End of Section

1.1 Description of Work

.1 The work consists of an extension to the wharf, plus a haul-out slip, at Tracadie Harbour.

.2 The Contractor shall be fully responsible to layout the work from the plans, lines and grades indicated.

.3 The work of this contract includes the provision of all materials, labour, equipment, and ancillaries, all as necessary for the completion of the work as indicated on the drawings and as described in the specifications and notes. Work on this project consists generally of, but not limited to, the following:

- .1 Supply, install and remove all environmental protection measures.
- .2 Construct Haul-Out Slip
  - .1 Supply and install steel sheet piles (SSP).
  - .2 Excavate and prepare granular base for precast concrete ramp sections.
  - .3 Place precast concrete ramp sections.
  - .4 Grade, place Class A granular and asphalt pavement.
- .3 All other labour, materials and work necessary to complete the project to the Department Representative's full satisfaction.

.4 All work to be carried out in accordance with applicable federal and provincial regulations for those agencies having jurisdiction for the work. The work is subject to the Canadian Environmental Protection Act, and the PEI Occupational and Safety Act and Regulations.

1.2 Familiarization with Site

.1 Before submitting a bid, it is recommended that bidders 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 carrying out such site inspection.

1.3 Codes and Standards

.1 Perform work in accordance with the 2005 National Building Code of Canada and any other code of provincial or local application, including all amendments up to bid closing date, provided that in any case of conflict or discrepancy, the more stringent requirement shall apply.

.2 Materials and workmanship must meet or exceed requirements of specified standards, codes and referenced documents.

1.4 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 Specification Manual.

1.5 Term Engineer

.1 Unless specifically stated otherwise, the term Engineer where used in the Specifications and on the Drawings shall mean the Department Representative of the Department of Fisheries and Oceans.

1.6 Setting out Work

.1 Set grades and lay out work in detail from control points and grades established by Departmental Representative.

.2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.3 Provide devices needed to lay out and construct work.

.4 Supply such devices as straight edges and templates required to facilitate Departmental Representative's inspection of work.

.5 Supply stakes and other survey markers required for laying out work.

1.7 Cost Breakdown

.1 Unit Price Table will be used as basis for progress payment.

1.8 Measurement for Payment

.1 Notify Departmental Representative sufficiently in advance of operations to permit required measurements for payment.

1.9 Maintenance of Work During Construction

.1 Maintain work during construction. Undertake continuous and effective maintenance work day by day, with adequate equipment and forces so that wharf or structures are continuously kept in a condition satisfactory to Department Representative.

1.10 Codes

.1 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) and other standards organizations.

.2 Conform to latest revision 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.

1.11 Work Within Project Boundaries

.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 the Department Representative.

.2 If Contractor fails to repair damage to the satisfaction of the Department Representative, the Department Representative may complete repairs 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 underground utility cables or overhead power lines.

.5 All sources of aggregate and asphalt cement must be submitted to the Department Representative for approval at least two weeks prior to the start of any work.

.6 The Contractor is responsible to follow the Provincial requirements regarding the following:
- .1 Pit and Quarry Guidelines
- .2 Environmental Construction Practice specifications

.7 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 well as making restitution of any damages and covering of costs

for same.

1.12 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 Plan locating underground cables.

1.13 Site Conditions

.1 The Contractor will be responsible to visit the harbour and review existing site conditions.

1.14 Department Representative $TABLE $TABLE

.1 Department Representatives can be contacted at:

Small Craft Harbour
Fisheries and Oceans Canada
165 John Yeo Drive
P.O. Box 1236
Charlottetown, PEI C1A 7M8
Telephone: (902) 566 -8777

1.15 Work Schedule

.1 Provide to the Department Representative in writing and within 5 working days after Contract award, a detailed construction schedule. The schedule shall show proposed work to be undertaken and anticipated completion dates for each category of work in the Unit Price Table.

.2 Complete all cutting and patching areas prior to the operation.

.3 Interim reviews of work progress based on work schedule will be conducted as decided by Department Representative and schedule updated by Contractor in conjunction with and to

approval of Department Representative.

.4 No work will begin until the pre-construction meeting is held, and the Contractor has provided an Insurance Certificate to Departmental Representative.

.5 Following the pre-construction meeting and approval of the schedule, the work will be so scheduled to meet the time restraints and have the project completed on time.

1.16 Sanitary Services

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

1.17 Contractor's Use of Site

.1 The Department Representative will specify the areas for work and storage.

.2 All waste generated from this project will be disposed of outside of harbour area.

1.18 Project Meetings

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

1.19 Cutting & 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 align with existing.

1.20 Existing Services

.1 Before commencing work, establish location and extent of service lines in area of work and notify Department Representative of findings.

.2 Submit schedule to and obtain approval from Department Representative for any shut down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.3 Where unknown services are encountered, immediately advise Department Representative and confirm findings in writing.

.4 Record locations of maintained, re routed and abandoned service lines.

.5 Ensure marine traffic is not unduly impeded, interrupted or endangered by execution or existence of work or plant.

.6 Verify locations of any underground utilities.

1.21 Additional Drawings

.1 Department 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.

1.22 Measurement of Quantities

.1 Area:
- .1 Longitudinal and transverse measurements for areas to be measured horizontally.
- .2 Longitudinal and transverse measurements for such items as topsoil and seeding to be made on actual flat or sloped surface seeded or sodded.

.2 Volume:
- .1 In computing volumes of excavation, average end area method will be used unless otherwise directed by Department Representative in writing.
- .2 Term: Litre shall mean 1000 mL or L.
- .3 All volume measurements refer to in place measure unless specified elsewhere in specification.

.3 Mass:
- .1 Term "tonne" shall mean 1000 kg.
- .2 Materials which are specified for measurement by mass shall be weighed on scales approved by and at locations designated by Department 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.

.4 Time:
- .1 Unless otherwise provided for elsewhere or by written authority of Department

Representative, hourly rental of equipment will be measured in actual working time and necessary travelling time of equipment within limits of project at an all-inclusive rate. Equip each unit of mobile equipment with an approved device to register hours of operation. Devices which only measure hours of running of motor will not be accepted.

1.23 Permits / Authorities

.1 The Contractor shall obtain, and pay for, permits from authorities as required for all operations and construction. He 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.

1.24 Equipment Rental Rates

.1 Upon written request, the Contractor will supply the Department Representative with a list of the rental equipment to be used on work beyond the scope of bid items. Equipment rental rates will be in accordance with current rates published by the PEI Department of Transportation and Infrastructure Renewal.

End of Section

1.1 Submittals

.1 Upon acceptance of bid and prior to commencement of work, submit to Departmental Representative the following work management documents:

- .1 Work Schedule as specified herein.
- .2 Shop Drawing Submittal Schedule specified in Section 01 33 00
- .3 Waste Management Plan specified in Section 01 74 21
- .4 Environmental Plan specified in Section 01 35 43
- .5 Health and Safety Plan specified in Section 01 35 28

1.2 Work Schedule

.1 Upon acceptance of bid submit:

- .1 Preliminary work schedule within 10 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 supported with;
- .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.
- .3 Generally Bar Charts derived from commercially available computerized project management system are preferred but not mandatory.

.5 Work schedule must take into consideration and reflect the work phasing.

.6 Schedule work in cooperation with the Departmental Representative.

.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 tenant or public might appear, will be subject to prior review and approval by the Departmental Representative.

End of Section

1.1 Related Sections

.1 Section 03 30 00 - Cast-in-Place Concrete.

1.2 Measurement

.1 All measurement shall be along a horizontal plane unless otherwise indicated.

1.3 Pay Items

.1 Mobilization including, but not limited to: Site Office, Traffic Control, Erosion and Sedimentation Control, Relocation of Existing Services and Mobilization Unit of Measurement: Lump Sum (L.S.) Method of Measurement: Payment to be made on a percentage completion basis of completed work.

.2 Select Borrow:

- .1 Unit of Measurement: cubic metre (m^3)
- .2 Method of Measurement: average end area method between cross sections of fill taken before placement of borrow to lines and elevations indicated after placement and compaction of borrow.
- .3 This item includes: transportation, supply, placement and compaction in layer.

.3 Steel Sheet Pile (SSP)

- .1 Supply
  - .1 Unit of Measurement: Metric tonne (1,000 kg)of SSP incorporated in the work.
- .2 Install (Drive)
  - .1 Unit of Measurement: Square metre (m^2) of SSP incorporated in the work.
- .3 Excess SSP
  - .1 Damaged or excess SSP beyond the finished elevations of the structure will not be measured for payment.

.4 Miscellaneous Steel

- .1 Miscellaneous steel is considered incidental to the work.
- .2 No measurement for payment will be made.

.5 Precast Concrete Deck Slabs

- .1 Unit of Measurement: Cubic metres (m^3) of precast units supplied and installed in the work.

