
- .7 Completed schedule shall be approved by Departmental Representative. When approved, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative's approval.
- .8 Ensure that all subtrades and subcontractors are made aware of the work restraints and operational restrictions specified.
- .9 Schedule Updates:
 - .1 Submit when requested by Departmental Representative.
 - .2 Provide information and pertinent details explaining reasons for necessary changes to implementation plan.
 - .3 Identify problem areas, anticipated delays, impact on schedule and proposed corrective measures to be taken.
- .10 Departmental Representative will make interim reviews and evaluate progress of work based on approved schedule. Frequency of such reviews will be as decided by Departmental Representative. Address and take corrective measures on items identified by reviews and as directed by Departmental Representative. Update schedule accordingly.

- .11 In every instance, change or deviation from the Work Schedule, no matter how minimal the risk or impact on safety or inconvenience to the Harbour Authority or the public might appear, will be subject to prior review and approval by the Departmental Representative.

1.2 PROJECT PHASING

- .1 Refer to 01 10 10 General Instructions for schedule restrictions and the construction completion date.

1.3 OPERATIONAL RESTRICTIONS

- .1 The Contractor must recognize that harbour users will be affected by implementation of this Contract. The Contractor must perform the Work with utmost regard to the safety and convenience of Harbour users. All work activities must be planned and scheduled with this in mind.
- .2 Site access must be restricted to only those approved by Contractor and knowledgeable of the Contractor's Site-Specific Safety Plan (SSSP).
- .3 Safety Signage:
 - .1 Provide on-site, and erect as required during progress of work, proper signage, mounted on self-supporting stands and/or fencing, warning the public of construction activities progress and alerting need to exercise caution in the area. This shall include signage to notify approaching vessels of construction activities in the harbour.
 - .2 Signage to be professionally printed and mounted on wooden backing, coloured and to express messages as directed by the Departmental Representative.
 - .3 Include costs for the supply and installation of these signs in the bid price.
- .4 Stockpile materials on site in laydown area identified as agreed upon by the Departmental Representative and the local Harbour Authority.
- .5 Dust and Dirt Control:
 - .1 See section 01 50 00 and 01 74 11 for dust control and cleaning requirements.
 - .2 Effectively plan and implement dust control measures and cleaning activities as an integral part of all construction activities. Review all measures with the Departmental Representative before undertaking work, especially for major dust generating activities.
 - .3 Do not allow demolition debris and construction waste to accumulate on site and contribute to the propagation of dust.
 - .4 As work progresses, always maintain construction areas in a tidy condition.
 - .5 Do not stockpile fill material any higher than 3m.

1.4 PROJECT MEETINGS

- .1 Schedule and administer project meetings for entire duration of work and more often when directed by Departmental Representative. Refer to Section 01 31 19 for required project meeting frequency.
- .2 Hold meetings at project site or where approved by Departmental Representative.

1.5 WORK COORDINATION

- .1 The Contractor is responsible for coordinating the work of the various trades and predetermining where the work of such trades interfaces with each other.
 - .1 Designate one person from own employees having overall responsibility to review contract documents and shop drawings, plan and manage such coordination.
- .2 No extra costs to the Contract will be considered by the Departmental Representative because of Contractor's failure to effectively coordinate all portions of the Work. Disputes between the various trades because of their not being informed of the areas and extent of interface work shall be the sole responsibility of the Contractor to be resolved at own cost.

END OF SECTION

Part 1 General

1.1 GENERAL

- .1 This section covers the measurement of Work done for payment purposes.
- .2 There shall be no measurement or payment for Work carried out beyond the limits defined on the Drawings.
- .3 The Contractor will only be entitled to payment when prior written authorization has been received from the Departmental Representative for utilization and then only to the extent of the work authorized by the Departmental Representative.
- .4 The lump sum prices for all items in the Unit Price and Lump Sum Table shall represent the full compensation for the work of the item and shall include the cost of furnishing all materials, labour, tools, and equipment necessary to complete the work in accordance with the Contract, the Drawings and Specifications, and shall cover all costs of surety. Each item shall include all necessary supervision, plant and services, and all operations and allowances customary and necessary to complete each item and the Contract as a whole, notwithstanding the fact that not every such necessary operation is mentioned or included specifically for measurement.
- .5 Unless specified otherwise, all materials necessary to complete the items listed in the Unit Price and Lump Sum Table and the finished Work, shall be new materials supplied by the Contractor and the cost of such material is to be included in the Contractor's prices.
- .6 All measurements for progress payment purposes shall be taken jointly by the Contractor and the Departmental Representative.
- .7 The following measurement procedures are for the purpose of measuring progress on the lump sum contract:
 - .1 Linear:
 - .1 Items which are measured by the linear meter shall be based on the final installed lengths and measure along the centreline of installation unless otherwise indicated on the plans.
 - .2 Area:
 - .1 Longitudinal and transverse measurements shall be made on the actual flat or sloped surface.
 - .3 Volume:
 - .1 In computing volumes of excavation or for infill quantities, average end area method will be used unless otherwise directed by Departmental Representative.
 - .2 All volume measurements refer to in-place measures unless specified otherwise.
 - .4 Mass:
 - .1 The terms "tonne" or "metric tonne" shall mean 1000 kilograms (kg).
 - .2 Materials which are specified for measurement by mass shall be weighed on scales approved by Departmental Representative. Units used to haul

material being paid for by mass shall bear legible identification numbers plainly visible to scale person as it approaches and leaves scale-house.

- .8 Refer to Section 01 10 10 – General Instructions, “Measurement for Payment” for measurement procedures for all payment items.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.2 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except as follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
 - .6 Additional tests specified as follows in the following paragraph.
- .2 Where tests or inspections by designated testing laboratory reveal that the Work is not completed in accordance with the contract requirements; the Contractor shall pay the costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment, and facilities to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative a minimum of 48 hours in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

END OF SECTION

Part 1 General

1.1 PRECONSTRUCTION MEETING

- .1 After receiving the Contractor's schedule, traffic control plan, health and safety hazard assessment, and environmental protection plan, and prior to start of construction, a meeting involving Contractor, Departmental Representative, Engineer, field inspectors and end users will be held at a place and time to be determined by the Contractor.
- .2 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .3 Agenda to include:
 - .1 Review of the design and the intentions of the project.
 - .2 Implications of the contract.
 - .3 Health and safety.
 - .4 Methods of construction.
 - .5 Environment protection methods.
 - .6 Traffic control.
 - .7 Appointment of official representative of participants in the Work.
 - .8 Schedule of Work: to be in GANTT Chart format.
 - .9 Schedule of submission of shop drawings, samples, etc. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .10 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .11 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
 - .12 Proposed changes, change orders, procedures, approvals required, and administrative requirements.
 - .13 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .14 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .15 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .16 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .17 Appointment of inspection and testing agencies or firms.
 - .18 Insurances, transcript of policies.

1.2 PROGRESS MEETINGS

- .1 Contractor will arrange bi-weekly progress meetings and assume responsibility for setting times and recording and distributing minutes. Minutes shall be distributed within 3 business days of the meeting. Contractor shall notify all attending parties a minimum of 5 days in advance of the meeting.
- .2 Contractor, major Subcontractors involved in Work, field inspector and Departmental Representative are to be in attendance.

- .3 Progress meeting agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for effect on construction schedule and on completion date.
 - .12 Other business.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Refer to Technical Specifications which reference “SUBMITTALS” under PART 1 – GENERAL of each section.

1.2 ADMINISTRATIVE

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

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings bearing stamp and signature of qualified Professional Engineer registered or licensed in Province of New Brunswick, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes, and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .4 Allow ten (10) business days, unless otherwise noted, for Departmental Representative's review of each submission
- .5 Adjustments made on shop drawings by the Departmental Representative are not intended to change Contract Price. If adjustments change the original scope of work and therefore the contract value, state such in writing to the Departmental Representative for review prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

- .11 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by the Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 2 years of date of contract award for project.
- .13 Submit electronic copy of certificates for requirements requested in specification Sections and as directed by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copy of manufacturer's instructions for requirements requested in specification Sections unless otherwise directed by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Documentation of the testing and verification actions by manufacturer's representative to confirm compliance with manufacturer's standards and instructions.
- .16 Delete information not applicable to project.
- .17 Supplement standard information to provide details applicable to project.
- .18 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, electronic copy will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- .19 The review of shop drawings by Departmental Representative is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that

pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract. No site work to occur until insurance transcript has been received.
- .3 Submit Certificates of Conformance to the Departmental Representative, stating that the component(s) has been installed in conformance with the approved shop drawings. Certificate of Conformance to bear the seal and signature of a Professional Engineer licensed in the province of New Brunswick, Canada.
- .4 Certificates of Conformance required for, but not limited to, the following:
 - .1 All components where shop drawings are required (unless otherwise directed by the Departmental Representative).
 - .2 As specified elsewhere in the Contract Documents.

1.6 PROCEDURES

- .1 Provide procedures required as specified in the Contract documents or as directed by the Departmental Representative.

1.7 AS-BUILT DOCUMENTS

- .1 Provide As-Built documents in accordance with Sections 01 77 00 Closeout Procedures and Section 01 78 00 Closeout Submittals and as directed by the Departmental Representative.

1.8 OTHER SUBMISSIONS

- .1 Provide a construction schedule and cash flow forecasts updated every month as well as any additional interim updates requested by the departmental representative.
- .2 Provide all other submissions as required by law and the Contract documents.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Fire Safety Requirements
- .2 Hot Work Permit
- .3 Existing Fire Protection and Alarm Systems

1.2 RELATED SECTIONS

- .1 Section 01 35 29.06 Health and Safety Requirements.

1.3 REFERENCES

- .1 National Fire Code 2015
- .2 National Building Code 2015

1.4 DEFINITIONS

- .1 Hot Work defined as:
 - .1 Welding work.
 - .2 Cutting of materials by use of torch or other open flame devices.
 - .3 Grinding with equipment which produces sparks.
 - .4 Use of open flame torches such as for roofing work.
 - .5 Use of cellphone or mobile device in area of equipment refueling.

1.5 SUBMITTALS

- .1 Submit copy of Hot Work Procedures and sample of Hot Work permit to Departmental Representative for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.6 FIRE SAFETY REQUIREMENTS

- .1 Implement and follow fire safety measures during Work. Comply with following:
 - .1 National Fire Code 2015.
 - .2 National Building Code 2015.
 - .3 Federal and Provincial Occupational Health and Safety Acts and Regulations.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.7 HOT WORK AUTHORIZATION

- .1 Obtain Departmental Representative's written "Authorization to Proceed" before conducting any form of Hot Work on site.

- .2 To obtain authorization submit to Departmental Representative:
 - .1 Contractor's typewritten Hot Work Procedures to be followed on site as specified below.
 - .2 Description of the type and frequency of Hot Work required.
 - .3 Sample Hot Work Permit to be used.
- .3 Upon review and confirmation that effective fire safety measures will be implemented and followed during performance of hot work, Departmental Representative will give authorization to proceed as follows:
 - .1 Issue one written "Authorization to Proceed" covering the entire project for duration of work or;
 - .2 Subdivide the work into pre-determined, individual activities, each activity requiring a separately written authorization to proceed.
- .4 Requirement for individual authorization will be based on:
 - .1 Nature or phasing of work.
 - .2 Risk to Facility operations.
 - .3 Quantity of various trades needing to perform hot work on project.
 - .4 Other situation deemed necessary by Departmental Representative to ensure fire safety on premises.
- .5 Do not perform any Hot Work until receipt of Departmental Representative's written "Authorization to Proceed" for that portion of work.

1.8 HOT WORK PROCEDURES

- .1 Develop and implement safety procedures and work practices to be followed during the performance of Hot Work.
- .2 Hot Work Procedures to include:
 - .1 Requirement to perform hazard assessment of site and immediate work area beforehand for each hot work event in accordance with Safety Plan specified in section 01 35 29.06.
 - .2 Use of a Hot Work Permit system with individually written permit issued by Contractor's Superintendent to specific worker or subcontractor granting permission to proceed with Hot Work.
 - .3 Permit required for each Hot Work event.
 - .4 Designation of a person on site as a Fire Safety Watcher responsible to conduct a fire safety watch for a minimum duration of 30 minutes immediately following the completion of the Hot Work.
 - .5 Compliance with fire safety codes, standards and occupational health and safety regulations specified.
 - .6 Site specific rules and procedures in force at the site as provided by the Harbour Authority.
- .3 Generic procedures, if used, must be edited, and supplemented with pertinent information tailored to reflect specific project conditions. Label document as being the Hot Work Procedures for this contract.

- .4 Procedures shall clearly establish responsibilities of:
 - .1 Worker performing hot work,
 - .2 Person issuing the Hot Work Permit,
 - .3 Fire Safety Watcher,
 - .4 Subcontractor(s) and Contractor.
- .5 Brief all workers and subcontractors on Hot Work Procedures and of Permit system. Stringently enforce compliance.
- .6 Failure to comply with fire safety procedures may result in the issue of a Non-Compliance notification as specified in Section 01 35 29.06.

1.9 HOT WORK PERMIT

- .1 Hot Work Permit to include the following:
 - .1 Project name and project number.
 - .2 Structure name and specific area where hot work will be performed.
 - .3 Date of issue.
 - .4 Description of Hot Work type needed.
 - .5 Special precautions to be followed, including type of fire extinguisher needed.
 - .6 Name and signature of permit issuer.
 - .7 Name of worker to which the permit is issued.
 - .8 Permit validity period not to exceed 8 hours. Indicate start time/date and termination time/date.
 - .9 Worker's signature with time/date of hot work completion.
 - .10 Stipulated period of safety watch.
 - .11 Fire Safety Watcher's signature with time/date.
- .2 Permit to be typewritten form. Industry Standard forms shall only be used if all data specified above is included on form.
- .3 Each Hot Work Permit to be completed in full, signed and returned to Contractor's Superintendent for safe keeping on site.

1.10 FIRE PROTECTION AND ALARM SYSTEMS

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut-off, unless approved by Departmental Representative.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes, and hose systems for purposes other than firefighting.
- .3 Costs incurred, from the fire department, Harbour Authority, and tenants, resulting from negligently setting off false alarms will be charged to the Contractor in the form of financial progress payment reductions and holdback assessments against the Contract.

1.11 DOCUMENTS ONSITE

- .1 Keep Hot Work Permits and Hazard assessment documentation on site for duration of Work.
- .2 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Procedures to isolate and lockout electrical facility and other equipment from energy sources.

1.2 RELATED SECTIONS

- .1 Section 01 35 29.06: Health and Safety

1.3 REFERENCES

- .1 CSA C22.1:21 - Canadian Electrical Code, Part 1, Safety Standard for Electrical Installations.
- .2 CSA C22.3 No.1-15 (R2020) - Overhead Systems.
- .3 CSA C22.3 No.7-20 - Underground Systems.
- .4 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

1.4 DEFINITIONS

- .1 Electrical Facility: means any system, equipment, device, apparatus, wiring, conductor, assembly, or part thereof that is used for the generation, transformation, transmission, distribution, storage, control, measurement, or utilization of electrical energy, and that has an amperage and voltage that is dangerous to persons.
- .2 Guarantee of Isolation means a guarantee by a competent person in control or in charge that a particular facility or equipment has been isolated.
- .3 De-energize: in the electrical sense, that a piece of equipment is isolated and grounded, e.g. if the equipment is not grounded, it cannot be considered de-energized (DEAD).
- .4 Guarded: means that an equipment or facility is covered, shielded, fenced, enclosed, inaccessible by location, or otherwise protected in a manner that, to the extent that is reasonably practicable, will prevent or reduce danger to any person who might touch or go near such item
- .5 Isolate: means that an electrical facility, mechanical equipment or machinery is separated or disconnected from every source of electrical, mechanical, hydraulic, pneumatic or other kind of energy that is capable of making it dangerous.
- .6 Live/alive: means that an electrical facility produces, contains, stores or is electrically connected to a source of alternating or direct current of an amperage and voltage that is dangerous or contains any hydraulic, pneumatic or other kind of energy that is capable of making the facility dangerous to persons.