.2 No measurement of payment will be made for reinforcing or formwork.

.6 Precast Concrete Retaining Sections

.1 Unit of Measurement: Cubic metres (m^3) of precast units supplied and installed in the work.

.2 No measurement or payment will be made for reinforcing or formwork.

.7 Cast-in-Place Concrete

.1 Unit of Measurement: Cubic metres (m^3) of cast -in-place concrete incorporated in the work.

.2 No measurement for payment will be made for reinforcing or formwork.

.8 Ladders and Mooring Cleats

.1 Unit of Measurement: Each (ea) for each unit supp lied and installed.

.2 No measurement of payment for associated bolts or washers.

End of Section

1.1 Related Sections

.1 Section 01 35 29 - Health & Safety Requirements.
.2 Section 01 45 00 - Testing and Quality Control.
.3 Section 01 78 00 - Closeout Submittals.
.4 Section 03 10 00 - Concrete Forming and Accessories.
.5 Section 03 20 00 - Concrete Reinforcing.
.6 Section 03 30 00 - Cast-in-Place concrete.
.7 Section 03 41 00 - Precast Structural Concrete.
.8 Section 05 51 29 - Metal Stairs and Ladders.
.9 Section 06 05 73 - Wood Treatment.
.10 Section 31 00 00.01 - Earthwork - Short Form.
.11 Section 31 09 16.01 - Pile Driving Templates.
.12 Section 31 23 33.01 - Excavating, Trenching and Backfilling.
.13 Section 31 61 13 - Pile Foundations, General Requirements.
.14 Section 31 62 16 - Steel Sheet Piles
.15 Section 35 59 29 - Mooring Devices.

1.2 Submittal General Requirements

.1 Submit to Departmental Representative for review requested submittals specified in various sections of the specifications including shop drawings, samples, permits, compliance certificates, test reports, work management plans and other data required as part of the work.

.2 Submit with reasonable promptness and in orderly sequence so as to allow for Departmental Representative's review and not cause delay in Work. Failure to submit in ample time will not be considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be allowed.

.3 Do not proceed with work until relevant submissions have been reviewed.

.4 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.5 Where items or information is not produced in SI Metric units, provide soft converted values.

.6 Review submittals prior to submission. Ensure that necessary requirements have been determined and verified and that each submittal has been checked and coordinated with requirements of Work and Contract Documents.

.1 Submittals not stamped, signed, dated and identified as to specific project will be returned unexamined by Departmental Representative and considered rejected.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.9 Contractor's responsibility for errors, omissions or deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative's review.

.10 Submittal format: paper originals, or alternatively clear and fully legible photocopies of originals. Facsimiles are not acceptable, except in special circumstances pre-approved by Departmental Representative. Poorly printed non-legible photocopies or facsimiles will not be accepted and be returned for resubmission.

.11 Make changes or revision to submissions which Departmental Representative may require, consistent with Contract Documents and resubmit as directed by Departmental Representative. When resubmitting, identify in writing of any revisions other than those requested.

.12 Keep one reviewed copy of each submittal document on site for duration of Work.

1.3 Shop Drawings and Product Data

.1 The term "shop drawings" means fabrication drawings, erection drawings, diagrams, illustrations, schedules, performance charts, technical product data, brochures, specifications, test reports installation instructions and other data which are to be provided by Contractor to illustrate compliance with specified materials and details of a portion of work.

End of Section

1.1 RELATED WORK

.1 Section 01 35 29 - Health and Safety Requirements

1.2 REFERENCES

.1 Fire Protection Standards issued by Fire Protection Services, Labour Program Division of Services Canada:

.1 FCC No. 301-June 1982 Standard for Construction Operations.

.2 FCC No. 302-June 1982 Standard for Welding and Cutting.

.2 FCC standards may be viewed at:

.1 http://www.hrsdc.gc.ca/en/lp/lo/fp/standards/commissioner.html

.2 Fire Protection Services - Atlantic Region Office, Halifax, N.S, (902)426 -6053.

1.3 FIRE SAFETY

.1 Implement and follow fire safety measures during Work. Comply with the following:

.1 National Fire Code.

.2 Fire Protection Standards FCC 301 and FCC 302.

.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.

End of Section

1 GENERAL

1.1 Related Sections

.1 Section 01 35 24 - Special Procedures on Fire Safety Requirements

.2 Section 01 41 00 - Regulatory Requirements

1.2 Definitions

.1 COSH: Canada Occupational Health and Safety Regulations made under Part II of the Canada Labour Code.

.2 Competent Person: means a person who is:

.1 Qualified by virtue of personal knowledge, training and experience 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.

.3 Medical Aid Injury: any minor 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.

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. Provide 3 copies.

.2 Departmental Representative will review Health and Safety Plan and provide comments.

.3 Revise the Plan as appropriate and resubmit within 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 certificate and other permits obtained.

.5 Submit copy of Letter of Good Standing from Provincial Workers' Compensation or other department of labour organisation.

.1 Work. Submit update of Letter of Good Standing whenever expiration date occurs during the period of

.6 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.7 Submit copies of incident reports.

1.4 Compliance Requirements

.1 Comply with Occupational Health and Safety Act for the Province of Prince Edward Island, and the Occupational Health and Safety Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code - Part II (entitled Occupational Health and Safety) and the Canada Occupational Health and Safety Regulations as well as any other regulations made pursuant to the Act.

.1 The Canada Labour Code can be viewed at: www.http//laws-lois.justice.gc.ca/eng/acts/L-2 fulltext.html.

.2 Canadian Occupational Health and Safety Regulations can be viewed at: www.http//laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html.

.3 A copy may be obtained at: Canadian Government Publishing Ottawa, O Public Works & Government Services Canada Ottawa, Ontario K1A 0S9 telephone:(819)956 -4800 or 800-635-7943 Publication number: L31-85/2000 E

.3 Treasury Board of Canada Secretariat (TBS):

.1 Treasury Board, Fire Protection Standard April 1, 2010 www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316&section=text

.4 Canadian Standards Association (CSA):

.1 CSA S350-M1980(R2003), Code of Practice for Safety Demolition of Structures.

.5 Observe and enforce construction safety measures required by:

.1 NBC 200, Division B, Part 8.

.2 Municipal by-laws and ordinances.

.6 In case of conflict or discrepancy between above specified requirements, the most stringent provision will apply.

.7 Maintain Workers' Compensation coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter of Good Standing.

.8 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 adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by all workers Site with safety requirements of Contract Documents, applicable federal, provincial, territorial 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 authorised persons. Immediately stop and remove non-authorised persons.

.1 Departmental Representative will provide names of those persons authorised by Departmental Representative to enter onto Work Site and will ensure that such authorised 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 authorised 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-authorised entry, and to protect pedestrians and vehicular traffic around and adjacent to the work and create a safe environment.

.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 two 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.

.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 protections 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 conditions 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.

.1 Departmental Representative will assist in locating address if needed.

1.9 Permits

.1 Post permits, licenses and compliance certificates at Work Site.

.2 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 or work.

1.10 Hazard Assessments

.1 Perform site specific health and safety hazard assessment of the Work and its Site.

.2 Carryout initial assessment prior to commencement of work with further assessments as needed

during process of work, including when new trades and subcontractors arrive on site.

.3 Record results and address in Health and Safety Plan.

.4 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 Known latent site and environmental conditions:

.1 Marine environment and tidal effects.

.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.

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 regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.

.3 Regular review of the Health and Safety Plan and Project Safety Orientation Checklist.

.4 Keep documents on site.

1.13 Health and Safety Plan

.1 Prior to commencement of Work, develop written Health and Safety Plan specific to Work. Implement, maintain, and enforce Plan for entire duration of Work and until final demobilization from site.

.2 Health and Safety Plan shall include the following components:

.1 List of health risks and safety hazards identified by hazard assessment.

.2 Control measures used to mitigate risks and hazards identified.

.3 On-site Contingency and Emergency Response Plan as specified below.

.4 On-site Communication Plan as specified below.

.5 Name of Contractor's designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship to Contractor's company.

.6 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

.7 Project Safety Orientation Checklist.

.3 On-site Contingency and Emergency Response Plan shall include:

.1 Operational procedures, evacuation measures and communication process to be implemented in the event of an emergency

.2 Evacuation Plan: site and floor plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of fire fighting equipment and other related data.

.3 Names, duties and responsibilities of persons designated as Emergency Warden(s) and deputies.

.4 Emergency Contacts: name and telephone number of officials from:

.1 General Contractor and subcontractors.

.2 Pertinent federal and provincial departments and authorities having jurisdiction.

.3 Local emergency resource organisations.

.5 Harmonise Plan with Facility's Emergency Response and Evacuation Plan. Departmental Representative will provide pertinent data including name of PWGSC and Facility Management contacts.

.4 On-site Communication Plan:

.1 Procedure for sharing of work related safety information to workers and subcontractors, including emergency and evacuation measures.

.2 List of critical work activities to be communicated with Facility Manager which have a risk endangering health and safety of Facility users.

.5 Address all activities of the Work including those of subcontractors.

.6 Review Health and Safety Plan regularly during the Work. Update as conditions warrant to

address emerging risks and hazards, such as whenever new trade or subcontractors arrive at Work Site.

.7 Departmental Representative will respond in writing, where deficiencies or concerns are noted and may request re-submission of the Plan with correction of deficiencies or concerns.

.8 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 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 bi-weekly basis. Record deficiencies and remedial action taken.

1.15 Training

.1 Use only skilled workers on Work Site who are effectively trained in occupational health and safety procedures and practices pertinent to their assigned task.

.2 Maintain employee records and evidence of training received. Make data available to Departmental Representative upon request.

.3 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; ensure the following minimum safety rules are obeyed by persons granted access to Work Site:
- .1 Wear appropriate PPE pertinent to the Work or assigned task; minimum being hard hat, safety footwear, safety glasses and hearing protection.
- .2 Immediately report unsafe condition at site, near-miss accident, injury and damage.
- .3 Maintain site and storage areas in a tidy condition free of hazards causing injury.
- .4 Obey warning signs and safety tags.

.2 Brief persons of disciplinary protocols to be taken for non-compliance. 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 may 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 the following incidents to Departmental Representative:
- .1 Incidents requiring notification to Provincial Department of Occupational Safety and Health, Worker's Compensation Board or other regulatory agency.
- .2 Medical aid injuries.
- .3 Property damage in excess of $ 10,000.00.

.2 Submit reporting in writing.

1.19 Blasting

.1 Blasting or other use of explosives is not permitted on site.

1.20 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 authorised Safety Officer for inspection.

1.21 Posting of Documents

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on Work Site in accordance with Acts and Regulations of Province having jurisdiction.

End of Section

1.1 Related Work

.1 Section 01 74 22 - Construction Demolition Waste Management and Disposal.

.2 Section 31 23 33.01 - Excavating, Trenching and Backfilling

1.2 References

.1 WHMIS: Workplace Hazardous Materials Information System, Health Canada.

.2 Transportation of Dangerous Goods Act. Transport Canada, updated 2008-02-21.

.3 MBCA: Migratory Birds Convention Act, Environment Canada, 1994.

.4 Canadian Coast Guard Regulations, Department of Fisheries and Oceans Canada.

.5 AWPA: American Wood Preserver Association.

1.3 Definitions

.1 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.

.2 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

.3 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.

.4 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.

.5 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.

1.4 Protection of Waterways

.1 Before commencing on-shore activity, install the silt boom and on-shore erosion and sediment control measures.

.2 On-shore environmental control measures, consisting of silt fences and/or straw bales, are to encompass the total on-shore Work area.

1.5 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 Maintain trucks clean and free of mud, dirt and other foreign matter.

.4 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 material and other hazardous materials. Immediately clean any spillage and soils.

.5 Before commencement of work, advise the 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.

1.6 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.

1.7 Petroleum, Oil and Lubricants

.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 metre buffer zone of watercourses and wetlands. Do not fuel or lubricate equipment within this 30 metre 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 contamination of the soil and water (both surface and subsurface) when handling petr oleum 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 over pack 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) at1 -800-565-1633 (24 hour report line). Perform cl ean-up in accordance with all regulations and procedures stipulated by authority having jurisdiction.

1.8 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 22.

.3 Do not dispose of hazardous waste, volatile materials (such as mineral spirits, paints, thinners etc.) and petroleum products into waterways, storm or sanit ary sewers or in waste landfill sites.

.4 Dispose of hazardous waste in accordance with applicable federal and provincial laws, regulations, codes and guidelines.

.5 Any construction, contaminated soil or demolition debris will be disposed of in a provincially approved manner (Either a permit or receipts for tippage must be submitted to the departmental representative to verify that the material was disposed of in a provincially approved manner).

1.9 Vegetation

.1 Work should be scheduled to avoid periods of heavy precipitation. Short-term erosion and sediment control measures (i.e. silt fence, straw bales, temporary matting, geotextile filter fabric) must be installed to prevent runoff from entering any adjacent waterway.

.2 Fill material used in construction must be clean and non-toxic (free from fuel, oil, grease and/or contaminates).

.3 Any exposed soil area must be minimized by limiting the area that is exposed at one time and by limiting the time that any one area is exposed. All stockpiled material must be covered and/or dyked to prevent erosion or silty runoff from leaving the site. Exposed soil should be replanted or sodded to ensure soil stabilization.

.4 Avoid disturbance of vegetation and natural features where possible.

.5 Restore disturbed areas as close as possible to previously existing conditions.

.6 No cutting of vegetation will take place between May 15th and August 31st.

.7 No staging of materials/equipment will take place on any environmentally sensitive areas, beaches or dunes.

1.10 Socioeconomic Restrictions

.1 Abide by municipal and provincial regulations for any restrictions on work performed during the night time and on flood lighting of the site. Obtain applicable permits.

.2 Place flood lights in opposite direction of adjacent residential and business areas.

.3 Equip equipment and machinery with purposely designed mufflers to reduce noise on site to lowest possible level. Maintain mufflers in good operating condition at all times.

.4 Adequate signage and safety measures must be supplied during transportation of materials and equipment to the harbour.

1.11 Water Quality

.1 Control runoff of water containing suspended solids from entering waterways.

.2 Construction material and debris are not allowed to become waterborne.

.3 All temporary falseworks, piles, silt, debris, curtains, etc. are to be removed from the waterway.

.4 No permanent in-water works allowed beyond the limits noted on the drawings.

.5 Maintenance of equipment must be carried out on a regular basis.

.6 The construction material must be clean and non-toxic (free of fuel, oil, grease, and/or any contaminants).

.7 Remove any accidental release of concrete on site prior to solidification.

.8 Ensure concrete trucks are clean and will not release any material during transport to the site.

.9 Do not discharge residual or rejected concrete on site. Do not wash and clean concrete vehicles on site. Carryout all dumping and cleaning operations at the concrete plant according to all provincially approved practices/regulations.

1.12 Bird and Bird Habitat

.1 Become knowledgeable 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 night time 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.

.6 Should nests of migratory birds in wetlands be encountered during work, immediately notify Departmental Representative for directives to be followed.

.1 Do not disturb nest site and neighbouring 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.

1.13 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.

.5 All construction equipment must be fitted with standard and well-maintained noise suppression devices. Construction activities must respect appropriate time restriction and use smaller, less disturbing equipment where possible.

1.14 Fires

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

1.15 Use of Explosives

.1 Blasting or use of explosives is not permitted.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 01 35 29 - Health and Safety Requirements.

1.2 References and Codes

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

2 PRODUCTS

2.1 Not Used

.1 Not Used.

3 EXECUTION

3.1 Not Used

.1 Not Used.

End f Section

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures

.2 Section 03 30 00 - Cast-in-Place Concrete Tracadie Launch Facility

.3 Section 31 00 00.01 - Earthwork - Short Form

.4 Section 31 23 33.01 - Excavating, Trenching and Backfilling

1.2 Inspection

.1 Give timely notice requesting inspection of Work designated for special tests, inspections or approvals by Departmental Representative or by inspection authorities having jurisdiction.

.2 In accordance with the General Conditions, Departmental Representative may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

.3 If Contractor covers or permits to be covered Work designated for special tests, inspections or approvals before such is made, uncover Work until particular inspections or tests have been fully and satisfactorily completed and until such time as Departmental Representative gives permission to proceed.

.4 Pay costs to uncover and make good work disturbed by inspections and tests.

1.3 Testing

.1 Tests on materials, as specified in various sections of the Specifications is the responsibility of PWGSC except where stipulated otherwise.

.2 Unspecified tests may also be made by Departmental Representative, at the discretion of the Departmental Representative. The costs of these tests will be paid for by the Departmental Representative.

.3 Where tests or inspections reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests and inspections incurred by Departmental Representative as required to verify acceptability of corrected work.

1.4 Independent Inspection Agencies

.1 Departmental Representative will engage and pay for service of Independent Inspection and Testing Agencies for purpose of inspecting and testing portions of Work except for the following which remain part of Contractor's responsibilities:

.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 other building systems.

.4 Tests as specified within various sections designated to be carried out by Contractor under the supervision of Departmental Representative.

.2 Provide sufficient advance notice to Departmental Representative of time when the Work will be ready for testing by designated Testing Agency in order for Departmental Representative to make attendance arrangements with such Agency. When directed by Departmental Representative notify the Agency directly.