1.5 COMPLIANCE REQUIREMENTS

- .1 Comply with the following in regards to isolation and lockout of electrical facilities and equipment:

- .1 Canadian Electrical Code
 - .2 Federal and Provincial Occupational Health and Safety Acts and Regulations.
 - .3 Regulations and code of practice as applicable to mechanical equipment or other machinery being de-energized.
 - .4 Procedures specified herein.
- .2 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

1.6 SUBMITTALS

- .1 Submit copy of proposed lockout procedures and sample of lockout permit or lockout tags to Departmental Representative for review, within 14 calendar days of acceptance of bid.
- .2 Submit in accordance with section 01 33 00.

1.7 ISOLATION OF EXISTING SERVICES

- .1 Obtain Departmental Representative's written authorization prior to working on existing live or active electrical facilities and equipment and before proceeding with isolation of such item.
- .2 To obtain authorization, submit to Departmental Representative the following documentation:
 - .1 Written request to isolate the particular service or facility and;
 - .2 Copy of Contractor's Lockout Procedures.
- .3 Make a Request for Isolation for each event, unless directed otherwise by Departmental Representative, as follows:
 - .1 Fill-out standard form in current use at the Facility as provided by Departmental Representative or;
 - .2 Where no form exist, make written request indicating:
 - .1 The equipment, system or service to be isolated and its location;
 - .2 Duration of isolation period (ie: start time & date and completion time & date).
 - .3 Voltage of service feed to system or equipment being isolated.
 - .4 Name of person making the request.
- .4 Do not proceed with isolation until receipt of written notification from Departmental Representative granting the Isolation Request and authorization to proceed with the work.
 - .1 Note that Departmental Representative may designate another person at the Facility being authorized to grant the Isolation Request.
- .5 Conduct safe, orderly shutdown of equipment or facility. De-energize, isolate and lockout power and other sources of energy feeding the equipment or facility.

- .6 Determine in advance, as much as possible, in cooperation with the Departmental Representative, the type and frequency of situations which will require isolation of existing services.
- .7 Plan and schedule shut down of existing services in consultation with the Departmental Representative and the Harbour Authority. Minimize impact and downtime of Facility operations. Follow Departmental Representative's directives in this regard.
- .8 Conduct hazard assessment as part of the process in accordance with health and safety requirements specified Section 01 35 29.06.

1.8 LOCKOUTS

- .1 De-energize, isolate and lockout electrical facility, mechanical equipment and machinery from all potential sources of energy prior to working on such items.
- .2 Develop and implement clear and specific lockout procedures to be followed as part of the Work.
- .3 Prepare typed written Lockout Procedures describing safe work practices, procedures, worker responsibilities and sequence of activities to be followed on site by workforce to safely isolate an active piece of equipment or electrical facility and effectively lockout and tagout it's sources of energy.
- .4 Include as part of the Lockout Procedures a system of lockout permits managed by Contractor's Superintendent or other qualified person designated by him/her as being "in-charge" at the site.
 - .1 A lockout permit shall be issued to specific worker providing a Guarantee of Isolation before each event when work must be performed on a live equipment or electrical facility.
 - .2 Duties of person managing the permit system to include:
 - .1 Issuance of permits and lockout tags to workers.
 - .2 Determining permit duration.
 - .3 Maintaining record of permits and tags issued.
 - .4 Making a Request for Isolation to Departmental Representative when required as specified above.
 - .5 Designating a Safety Watcher, when one is required based on type of work.
 - .6 Ensuring equipment or facility has been properly isolated.
 - .7 Collecting and safekeeping lockout tags returned by workers as a record of the event.
- .5 Clearly establish, describe and allocate responsibilities of:
 - .1 Workers.
 - .2 Person managing the lockout permit system.
 - .3 Safety Watcher.
 - .4 Subcontractor(s) and General Contractor.
- .6 Generic procedures, if used, must be edited and supplemented with pertinent information to reflect specific project requirements.

- .1 Incorporate site specific rules and procedures in force at site as provided by Harbour Authority through the Departmental Representative.
- .2 Clearly label the document as being the lockout procedures applicable to work of this contract.
- .7 Use energy isolation lockout devices specifically designed and appropriate for type of facility or equipment being locked out.
- .8 Use industry standard lockout tags.
- .9 Provide appropriate safety grounding and guards as required.

1.9 CONFORMANCE

- .1 Brief all workers and subcontractors on requirements of this section. Stringently enforce use and compliance.
- .2 Failure to follow lockouts procedures specified herein may result in the issuance of a Non-Compliance notification as specified in section 01 35 29.06.

1.10 DOCUMENTS ONSITE

- .1 Post Lockout Procedures on site in common location for viewing by workers.
- .2 Keep copies of Request for Isolation forms and lockout permits and tags issued to workers on site for full duration of Work.
- .3 Upon request, make available to Departmental Representative or to authorized safety Representative for inspection.

END OF SECTION

1.1 RELATED SECTIONS

- .1 Section 01 35 24: Special Procedures on Fire Safety Requirements.
- .2 Section 01 35 25: Special Procedures on Lockout Requirements.

1.2 DEFINITIONS

- .1 Competent Person: means a person who is:
 - .1 Qualified by virtue of personal knowledge, training and experience to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
 - .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
 - .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .2 Medical Aid Injury: any injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
- .3 PPE: personal protective equipment.
- .4 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, used by Contractor to perform all of the activities associated with the performance of the Work.
- .5 Incident - occurrence, condition, or situation arising in the course of work that resulted in or could have resulted in injury, illness, property damage, environmental issues or fatality.

1.3 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit Site-Specific Health and Safety Plan prior to commencement of Work.
 - .1 Submit within 10 work days of notification of Bid Acceptance. Allow for 5-10 days for Department review and recommendations prior to the commencement of work. Provide 3 copies.
 - .2 Departmental Representative will review Health and Safety Plan and provide comments.
 - .3 Revise the Plan as appropriate and resubmit within 5-10 work days after receipt of comments.
 - .4 Departmental Representative's review and comments made of the Plan shall not be construed as an endorsement, approval or implied warranty of any kind by Canada and does not reduce Contractor's overall responsibility for Occupational Health and Safety of the Work.
 - .5 Submit revisions and updates made to the Plan during the course of Work.
- .3 Submit name of designated Health and Safety Site Representative and support documentation specified in the Safety Plan.

- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other Department of Labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal or Provincial authorities within 24 hours after the visit to the Departmental Rep.
- .7 Submit copies of incident reports (incident, accident, injury, near-miss, fire, explosion, chemical spill or damage to property occurring at the work site) 24 hours after the event to the Departmental Representative.
- .8 Submit documented plans as prescribed through Public Health requirements, directions, orders and declarations. Include industry best practices when preparing the plan and revise/update accordingly and in a timely manner as per Public Health requirements and recommended industry best practices. (Covid 19 – a source of advice can be found in the link below
<https://www.cca-acc.com/wp-content/uploads/2020/06/CCA-COVID-19-Standardized-Protocols-for-All-Canadian-Construction-Sites-05-26-20.pdf>)

1.4 COMPLIANCE REQUIREMENTS

Comply with Occupational Health and Safety Act for Province of New Brunswick, and General Regulations made pursuant to the Act.

- .1 Comply with Provincial/Federal Public Health requirements, directions, and declarations. Prepare documented plans as prescribed by Public Health and/or industry best practices in consultation with the Departmental Representative.
- .2 Canadian Standards Association (CSA):
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .3 Observe construction safety measures of:
 - .1 NBC 2015, Division B, Part 8.
 - .2 NFC 2015,
 - .3 Municipal by-laws and ordinances.
- .4 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply.
- .5 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .6 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

1.5 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.

- .2 Comply with and enforce compliance by all workers, sub-contractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.6 SITE CONTROL AND ACCESS

- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
- .2 Isolate Work Site from other areas of the premises by use of appropriate means.
 - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 50 00 for minimum acceptable requirements.
 - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.
 - .3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.
- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site. Maintain records of such orientation on site for review and audit by the DR or their authorized inspector.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. [Provide security guard where adequate protection cannot be achieved by other means].

1.7 PROTECTION

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 FILING OF NOTICE

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work. Departmental Representative will assist in locating address if needed.

1.9 PERMITS

- .1 Is responsible to pay all fees to obtain all permits required to conduct the work.

- .2 Is responsible to provide authorities with plans and information for acceptance certificates and the costs arising from same.
- .3 Is responsible to provide inspections certificates as evidence that work conforms to requirements of Authorities Having Jurisdiction (AHJ)
- .4 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site.
- .5 Where a particular permit or compliance certificate cannot be obtained, notify Departmental Representative in writing and obtain approval to proceed before carrying out applicable portion of work.

1.10 HAZARD ASSESSMENTS

- .1 Perform a documented site specific Project hazard assessment for the Work. Include any site issues / hazards / concerns identified arising from the site visit that must be considered.
- .2 Carryout initial assessment prior to commencement of Work with further assessments completed and documented as needed during progress of work, [including when new trades and subcontractors arrive on site].
- .3 Record results and address in Health and Safety Plan.
- .4 Share information and controls identified from original and updated Project hazard assessments with project workers. Record this information sharing complete with names and dates. Keep documentation on site for entire duration of the Work.

1.11 PROJECT/SITE CONDITIONS

- .1 Following are potential health, environmental and safety hazards at the site for which Work may involve contact with:
 - .1 Existing hazardous and controlled products stored on site:
 - i. Gasoline dispensing station.
 - ii. Waste oil storage tank.
 - .2 Existing hazardous substances or contaminated materials:
 - i. Creosote treated timber
 - .3 Known latent site and environmental conditions:
 - i. Work above and in waters.
 - ii. Site exposed to waves
 - iii. Site exposed to marine storms
 - iv. Cold weather, freezing rain and snow
 - v. Ice in harbour and ice-covered surfaces, materials and equipment
 - .4 Facility on-going operations:
 - i. Pedestrian and vehicular traffic adjacent to the Work.
 - ii. Continued use of Wharf and facilities by harbour users.
 - iii. Working with or near heavy equipment
 - iv. Heavy lifting
 - v. Cutting tools and other power tools
 - vi. Welding equipment

- vii. Use of watercrafts, working from vessel and floating platforms
 - viii. Marine navigation and mooring.
- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazards encountered during Work.
 - .3 Include above items in the hazard assessment of the Work.
 - .4 MSDS Data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

1.12 MEETINGS

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
 - .1 Superintendent of Work.
 - .2 Designated Health & Safety Site Representative.
 - .3 Subcontractors.
- .2 Conduct pre shift tool box talks with the crew and conduct regularly scheduled (minimum bi-weekly) safety meetings during the Work.
- .3 Keep documents on site for review by DR or their authorized rep.

1.13 HEALTH AND SAFETY PLAN

- .1 Prior to commencement of Work, develop a written Site Specific Safety Plan for the Project. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site. Items to include in the Site Specific Safety Plan;
 - .1 Name of the designated Site Safety Rep showing proof of his/her competence and reporting relationship in Contractor's company. This person is expected to be on site during all work execution.
 - .2 A copy of a current WCB Letter of Good Standing
 - .3 Details as to how WHMIS 2015 / GHS will be managed on site.
 - .4 Details as to how the Project work areas will be delineated/protected from other areas of the premises. (fences, signs). Must be project specific.
 - .5 Details as to how Safety orientations will be managed. Include a summary of what topics are covered in the safety orientation described in this section?
 - .6 A copy of a Notice of Project that was sent to the Provincial OHS regulator.
 - .7 Project site specific hazard assessment.
 - .8 Details as to how tool box and safety meetings will be held and recorded.
 - .9 An organizational chart illustrating supervision and subs (if available) that are assigned to this Project.
 - .10 On-site Emergency Response Plans that cover all potential emergency situations that could arise. This should harmonize with the facility if possible. Emergency Contacts: name and telephone number of officials from:
 - .1 General Contractor and subcontractors. (key personnel)
 - .2 Pertinent Federal and Provincial Departments and Authorities having jurisdiction.

- .3 Local emergency resource organizations.
 - .11 List of critical work activities which have a risk of endangering health and safety of Facility users and/or others.
 - .12 Details as to how the subcontractors documented safety program will be reviewed and managed prior to allowing them to work on site.
 - .13 Details as to how the site safety inspection program will be managed. Include frequency, assignment of responsibility as well as standard inspection form to be used.
 - .14 Basic PPE requirements as well as specialized PPE requirements; minimum being hard hat, safety footwear, safety glasses and high vis vest.
 - .15 General safety rules as well as the disciplinary protocols to be taken for noncompliance.
 - .16 Details as to how Incident investigations will be managed. Include procedure and incident form.
- .2 Post copy of the Plan, and updates, prominently on Work Site.

1.14 SAFETY SUPERVISION

- .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other person designated by Contractor and shall be assigned the responsibility and authority to:
 - .1 Implement, monitor and enforce daily compliance with health and safety requirements of the Work
 - .2 Monitor and enforce Contractor's site-specific Health and Safety Plan.
 - .3 Conduct site safety orientation session to persons granted access to Work Site.
 - .4 Ensure that persons allowed site access are knowledgeable and trained in health and safety pertinent to their activities at the site or are escorted by a competent person while on the Work Site.
 - .5 Stop the Work as deemed necessary for reasons of health and safety.
- .3 Health & Safety Site Representative must:
 - .1 Be qualified and competent person in occupational health and safety.
 - .2 Have site-related working experience specific to activities of the Work.
 - .3 Be on Work Site at all times during execution of the Work.
 - .4 All supervisory personnel assigned to the Work shall also be competent persons.
 - .5 Inspections:
 - .1 Conduct regularly scheduled safety inspections of the Work on a minimum [weekly] basis. Record deficiencies and remedial action taken.
 - .2 Follow-up and ensure corrective measures are taken.
 - .3 Share inspection reports with crews / subs
 - .6 Cooperate with the Facility's and / or the PSPC Occupational Health and Safety representative.
 - .7 Keep inspection reports and supervision related documentation on site.

1.15 TRAINING

- .1 Use only skilled workers on Work Site who are deemed competent and are trained in occupational health and safety procedures and practices pertinent to their assigned task.
- .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers. Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.
- .3 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.
- .4 When unforeseen or peculiar safety-related 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 Province having jurisdiction and advise Departmental Representative verbally and in writing.

1.16 MINIMUM SITE SAFETY RULES

- .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; the company shall establish rules to govern the conduct and actions of their employees. These rules should leave no room for discretion and argument. The rules must be enforced and action should be taken every time a rule is violated.
- .2 Brief persons of the documented disciplinary protocols to be taken for noncompliance. Post rules on site.

1.17 CORRECTION OF NON-COMPLIANCE

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

1.18 INCIDENT REPORTING

- .1 Investigate and report all incidents to Departmental Representative.
- .2 Notify the Departmental representative as soon as reasonably practicable following the incident.
- .3 Ensure the Authority having Jurisdiction is notified as prescribed by applicable legislation.
- .4 Submit report in writing.

1.19 HAZARDOUS PRODUCTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.

Submit copy to Departmental Representative.

1.20 POWDER ACTUATED DEVICES

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

1.21 CONFINED SPACES

- .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- .2 Obtain an Entry Permit in accordance with Part XI of the Canada Occupational Health and Safety Regulations for entry into an existing identified confined space located at the Facility or premises of Work.
 - .1 Obtain permit from Facility Manager.
 - .2 Keep copy of permit issued.
- .3 Safety for Inspectors:
 - .1 Provide PPE and training to Departmental Representative and other persons who require entry into confined space to perform inspections.
 - .2 Be responsible for efficacy of equipment and safety of persons during their entry and occupancy in the confined space.

1.22 SITE RECORDS

- .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.
- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.23 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in a conspicuous location on the Work Site in accordance with Acts and Regulations of Province. See local legislation for specifics.
- .2 Post other documents as specified herein, including:
 - .1 Site specific Health and Safety Plan.
 - .2 WHMIS data sheets.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Waste Management and Disposal.

1.2 REFERENCES

- .1 WHMIS: Workplace Hazardous Materials Information System, Health Canada.
- .2 Transportation of Dangerous Goods Act. Transport Canada amended 2011-11-09.
- .3 Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, Department of Fisheries and Oceans Canada, 1998.
- .4 MBCA: Migratory Birds Convention Act, Environment Canada, 1994.
- .5 Canadian Coast Guard Regulations, Department of Fisheries and Oceans Canada.
- .6 Canadian Shipping Act, Transport Canada, 2001.
- .7 AWWPA: American Wood Preserver Association.
- .8 Canadian Environmental Assessment Act, 2012, amended 2013-11-25.
- .9 Canadian Environmental Protection Act, 1999, amended on 2014-03-28.
- .10 Fisheries Act, 1985, Fisheries and Oceans Canada, amended 2013-11-25.
- .11 Migratory Birds Convention Act, 1994, Environment Canada, amended 2010-12-10.
- .12 Canadian Navigational Waters Act (CNWA).
- .13 New-Brunswick – Environmental Protection Act.
- .14 Species at Risk Act, 2002, amended 2013-03-08.
- .15 The Federal Policy on Wetland Conservation, 1991, Environment Canada.

1.3 REFERENCE STANDARD

- .1 Contractor to Submit methods, means, and sequences for compliance with: applicable permits, certificates, approvals, or any other form of authorizations; other federal, provincial, or municipal requirements; and in accordance with the Contract.
- .2 Generally, provincial, territorial and municipal laws, regulations, bylaws and other requirements do not apply to federal lands, works or undertakings. Soil, sediment, water or other materials that are removed from federal lands may become subject to provincial, territorial or municipal laws and regulations.
- .3 Provincial, territorial or municipal standards may be used in relation to federal lands only as guidelines for the purpose of establishing remediation goals and objectives. The term "standards" is used in this part in order to maintain consistency in terminology throughout this document, and does not imply that standards contained in provincial, territorial or municipal laws and regulations apply on Federal lands, activities or undertakings.

1.4 DEFINITIONS

- .1 Archaeological Resources: All tangible evidence of human activity that is of historical, cultural, or scientific interest. Examples include features, structures, archaeological objects or remains at or from an archaeological site, or an object recorded as an isolated archaeological find.
- .2 Buffer zone: a vegetated land that protects watercourses from adjacent land uses. It refers to the land adjacent to watercourses, such as streams, rivers, lakes, ponds, oceans, and wetlands, including the floodplain and the transitional lands between the watercourse and the drier upland areas
- .3 Deleterious substance: (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or (b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water.
- .4 Fish habitat: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.
- .5 Hazardous material: Product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to the environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .6 Invasive or alien species refers to a species or subspecies introduced outside its normal distribution whose establishment and spread threaten ecosystems, habitats or species with economic or environmental harm.
- .7 Navigable water: a canal and any other body of water created or altered as a result of the construction of any work.
- .8 Surface watercourse: refers to the bed and shore of a river, stream, lake, creek, pond, marsh, estuary, or salt-water body that contains water for at least part of each year.
- .9 Wetlands: land where the water table is at, near or above the surface or which is saturated for a long enough period to promote such features as wet-altered soils and water tolerant vegetation. Wetlands include organic wetlands or "peatlands," and mineral wetlands or mineral soil areas that are influenced by excess water but produce little or no peat.
- .10 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
- .11 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

- .12 Environmental Protection Plan: plan developed by the Contractor to ensure Environmental Protection and prevent Environmental Pollution and Damage identifying all environmental risks and mitigation measures, including: personnel requirements, emergency contacts, Environmental Protection methods, procedures, and equipment, and emergency response including a Spill Control Plan.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for environmental protection and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29 - Health and Safety Requirements.
 - .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
 - .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
 - .5 Address topics at level of detail commensurate with environmental issues and required construction tasks.
 - .6 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

- .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan to include procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Wastewater Management Plan identifying methods and procedures for management and discharge of wastewaters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- .14 Historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources, and wetlands.
- .15 Pesticide treatment plan to be included and updated, as required.

1.6 MITIGATION MEASURES

- .1 To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed in the permit), the Contractor must implement the following mitigation measures:
 - .1 Operate machinery in a manner that minimizes disturbance to the bed of the waterbody.
 - .2 Replace/restore any other disturbed habitat features and remediate any areas impacted by the works, undertakings, or activity.
- .2 Develop and implement a Sediment Control Plan to minimize sedimentation of the waterbody during all phases of the works undertakings and activities:
 - .1 Install site isolation measures where possible and conduct all in-water works, undertakings and activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse.
 - .2 Regularly inspect and maintain the erosion and sediment control measures and structures during all phases of the works, undertakings, and activities.

- .3 Schedule work to avoid wet, windy, and rainy periods (and heed weather advisories).
 - .4 Operate machinery from wharf, on land, from barges or on ice.
 - .5 Monitor the watercourse to observe signs of excessive sedimentation during all phases of the work, undertaking or activity and take corrective action.
- .3 Develop and immediately implement a response plan to avoid a deleterious substance from entering a waterbody:
 - .1 Stop works, undertakings and activities in the advent of a spill of a deleterious substance.
 - .2 Report any spills of sewage, oil, fuel, or other deleterious material whether near, or directly into a waterbody.
 - .3 Keep an emergency spill kit onsite during all phases of the works, undertakings, and activities.
 - .4 Ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.
 - .5 Clean-up and appropriately dispose of water contaminated with deleterious substances.
 - .6 Maintain all machinery on site free of fluid leaks, aquatic invasive species, and noxious weeds.
 - .7 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.
 - .4 Plan in-water works, undertakings and activities to respect timing windows to protect fish and fish habitat:
 - .1 Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out one or more of their life processes (spawning, rearing, feeding, migrating):
 - .5 Work must comply with all conditions of the Letter of Advice issued by Fisheries and Oceans Canada. A copy of the Letter of Advice must be kept on site at all times.

1.7 TRANSPORTATION

- .1 Transport hazardous materials and hazardous waste in compliance with Federal Transportation of Dangerous Goods Act.
- .2 Do not overload trucks when hauling material. Secure contents against spillage.
- .3 Eliminate free board spillage when excavating, loading, and hauling dredged material.
- .4 Trucks containing dredged material will have watertight boxes.
- .5 Maintain trucks clean and free of mud, dirt, and other foreign matter.
- .6 Avoid potential release of contents and of any foreign matter onto highways, roads and access routes used for the Work. Take extra care when hauling materials. Immediately clean any spillage and soils.

- .7 Before commencement of work, advise a Departmental Representative of the existing roads and temporary routes proposed to be used to access work areas and to haul material to and from the site.
- .8 Machinery is not allowed in water. Refer to 1.6 for equipment requirements that may meet water.
- .9 Construction material and debris is not to become waterborne.
- .10 Any tools, equipment, vehicles, temporary structures, or parts thereof used or maintained for the purpose of building or placing a work in navigable water are not to remain in place after the completion of the project.
- .11 Vessels are to be always permitted safe access through the worksite and assisted as necessary.
- .12 Advise the Canadian Coast Guard, Marine Communication and Traffic Services (MCTS) at (902)564-7751 or toll free at 1-800-686-8676 sufficiently in advance of commencement of work or when deploying or removing site markings in order to allow for appropriate Notices to Shipping/Mariner's action.

1.8 TEMPORARY CAUSEWAY AND ACCESS ROADS

- .1 It will be the Contractor's responsibility to:
 - .1 Gain access to the dredge area. The construction and removal of temporary causeways and access roads will be at the Contractor's expense and will be removed immediately after clearance of the dredge area.
 - .2 Identify a location for the disposal of material imported by the Contractor for the construction of temporary causeways and access roads.
 - .3 Obtain the necessary environmental approvals from all Federal and Provincial agencies prior to starting the work.
- .2 All material used for construction of temporary causeways and access roads must be clean and free from excessive fines, organics, debris and non-toxic (i.e., free of fuel, oil, grease and/or any other contaminants), non-ore bearing and from a provincially approved non-water source.
- .3 Material is to be screened, if required, to ensure that no fines or stones less than 0.2 kilograms are placed in the work. Gradation of the material to be imported for the construction of the causeways, roads etc. shall be within the following limits:
 - .1 100% passing 450mm
 - .2 44-75% passing 200mm
 - .3 24-50% passing 100mm
 - .4 7-14% passing 50mm
- .4 Heavy machinery and equipment must be operated from a dry platform only. Temporary causeways and access roads shall be constructed at an elevation such that machinery and equipment is operating completely out of the water at all stages of the tide. If tidal work is being carried out, machinery and equipment shall be relocated back to a suitable elevation to prevent operating in submerged waters.

- .5 The Contractor is to maintain temporary buoys to mark the position of the access road including the outer toe as construction proceeds. All buoys are to meet requirements for the applicable Canadian Coast Guard standard and be equipped with radar reflectors.

1.9 OPERATION OF MACHINERY

- .1 Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds.
- .2 Whenever possible, operate machinery on land above the high-water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the water body.
- .3 Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.

1.10 HAZARDOUS MATERIAL HANDLING

- .1 Handle and store hazardous materials on site in accordance with WHMIS procedures and requirements.
- .2 Store all hazardous liquids in location and manner to prevent their spillage into the environment.
- .3 Maintain written inventory of all hazardous materials kept on site. List product name, quantity, and storage date.
- .4 Keep MSDS data sheets on site for all items.
- .5 Store and handle flammable and combustible materials in accordance with National Fire Code.

1.11 CONTAINMENT AND SPILL MANAGEMENT

- .1 Comply with Federal and Provincial laws, regulations, codes, and guidelines for the storage of fuel and petroleum products on site.
- .2 Do not place fuel storage tanks and store fuel or other petroleum products within a 30-meter buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30-meter buffer zone. Obtain approval from Departmental Representative of acceptable location on site for fuel storage and equipment service.
- .3 Do not dump petroleum products or any other deleterious substances on ground or in the water.
- .4 Be diligent and take all necessary precautions to avoid spills and contaminate the soil and water (both surface and subsurface) when handling petroleum products on site and during fueling and servicing of vehicles and equipment.
- .5 Maintain on site appropriate emergency spill response equipment consisting of at least one 250-litre (55 gallon) overpack spill kit for containment and cleanup of spills.
- .6 Maintain vehicles and equipment in good working order to prevent leaks on site.
- .7 In the event of a petroleum spill, immediately notify the Departmental Representative and the Canadian Coast Guard (CCG) at 1-800-565-1633 (24-hour report line). Perform

clean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.

- .8 If using a floating barge, the following mitigation measures should be adhered to:
 - .1 Vessels should be compliant with all Canada Shipping Act, 2001, requirements for inspection, which includes certification of the vessel and adequate training and appropriate certification of competency for the operator.
 - .2 Ensure that all vessels will have procedures in place to ensure safeguards against marine pollution: awareness training of all employees, means of retention of waste oil on board and discharge to shore-based reception facilities, capacity of responding to and clean-up of accidental spill caused by vessels involved in any particular part of the project.
 - .3 Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, on-site. Spill equipment will include, as a minimum, at least one 250 L (i.e., 55 gallon) overpack spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environment Emergencies Report System (1-800-565-1633).
- .9 Materials such as paint, primers, blasting abrasives, rust solvents, degreasers, grout, or other chemicals are not to enter the watercourse.
- .10 Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance.

1.12 DISPOSAL OF WASTES

- .1 Do not bury rubbish, demolition debris and waste materials on site.
- .2 Dispose and recycle demolition debris and waste materials in accordance with project waste management requirements specified in section 01 74 21.
- .3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc...) and petroleum products into waterways, storm, or sanitary sewers or in waste landfill sites.
- .4 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
- .5 Concrete waste:
 - .1 Do not discharge residual or rejected concrete on site.
 - .2 Immediately clean any accidental release of concrete on site prior to solidification.
 - .3 Do not wash and clean concrete vehicles on site.
 - .4 Perform dumping of residual material and truck cleaning operations only at the concrete plant. Follow environmental regulations and good practices as approved by the Provincial Department of the Environment and other authorities having jurisdiction.

1.13 EXCAVATED MATERIAL

- .1 All stockpiled soil must be dyked (complete with silt fencing) to prevent erosion and release of sediment laden water.
- .2 If any material is excavated during the proposed project activities, then the Departmental Representative must be consulted to identify an appropriate stockpile location for the excavated material to ensure the material, or any part of the material, does not re-enter any waterbody.
- .3 Excavated material shall be tested if it is to leave existing facility. If testing of material is required, the cost will be the responsibility of the Crown.

1.14 DREDGING AND DISPOSAL OF MARINE SEDIMENT

- .1 Conduct work in such a manner to limit turbidity and minimize sediment resuspension in the water to an absolute minimum at all times:
 - .1 Maintain appropriate production speed and momentum of the excavation equipment. Make adjustments as required and as approved by Departmental Representative.
 - .2 Strategically position excavation equipment and [haul vehicles] [scows] to minimize over the water swings of dredged material whenever possible.
 - .3 Avoid overfilling of the dredge bucket.
 - .4 Minimize wash downs of equipment and wharf deck.
 - .5 Restrict the volume of material dredged to the areas and depths in the contract, unless otherwise directed by the Departmental Representative.

1.15 WATER QUALITY

- .1 During construction activities, a floating silt curtain and/or silt boom must be installed around the work site to prevent any suspended solids and/or debris from entering the adjacent water body. The floating silt curtain must be installed before the commencement of any work activity.
 - .1 The silt curtains will be measured for payment as per Section 01 10 10.
 - .2 The silt curtain must be marked at 10m intervals with 0.4m yellow buoys.
 - .3 The silt curtain is not to be in the path of any vessels.
- .2 Water contamination by preservative treated wood:
 - .1 Preservative treated lumber and timber, whether plant or site treated, shall be cured for a minimum of 30 days from date of the treatment application before their installation in areas which will be in contact with the water.
 - .2 Do not cut treated wood lumber over the surface of a watercourse or wetland.
 - .3 Do not use liquid applied preservative products over the surface of a watercourse or wetland.
 - .4 Wood treated with Chromate Copper Arsenate (CCA), or Ammoniac Copper Zinc Arsenate (ACZA) must be CSA or AWPA approved.
 - .5 Do not use timber and lumber treated with creosote, petroleum, and pentachlorophenol for any part of the Work.

- .3 Contractor is responsible to visually monitor the water turbidity and will be required in the vicinity of the project to ensure that turbidity is limited. If excessive change occurs in the turbidity that differs from the existing conditions of the surrounding water body (i.e., distinct change in water clarity) as a result of the project activities, the work will stop, the contractor will notify the Departmental Representative and implement contingency measures as required.
- .4 Any construction debris entering the marine environment will be immediately retrieved when it is safe to do so.
- .5 The construction material used must be clean and non-toxic (free of fuel, oil, grease, and/or any contaminants).
- .6 The Contractor shall develop, submit for review, and implement an Erosion and Sediment Control Plan.