.3 When specified or directed, submit Representative samples of materials, in required quantities, to Testing Agency for testing purposes. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.4 Provide labour and facilities to obtain, handle and deliver samples.

.5 Provide sufficient space on site for Testing Agency's exclusive use to store equipment and cure test samples.

.6 Employment of Independent Inspection and Testing Agencies by Departmental Representative does not relax responsibility to perform Work in accordance with Contract Documents.

1.5 Access to Work

.1 Facilitate Departmental Representative's access to Work. If part of Work is being fabricated at locations other than construction site, make preparations to allow access to such Work whenever it is in progress.

.2 Furnish labour and facility to provide access to the work being inspected and tested.

.3 Co-operate to facilitate such inspections and tests.

1.6 Rejected Work

.1 Remove and replace defective Work, whether result of poor workmanship, use of defective or damaged products and whether incorporated in Work or not, which has been identified by Departmental Representative as failing to conform to Contract Documents.

.2 Make good damages to new construction and finishes resulting from removal or replacement of defective work.

End of Section

1.1 Site Access and Parking

.1 The Departmental Representative will designate Contractor's access to project site as well as parking facilities for equipment and workers.

.2 The Contractor is advised that while parking facilities for his workers and subcontractors will be on property, such parking facilities may be remote from the actual site of the work. In any case, follow all instructions from the Departmental Representative in regard to parking facilities.

.3 Parking facilities at site are limited and cannot be used by Contractor. Make arrangements elsewhere for Contractor's vehicles including those of subcontractors and workers.

.4 Build and maintain temporary access roads and provide snow removal and dust control during period of work.

.5 Maintain new and 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.

1.2 Contractor's Site Office

.1 Be responsible for and provide own site office, if required, including electricity, heat, lights and telephone. Locate site office as directed by Departmental Representative.

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 Construction Sign and Notices

.1 Upon request by Departmental Representative, erect a self-supporting project sign in location indicated.

.2 Departmental Representative will provide a vinyl sign facing for installation by Contractor on sign framework. Sign frame to be plywood face of approximately 1200 x 2400 mm in size complete with required wood framing at 400 mm o/c and support posts.

.3 Install sign plumb and level in neat wood framework and securely anchor in ground by posts to withstand wind pressure of 160 km/h.

.4 Contractor or subcontractor advertisement signboards are not permitted on site.

.5 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 CAN/CAN3 Z321-96(R2006).

.6 Maintenance and Disposal of Site Signs:

.1 Maintain approved signs and notices in good condition for duration of project and dispose of off-site on completion of project or earlier if directed by Departmental Representative.

1.5 Removal of Temporary Facilities

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

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Section 31 61 13 - Pile Foundations, General Requirements.

1.2 Installation and Removal

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.3 Hoarding

.1 Erect temporary site enclosure using new 1.2 m 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.

.2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 Guard Rails and Barricades

.1 Provide secure, rigid guard rails and barricades around deep excavations.

1.5 Access to Site

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.6 Public Traffic Flow

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.7 Fire Routes

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

1.8 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.

1.9 Protection of Building Finishes

.1 Be responsible for damage incurred due to lack of or improper protection.

1.10 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Not Used

.1 Not Used.

3 EXECUTION

3.1 Not Used

.1 Not Used.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 31 00 00.01 - Earthwork - Short Form

.2 Section 31 09 16.01 - Pile Driving Templates

1.2 Project Cleanliness

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative .

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Dispose of waste materials and debris off site.

.5 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.7 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 Final Cleaning

.1 When Work is Substantially Performed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by Departmental Representative or other Contractors.

.5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of

waste and debris.

1.4 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Not Used

.1 Not Used.

3 EXECUTION

3.1 Not Used

.1 Not Used.

End of Section

1.1 Definitions

.1 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.

1.2 Related Sections

.1 Section 01 35 44 - Environmental Protection Procedures
.2 Section 01 56 00 - Temporary Barriers and Enclosures
.3 Section 01 74 11 - Cleaning
.4 Section 03 20 00 - Concrete Reinforcing
.5 Section 03 30 00 - Cast-in-Place Concrete
.6 Section 05 51 29 - Metal Stairs and Ladders
.7 Section 06 05 73 - Wood Treatment
.8 Section 31 00 00.01 - Earthwork - Short Form
.9 Section 31 09 16.01 - Pile Driving Templates
.10 Section 31 23 33.01 - Excavating, Trenching and Backfilling
.11 Section 31 61 13 - Pile Foundations, General Requirements
.12 Section 31 62 16 - Steel Sheet Piles

1.3 Waste Management

.1 Provide waste management plan. Incorporate environmental and sustainable practices in managing waste resulting from work.

.2 Divert as much waste as possible from landfill.

.3 Coordinate work of subtrades and subcontractors to ensure all possible waste reduction and recycling opportunities are taken. Follow waste management requirements specified in trade sections of the Specifications.

.4 Reduce waste during installation of new materials. Undertake practices which will optimize full use of materials and minimize waste.

.5 Provide on-site facilities to collect, handle and store anticipated quantities of reusable, salvageable and recyclable materials.

.6 Establish methods whereby hazardous and toxic materials, and their containers used on site are

properly handled, stored and disposed in accordance with applicable federal, provincial and municipal laws and regulations.

1.4 Disposal Requirements

.1 Burying or burning of rubbish and waste materials is prohibited.

.2 Disposal of volatile materials, mineral spirits, oil, paint, and other hazardous materials into waterways, storm, or sanitary sewers is prohibited.

.3 Dispose of waste only at approved waste processing facility or landfill sites approved by authority having jurisdiction.

End of Section

1.1 Related Sections

.1 Section 01 78 00 - Closeout Submittals.

1.2 Inspection and Declaration

.1 Contractor's Inspection: 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.

.1 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.

.2 Departmental Representative's Inspection: Accompany Departmental Representative during all substantial and final inspections of the Work.

.1 Address defects, faults and outstanding items of work identified by such inspections.

.2 Advise Departmental Representative when all deficiencies identified have been rectified.

.3 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 Compliance certificates from applicable authorities;

.3 Reports resulting from designated tests;

.4 Correct all discrepancies before Departmental Representative will issue the Certificate of Completion.

End of Section

1.1 Documentation

.1 Project Record Documents.

.2 Operations and Maintenance data.

1.2 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 77 00 - Closeout Procedures

1.3 Project Record Documents

.1 Departmental Representative will provide 2 white print sets of contract drawings and 2 copies of Specifications Manual specifically for "as-built" purposes.

.2 Maintain at site one set of the contract drawings and specifications to record actual as-built site conditions.

.3 Maintain up-to-date, real time as-built drawings and specifications in good condition and make available for inspection by the Departmental Representative upon request.

.4 As-Built Drawings:

.1 Record changes in red ink on the prints. Mark only on one set of prints and at completion of work, neatly transfer notations to second set (also by use of red ink).

.2 Submit both sets to Departmental Representative prior to application for Certificate of Substantial Performance.

.3 Stamp all drawings with "As-Built Drawings". Label and place Contractor's signature and date.

.4 Show all modifications, substitutions and deviations from what is shown on the contract drawings or in specifications.

.5 All change orders issued over the course of the contract must be documented on the finished as-built documents, accurately and consistently depicting the changed condition as it applies to all affected drawing details.

.6 As-built Specifications: legibly mark in red each item to record actual construction, including:

.1 Changes made by Addenda and Change Orders.

.2 Mark up both copies of specifications; stamp "as-built", sign and date similarly to

drawings as per above clause.

.7 Maintain As-built documents current as the contract progresses. Departmental Representative will conduct reviews and inspections of the documents on a regular basis. Failure to maintain as-built drawings current and complete to satisfaction of the Departmental Representative shall be subject to financial penalties in the form of progress payment reductions and holdback assessments.

1.4 Reviewed Shop Drawings

.1 Provide a complete set of all shop drawings reviewed for project.

End of Section

1 GENERAL

1.1 Related Sections

.1 Section 03 30 00 - Cast-In-Place Concrete.

.2 Section 03 41 00 - Precast Structural Concrete.

1.2 References

.1 Canadian Standards Association (CS A International)

.1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-O86S1-05, Supplement #1 to CSA-O86-14 Engineering Design in Wood.

.3 CSA O121-08(R2013), Do uglas Fir Plywood.

.4 CSA O151-09(R2014), Canadian Softwood Plywood.

.5 CSA O153-13, Poplar Plywood.

.6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.

.7 CSA O437 SERIES-93(R2011), Standards for OSB and Waferboard.

.8 CAN/CSA S269.3-M92(R2013) , Concrete Formwork, National Standard of Canada

1.3 Submittals

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

.2 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts.

1.4 Delivery, Storage and Handling

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Materials

.1 Formwork materials:

.1 Use wood and wood product formwork materials to CSA-O121 and CSA-O86-14.

.2 Tubular column forms: round, spirally wound laminated fibre forms steel, internally treated with release material.

.1 Spiral pattern to show not to show in hardened concrete.

.3 Form release agent: non-toxic, biodegradable and low VOC.

.4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable and low VOC, free of kerosene.

.5 Falsework materials: to CSA-S269.1-1975(R2003).

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 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1-1975(R2003) and COFI Exterior Plywood for Concrete Formwork.

.5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

.6 Do not place shores and mud sills on frozen ground.

.7 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.8 Fabricate and erect formwork in accordance with CAN/CSA-S269.3-M92(R2013) to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1-14/A23.2-14.

.9 Align form joints and make watertight.

.1 Keep form joints to minimum.

.10 Locate horizontal form joints for exposed columns 2400 mm above finished floor elevation.

.11 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.12 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

3.2 Removal and Reshoring

.1 Leave formwork in place for a minimum period of three(3) days after placing concrete.

.2 Remove formwork when concrete has reached 50% of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 03 41 00 - Precast Structural Concrete.

1.2 Price and Payment Procedures

.1 Measurement and Payment:

.1 No measurement will be made under this Section.

.1 Include reinforcement costs in items of concrete work in Section 03 30 00 - Cast-In-Place Concrete.

1.3 References

.1 American Concrete Institute (ACI)

.1 SP-66-04, ACI Detailing Manual 2004.

.2 CSA International

.1 CSA-A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CSA-A23.3-14, Design of Concrete Structures.

.3 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel, Includes Update No.1 (2014).

.4 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CSA W186-M1990(R2012), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.3 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.4 Action and Informational Submittals

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

.2 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Prince Edward Island, Canada.

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by 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.

.2 Detail lap lengths and bar development lengths to CSA-A23.3-14, unless otherwise indicated.

.1 Provide type A tension lap splices unless otherwise indicated.

1.5 Delivery, Storage and Handling

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

2 PRODUCTS

2.1 Materials

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18-09(R2014), unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18-09(R2014).

.4 Chairs, bolsters, bar supports, spacers: to CSA-A23.1-14/A23.2-14.

2.2 Fabrication

.1 Fabricate reinforcing steel in accordance with CSA-A23.1-14/A23.2-14, ACI 318M-14 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

.2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186-M1990 (R2012).

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

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.

3 EXECUTION

3.1 Field Bending

.1 Do not field bend or field weld reinforcement except where indicated on shop drawings.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.2 Placing Reinforcement

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1-14/A23.2-14.

.2 Ensure cover to reinforcement is maintained during concrete pour.

3.3 Cleaning

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 03 10 00 - Concrete Forming and Accessories.

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 41 00 - Precast Structural Concrete.

1.2 Price and Payment Procedures

.1 Measurement and Payment:

.1 Measurement Procedures: in accordance with Section 01 29 00 - Payment Procedures.

.2 Measure cast-in-place concrete in sub-structure in cubic metres calculated from neat dimensions as indicated authorized in writing by Departmental Representative.

.1 Concrete placed beyond dimensions indicated will not be measured.

.3 No deductions will be made for volume of concrete displaced by reinforcing steel, structural steel, or piles.

.4 No deductions will be made for volume of concrete less than 0.1 m^3 in cross sectional area displaced by individual drainage openings.

.5 Heating of water and aggregates and providing cold weather protection will not be measured but considered incidental to work.

.6 Cooling of concrete and providing hot weather protection will not be measured but considered incidental to work.

.7 Supply and installation of anchor bolts, nuts and washers and bolt grouting will not be measured but considered incidental to work.

1.3 References

.1 Reference Standards:

.1 ASTM International

.1 ASTM C 309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.2 ASTM C494/C494M-13, Standard Specification for Chemical Admixtures for Concrete.

.2 CSA International

.1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06(R2011), Qualification Code for Concrete Testing Laboratories.

1.4 Action and Informational Submittals

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

.2 At least 4 weeks prior to beginning Work, provide Departmental Representative with samples of materials proposed for use as follows:

.1 5 L of curing compound.

.2 1 m length of each type of joint filler.

.3 1 m length of each type of waterstops.

.4 3 kg of each type of supplementary cementing material.

.5 10 kg of each type of blended hydraulic cement.

.6 5 L of each admixture.

.7 25 kg of each fine and coarse aggregate.

1.5 Delivery, Storage and Handling

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1-14/A23.2-14.

.2 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Materials

.1 Cement: to CSA A3000-13, Type GU HS.

.1 Reduction in cement from Base Mix to Actual Supplementary Cementing Materials (SCMs) Mix, as percentage.

.2 Water: to CSA A23.1-94.

.3 Aggregates: to CSA A23.1-14/A23.2-14.

.4 Admixtures:

.1 Air entraining admixture: to ASTM C 260/C 260M-1a.

.2 Chemical admixture: to ASTM C 494/C 494M-13, ASTM C1017/C1017M-13. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.5 Curing compound: to CSA A23.1-14/A23.2-14 and ASTM C 309-11, Type 1, Class B, water based.

.6 Weep hole tubes: plastic.

.7 Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

2.2 Mixes

.1 Proportion normal density concrete in accordance with CSA-A23.1-94.

.1 Cement:

.1 Type 10 Portland cement.

.2 Type GU blended hydraulic cement.

.2 Minimum comprehensive strength at 28 days: 35MPa.

.3 Class of exposure: C1.

.4 Nominal size of coarse aggregate: 20 mm.

.5 Slump at time and point of discharge: 60 to 100 mm.

.6 Air content: 5 to 8 percent.

.7 Chemical admixtures: following admixtures in accordance with ASTM C494/C 494M-13.

.8 Air-dry density: 2400 to 2500 kg/m3.

3 EXECUTION

3.1 Preparation

.1 Obtain Departmental Representative's written approval before placing concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Ensure reinforcement and inserts are not disturbed during concrete placement.

.5 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.

.6 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.7 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 Installation / Application

.1 Do cast-in-place concrete work to CSA A23.1-14/A23.2-14.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by Departmental Representative.

.2 Confirm locations and sizes of sleeves and openings shown on drawings.

.3 Anchor bolts:

.1 Grout anchor bolts in preformed holes or holes drilled after concrete has set.

.1 Formed holes: 100 mm minimum diameter.

.2 Drilled holes: 25 mm minimum diameter larger than bolts used.

.2 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.3 Set bolts and fill holes with epoxy grout.

.4 Drainage holes and weep holes:

.1 Install weep hole tubes and drains as indicated.

.5 Finishing and curing:

.1 Provide float finish unless otherwise indicated.

.2 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.6 Toppings:

.1 Apply latex bonding agent to base course to CSA A23.1-14/A23.2-14.

.2 Place bonded topping to CSA A23.1-14/A23.2-14 and topping manufacturer's recommendations. and topping manufacturer's recommendations.

.3 Follow instructions by Departmental Representative in case conflicting requirements arise

between CSA-A23.1-94 and manufacturer's recommendations.

3.3 Surface Tolerance

.1 Concrete tolerance to CSA A23.1-94 Straightedge Method.

3.4 Field Quality Control

.1 Site tests: PWGSC will conduct tests as follows in accordance with Section 01 45 00 - Quality Control.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1-14/A23.2-14 and Section 01 45 00 - Testing and Quality.

.3 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.4 Non-Destructive Methods for Testing Concrete: to CSA A23.1-14/A23.2-14.

.5 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

End of Section

1 GENERAL

1.1 Related Sections

.1 Section 03 10 00 - Concrete Forming.

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 30 00 - Cast-in-Place Concrete.

1.2 Measurement Procedures

.1 Measurement of precast elements in cubic metres (m ü) of total units supplied, delivered, stored and erected.

.2 Precast elements measured as individual units, will include cost, supply, delivery, storage and erection of bearing assemblies anchor bolts removal and patching of erection devices transverse connections and field grouting of grout keys between precast members.

1.3 References

.1 Canadian Standards Association (CSA International)

.1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-A23.3-14, Design of Concrete Structures.

.3 CSA-A23.4-09(R2014), Precast Concrete - Materials and Construction.

1.4 Design Requirements

.1 Design precast elements to CSA-A23.3-14 and CSA-A23.4-09(R2014) to carry handling stresses.

.2 Design precast elements to carry loads specified by Departmental Representative as indicated in accordance with applicable codes.

1.5 Performance Requirements

.1 Tolerance of precast elements to CSA-A23.4-09(R2014).

.2 Length of precast elements not to vary from design length by more than plus or minus 5 mm.

1.6 Action and Informal Submittals

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

.2 Submit shop drawings and include following items:

.1 Openings, sleeves, inserts and related reinforcement.