1.16 SOCIOECONOMIC RESTRICTIONS

- .1 Must abide by municipal and provincial regulations for any restrictions on work performed during the nighttime and on flood lighting of the site. Obtain applicable permits.
- .2 Place and shield flood lights in opposite direction of adjacent residential and business area.
- .3 Equip equipment and machinery with purposely designed mufflers to reduce noise on site to lowest possible level. Always maintain mufflers in good operating condition.
- .4 Adequate signage and safety measures must be supplied during transportation of materials and equipment to the harbour.

1.17 BIRDS AND BIRD HABITAT

- .1 Become knowledgeable with and abide by the Migratory Birds Convention Act (MBCA) in regard to the protection of migratory birds, their eggs, nests and their young encountered on site and in the vicinity.
- .2 Minimize disturbance to all birds on site and adjacent areas during the entire course of the Work.
- .3 Do not approach concentrations of seabirds, waterfowl and shorebirds when anchoring equipment, accessing wharves, or ferrying supplies.
- .4 During nighttime work, position flood lights in opposite direction of nearby bird nesting habitat.
- .5 Do not use beaches, dunes, and other natural previously undisturbed areas of the site to conduct work unless specifically approved by the Departmental Representative.
- .6 Should nests of migratory birds be encountered during work, immediately notify Departmental Representative for directives to be followed.
 - .1 Do not disturb nest site and neighboring vegetation until nesting is completed.
 - .2 Minimize work immediately adjacent to such areas until nesting is completed.
 - .3 Protect these areas by following recommendations of Canadian Wildlife Service.
- .7 Ensure that food scraps and garbage are not left at the work site.

- .8 Project vehicles will keep to designated project transportation routes and stay within facility property boundaries.
- .9 No staging of vehicles or equipment/material storage will take place on any beaches, wetlands, or dunes, unless otherwise advised, via permit, by Departmental Representative. The project footprint will not encroach/impact these abovementioned Areas.
- .10 Dredge disposal sites may provide habitat suitable for ground-nesting and burrowing birds, including species of conservation concern such as the Common Nighthawk and Bank Swallow. During the breeding season, it is important that nests not be disturbed by erosion prevention and control measures or by excavation and construction activities. If stockpiles are on site or will be on site, any disturbance to such dredge stockpiles is not to be undertaken during the regional nesting period for migratory birds. Nest searches must be undertaken by an experienced observer prior to construction activities, and any nests that are discovered must be protected with an appropriate buffer for the species. When disposing or stockpiling dredge material contour faces to have less than a 70 degree vertical slope to discourage bank swallow nesting.

1.18 FISH AND FISH HABITAT

- .1 Avoid wet, windy, and rainy periods that may increase erosion and sedimentation.
- .2 Ensure that all in-water activities, or associated in-water structures, do not interfere with fish passage, constrict the channel width, or reduce flows.
- .3 Screen any water intakes or outlet pipes to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when an entrapped fish is held in contact with the intake screen and is unable to free itself.
- .4 Be aware of the risk for contamination of the fish habitat at the site because of alien species being introduced in the water.
- .5 To minimize the possibility of fish habitat contamination, all construction equipment which will be immersed into the water of a watercourse or has the possibility of coming into contact with such water during the course of the work, must be cleaned and washed to ensure that they are free of marine growth and alien species.
 - .1 Equipment shall include boats, barges, cranes, excavators, haul trucks, pumps, pipelines and other all miscellaneous tools and equipment previously used in a marine environment.
- .6 Cleaning and washing of equipment shall be performed immediately upon their arrival at the site and before use in or over the body of water.
- .7 Conduct cleaning and washing operations as follows:
 - .1 Scrape and remove heavy accumulation of mud and dispose appropriately.
 - .2 Wash all surfaces of equipment by use of a pressurized fresh water, supplied by contractor.
 - .3 Immediately follow with application of a heavy sprayed coating of undiluted vinegar or other environmentally approved cleaning agent to thoroughly remove all plant matter, animals, and sediments.

- .4 Checks and remove all plant, animal and sediment matter from all bilges and filters.
- .5 Drain standing water from equipment and let fully dry before use.
- .6 Upon removal from the water, drain standing water from equipment and let fully dry before removal off the site.
- .8 Do not perform cleaning and wash down within a 30-meter buffer zone of a wetland, watercourse, or other identified environmentally sensitive area.
- .9 Record of Assurance Logbook:
 - .1 Maintain an on-going log of past and present usage and wash down of all equipment to illustrate mitigation measures undertaken against fish habitat contamination by alien species.
 - .2 Include the following:
 - .1 Date and location where equipment was previously used in a watercourse or wetland.
 - .2 Type of work performed.
 - .3 Dates of wash down for each piece of equipment.
 - .4 Cleaning method and cleaning agent(s) used.
- .10 Keep Record of Assurance Logbook updated from project to project. Upon request, submit logbook to Departmental Representative for review.
- .11 Abide by requirements and recommendations of the Federal Department of Environment and the Department of Fisheries and Oceans - Habitat Protection and Sustainable Development Branch in cleaning and wash down of equipment.

1.19 MITIGATION MEASURES DURING CONCRETE PLACEMENT

- .1 Concrete placement should stop in moderate to heavy rain [2.6-7.6 mm/hr or more] to prevent leaching contaminants into aquatic environment.
- .2 Forms will have sealed corners to prevent leakage.
- .3 Splash panels to be used during the pour to prevent material from entering the aquatic environment.
- .4 Any accidental release of concrete will be removed prior to solidification.
- .5 Work will cease until the spill is contained and the source of the leak can be identified.
- .6 Contractor must notify the Departmental Representative of all accidental releases of concrete into fish bearing waters and contact applicable federal and provincial regulators immediately.

1.20 AIR QUALITY

- .1 Keep airborne dust and dirt resulting from the work on site to an absolute minimum.
- .2 Apply dust control measures to roads, parking lots and work areas.
- .3 Spray surfaces with water or other environmentally approved product. Use purposely suited equipment or machinery and apply in sufficient quantity and frequency to provide effective result and continued dust control during the entire course of the work.

- .4 Do not use oil or any other petroleum products for dust control.

1.21 FIRES

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

1.22 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Manage disposal or runoff of water in accordance with local authority requirements.

1.23 SITE CLEARING AND PLANT PROTECTION

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

1.24 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
- .3 Waterways to be kept free of excavated fill, waste material, and debris.
- .4 Design and construct temporary crossings to minimize the potential for erosion and prevent equipment from entering waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Blasting is not permitted on site.

1.25 POLLUTION CONTROL

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

- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials to prevent blowing dust and debris. Provide dust control for temporary roads.

1.26 HISTORICAL/ ARCHAEOLOGICAL CONTROL

- .1 All construction personnel are responsible for reporting any unusual materials unearthed during construction to the construction supervisor. If the find is believed to be an archaeological resource, the Construction Supervisor will immediately stop work in the vicinity of the find and notify a Departmental Representative.
- .2 If an archaeological and / or historically significant item is discovered during the work activities, work in the area will be stopped immediately and the Departmental Representative will be contacted as well as the provincial Archaeological Services unit.
- .3 Work can only resume in the vicinity of the find when authorized by the Departmental Representative and Construction Supervisor, after approval has been granted by the applicable Provincial Agencies.
- .4 In the event of the discovery of human remains or evidence of burials, excavation work will immediately cease, and nearest law enforcement agency will be contacted immediately by the Departmental Representative and/or the Construction Supervisor.
- .5 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
- .6 Plan must include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.27 NOTIFICATION OF NON-COMPLIANCE

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 After receipt of such notice, the Contractor must inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 Execution

2.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction & Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 77 00 – Closeout Procedures
- .3 Section 01 78 00 – Closeout Submittals

1.2 DEFINITIONS

- .1 Quality Control (QC): The process of checking specific product or services to determine if they comply with relevant quality standards and identify ways to eliminate causes of unsatisfactory product or service performed.
- .2 Quality Assurance (QA): The process of ensuring that the Contractor's Quality Management Plan (QMP) (QC, non-conformances, etc.) is being followed. The results of the QA are provided as feedback to both the Contractor and the Departmental Representative. Where required, the Contractor shall implement changes to the project based on the feedback received from the QA process.

1.3 INSPECTION

- .1 Allow Departmental Representative adequate time and access to Work. If part of Work is in preparation at locations other than Place of Work, allow time and access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed. Pay costs to uncover and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.
- .5 The Departmental Representative shall participate in the taking of survey of all quantities with the Contractor responsible to complete the surveys in the presence of the Departmental Representative.

1.4 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged and coordinated by Departmental Representative for purpose of inspecting and/or testing portions of Work. These agencies include, but are not limited to, concrete testing, coating testing and

inspection, aggregate tests, compaction tests. Cost of such services will be borne by Departmental Representative. The Contractor remains responsible for:

- .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Mill tests and certificates of compliance.
 - .4 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.
- .2 Provide equipment and materials required for executing inspection and testing by appointed agencies.
 - .3 Employment of inspection/testing agencies does not relax responsibility of Contractor to perform Work in accordance with Contract Documents.
 - .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no additional cost to Contract. Contractor shall pay costs for retesting and re-inspection.

1.5 ACCESS TO WORK

- .1 Allow inspection/testing agencies access and required time to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.
- .3 Make good work disturbed by inspections and tests.

1.6 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative sufficiently in advance of when work is ready for tests, in order for Departmental Representative to make attendance arrangements with Testing Agency. When directed by Departmental Representative, notify such agency directly.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Deliver in required quantities to Testing Agency. Submit with reasonable promptness and in an 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 on site for Testing Agency's exclusive use to store equipment and cure test samples.

1.7 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good damages to existing or new work, including work of other Contracts, resulting from removal or replacement of defective work.

- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.

1.8 TESTING BY CONTRACTOR

- .1 Provide all necessary instruments, equipment and qualified personnel to perform tests designated as Contractor's responsibilities herein or elsewhere in the Contract Documents.

1.9 REPORTS

- .1 Submit the original and electronic copy of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.10 TESTS AND MIX DESIGNS

- .1 Furnish test results and mix designs as requested and as specified in relevant Technical Specification section.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

1.11 MILL TESTS

- .1 Submit mill test certificates as required of specification Sections or as requested by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SITE ACCESS AND PARKING

- .1 Contractor's access to project site as well as parking facilities for equipment and workers will be by arrangement with the Harbour Authority.
- .2 The Contractor is advised that while parking facilities for workers and subcontractors will be on DFO-SCH property, such parking facilities may be removed from the actual site of the work. In any case, follow all instructions from the Harbour Authority in regard to parking facilities.
- .3 Parking facilities at site are limited. Plan elsewhere for Contractor's vehicles including those of subcontractors and workers by consultation with the Harbour Authority.
- .4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.
- .5 Maintain existing roads and parking areas at site, where used by Contractor, for duration of contract.
 - .1 Keep clean and free of mud and dirt by washing on a regular basis.
 - .2 Provide snow removal in areas located within construction site or enclosed by work.
 - .3 Make good and repair damage resulting from Contractor's use of existing roads, asphalted areas and lawns on site. This will be strictly enforced.

1.2 CONTRACTOR'S SITE OFFICE

- .1 Be responsible for and provide own site office, if required, including electricity, heat, lights, and telephone. A laydown area has not been identified on the tender drawings. The laydown area shall be negotiated with the Harbour Authority of Botsford Harbour, attention: Harold Straight at (506) 531-7441.

1.3 MATERIAL STORAGE

- .1 Material storage space on site is limited. Coordinate delivery to minimize storage period on site before being needed for incorporation into work.

1.4 SITE ENCLOSURES

- .1 Provide temporary fence to enclose various construction areas of work site.
- .2 Erect plastic mesh fence constructed as follows:
 - .1 1200 mm height, constructed of high-density polyethylene mesh fence fabric, orange in color.
 - .2 Supported by steel T-bar posts or other similar framing, of sufficient quantity, adequate spacing and set firmly in ground to secure fence against sags.
 - .3 Inspect fence regularly, repairing sags and damaged sections.
 - .4 Incorporate within fence one operable truck gate and one pedestrian gate.
- .3 Make all gates lockable and provide keyed padlocks.

- .4 Obtain Departmental Representative's approval beforehand of location and layout of all temporary fence enclosures.
- .5 Provide battery powered lanterns around the perimeter of the site enclosure to clearly mark its location at night.
- .6 Provide warning signs affixed to all fenced areas, identifying those enclosed areas as "Construction Zones" with access restricted to only those persons so authorized by General Contractor.

1.5 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.6 ENCLOSURE OF STRUCTURE

- .1 Design enclosures to withstand wind pressure, tides, ice and snow loading.

1.7 POWER AND LIGHTING

- .1 Power supply may be available and may be provided for construction usage, pending negotiation for same with the Harbour Authority.
 - .1 Plan for the use of such services through the Harbour Authority and negotiate fee to use the service prior to commencing the work.
 - .2 DFO/SCH and the Harbour Authority will designate and approve each location of existing power source to which connections can be made to obtain temporary power service.
 - .3 Connect to existing power supply in accordance with Canadian Electrical Code.
- .2 Provide and maintain temporary lighting to conduct work and to provide temporary lighting for the structures between April 1st and November 1st of any year (between 4:00 AM and 9:00 PM) during the construction period between the time whenever the current lighting system is disconnected, and the new lighting system is connected. This may include areas outside of work areas if the lighting in those areas has been compromised. Ensure illumination level is not less than 162 lux in all locations. Temporary lighting shall be considered incidental to the work.
- .3 Power used for heating and hoarding will require self-contained power supply units supplied by the contractor. No connection will be available from Harbour Authority services for this power requirement.

1.8 WATER SUPPLY

- .1 Water supply may be available on site and may be provided for construction usage, pending negotiation with the Harbour Authority. Plan for the use and transportation of such services to work area through the Harbour Authority.

1.9 CONSTRUCTION SIGNS AND NOTICES

- .1 Contractor or subcontractor advertisement signboards are not permitted on site.

- .2 Safety and Instruction Signs and Notices:
 - .1 Signs and notices for safety and instruction shall be in both official languages or commonly understood graphic symbols conforming to CAN3-Z321-96(R2006).
- .3 Maintenance and Disposal of Site Signs:
 - .1 Maintain approved signs and notices in good condition for duration of project and dispose of offsite upon completion of project or earlier if directed by Departmental Representative.

1.10 REMOVAL OF TEMPORARY FACILITIES

- .1 Remove temporary facilities from site when directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29.06 – Health and Safety
- .3 Section 01 35 44 – Environmental Procedures
- .4 Section 01 56 00 – Temporary Barriers and Enclosures

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A23.1:19/A23.2:19, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA O121-17, Douglas Fir Plywood.
 - .3 CSA S269.2-16, Access Scaffolding for Construction Purposes.
 - .4 CSA Z321-96 (R2006), Signs and Symbols for the Workplace.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for all temporary structures which are required to be engineered. Shop drawings submitted to bear signature and stamp of qualified professional engineer registered or licensed in Province of New Brunswick, Canada.

1.4 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which must be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities to execute work expeditiously.
- .5 Remove from site all such work after use.

1.5 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs as required.

1.6 HOISTING

- .1 Provide, operate, and maintain hoists required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists and cranes to be operated by qualified operator. Cranes must be certified and inspected on a regular basis.

1.7 SITE STORAGE/LOADING

- .1 Confine work and operations of employees to an area agreed to by the Departmental Representative. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load existing structures or any part of Work with weight or force that will endanger existing structures or the new Work.
- .3 The capacity of existing structures is unknown.