1.7 Delivery, Storage and Handling

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section01 74 22 - Construction/Demolition Waste Management and Disposal.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

.3 Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

2 PRODUCTS

2.1 Materials

.1 Cement, aggregates, water, admixtures: to CSA-A23.1-14/A23.2-14 and CSA-A23.4-09(R2014).

.2 Reinforcing steel: to CSA-G30.18-09(R2014).

.3 Hardware and miscellaneous materials: to CSA-A23.1-14/A23.2-14.

.4 Forms: to CSA-A23.4-09(R2014).

.5 Anchors and supports: to CSA G40.20-13/G40.21-13 Type 300 W galvanized.

.6 Welding materials: to CSA-W48-14.

.7 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m^2 to CAN/CSA G164-M92(R2003).

2.2 Mixes

.1 Proportion normal density concrete in accordance with CSA-A23.1-14/A23.2-14.

.1 Type 10 Portland cement.

.2 Type GU blended hydraulic cement.

.2 Minimum comprehensive strength at 28 days: 35MPa.

.3 Class of exposure: C1.

.4 Nominal size of coarse aggregate: 20 mm.

.5 Slump at time and point of discharge: 60 to 100 mm.

.6 Air content: 5 to 8 percent.

.7 Chemical admixtures: following admixtures in accordance with ASTM C494/C494-13.

.8 Air-dry density: 2400 to 2500 kg/m^3.

2.3 Manufactured Units

.1 Manufacture units in accordance with CSA-A23.4-09(R2014) .

.2 Mark each precast unit to correspond to identification mark on shop drawings for location with date cast on part of unit not be exposed.

.3 Provide hardware suitable for handling elements.

3 EXECUTION

3.1 Field Measurements

.1 Undertake field measurements to confirm dimensions of precast elements prior to fabrication.

3.2 Erection

.1 Do precast concrete work in accordance with CSA-A23.4-09(R2014),CSA -A23.3-14 and CAN/CSA S6-14.

.2 Do welding in accordance with CSA W59-13, for welding to steel structures and CSA W186-M1990(R2012), for welding of reinforcement.

3.3 Cleaning

.1 Use cleaning methods as reviewed by Departmental Representative before cleaning soiled precast concrete surfaces.

End of Section

1 GENERAL

1.1 Related Sections

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 22 - Construction/Demolition Waste Management And Disposal.

1.2 References

.1 Canadian General Standards Board (CGSB)

.1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel, Includes Updates No. 1 (2014).

.2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 Canadian Standards Association (CSA International)

.1 CSA W59-13, Welded Steel Construction (Metal Arc Welding/Imperial Version).

1.3 Action and Informal Submittals

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

.2 Shop Drawings

.1 Indicate construction details, sizes of steel sections and thickness of steel sheet.

1.4 Delivery, Storage and Handling

.1 Storage and Handling Requirements:

.1 Store matrials off ground in dry location.

.2 Store and protect ladders from nicks, scratches and blemishes.

.3 Replace defective or damaged materials.

2 PRODUCTS

2.1 Materials

.1 Steel sections: to CSA-G40.20-13/G40.21-13 Grade 300 W.

.2 Steel plate: to CSA-G40.20-13/G40.21-13, Grade 60 W , Grade 60 W

.3 Steel pipe: to ASTM A53/A53M-12, standard weight, schedule 40 seamless black.

.4 Welding materials: to CSA W59-13.

.5 Bolts: to ASTM A307-14.

2.2 Fabrication

.1 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.2 Grind or file exposed welds and steel sections smooth.

.3 Shop fabricate ladders in sections as large and complete as practicable.

2.3 Finishes

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/mý to CAN/CSA-G164M92(R2003).

3 EXECUTION

3.1 Installation of Ladders

.1 Install plumb and true in exact locations, using welded connections wherever possible to provide rigid structure. Provide anchor bolts, bolts and plates for connecting stairs to structure.

.2 Do welding work in accordance with CSA W59-13 unless specified otherwise.

.3 Touch up shop primer to bolts, welds, and burned or scratched surfaces at completion of erection.

3.2 Cleaning

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

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

3.3 Protection

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

.2 Repair damage to adjacent materials caused by metal stairs and ladders installation.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

1.2 References

.1 American Wood-Preservers' Association (AWPA)

.1 AWPA M2-15, Standard for Inspection of Treated Wood Products.

.2 AWPA M4-15, Standard for the Care of Preservative-Treated Wood Products.

.2 Canadian Standards Association (CSA International)

.1 CSA O80 SERIES-08(R2012) - O80S2-05, Wood Preservation and fire-retardant treatment of lumber by pressure processes.

.2 CSA O322-02(R2012), Procedure for Certification of Pressure -Treated Wood Materials for Use in Preserved Wood Foundations.

1.3 Action and Informational Submittals

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

.2 Quality assurance submittals:

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

1.4 Delivery, Storage, and Handling

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Materials

.1 Preservative: to CSA-O80 SERIES-08(R2012), chro mate copper arsenate (CCA) treatment.

3 EXECUTION

3.1 Application: Preservative

.1 Treat to CSA-O80 SERIES-08(R2012) . Preservative to obtain minimum net retention of 6.4 kg/m^3 of wood and 10 mm penetration.

3.2 Application: Field Treatment

.1 Comply with AWPA M4 and revisions specified in CSA-O80 SERIES-08(R2012), Supplementary Requirements to AWPA M2-15.

.2 Remove chemical deposits on treated wood to receive applied finish.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 References

.1 ASTM International

.1 ASTM D 698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft -lbf/ft^3 (600kN -m/m^3)).

.2 CSA International

.1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CSA A3000-13, Cementitious Materials Compendium.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 Administrative Requirements

.1 Co-ordination: arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work.

.1 Pay costs of relocating services.

1.4 Action and Informational Submittals

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

.1 Temporary lateral support details and construction sequence for steel sheet piles walls prior to placement of precast base slabs and backfilling.

.2 Samples: submit to designated testing agency, 23 kg sample of backfill for unshrinkable fill material proposed for use, no later than 1 week before backfilling or filling work.

.3 Site Quality Control Submittals: submit in accordance with Section 01 45 00 - Quality Control.

.1 Submit condition survey of existing conditions as described in Existing Conditions article.

.2 Submit testing and inspection results report as described in Part 3 - Field Quality Control.

2 PRODUCTS

2.1 Not Used

.1 Not Used

3 EXECUTION

3.1 Examination

.1 Evaluation and Assessment:

.1 Examine soil report.

.2 Before commencing work verify locations of buried services on and adjacent to site.

3.2 Preparation

.1 Temporary erosion and sedimentation control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.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.

.2 Protection of in-place conditions:

.1 Protect excavations from freezing.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.3 Excavation

.1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial regulations.

.2 Excavate as required to carry out work.

.1 Do not disturb soil or rock below bearing surfaces.

.2 Notify Departmental Representative when excavations are complete.

.3 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work.

.4 Excavation taken below depths shown without Departmental Representative's written authorization to be filled with concrete of same strength as for footings at Contractor's expense.

.3 Excavate trenches to provide uniform continuous bearing and support for 150 mm thickness of pipe bedding material on solid and undisturbed ground.

.4 Excavate for slabs and paving to subgrade levels.

.1 In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.4 Field Quality Control

.1 Testing of materials and compaction of backfill and unshrinkable fill will be carried out by testing laboratory designated by Departmental Representative.

.2 Not later than 1 week minimum before backfilling or filling, submit to designated testing agency, samples of backfill as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.3 Do not begin backfilling or filling operations until material has been approved for use by Departmental Representative.

.4 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative to allow compaction tests to be carried out by designated testing agency.

3.5 Backfilling

.1 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.2 Lateral support: maintain even lateral support as steel sheet pile walls as work progresses, to

neutralise earth pressures.

.3 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as fill in fill excavated areas with selected subgrade material compacted as specified for fill.

.4 Placing:

.1 Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.

.2 Place unshrinkable fill in areas as indicated: consolidate and level unshrinkable fill with internal vibrators.

.5 Compaction: compact each layer of material to following densities for material to ASTM D 698-12e2:

.1 To underside of base courses: 95%.

.2 Base courses: 100%.

.3 Elsewhere: 90%.

.6 Against steel sheet pile walls: excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

3.6 Grading

.1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by Departmental Representative.

.1 Grade to be gradual between finished spot elevations shown on drawings.

3.7 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Dispose of cleared and grubbed material off site daily.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling and organics in accordance with Section 01 74 22 – Construction / Demolition Waste Management and Disposal.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 31 62 16 - Steel Sheet Piles

1.2 Measurement Procedures

.1 No measurement will be made under this section. Include costs in items of Work that require templates.