1.8 CONSTRUCTION PARKING

- .1 Parking will be permitted in the negotiated laydown area only.
- .2 Provide and maintain adequate access to project site.
- .3 Keep parking areas clean and maintain during period of Contract.

1.9 SECURITY

- .1 If deemed necessary by the contractor, provide, and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.10 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors shall provide their own offices as necessary. Offices must be located within the laydown area identified on the drawings.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in the laydown area.

1.12 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.13 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Make good any road surfaces as good or better than their original condition upon completion of the work.
- .4 Store materials resulting from demolition activities that are salvageable.
- .5 Stack stored new or salvaged material not in construction facilities.

Part 2 Products

Not Used.

Part 3 Execution

3.1 GENERAL

- .1 Construct and maintain construction facilities in accordance with applicable Sections contained in these specifications.

3.2 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, watercourses, and walkways, according to requirements of authorities having jurisdiction.
- .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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 35 29.06 – Health and Safety
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 02 41 13 – Selective Site Demolition

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA O121-17, Douglas Fir Plywood.
- .3 New Brunswick Department of Transportation and Infrastructure
 - .1 New Brunswick Work Area Traffic Control Manual (WATCM).

1.3 INSTALLATION AND REMOVAL

- .1 Provide temporary controls to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.4 HOARDING

- .1 Erect temporary site enclosures when and where required using minimum 38 x 89mm construction grade lumber framing at 600mm centres and 1200 x 2400 x 13mm exterior grade fir plywood to CSA O121.
- .2 Apply plywood panels vertically as indicated flush and butt jointed.
- .3 Provide one or two lockable truck entrance gates and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .4 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
- .5 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189 and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
- .6 Erect temporary site enclosure where and when required using new 1.2m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

1.5 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, and open edges of structures or as indicated in Contract Documents. Provide as required by governing authorities and as indicated.

1.6 WEATHER ENCLOSURES

- .1 Provide weather tight closures where and when required to facilitate construction operations.
- .2 Design enclosures to withstand wind pressure and snow loading.

1.7 DUST TIGHT SCREENS

- .1 Provide dust tight screens to localize and control dust generating activities, and for protection of workers and the environment.
- .2 Maintain and relocate protection until such work is complete.

1.8 ACCESS TO SITE

- .1 Provide and maintain access roads as may be required for access to Work.

1.9 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.11 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 PRECEDENCE

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

1.2 REFERENCES

- .1 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .2 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .3 Cost for such testing will be borne by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.
- .4 Conform to latest date of issue of referenced standards in effect on date of submission of Tenders, except where specific date of issue is specifically noted.

1.3 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and electrical items indicated as approximate.
- .2 Inform Departmental Representative of conflicting installation. Install as directed.

1.12 PROTECTION OF WORK IN PROGRESS

- .1 Prevent overloading of parts of new and existing structures. Do not cut, drill, or sleeve load bearing structural members, unless specifically indicated without written approval of Departmental Representative.

1.13 EXISTING UTILITIES

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, pedestrian and vehicular traffic.
- .2 Protect, relocate, or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 78 00 – Closeout Submittals.

1.2 REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.3 SURVEY REFERENCE POINTS

- .1 Locate, confirm, and protect working/datum points prior to starting site work.
- .2 Make no changes or relocations without prior written notice to Departmental Representative.
- .3 Report to Departmental Representative when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

1.4 SURVEY REQUIREMENTS

- .1 Establish lines and levels, locate, and lay out, by instrumentation.

1.5 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of active (or previously abandoned) service lines in area of Work and notify Departmental Representative of findings.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative for approval.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Harbour Authority or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from access to site, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .9 Provide adequate ventilation during use of volatile or noxious substances.

1.3 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .3 Remove waste products and debris including that caused by other Contractors and leave Work clean and suitable for occupancy.
- .4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Inspect finishes and ensure specified workmanship and operation.
- .7 Broom clean and wash exterior walks, steps, and surfaces; rake clean other surfaces of grounds.
- .8 Remove dirt and other disfiguration from exterior surfaces.
- .9 Sweep and wash clean finished paved and concreted areas within the work site.
- .10 Clean downspouts and drainage systems.

- .11 Remove debris and surplus materials from site.
- .12 Remove snow and ice from access to site.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss DFO-SCH Waste Management Plan and Goals.
- .2 Accomplish maximum control of solid construction waste.
- .3 Preserve environment and prevent pollution and environmental damage.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 02 41 13 – Selective Site Demolition

1.3 REFERENCES

- .1 New Brunswick Environmental Guidelines
- .2 NBDTI Standard Specification

1.4 DEFINITIONS

- .1 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .2 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .3 Recycling: process of sorting, cleansing, treating, and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .4 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .5 Salvage: removal of structural and non-structural structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .6 Separate Condition: refers to waste sorted into individual types.
- .7 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
- .8 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .6 Separate and store materials produced during project in designated areas.
- .7 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
 - .1 On-site source separation is required.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.

1.6 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner and the like into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.
- .6 All treated timbers removed from the work to be disposed of in a Provincial approved manner.
- .7 All contaminated soils excavated during the construction of the new launching ramp shall be disposed at a Provincially approved contamination facility. It is the contractor's responsibility to verify the location of the facility.
- .8 The Contractor shall develop, submit for review and implement a Waste Management Plan and Certification of Material Diversion.

1.7 USE OF SITE FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.

- .2 Maintain security measures established by DFO-SCH and The Harbour Authority.

1.8 SCHEDULING

- .1 Co-ordinate work with other activities at site to ensure timely and orderly progress of work.

Part 2 Products

Not Used.

Part 3 Execution

3.1 APPLICATION

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean up Work area as work progresses.
- .2 Remove tools and waste materials on completion of Work and leave work area in clean and orderly condition.
- .3 Source separate materials to be reused/ recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 78 00 - Closeout Submittals.

1.2 INSPECTION AND DECLARATION

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection:
 - .1 Coordinate and perform, in concert with subcontractors, an inspection and check of all Work. Identify and correct deficiencies, defects, repairs and perform outstanding items as required to complete work in conformance with Contract Documents.
 - .2 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .3 Request Departmental Representative's Inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Accompany Departmental Representative during all substantial and final inspections of the Work.
 - .2 Contractor to correct Work accordingly.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.
 - .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance:
 - .1 When Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .2 Note that Departmental Representative will not issue a Certificate of Substantial Performance of the work until such time that Contractor performs following work and turns over the specified documents:
 - .1 Project record as-built documents;
 - .2 Reports resulting from designated tests;
 - .3 Commissioning reports;
 - .6 Final Payment:

- .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
- .2 When Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
- .7 Payment of Holdback:
 - .1 After issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.
- .8 Notify Departmental Representative in writing when deficiencies from Contractor's inspection have been rectified and that Work is deemed to be complete and ready for Departmental Representative's inspection of the completed work.
- .9 Address defects, faults and outstanding items of work identified by such inspections.
- .10 Advise Departmental Representative when all deficiencies identified have been rectified.

1.3 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment. Remove waste and surplus materials, rubbish and construction facilities from the site in accordance with applicable sections of these specifications.
- .2 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 77 00 – Closeout Procedures

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide As-built documents and samples.

1.3 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text, fold larger drawings to size of text pages.

1.4 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project.
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.
 - .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain at site for Departmental Representative one record copy of:
 - .1 Contract Drawings (Departmental Representative will provide a full-size copy of the drawings to be used as Red-Line set of as-builts).
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry, and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.6 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of opaque drawings.
- .2 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .3 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface features.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by change orders.

- .5 Details not on original Contract Drawings.
- .6 References to related shop drawings and modifications.
- .4 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .5 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.7 WARRANTIES AND BONDS

- .1 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .2 Except for items put into use with Department Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

END OF SECTION

Part 1 General

1.1 DESCRIPTION OF WORK

- .1 This Section includes but is not limited to the following:
 - .1 All sitework, demolition and removals as required to complete the work. All items to be verified prior to submission of a tender.

1.2 RELATED SECTIONS

- .1 Refer to Section 01 33 00 for Submittal Procedures.

1.3 SUBMISSIONS

- .1 Methodology:
 - .1 Provide methodology for carrying out the major components of the work.
 - .2 Provide submissions in accordance with Section 01 33 00.

1.4 PROTECTION

- .1 Prevent movement, settlement, or damage of adjacent structures. Provided bracing and shoring as required. In event of damage, immediately replace such items or make repairs to approval of a Departmental Representative and at no additional cost.
- .2 Prevent debris from entering harbour and creating navigational hazards.
- .3 All damage to existing structures, roadways, etc., not specified for removal to be repaired at the Contractor's cost to the satisfaction of the Departmental Representative.
- .4 Do not load or travel on any structures other than those designated for rehabilitation.

1.5 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.
- .2 Item shall include demolitions, selective demolitions, removals, transportation, disposal, environmental protective measures, and site cleanup.

Part 2 Products

2.1 Not Used

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site and verify with a Departmental Representative, items designated for removal and items to be preserved.
- .2 Do not disturb adjacent structures designated to remain in place.

3.2 REMOVAL

- .1 Remove items indicated. These items include but are not limited to:
 - .1 The existing concrete launching ramp
 - .2 Partial demolition of the existing crib supporting the existing concrete launching ramp. After the crib structure has been partially demolished, the Contractor shall cut and trim all remaining timbers to create a flat or sloping surface for the new work.
 - .3 Removal of existing materials including soils, ballast stone, and other fill material as required to complete the work.
- .2 At end of each day's work, leave work in safe condition so no part is in danger of toppling or failing.
- .3 Excavate to extents and dimensions indicated on the drawings.
- .4 Do not leave existing or new structure open or exposed to the elements at the end of each day.

3.3 DISPOSAL OF MATERIAL

- .1 Treated timber materials to be disposed of at provincially operated land fill facility. It is the contractor's responsibility to verify the location of the facility and collect receipts/tickets with the disposed timber weight, description, and cost.
- .2 Disposal of all other materials offsite shall be completed in accordance with all Provincial and Federal laws and regulations. These materials could include existing soils, ballast rock from the partially demolished crib, disposal of concrete and reinforcing steel from the existing concrete launching ramp, etc.

3.4 RESTORATION

- .1 Upon completion of work, remove debris, trim surfaces, and leave work site clean.
- .2 Reinstate areas and existing works outside areas of demolition to conditions that existed prior to commencement of work. Match condition of adjacent, undisturbed areas.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .3 Section 03 20 00 – Concrete Reinforcing
- .4 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA A23.1:19/A23.2:19, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA O86-19, Engineering Design in Wood.
 - .3 CSA O121-17, Douglas Fir Plywood.
 - .4 CSA O151-17, Canadian Softwood Plywood.
 - .5 CSA O153-19, Poplar Plywood.
 - .6 CSA O325-21, Construction Sheathing.
 - .7 CSA S269.1-16 (R2021), Falsework and Formwork

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings for formwork and falsework.
 - .1 Submit drawings and calculations stamped and signed by Professional Engineer registered or licensed in Province of New Brunswick, Canada at least four (4) weeks before construction. The submission is intended for information purposes only and shall in no way relieve the Contractor of full responsibility to carry out work related in accordance with CSA S269.1 for Falsework and Formwork.
- .3 Indicate method and schedule of construction, shoring, stripping, and re-shoring procedures, and materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1 for formwork drawings.
- .4 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.
- .5 Indicate sequence of erection and removal of formwork/falsework as directed by formwork Engineer.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Store and manage hazardous materials in accordance with jurisdictional requirements.
- .2 Deliver, handle and store formwork materials to prevent weathering, warping or damage detrimental to the strength of the materials or to the surface to be formed.

- .3 Ensure that formwork surfaces which will be in contact with concrete are not contaminated by foreign material. Handle and erect the fabricated formwork so as to prevent damage.
- .4 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Place materials defined as hazardous or toxic waste in designated containers.
 - .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
 - .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low volatile organic compounds (VOC's).

1.5 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Use wood and wood product formwork materials to CSA O121, CSA O86.
 - .2 Formwork shall be constructed from lumber devoid of warped defects in order to achieve a face alignment free of distortion. This shall apply to all panel forms including prefabricated boards, plywood, and steel panels.
 - .3 Formwork on exposed concrete surfaces shall be new or like new to achieve a quality aesthetically pleasing finish.
- .2 Form ties:
 - .1 Use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface. Holes to be filled with non-shrink grout.
 - .2 Form tie components which remain embedded in concrete are to be galvanized or non-metallic. Dissimilar metals which are in contact must be separated by denso tape barrier.
- .3 Form release agent: non-toxic, biodegradable, low VOC. Form release agents must be compatible with waterproofing systems where applicable.
- .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 The method of forming the traction control grooves on top of slab shall be developed by the Contractor and reviewed by the Departmental Representative prior to the work.
- .3 Fabricate and erect falsework in accordance with CSA S269.1.
- .4 Do not place shores and mud sills on frozen ground.
- .5 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .6 Fabricate and erect formwork in accordance with CSA S269.1 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA A23.1/A23.2.
- .7 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .8 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.
- .9 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .10 Construct forms for architectural concrete as indicated.
 - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .11 Built 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 concrete texturing.
 - .2 Anchors and inserts cast into the concrete shall be non-metallic or galvanized metal and either be isolated from dissimilar metals by either a 30 mm clear spacing or 'Denso' tape barrier on the formwork anchors / inserts.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Notify Departmental Representative prior to form removal.
- .2 Form removal times are dependent on proper curing in accordance with CSA A23.1 and CSA-S269.1. Provide written evidence of concrete strength to the Departmental Representative 24 hours prior to form removal to show the suitable strength has been achieved. Contractor shall pay for the concrete cylinder strength tests to demonstrate concrete strength prior to form removal.
- .3 Remove formwork when concrete has reached 70% of its design strength and replace immediately with adequate reshoring (if required). No vehicle loading or backfilling shall take place until concrete reaches design strength, unless otherwise approved in writing by Departmental Representative.
- .4 If formwork is used to aid curing, it shall not be removed until seven days after the concrete placement.
- .5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 45 00 – Quality Control
- .3 Section 03 10 00 – Concrete Forming and Accessories
- .4 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 ACI SP-66-04, ACI Detailing Manual 2004.
 - .1 ACI 315R-18, Guide to Presenting Reinforcing Steel Design Details.
 - .2 ACI 302.1R-15, Guide to Concrete Floor and Slab Construction.
 - .3 ACI 360R-10, Guide to Design of Slabs-on-Ground.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A36/A36M-19, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A108-18, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
 - .3 ASTM A143/A143M-07 (2020), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 - .4 ASTM A780 /A780M-20, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA A23.1:19/A23.2:19, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CSA A23.3-19, Design of Concrete Structures.
 - .3 CSA G30.18:21, Carbon Steel Bars for Concrete Reinforcement.
 - .4 CSA G40.20-13/G40.21-13 (R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .5 CSA G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .6 CSA W186-21, Welding of Reinforcing Bars in Reinforced Concrete Construction.
 - .7 CSA S6-19, Canadian Highway Bridge Design Code.
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2020, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and ACI 315R, except as noted herein. Shop drawings are to be submitted at least four (4) weeks prior to commencing fabrication for review and approval. The Contractor retains responsibility for correctly detailing reinforcement, but the shop drawings must be approved for conformity with the design. Fabrication shall not proceed until the final approval of shop drawings. Shop drawings shall be stamped by a Professional Engineer licensed to practice in the Province of New Brunswick, Canada.
- .3 Submit shop drawings including placing of reinforcement and indicate:
 - .1 Bar bending details as per RSIC-2020, Reinforcing Steel Manual of Standard Practice.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices as specified / if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
- .4 Detail lap lengths and bar development lengths to CSA A23.3, unless otherwise indicated.
 - .1 Provide Class B tension lap splices unless otherwise indicated.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2.3 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.5 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 off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

1.6 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400W (weldable), deformed bars to CSA G30.18, unless indicated otherwise.
- .3 Chairs, bolsters, bar supports, spacers: to CSA A23.1/A23.2.
- .4 Mechanical splices:
 - .1 The use of mechanical rebar splices shall be subject to approval of Departmental Representative.
- .5 Wire ties: to CSA G30.3 plain, cold drawn annealed steel wire.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA A23.1/A23.2, ACI 315R and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
- .4 Do not weld reinforcing steel unless noted otherwise.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

- .1 All steel reinforcing bars shall have the necessary net sectional area, and shall be cut to the exact lengths, and bent cold to the exact forms and dimensions, shown on the approved plans, or otherwise required, before being placed in position.
- .2 Bending shall be accurately done, in a bending machine and no welding or heating of any bars shall be allowed, except with written approval from the Departmental Representative. All stirrups and hoops shall accurately fit the rods, and all bends shall be taken out of bars to be used as straight members.