1.3 System Description

.1 Design Requirements: design templates to safely withstand following loads:
- .1 Gravity loads to which template are subjected.
- .2 Maximum lateral thrust of applied loads at top chord of batter pile guides.
- .3 Lateral loads to firmly hold pile in position when driving.

1.4 Action and Informational Submittals

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

.2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.
- .1 Include product characteristics, performance criteria, and limitations.

.3 Submit shop drawings and indicate following items:
- .1 Material.
- .2 Anchorage, field control and alignment methods.
- .3 Design parameters.
- .4 Tolerance for driving pile.
- .5 Removable members.

1.5 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

.2 Dispose of unused paint or coating material at official hazardous material collections site as approved by Departmental Representative.

.3 Do not dispose of unused paint or coating material into sewer system, into streams, lakes, onto

ground or in other location where it will pose health or environmental hazard.

2 PRODUCTS

2.1 Materials

.1 Steel sections and plates: to CSA-G40.20-13/G40.21-13, Type 300W.

.2 Welding materials: to CSA W48-14, CSA W59-13.

.3 Bolts, nuts and washers: to ASTM A 307-14

2.2 Fabrication

.1 Fabricate structural steel for templates: to CSA-S16-14 and reviewed shop drawings.

.2 Welding: to CSA W59-13.

3 EXECUTION

3.1 Positioning

.1 Position and hold template in location to receive piles.

.1 Ensure pile positions are within tolerances specified.

.2 Before driving batter piles set templates to within 10 mm of elevations as indicated.

.3 Secure templates to vertical piles in accordance with shop drawings before batter piles are placed.

3.2 Placing Batter Piles

.1 Remove members in templates as necessary to place batter piles.

.1 Replace members prior to placing other batter piles or driving of batter piles.

.2 Indicate members to be removed for this operation on shop drawings.

.3 Mark them "Removable".

3.3 Removal Of Templates

.1 Avoid damage to piling when removing templates.

.2 When instructed by Departmental Representative, remove templates from Project site.

3.4 Cleaning

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

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

3.5 Protection

.1 Protect templates from damage.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 31 00 00.01 - Earthwork - Short Form

.2 Section 31 62 16 - Steel Sheet Piles

1.2 Measurement Procedures

.1 Excavated materials will be measured in cubic metres in their original location.

.1 Common excavation quantities measured will be actual volume removed within following limits:

.1 Width for trench excavation as indicated.

.2 Width for excavation for structures as indicated.

.3 Depth from ground elevation immediately prior to excavation, to elevation as indicated by Departmental Representative.

.2 Rock quantities measured will be actual volume removed within following limits:

.1 Width for trench excavation as indicated.

.2 Width for excavation for structures to be bounded by vertical planes up to 500 mm outside of and parallel to neat lines of footings as indicated.

.3 Depth from rock surface elevations immediately prior to excavation, to elevation as indicated.

.4 Where design elevation is less than 300 mm below original rock surface, depth will be considered to be 300 mm below original rock surface.

.5 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.

.2 Sheeting and bracing left in place on direction of Departmental Representative will be measured in square metres of surface area of plane surface of sheeting.

.3 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.

.4 Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.

.5 Placing and spreading of topsoil will be measured for payment in cubic metres calculated from cross sections taken in area of excavation from original location.

.1 If double handling of topsoil is directed by Departmental Representative (stockpiling and

later placing), then quantities will be measured twice; on excav ation from original location and on excavation from stockpile.

1.3 References

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C 117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C 136/C 136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D 422-63(2007)E2, Standard Test Method for Particle -Size Analysis of Soils.
- .4 ASTM D 698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft -lbf/ft ü) (600 kN -m/m ü)).
- .5 ASTM D 4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 U.S. Environmental Protection Agency (EPA)/Of fice of Water

- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 Definitions

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

- .1 Rock : solid material in excess of 1.00 m ü and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 mü bucket. Frozen material not classified as rock.
- .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil:

- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 mm in any dimension.

.4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.7 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318-10e1.

1.5 Action and Informational Submittals

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

.1 Temporary support details and sequesnce of backfill procedures.

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit for review by Departmental Representative proposed dewatering methods as described in PART 3 of this Section.

.3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.4 Submit to Departmental Representative written notice when bottom of excavation is reached.

.5 Submit to Departmental Representative testing inspection results and report as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field.

.4 Samples:

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

.2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of unshrinkable fill materials and provide access for sampling.

1.6 Quality Assurance

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit design and supporting data at least 2 weeks prior to beginning Work.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Prince Edward Island, Canada.

.4 Keep design and supporting data on site.

.5 Engage services of qualified professional Engineer who is registered or licensed in Province of Prince Edward Island, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.6 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.

.7 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.7 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

.2 Divert excess aggregate materials from landfill to local quarry facility for reuse as directed by Departmental Representative.

1.8 Existing Conditions

.1 Examine soil report.

.2 Buried services:

.1 Before commencing work verify location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable Departmental Representative and authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing. Costs for such Work to be paid by Departmental Representative.

.9 Record location of maintained, re-routed and abandoned underground lines.

.10 Confirm locations of recent excavations adjacent to area of excavation.

2 PRODUCTS

2.1 Not Used

.1 Not Used

3 EXECUTION

3.1 Temporary Erosion and Sedimentation Control

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

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

3.2 Site Preparation

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

3.3 Preparation/ Protection

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 Stockpiling

.1 Stockpile fill materials in areas designated by Departmental Representative.

.1 Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 Cofferdams, Shoring, Bracing and Underpinning

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29 - Health and Safety Requirements Health and Safety Act for the Province of Prince Edward Island

.1 Where conditions are unstable, Departmental Representative to verify and advise methods.

.2 Obtain permit from authority having jurisdiction for temporary diversion of water course.

.3 Construct temporary Works to depths, heights and locations as indicated or directed by

Departmental Representative.

.4 During backfill operation:

.1 Unless otherwise indicated or directed by Departmental Representative, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.

.5 When sheeting is required to remain in place, cut off tops at elevations as indicated.

.6 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site and restore watercourses as directed by Departmental Representative .

3.6 Dewatering and Heave Prevention

.1 Keep excavations free of water while Work is in progress.

.2 Provide for Departmental Representative review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 44 - Environmental Procedures to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

.6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.7 Excavation

.1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Excavation must not interfere with bearing capacity of adjacent foundations.

.4 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.5 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.6 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative .

.7 Restrict vehicle operations directly adjacent to open trenches.

.8 Dispose of surplus and unsuitable excavated material in approved location on site.

.9 Do not obstruct flow of surface drainage or natural watercourses.

.10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.11 Notify Departmental Representative when bottom of excavation is reached.

.12 Obtain Departmental Representative approval of completed excavation.

.13 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.14 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings with Class A granular fill compacted to not less than 100% of corrected Standard Proctor maximum dry density.

.2 Fill under other areas with Class A granular fill compacted to not less than 95 % of corrected Standard Proctor fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.

.15 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density of undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

3.8 Backfilling

.1 Do not proceed with backfilling operations until completion of following:

.1 Departmental Representative has inspected and approved installations.

.2 Departmental Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations:

.1 Place bedding and surround material as specified.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.

.4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Departmental Representative, or:

.2 Erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Departmental Representative.

.6 Place fill in areas as indicated.

.7 Consolidate and level unshrinkable fill with internal vibrators.

3.9 Restoration

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 22 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative

.2 Reinstate lawns to elevation which existed before excavation.

.3 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.4 Clean and reinstate areas affected by Work as directed by Departmental Representative.

.5 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 01 74 22 - Construction Demolition Waste Management and Disposal.

.2 Section 31 62 16 - Steel Sheet Piles.

1.2 Action and Informational Submittals

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

.2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.

.3 Sub-surface investigation report: when site conditions differ from those indicated, submit written notification to Departmental Representative and await further instructions.

.4 Submit schedule of planned sequence of driving to Departmental Representative for review, as specified.

.5 Equipment:

.1 Submit prior to pile installation for review by Departmental Representative, list and details of equipment for use in installation of piles.

.2 Impact hammers: submit manufacturer's written data as specified.

.3 Non-impact methods; submit characteristics to evaluate performance.

1.3 Delivery, Storage and Handling

.1 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.

.2 Replace damaged piles as directed by Departmental Representative.

1.4 Waste Management and Disposal

.1 Separate waste materials for recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

1.5 Existing Conditions

.1 Sub-surface investigation report is bound into specification.

.2 Notify Departmental Representative in writing if subsurface conditions at site differ from those

indicated and await further instructions from Departmental Representative.

1.6 Scheduling

.1 Provide schedule of planned sequence of driving to Departmental Representative for review, not less than two weeks prior to commencement of pile driving.

2 PRODUCTS

2.1 Materials

.1 Supply or fabricate full length piles as indicated and provide equipment to handle full length piles without cutting and splicing.