3.2 FIELD BENDING

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

3.3 CLEANING

- .1 Clean reinforcing before placement.

3.4 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on placing drawings.
- .2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete placement.
- .4 All reinforcing bars shall be placed and held rigidly in the exact positions in the forms as shown on the approved plans, or otherwise required, and there shall be no displacement of the same by the placing and tamping of the concrete. Adjusting or moving the bars, while the concrete is being placed, shall not be permitted, unless specified on the plans.
- .5 Concrete protection required for reinforcing steel shall be in accordance with the Contract Documents, or as directed by the Departmental Representative. All bars shall be tied and properly braced to prevent displacement. No concrete shall be placed until the reinforcement, after being cleaned and placed in position, has been examined and approved by the Departmental Representative.

3.5 SURFACE CONDITION

- .1 Reinforcement (at time concrete is placed) to be free from mud, oil or other nonmetallic coatings that adversely affect bonding capacity.
- .2 Reinforcement with rust, mill scale, or combination of both to be considered as satisfactory provided minimum dimensions, including height of deformations, and mass of hand wire brushed test specimen are not less than specified requirements in applicable CSA Standards.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 35 29.06 – Health and Safety Requirements
- .3 Section 01 45 00 – Quality Control
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .5 Section 03 10 00 – Concrete Forming and Accessories
- .6 Section 03 20 00 – Concrete Reinforcing

1.2 REFERENCES

- .1 ACI 117-10/117R-10, Specifications for Tolerances for Concrete Construction and Materials and Commentary.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C309-19, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM C457/C457M-16, Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete.
 - .4 ASTM C494/C 494M-19, Standard Specification for Chemical Admixtures for Concrete.
 - .5 ASTM C1017/C 1017M-13, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .6 ASTM C1202-19, Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA A23.1:19/A23.2:19, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A23.5, Supplementary Cementing Materials
 - .3 CSA A283-19, Qualification Code for Concrete Testing Laboratories.
 - .4 CSA S269.1-16 (R2021), Concrete Falsework and Formwork.
 - .5 CSA A3000-18, Cementitious Materials Compendium.
 - .1 CSA A3001-18, Cementitious Materials for Use in Concrete.
 - .6 CSA S6-19, Canadian Highway Bridge Design Code

1.3 DESIGN REQUIREMENTS

- .1 Table 5-Alternative 1 – Performance: in accordance with CSA A23.1/A23.2, and as described in Mixes of Part 2 – Products.

- .1 Concrete mixture designs shall be proportioned as normal density concrete in accordance with CSA A23.1 latest edition, Table 5-Alternative #1. Concrete shall be proportioned using Portland cement, Type SF silica fume, fly ash, fine and coarse aggregates, air entraining, water reducing, and superplasticisers and / or set retarding admixtures. Other supplementary cementing materials may include Class F fly ash. Set retarding admixtures may be used as ambient and site conditions warrant upon approval from a Departmental Representative.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit the following at least four (4) weeks prior to the commencing concrete work:
 - .1 Certification from the qualified independent inspection and testing company that plant, equipment, and materials to be used in the concrete comply with requirements of CSA A23.1/A23.2.
 - .2 Manufacturer's test data and certification by qualified independent inspection and testing laboratory that the following materials will meet specified requirements:
 - .1 Portland cement
 - .2 Blended hydraulic cement
 - .3 Supplementary cementing materials
 - .4 Admixtures
 - .5 Water
 - .6 Aggregates
 - .3 Mix designs for concrete, mix proportions and aggregate sources, which will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CSA A23.1/A23.2, and that mix design is adjusted to prevent alkali aggregate reactivity problems.
 - .4 Certification for the concrete supplier from the Atlantic Provinces Ready Mixed Concrete Association – APRMCA Concrete Production Facilities Certification Program.
 - .5 Steel armour angles and panel connection assemblies.
 - .6 Method for forming or stamping the ramp traction control detail.
- .3 Include in the submission of the mix designs, test results for each mix containing the following information:
 - .1 Plastic Concrete Tests
 - .2 Slump (CSA A23.2-5C)
 - .3 Air Content of Plastic Concrete by Pressure Method (CSA A23.2-4C)
 - .4 Mass Density and Yield (CSA A23.2-6C)
 - .5 Compressive Strength Testing (CSA A23.2-9C)
 - .6 2 cylinders to be tested at 28 days
 - .7 Air Void Analysis on Hardened Concrete (ASTM C457) tested at 7 days
 - .8 Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration (ASTM C1202) tested at 56 days

- .9 Alkali Reactivity Test Results
- .4 Submit four (4) weeks in advance of concrete placement, relevant test data for all aggregate materials indicating conformance to the requirements of CSA A23.1 and this specification. The test results required, but not be limited to, shall include:
 - .1 Sieve Analysis of Fine and Coarse aggregate
 - .2 Amount of Material Finer than 80 µm in Aggregate
 - .3 Bulk Relative Density and Absorption of Fine and Coarse Aggregate (SSD basis)
 - .4 Fineness Modulus of Fine Aggregate
 - .5 Clay Lumps and Light Weight Pieces
 - .6 Test for Organic Impurities in Fine Aggregate
 - .7 Flat and Elongated Particles in Coarse Aggregates
 - .8 Petrographic Analysis of Coarse Aggregate
 - .9 Resistance to Degradation of Coarse Aggregate by Abrasion and Impact in the Los Angeles machine
 - .10 Micro-Deval test for Coarse and Fine Aggregate
 - .11 Soundness of Coarse and Fine Aggregate by Use of Magnesium Sulphate
 - .12 Test for Detection of Alkali-Aggregate Reactivity (AAR) on Coarse and Fine Aggregate
 - .13 Unconfined Freeze and Thaw test
- .5 Submit two (2) weeks prior to commencement of the project adequate details of all equipment to be used. Equipment shall include that required for transporting, handling, placement and curing of all concrete.
- .6 Concrete pours: submit accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in Part 3 – Field Quality Control.

1.5 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Submit to Departmental Representative, minimum of four weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.
 - .1 When plant does not hold valid certification, provide test data and certification by qualified independent inspection and testing laboratory that materials used in concrete mixture will meet specified requirements.
- .3 Minimum four weeks prior to starting concrete work, submit proposed quality assurance procedures for review by the Departmental Representative on the following items:
 - .1 Falsework erection
 - .2 Hot weather concrete
 - .3 Cold weather concrete
 - .1 Departmental Representative can provide expected provisions for cold weather concreting prior to submitting a procedure.
 - .4 Placement method(s)

- .5 Curing
- .6 Finishes
- .7 Formwork Removal
- .4 Quality Control Plan: submit written report to Departmental Representative verifying compliance that concrete in place meets performance requirements of concrete as established in Part 2 – Products.
- .5 Health and Safety Requirements: undertake occupational health and safety in accordance with Section 01 35 29.06 – Health and Safety Requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Concrete hauling time: maximum allowable time for concrete to be delivered to site of Work and discharged not to exceed 120 minutes after batching.
 - .1 Modifications to maximum time limit must be agreed to by Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
- .2 The concrete materials shall be mixed and transported in a manner which will not segregate or damage the mix in any fashion. Concrete shall be mixed using stationary or truck mixers. The mixer shall carry the Manufacturer's rating plate in a prominent position that indicates the following:
 - .1 The gross volume of the mixer
 - .2 The rated maximum mixing capacity
 - .3 The minimum and maximum speeds for mixing and agitating of the mixer
- .3 The mixer shall be capable of combining the concrete ingredients into a thoroughly mixed and uniform mass and shall not exceed the capabilities of the mixer.
- .4 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.
- .5 Where ready mix trucks are used to transport the concrete, the Departmental Representative reserves the right to subject any truck suspected of poor mixing to a uniformity test as outlined in CSA A23. If the truck fails the test, then the concrete and the truck shall be rejected at the sole cost of the Contractor unless otherwise directed by the Departmental Representative.
- .6 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
 - .2 Use trigger operated spray nozzles for water hoses.
 - .3 Carefully coordinate the specified concrete work with weather conditions.
 - .4 Divert unused concrete materials from landfill to local facility approved by Departmental Representative.
 - .5 Refer to Section 01 35 44 for requirements associated with the cleaning of concrete trucks and tools.
 - .6 Prevent admixtures and additive materials from entering drinking water supplies or streams. Using appropriate safety precautions collect liquid or solidify liquid

with inert, non-combustible material and remove for disposal. Dispose of waste in accordance with applicable local, provincial, and national regulations.

- .7 Choose least harmful, appropriate cleaning method which will perform adequately.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.
- .2 Costs associated with cold and/or hot weather concreting shall be considered incidental to the work.

Part 2 Products

2.1 MATERIALS

- .1 All cementing materials to CSA A3001.
- .2 Portland Cement: to CSA A5, normal type 10.
- .3 Water: to CSA A23.1 and to be free from injurious amounts of oil, acid, alkali soluble chloride, organic matter, sedimentation and other deleterious substances.
- .4 Aggregates: to CSA A23.1/A23.2 for Class C-1 exposure, with a minimum 28-day compressive strength of 35 MPa.
- .5 Coarse aggregates shall consist of washed crushed stone having a nominal size of 20 mm.
- .6 Fine aggregate shall be washed and classified for conform to the gradation limits specified in CSA A23.1.
- .7 The use of Alkali-Silica Reactive Aggregates shall not be permitted.
- .8 Joint sealer: self-leveling, two component sealant capable of remaining resilient over temperatures ranging from - 25° C to 35° C. Material will be capable of an elongation of 300%, have tensile recovery of 90% ASTM D412-75 (or latest edition), hardness of 25-35 Shore A and have a high bond strength to the concrete faces.
- .9 Silane Sealer: self-penetrating, 100% silane, clear, breathable. Hydrozo 100 or equal.
- .10 Silicone Sealant: Dow Corning 888 Silicone Joint Sealant or approved alternate. The color shall be gray.
- .11 All epoxy adhesives shall be Hilti HIT RE-100 or Redhead Epcon C6+ and installed per manufacturer's specifications.
- .12 All new steel plates and angles shall be CSA G40.21-350W.
- .13 All new threaded rods shall be hot dip galvanized, ASTM A193, grade B7 high impact bars with an ultimate stress of 861 MPa.
- .14 All new steel studs shall conform to ASTM Grade 1015.
- .15 All new steel angle assemblies, studs, threaded rods, and connection plates shall be hot dipped galvanized after fabrication per CAN/CSA G164 to 610 g/m².
- .16 Lifting anchors shall be CONAC 316 stainless steel A-Anchor System, Item Code 6CA18 with a safe working load of 7500/11,600 lbs in tension and shear respectively.

- .17 Lifting anchors shall be patched after installation with Euclid Speed Crete Blue Line or approved equivalent.

2.2 MIXES

- .1 Concrete Mixes:
 - .1 Prior to starting concrete work, submit to the Departmental Representative the proposed mix designs for approval. Mix designs to be in accordance with Alternative 1 of Table 5 in CSA A23.1-latest edition. Comply with additional requirements of CSA A23.1-latest edition, Section 15 for concrete placed near sea water.
 - .2 Use concrete mix that meets the following parameters:
 - .1 Cement to be normal Portland Cement, Type GU.
 - .2 Minimum compressive strength of 35 MPa at 28 days.
 - .3 Exposure Class C-1.
 - .4 Maximum aggregate size: 20 mm.
 - .5 Air Content: 5-8%.
 - .6 Maximum water to cement ratio of 0.4.
 - .7 Slump at time and point of discharge of 20-80mm. Where the nature of work requires larger slumps, they must be obtained using admixtures rather than increasing the water content. The use of such admixtures and the increase in slump to be approved by a Departmental Representative prior to implementation in the work.
 - .8 Admixtures to the approval of the Consultant and the recommendation of the manufacturer. Admixtures must be dispersed separately into mixing water.
 - .9 The contractor shall submit a modified concrete mix to the Departmental Representative for review to accommodate pumping.
 - .2 Do not use calcium chloride or compounds containing calcium chloride.
 - .3 Weigh aggregates, cement, water and admixtures separately when batching. Inspect and test scales for accuracy as directed. Accuracy to be such that successive quantities can be measured to within one percent of desired amounts. Test certificates to be submitted to Departmental Representative upon request.
 - .4 Where seven-day strength is less than 70% of specified 28-day strength; provide additional protection curing and make changes to mix proportions to the satisfactions of the Departmental Representative.
 - .5 Provide certification that plant, equipment and all materials to be used in concrete comply with the requirements of CSA A23.1-14-latest edition.
 - .6 Provide certification from independent testing and inspection company that mix proportions selected will produce concrete of specified quality and can be effectively placed and finished for all work under this contract.
 - .7 Flowable fill shall be a cementitious slurry consisting of fine aggregate, water, and cementitious material(s). It shall be self-compacting and in a flowable state at placement.

2.3 FINISHES

- .1 Finish concrete components per the below requirements:
 - .1 Provide a uniform broom finish on top surface of concrete slab parallel with the slope of the ramp.
 - .2 Provide a uniform broom finish on top surface of concrete curb parallel with its length.
 - .3 Unless noted otherwise, provide a smooth troweled surface on all concrete surfaces.
 - .4 Top of concrete slab shall also consist of traction control grooves as detailed in the drawings.

Part 3 Execution

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete. Provide 24 hours minimum notice prior to placing concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
 - .1 All construction joint locations shall be approved by a Departmental Representative.
 - .2 Control joints shall be saw cut at locations identified on the plans.
 - .3 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after review of equipment and mix by Departmental Representative.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.
- .7 Protect previous Work from staining.
- .8 Clean and remove stains prior to application of concrete finishes.
- .9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .10 Remove all debris including sawdust, chips and any other deleterious materials from the interior of the forms.
- .11 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 CONSTRUCTION

- .1 Perform cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Comply with additional requirements of CAN/CSA A23.1 for concrete exposed to a seawater environment except where specified otherwise.

- .3 All reinforcing steel shall have 75 mm cover unless noted otherwise.
- .4 Placing of concrete:
 - .1 Contractor is responsible for the placing method used.
 - .2 Concrete shall be delivered to the point of final deposit in a manner satisfactory to the Departmental Representative using means and equipment which will prevent segregation or loss of materials.
 - .3 The size of section to be placed in one continuous operation shall be as detailed on the drawings or as directed by the Departmental Representative.
 - .4 Unless otherwise authorized by the Departmental Representative, forms shall be kept dry during the placing of the concrete until the concrete has reached initial set.
 - .5 Concrete shall be deposited in the forms in maximum lifts of 500 mm and in layers that are approximately horizontal and as close as practicable to its final position.
 - .6 Concrete shall not be moved horizontally with vibrators or by other methods which could cause segregation.
 - .7 Under adverse weather conditions the Contractor shall be prepared to provide suitable protection to prevent damage to concrete.
 - .8 Consolidation:
 - .1 All methods of consolidation shall be subject to the approval of the Departmental Representative.
 - .2 Concrete shall be consolidated thoroughly and uniformly by means of hand tamping, vibrators or finishing machines to obtain a dense, homogeneous structure, free from cold joints, voids and honeycomb.
 - .3 Enough vibrators shall be employed to adequately handle the anticipated rate of placement. The size and frequency of vibrators shall be as specified in CSA A23.1. A stand-by vibrator shall be always available on the site.
 - .4 Internal vibrators shall be used wherever practicable. External type vibrators may be used where surfaces cannot be properly consolidated with the internal type alone.
 - .5 Insertion of internal vibrators shall be made systematically at intervals such that the zones of influence of the vibrator overlap.
 - .6 Extreme care shall be taken to ensure that the internal type vibrators do not displace the reinforcing steel or the forms. Vibrators shall have rubber or non-metallic vibrating heads.
- .5 Curing concrete:
 - .1 Wet curing shall be completed to Curing Type 2 per Table 19 as indicated in CSA A23.1 to protected from freezing, premature drying, high temperature and moisture loss.
 - .2 Curing shall be applied to concrete as soon as possible without damaging or marring the surface.

- .3 Provide protection for cold and hot weather concrete work per the requirements of CAN/CSA A23.1 and A23.2. See below maximum and minimum temperatures that prompt the requirements for cold and hot weather protection.
 - .1 Cold Weather Concreting: If the air temperature is forecasted to fall below 10 °C within 24 hours of placement (as forecast by the nearest official meteorological office), then cold weather protection is required.
 - .2 Hot Weather Concreting: If the air temperature is forecasted to be 27 °C or higher within 24 hours of placement (as forecast by the nearest official meteorological office), then hot weather protection is required.
- .4 Curing compounds cannot be used as a curing method due to the use of penetrating sealers.
- .5 Apply two coats of penetrating silane sealers on all exposed concrete surfaces.
 - .1 Surfaces include, as minimum, the exposed edges/faces of the slab and curb.
- .6 Finishing of Concrete:
 - .1 Finish concrete in accordance with CAN/CSA A23.1.
 - .2 Concrete tolerance in accordance with CSA-A23.1/A23.2.
 - .3 Float surfaces with wood or metal floats or power finishing machines to bring surfaces to true grades and dimensions.
 - .4 Finish concrete components per the below requirements:
 - .1 Top of boat ramp slab shall consist of traction control grooves as detailed in the drawings. The method of forming the traction control grooves shall be approved by a Departmental Representative prior to placement of concrete.
 - .2 Provide a uniform broom finish on top surface of concrete slab parallel with the slope.
 - .3 Provide a uniform broom finish on top surface of concrete curb parallel with its length.
 - .4 Unless noted otherwise, provide a smooth troweled surface on all concrete surfaces.
- .7 Precast Panels
 - .1 Lifting devices are permitted in the top of the panel. All inserts must be filled with epoxy adhesive after the panels are installed.
 - .2 The proposed lifting cables, inserts, and rigging shall be designed and stamped by an Engineer in the Province of New Brunswick

3.3 CRACKS

- .1 Repair all cracks greater than 0.2mm in width with an epoxy injection grout. Repair methods and materials to be submitted to a Departmental Representative for approval.

3.4 FIELD QUALITY CONTROL

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and Section 1.6, Quality Assurance, of this Section and submit report as described in Part 1 - Submittals.

- .1 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
- .2 Carry out tests for slump, air content, compressive strength, and temperature in conformance with CSA A23.1 and CSA A23.2
- .3 Frequency of testing as follows:
 - .1 Air, Slump and Temperature: one test for each load of concrete until satisfactory control is established daily and rate of placement $> 35 \text{ m}^3$ per hour; then one (1) test for each three (3) loads of concrete. Satisfactory control is considered to have been established when tests on five consecutive loads or batches of concrete are within specification requirements.
 - .2 Concrete shall be tested for slump, air content and temperature prior to and after the addition of superplasticizer (if added on site). Testing shall be carried out at the point of discharge from the truck and as close as possible to the final deposit into the forms. Sufficient superplasticizer shall be added to produce the desired consistency and if added on site, the superplasticizer shall be mixed into the load a minimum of five minutes prior to retesting.
 - .3 A set of three regular compressive strength cylinders shall be made for every 50 m^3 of concrete placed, or fraction thereof, or as directed by the Departmental Representative. In addition, for every regular set of three cylinders, two additional cylinders will be cast to be tested only if requested by the Departmental Representative for appeal purposes.
 - .4 The responsibility for casting any additional cylinders required for interim testing lies with the Contractor.
 - .5 Ensure there is no accelerated curing of concrete cylinders
- .2 The Departmental Representative shall have the right to sample and test all materials used in the mixture design and given access to the production facilities of the ready-mix supplier. Materials failing to meet requirements to be immediately rejected.
- .3 Ensure test results are distributed to all parties.
- .4 Departmental Representative will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .5 Departmental Representative may take additional test cylinders as required. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.
- .7 Inspection or testing by Departmental Representative will not relieve Contractor of their contractual responsibility.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 44 - Environmental Procedures.
- .3 Section 01 50 00 - Temporary Facilities.
- .4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Section 02 41 13 – Selective Site Demolition.
- .6 Section 31 32 19.01 – Geotextiles.
- .7 Section 31 37 00 – Fills

1.2 MEASUREMENT PROCEDURES

- .1 Excavated materials will be measured in accordance with Section 01 10 10.
- .2 Backfilling to authorized excavation limits will be measured in accordance with Section 01 10 10.
- .3 Placing and spreading of gravel will be measured for payment in accordance with Section 01 10 10.

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM C117-17, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136/C136M-19, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-12 (2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .4 ASTM D1557-12 (2021), Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .5 ASTM D 4318-17, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - .6 ASTM D6913/D6913M-17, Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.
 - .7 ASTM D7928-21, Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 8.1-Latest Edition, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CGSB 8.2-Latest Edition, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA)

- .1 CSA A3000-18, Cementitious Materials Compendium.
- .2 CSA A23.1-00, Concrete Materials and Methods of Concrete Construction.

1.4 SUBMITTALS

- .1 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform a Departmental Representative at least 4 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.
 - .3 Upon Request, submit 70 kg samples of type of fill specified including representative samples of excavated material.
 - .4 Upon request, ship samples prepaid to an address specified by the Departmental Representative in tightly closed containers to prevent contamination.

1.5 DATUMS

- .1 Horizontal Datum: All horizontal coordinates used in this specification and contact drawings are in metres referenced to U.T.M. projection based on the North American Datum, 1983, (NAD83, Zone 20). Survey control monuments and their coordinate values are shown on Plan.
- .2 Vertical Datum: All elevations and soundings used in this specification and contract drawings are in metres referenced to Chart Datum.

Part 2 Products

2.1 MATERIALS

- .1 See Section 31 37 00 for material specifications.

2.2 GEOTEXTILES

- .1 See Section 31 32 19.01 for geotextile specification.

Part 3 Execution

3.1 SITE PREPARATION

- .1 Remove obstructions, ice, and snow, from surfaces to be excavated within limits indicated.

3.2 STOCKPILING

- .1 Stockpile fill materials in the laydown area. Stockpile granular materials in a manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.3 EXCAVATION

- .1 Advise a Departmental Representative at least 7 days in advance of excavation operations.
- .2 Excavate to lines, grades, elevations, and dimensions as directed by a Departmental Representative.
 - .1 The Contractor shall remove the existing crib structure and existing fill materials as required to achieve the desired slope to build the new ramp structure.
 - .2 All new fills placed outside the footprint of the existing crib shall be founded on competent material. Prior to placement of fills outside the footprint of the existing crib, a Departmental Representative shall review the existing soils to ensure they will provide a competent base to support the new fills/ramp structure.
- .3 Contract drawings indicate those areas which require excavation at the time of the most recent surveys. Actual extent of excavation removals within the areas may vary slightly from those indicated on the drawings.
- .4 Remove concrete and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.
- .5 Excavation must not interfere with stability of the surrounding structures.
- .6 Plan and execute work in a manner that will not interfere with activities at wharf sites, or access to wharves by land or water.
 - .1 The Departmental Representative or owner will not be responsible for loss of time, equipment, material, or any other charges related to interference with vessels in the harbour, weather conditions, or due to other Contractor's operations.
- .7 There will be no additional payment for side slopes as they are considered incidental to this contract.
- .8 Install geotextiles in accordance with Section 31 32 19.01 – Geotextiles.
- .9 Dispose of surplus and unsuitable excavated material in approved location.
- .10 Take care during work not to damage or undermine adjacent structures. The Contractor shall repair all damage or work associated with re-instating adjacent structures to their current condition.

3.4 FILL TYPES AND COMPACTION

- .1 All fill materials will be in accordance with Section 31 37 00 – Fills. Compaction densities are percentages of maximum densities obtained from ASTM D 698. See Section 31 37 00 for compaction requirements for different fills.

3.5 BACKFILLING

- .1 Do not proceed with backfilling operations until a Departmental Representative has inspected and approved installations.
- .2 Install geotextiles in backfill in accordance with Section 31 32 18.01 – Geotextile as directed by a Departmental Representative.
- .3 Areas to be backfilled shall be free from debris, snow, ice, water, and frozen ground.

- .4 Do not use backfill material which is frozen or contains ice, snow, or debris.
- .5 Place backfill material in uniform layers not exceeding 300 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 During backfilling and compaction work, the Contractor shall use appropriately sized equipment to ensure the new or existing structures are not damaged.
- .7 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 48 hours after placing of concrete.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation of polymeric geotextiles purpose of which is to:
 - .1 Separate and prevent mixing of granular materials of different grading.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.3 MEASUREMENT PROCEDURES

- .1 Refer Sections 01 10 10 for measurements for payment.

1.4 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM D4632. Grab Tensile strength test.
 - .2 ASTM D 4751, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 11.2-M89(April 1997), 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.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

1.5 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit samples to a Departmental Representative at least 4 weeks prior to beginning the Work.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris, and rodents.

1.7 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile: Non-Woven synthetic fiber fabric, supplied in rolls.

- .1 Width: 4 m minimum.
- .2 Length: 100 m minimum.
- .2 Synthetic non-woven geotextile (also referred to as filter fabric) to be used to:
 - .1 Provide filtration and separation of the new rock fill from the existing harbour bottom or existing crib.
- .3 Minimum Geotextile Properties:

<u>PROPERTY</u>	<u>ASTM TEST METHOD</u>	<u>VALUE (METRIC UNITS)</u>
Grab Tensile Strength	D4632	1690 N
Grab Elongation	D4632	50-105%
Tear Resistance	D4533	644 N
Puncture CBR	D6241	4820 N
Permittivity	D4491	0.7 sec ⁻¹
Water Flow	D4491	2035 l/min/m ²
Apparent Opening Size	D4751	0.150 mm
U.V. Stability	D4355	70% @ 500 hrs

- .4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m² to CAN/CSA G164.

Part 3 Execution

3.1 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated and retain in position with pins or weights.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles, and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile a minimum of 600 mm over previously laid strip.
- .5 Pin successive strips of geotextile with securing pins at 600 mm interval at mid-point of lap.
- .6 Protect installed geotextile material from displacement, damage, or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within 4 h of placement

- .8 Replace damaged or deteriorated geotextile to approval of a Departmental Representative.
- .9 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating Trenching and Backfilling.

3.2 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Refer to Section 01 33 00 for submittal requirements.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117 -17, Standard Test Method for Materials Finer than 0.075mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C127-12, Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
 - .3 ASTM C 131/C131M-20, Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .4 ASTM C136/C136M-19, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .5 ASTM D1557-12 (2021), Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-mm³)).
 - .6 ASTM D4318-17, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - .7 ASTM D5821-13(2017). Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate.
- .2 New Brunswick Department of Transportation and Infrastructure
 - .1 Department of Transportation and Infrastructure Standard Specifications for Highway Construction (NBDTI Standard Specification) – Latest Edition.
- .3 Ministry of Transportation, Ontario Laboratory Testing Manual
 - .1 MTO LS-618 – The Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus.
 - .2 MTO LS-614 – Freezing and Thawing of Coarse Aggregate.

1.3 SUBMISSIONS

- .1 Product Data/Samples:
 - .1 Provide samples of materials proposed for the work.
- .2 Methodology:
 - .1 Provide methodologies for carrying out the work
- .3 Provide submissions in accordance with Section 01 33 00.

1.4 MEASUREMENT FOR PAYMENT

- .1 All fills shall be measured in accordance with Section 01 10 10.

- .2 Prices will include the entire cost of supplying and placing the material in the work, rough grading as necessary, the leveling and finish grading of the listed materials, taking soundings, diving inspections, shoring, bracing, underpinning, all as shown on the drawings, and as specified.
- .3 Departmental Representative will only pay for incorporated fills used in the work.

Part 2 Products

2.1 MATERIALS

- .1 Rock Fills:
 - .1 The rock fills shall be free from flat, elongated, or other objectionable pieces and shall be approved by the Departmental Representative prior to utilization. The stone shall be quarry stone with all piece’s sound and subject to approval by the Departmental Representative.
 - .2 The rock fills shall meet the requirements of Class “A” backfill for structures as specified in Item 167 of the NBDTI Standard Specification, meeting the material type and gradation specified below:
 - .1 Class “A” backfill shall be a well graded granular material composed of clean, uncoated particles free of lumps of clay or other deleterious material and having not more than 10% retained on the 100 mm sieve, and not more than 10% Dust.
- .2 Sub-base Material:
 - .1 Sub-base material shall be free from flat, elongated or other objectionable pieces and shall be approved by the Departmental Representative prior to utilization. Sub-base material shall be tested in accordance with ASTM C 117 and C 136 and shall fulfil the gradation requirements detailed in Table 1 – Sub-base material Gradation.
 - .2 Table 1- Sub-Base Material Gradation:

ASTM Sieve Size, mm	Percent Passing, %
63.0 mm	100
50.0 mm	95-100
37.5 mm	79-100
25.0 mm	63-85
19.0 mm	53-78
9.5 mm	35-62
4.75 mm	24-51
2.36 mm	17-42
1.18 mm	12-33
300 µm	5-18
75 µm	0-7

- .3 The sub-base material shall be tested in accordance with ASTM D5821 and have a minimum of 40% of the particles, by mass, having at least one fractured face.

.3 Gravel:

- .1 The gravels shall be crushed quarry stone free from flat, elongated or other objectionable pieces and shall be approved by the Departmental Representative prior to utilization. The gravels shall be tested in accordance with ASTM C 117 and C 136 and shall fulfil the gradation requirements detailed in Table 2 –Gravel Gradation.

.2 Table 2- Gravel Gradation:

ASTM Sieve Size, mm	Percent Passing, %
31.5 mm	100
25.0 mm	95-100
19.0 mm	75-100
12.5 mm	60-82
9.5 mm	52-75
4.75 mm	36-61
2.36 mm	25-48
1.18 mm	16-36
300 µm	5-16
75 µm	0-6

- .3 The gravel shall be tested in accordance with ASTM D5821 and have a minimum of 40% of the particles, by mass, having at least one fractured face.

.4 Riprap

- .1 Riprap shall consist of clean, hard, sound, durable quarry rock, having a density of not less than 2.6 t/m³ and angular surfaces such that the rocks interlock when placed. Rip rap shall be approved by the Departmental Representative prior to utilization and shall fulfil the gradation requirements of Table 3 – Riprap Gradation.

.2 Table 3 – Riprap Gradation:

Mass, kg	Size, mm	Finer by Mass (%)	
		R-25	R-50
150	480		100
100	420		70-90
75	380	100	
50	330	70-90	40-55
25	260	40-55	
10	190		
5	150		0-15
2.5	120	0-15	
^l Thickness, mm		500	600

¹Measured perpendicular to the prepared surface

- .3 Riprap for each rock shall have both thickness and breadth greater than or equal to one-third of its length and tested to meet the following requirements:
 - .1 Riprap shall be tested in accordance with MTO LS-618 and achieve a Micro-Deval loss not greater than 70%.
 - .2 Riprap shall be tested in accordance with MTO LS-614 and achieve a Freeze/Thaw loss not greater than 30%.

Part 3 Execution

3.1 PREPARATION

- .1 Prior to placing fills in the positions indicated on the drawings, ensure all construction debris is removed and Geotextile is installed as per Section 31 32 19.01.

3.2 PLACEMENT

- .1 Ensure the placement method for all fills are reviewed and approved by a Departmental Representative before commencing the work.
- .2 Install the geotextile as indicated on the drawings.
- .3 Reinstate existing rock fill if the material is deemed acceptable by a Departmental Representative.
- .4 Place new rock fill and sub-base material as stated on the drawings to build up the underside of the new concrete boat ramp slab.
- .5 Place Riprap as stated on the drawings to prevent the loss material underneath the new concrete boat ramp slab.
- .6 Place the gravel layer up to the underside of the new asphalt surface.
- .7 Rock fill, gravel and sub-base material shall be placed and compacted to a minimum of 95% of the ASTM D1557 (modified Proctor) maximum dry density.
- .8 Riprap shall be placed by hand or machine to avoid waste and to ensure that the stone is in a stable position. The Riprap shall be placed to the elevations and grades shown of the drawings.

3.3 TOLERANCES

- .1 All fills to be within 19 mm of elevation indicated on drawing.

3.4 PROTECTION

- .1 Take into account anticipated weather conditions and degree of exposure of site in setting requirements for protection.
- .2 Schedule and carry out construction so that each phase of work is not left exposed longer than necessary.
- .3 The Contractor should note that the work site is subject to water level variations due to tidal action.

- .4 The Contractor will be responsible to replace any materials lost due to storms, tidal erosion or by their own activities.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 AASHTO T-283 with Lottman Conditioning.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C88/C88M-18, Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
 - .2 ASTM C117-17, Test Method for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .3 ASTM C123/C123M-14, Test Method for Lightweight Pieces in Aggregate.
 - .4 ASTM C127-15, Test Method for Specific Gravity and Absorption of Coarse Aggregate.
 - .5 ASTM C128-15, Test Method for Specific Gravity and Absorption of Fine Aggregate.
 - .6 ASTM C131/C131M-20, Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
 - .7 ASTM C136/C136M-19, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .8 ASTM D995-88, Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
 - .9 ASTM D1559-89, Test Method for Resistance to Plastic flow of Bituminous Mixtures Using Marshall Apparatus.
 - .10 ASTM D2419-14, Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
 - .11 ASTM D2041/D2041M-19, Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
 - .12 ASTM D2950/D2950-14, Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
 - .13 ASTM D3203/D3203M-17, Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures.
 - .14 ASTM D3515-01, Standard Specifications for Hot Mixed, Hot Laid Bituminous Paving Mixtures.
 - .15 ASTM D4460-97(2015), Standard Method for Calculating Percent Asphalt Absorption by the Aggregate in an Asphalt Pavement Mixture.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.2-M88 (R10/3 Series), Sieves Testing, Woven Wire, Metric.
 - .2 CAN/CGSB-16.3-M90, Asphalt Cements for Road Purposes.
- .4 New Brunswick Department of Transportation and Infrastructure

- .1 Standard Specifications for Highway Construction (NBDTI Standard Specification) – Latest Edition.

1.2 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Upon request and at least 4 weeks prior to commencing work submit samples of following materials proposed for use:
 - .1 One 4 L container of asphalt cement.

1.3 MATERIAL CERTIFICATION

- .1 At least 4 weeks prior to commencing work submit viscosity-temperature chart for asphalt cement to be supplied showing kinematic viscosity in mm²/s versus temperature range from 105° to 175°.
- .2 At least 4 weeks before commencing work, submit refinery's test data and certification that asphalt cement meets requirements of this section which also includes the specific gravity of the asphalt cement.

1.4 DELIVERY AND STORAGE

- .1 Coarse aggregate stockpile shall contain no more than 15% passing 5000 sieve.
- .2 Fine aggregate stockpile shall contain no more than 15% retained on 5000 sieve.
- .3 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.
- .4 When dryer drum mixing plant is used, stockpile fine aggregate separately from coarse aggregate.
- .5 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

1.5 MEASUREMENT FOR PAYMENT

- .1 Refer to Section 01 10 10 – General Instructions for measurement for payment.

Part 2 Products

2.1 MATERIALS

- .1 Asphalt concrete: hot mixed, hot-laid combination of mineral aggregates, uniformly coated and mixed with an asphaltic binder in a suitable mixing plant. Asphalt materials and aggregates must meet the requirements of Item 261 of the NBDTI Standard Specification, latest edition:
 - .1 For asphalt base – Hot mix asphalt concrete base mix “B”.
 - .2 For asphalt seal – Hot mix asphalt concrete surface mix “D”.
- .2 Bituminous Prime and Tack coats to be in accordance with NBDTI Standard Specification.

Part 3 Execution

3.1 EXECUTION

- .1 Asphalt to be hot mix asphalt (HMA) supplied and placed as per the requirements of the NBDTI Standard Specification Item 603 and as detailed in this specification.

3.2 EQUIPMENT

- .1 Pavers: Mechanical grade controlled self powered pavers capable of spreading asphalt concrete within specified tolerances, true to line, grade and crown indicated.
 - .1 Pavers shall be equipment with hoppers and distributing screws to place mixture evenly in front of the screeds.
 - .2 Pavers shall be equipped with vibrating screeds and shall be capable of spreading mixtures, without segregation and with a smooth and uniform textured surface, to the required thickness and in widths of 3 m to 5 m.
 - .1 Screeds shall be equipped with heaters which are capable of preheating the entire screed and screed extensions.
 - .3 The Contractor shall provide 3 m straight edge with each paver
 - .4 Pavers shall be equipped with automatic screed controls
 - .1 The longitudinal grade control shall be equipped to operate from either side of the paver and be capable of providing longitudinal grade control as well as matching longitudinal joints.
 - .2 The Contractor shall use a minimum 12 m ski/floating beam or an approved equivalent for longitudinal grade control.
 - .1 A joint matching shoe may be used to control longitudinal grade of subsequent mats placed adjacent to the original mat
 - .3 A calibrated Slope indicator shall be installed in readily visible locations on each paver.
 - .5 Longitudinal grade control shall be used on all lifts.
 - .6 Vibrating hydraulic screed extensions and vibrating bolt-on screed extensions shall be used in placing mat widths greater than 3 m.
- .2 Rollers: sufficient number of rollers of type and mass to obtain specified density of compacted mix.
- .3 Haul trucks: of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
 - .1 Boxes with tight metal bottoms.
 - .2 Covers (tarps) of sufficient size and weight to completely cover and protect asphalt concrete when truck fully loaded.
 - .3 In cool weather or for long hauls, insulate entire contact area of each truck box.
 - .4 Trucks which cannot be weighed in a single operation on scales supplied will not be accepted.
 - .5 Truck tailgate assemblies must be such that they do not strike paver hopper when emptying into the hopper.

3.3 PREPARATION

- .1 Apply asphalt prime to granular base.
- .2 Apply tack coat.
- .3 Pavement sites as indicated by the Drawings or the Owner's Representative for overlay and skin patching shall be free of loose and foreign material and tack coat shall be applied.

3.4 TRANSPORTATION OF ASPHALT CONCRETE

- .1 Transport asphalt concrete to job site in vehicles cleaned of foreign material.
- .2 Loads shall be covered with tarpaulins of sufficient size to overhang the fully loaded truck boxes and be tied down on three sides and the front shall be tight to the box of the truck or shielded to prevent air infiltration.
- .3 Truck boxes may be lightly lubricated with an environmentally acceptable release agent, as required, but must be raised and drained after each application and before loading.
 - .1 Hydrocarbon fuels or solvents shall not be used.
- .4 Schedule delivery of asphalt concrete for placing in daylight unless the Owner's Representative approves artificial light.
- .5 Deliver asphalt concrete to paver at a uniform rate and in an amount within capacity of paving and compacting equipment.
- .6 Deliver loads continuously in covered vehicles and immediately spread and compact. Deliver and place asphalt concrete at temperature within range as directed by the Owner's Representative or the Specification, but not less than 135°.

3.5 PLACING

- .1 Obtain approval from the Owner's Representative of the base surface and tack coat prior to placing asphalt.
- .2 Place asphalt paving to thicknesses, grades, and lines as indicated or as directed by the Owner's Representative.
- .3 Placing conditions:
 - .1 Place asphalt paving only when air temperature is above 5° C.
 - .2 When temperature of surface on which asphalt concrete is to be placed falls below 10°C, provide extra rollers as necessary to obtain required compaction before cooling.
 - .3 Do not place asphalt when pools of standing water exist on surface to be paved, during rain, when surface is damp, or if ambient temperature is below 5°C.
- .4 Place asphalt paving in compacted lifts as indicated on the project drawings:
 - .1 Base course and a finish course in (minimum) two separate lifts.
- .5 Spread and strike off asphalt concrete overlay with self-propelled mechanical finisher.
 - .1 Place individual strips no longer than 500 m.

- .2 Construct longitudinal joints and edges true to line markings. Lines for paver to follow will be established by the Owner's Representative parallel to centerline of proposed pavement. Position and operate paver to follow established line closely.
 - .3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.
 - .4 Correct irregularities in alignment left by paver by trimming directly behind machine.
 - .5 Correct irregularities in surface of pavement course directly behind paver. Remove by shovel or lute access asphalt concrete forming high posts. Fill and smooth dips with asphalt concrete.
 - .6 Do not broadcast asphalt concrete over surface.
 - .7 The forward speed of the paver shall be regulated by capacity of the plant and the rollers but shall not exceed a forward speed of 10 m/min.
- .6 When hand spreading is used:
- .1 Approved wood or steel forms, rigidly supported to assure correct grade and cross section, may be used. Use measuring blocks and intermediate strips to aid in obtaining required cross-section.
 - .2 Distribute material uniformly. Do not broadcast material.
 - .3 During spreading operation, thoroughly loosen and uniformly distribute asphalt concrete by lutes or covered rakes. Reject asphalt concrete that has formed into lumps and does not break down readily.
 - .4 After placing and before rolling, check surface with templates and straightedges and correct irregularities.
 - .5 Provide heating equipment to keep hand tools free from asphalt. Avoid high temperatures which may burn asphalt concrete. Do not use tools at a higher temperature than temperature of asphalt concrete being placed.

3.6 COMPACTING

- .1 Compact asphalt concrete continuously using established rolling pattern.
- .2 Do not change rolling pattern unless asphalt concrete changes or lift thickness changes. Change rolling pattern only as directed by the Owner's Representative.
- .3 General:
 - .1 Provide as many additional rollers as necessary to achieve specified pavement density.
 - .2 Start rolling operations as soon as asphalt concrete can bear mass of roller without undue displacement of asphalt concrete or cracking of surface.
 - .3 Operate roller slowly initially to avoid displacement of asphalt concrete. For subsequent rolling do not exceed 5 km/h for static steel-wheeled rollers and 8 km/h for pneumatic-tired rollers.
 - .4 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 20 impacts per metre of travel.
 - .5 Overlap successive passes of roller by at least one-half width of roller and vary pass lengths.

- .6 Keep wheels of roller slightly moistened with water to prevent pick-up of asphalt concrete but do not over-water and do not use diesel fuel.
- .7 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.
- .8 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.
- .9 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.
- .10 Where rolling causes displacement of asphalt concrete, loosen affected areas at once with lutes or shovels and restore to original grade of loose asphalt concrete before re-rolling.
- .11 Do not refuel rollers on fresh asphalt concrete.
- .4 Breakdown rolling:
 - .1 Commence breakdown rolling with static steel wheeled roller vibratory roller immediately following rolling of transverse and longitudinal joint and edges.
 - .2 Operate rollers as close to paver as necessary to obtain the specified density without causing undue displacement.
 - .3 Operate breakdown roller with drive roll or wheel nearest finishing machine. Exceptions may be made when working on steep slopes or super-elevated sections.
 - .4 Use only experienced roller operators for this work.
- .5 Second rolling:
 - .1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving asphalt concrete temperature allows maximum density from this operation.
 - .2 Rolling shall be continuous after initial rolling until asphalt concrete placed has been thoroughly compacted.
- .6 All asphalt concrete shall be compacted to meet the requirements of the NBDTI Standard Specification.
- .7 The Contractor will supply additional compaction equipment if required density is not achieved.

3.7 JOINTS

- .1 General:
 - .1 Trim vertical face to provide true surface and cross section against which new pavement may be laid. Remove loose particles.
 - .2 Paint joint face with coat of tack coat emulsified asphalt cement or preheat joint face with approved heater, prior to placing of fresh asphalt concrete.
 - .3 Overlap previously laid strip with spreader by 100 mm.
 - .4 Rake fresh asphalt concrete against joint and thoroughly tamp and roll.
 - .5 Remove surplus material from surface of previously laid strip. Dispose of surplus material as directed by the Owner's Representative.
 - .6 Do not throw surplus material on freshly screened mat surface.

- .2 Transverse Joints:
 - .1 Carefully construct and thoroughly compact transverse joints to provide a smooth riding surface.
 - .2 Limit transverse joints to a minimum
 - .3 Stagger joint locations 1.5 to 3.0 meters. Schedule each day's paving operation to terminate adjacent lanes in any one area to within above specified joint location.
 - .4 Offset transverse joint in succeeding course by at least 600 mm.
- .3 Longitudinal Joints:
 - .1 Before rolling, carefully remove with a lute or rake and discard coarse aggregate in asphalt concrete overlapping joint.
 - .2 Roll longitudinal joints directly behind paving operation
 - .3 When rolling with static roller, shift roller over onto previously placed lane in order that no more than 150 mm of roll rides on edge of newly laid lane, then operate roller to pinch and press fines gradually across joint. Continue rolling until a thoroughly compacted neat joint is obtained.
 - .4 When rolling with vibratory roller, have most of drum width ride on newly placed lane with remaining 100 to 150 mm extending onto previously placed and compacted lane.
- .4 When the abutting lane is not placed in same day, or when joint is distorted during day's work by traffic or other means, carefully trim edge of lane to line and paint with a thin coating of asphalt before abutting lane is placed.
- .5 Ensure joints are offset at least 150 to 200 mm from those in lower layers.

3.8 FINISH TOLERANCES

- .1 Finished asphalt concrete to be within 6 mm of design elevation but not uniformly high or low.
- .2 Finished asphalt concrete not to have irregularities exceeding 6 mm when checked with a 3 m straight edge placed in any direction.

3.9 DEFECTIVE WORK

- .1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required. If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form a true and even surface and compact immediately to specified density.
- .2 Where the finished asphalt surface does not meet the grading requirements as per the acceptable tolerance, the Contractor shall repair or replace the defective work at no additional cost to the Owner. The defective work must be repaired/replaced by a method that is to the satisfaction of the Owner's Representative. The Contractor shall submit the proposed repair method to the Owner's Representative prior to completing the Work. The Contractor shall not proceed with repair until receiving written approval from the Owner's Representative.
- .3 Repair areas showing checking or rippling

- .4 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

END OF SECTION