.2 Do not splice piles.

2.2 Equipment

.1 Prior to pile installation, submit to Departmental Representative details of equipment for installation of piles.

.1 Impact hammers: provide manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.

.2 Hammer:

.1 Hammers to be selected on basis of driveability analysis using wave equation theory, performed to show that piles can be driven to levels indicated.

.2 Driveability analysis to include, but not be limited to, following: hammer, cushion, and cap block details; static soil parameters; quake and damping factors, total soil resistance, blow count, pile stresses and energy throughput at representative penetrations.

.3 When required criteria cannot be achieved with the proposed hammer, use larger hammer and take other measures as required.

3 EXECUTION

3.1 Preparation

.1 Protection:

.1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.

.2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.

.3 When damages occur, remedy damaged items to restore to original or better condition at own expense.

.2 Ensure that ground conditions at pile locations are adequate to support pile driving operation and load testing operation.

.1 Make provision for access and support of piling equipment during performance of Work.

.3 Drive piles only when excavation has been completed.

.4 Drive piles within embankments only when embankment has been placed and compacted to at least bottom elevation of pile cap.

.5 Pre-boring of holes may be acceptable to facilitate pile alignment control.

3.2 Installation

.1 Leads: construct pile driver leads to provide free movement of hammer.

.1 Hold fixed leads in position at top and bottom, with guys, stiff braces, or other means approved reviewed by Departmental Representative to ensure support to pile while being driven.

.2 Fixed inclined leads to be used for battered piles.

.3 Length: except for piles driven through water, provide sufficient length of leads to ensure that use of follower is unnecessary.

.4 Swing leads:

.1 Swing or fixed leads are required to ensure the proper alignment of the hamper pile system.

.2 Obtain approval from Departmental Representative prior to using swing leads.

.3 Firmly guy top and bottom to hold pile in position during driving operation.

.4 Method to be approved by Departmental Representative prior to installation.

.5 The crane to be capable of handling the load from the pile driving equipment with sufficient capacity that the reach of the crane does not limit the installation process.

.6 The leads and hammer are to be held by separate crane lines. Pile support by backhoe or excavator is not permitted.

.2 Installation of each pile will be subject to approval of Departmental Representative.

.1 Departmental Representative will be sole judge of acceptability of each pile with respect to final driving resistance, depth of penetration or other criteria used to determine load capacity.

.3 Drive each pile to practical refusal in bedrock.

.1 Do not overdrive to cause damage to piles in bedrock.

.2 Departmental Representative will determine refusal criteria for piles driven to rock based on type of pile and driving equipment.

3.3 Application / Driving

.1 Use driving caps and cushions to protect piles.

.1 Reinforce pile heads as required by Departmental Representative.

.2 Piles with damaged heads as determined by Departmental Representative will be rejected.

.2 Hold piles securely and accurately in position while driving.

.3 Deliver hammer blows along axis of pile.

.4 Restrike already driven piles lifted during driving of adjacent piles to assure set.

.5 Remove loose and displaced material from around piles after completion of driving, and leave clean, solid surfaces to receive foundation concrete.

.6 Cut off piles neatly and squarely at elevations as indicated.

.1 Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.

.7 Remove cut-off lengths from site on completion of work.

3.4 Driving Tolerances

.1 Pile heads to be within 125 mm of locations as indicated.

.2 Piles not to be more than 1.0% of length out of vertical alignment.

3.5 Obstructions

.1 Where obstruction is encountered that causes sudden unexpected change in penetration resistance or deviation from specified tolerances, proceed as directed by Departmental

Representative.

3.6 Repair and Restoration

.1 Pull out rejected piles and replace with new piles.

.2 Remove rejected pile and replace with new, and if necessary, longer pile.

.3 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

3.7 Field Quality Control

.1 Pile Driving Analyzer:

.1 Use Pile Driving Analyzer and Wave Equation Analysis to determine and confirm driving criteria such as hammer size and variation in impact, suitability of driving cap and cushions and penetration resistance at the start of pile placement.

.2 Make allowance for probable interruption in driving for:

.1 Changing/modifying hammer, cap, cushions, or other equipment;

.2 Replacing/adjusting of transducers and accelerometers;

.3 Assessing of monitored results.

.3 Replace/adjust hammer and modify cap, cushions, and other equipment, as directed by Departmental Representative.

.4 Confirm that final set has been achieved, when instructed by restriking instrumented piles 3 days after determination of penetration resistance for initial set.

.5 Measurement:

.1 Maintain accurate records of driving for each pile, including:

.1 Type and make of hammer, stroke or related energy.

.2 Other driving equipment including water jet, driving cap, cushion.

.3 Pile size and length, location of pile in pile group, location or designation of pile group.

.4 Sequence of driving piles in group.

.5 Number of blows per metre for entire length of pile.

.6 Final tip and cut-off elevations.

.7 Other pertinent information such as interruption of continuous driving, pile

damage.

.8 Record elevation taken on adjacent piles before and after driving of each pile.

.2 All measurements, observations and calculations associated with pile driving analyzer and wave equation analysis.

.3 Provide Departmental Representative with three copies of records.

End of Section

1 GENERAL

1.1 Related Requirements

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 22 - Construction Demolition Waste Management and Disposal

.3 Section 31 09 16.01 - Pile Driving Templates

.4 Section 31 23 33.01 - Excavating, Trenching and Backfilling

.5 Section 31 61 13 - Pile Foundations, General Requirements

1.2 Measurement Procedures

.1 Measure supply of steel sheet piling in tonnes of piling authorized by Departmental Representative and delivered to site. No measurement for payment will be made for any amount of steel sheet piling brought to the site in excess of the supply amount indicated. Over-length supplied made necessary by market availability of steel sheet piling, or as required for particular site condition or desired work method must be accounted for within the indicated maximum supply length.

.2 Measure installation of sheet piling in square metres of piling remaining in place after cut-off.

.1 Piling will be measured in plane of bulkhead, calculated by multiplying straight horizontal centre line length of bulkhead measured at top of piles by average vertical length of piles installed and left in work.

.3 Measure tie rods, nuts, sleeve nuts, turnbuckles, pipe sleeves, bearing plates, washers, transfer bolts, steel wales and other associated hardware supplied and incorporated in Work, as indicated, in kilograms.

.4 Pile toe reinforcement, pile shoes and pile caps will not be measured separately.

.5 Mobilization and de-mobilization of equipment for installation of steel sheet piling will not be measured for payment.

1.3 References

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM A 6/A 6M-14, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.

.2 ASTM A 307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.

.3 ASTM A 615/A 615M-15A, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

.4 ASTM A 1011/A 1011M-14, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

.2 Canadian Standards Association (CSA International).

.1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA W47.1-09(R2014), Certification of Companies for Fusion Welding of Steel Structures.

1.4 Action and Informational Submittals

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

.2 Submit shop drawings for following items:

.1 The steel sheet pile assembly includes wale, tie rods, transfer bolts and plates.

1.5 Quality Assurance

.1 Inspection and testing of steel sheet piling material will be carried out by testing laboratory designated by Departmental Representative.

.2 Materials inspected or tested by Departmental Representative which fail to meet contract requirements will be rejected.

.3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, Contractor to pay costs for additional tests or inspections. Departmental Representative to approve corrected work.

1.6 Delivery, Storage and Handling

.1 Use slings for lifting piling so that mass is evenly distributed and piling is not subjected to excessive bending stresses.

.2 Store sheet piling on level ground or provide supports so that sheet piling is level when stored.

.1 Provide blocking at spacing not exceeding 5 m so that there is no excessive sagging in piling.

.2 Overhang at ends not to exceed 0.5 m.

.3 Block between lifts directly above blocking in lower lift.

.3 If material is stock-piled on structure, ensure that structure is not overloaded.

1.7 Waste Management and Disposal

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.1 Materials

.1 Steel sheet piles: to CSA g40.20-13/G40.21-13, including chemical and mechanical requirements grade 350W, and following:

.2 Continuous interlocking Z trough section:

.1 Minimum effective section modulus of 2,600 cm^3 per metre of wall.

.2 Minimum flange thickness of 12 mm.

.3 Minimum web thickness of 12 mm.

.3 Sheet piling: section modulus of 2,600 cm^3 /m or equivalent as approved by Departmental Representative.

.1 Minimum thickness of any portion Web Flange of 12.0 mm.

.2 Special corners: provide fabricated special corners as specified by manufacturer for type of sheet piling supplied.

.3 Mark each piece of sheet piling legibly by stenciling or die-and-stamping with following information.

.1 Heat Number.

.2 Manufacturer's Name.

.3 Length and Section Number.

.4 Do not precut lifting or slinging holes in sheet piles.

.4 Structural steel for wales, bearing plates, wales splices, capping channels, support angles and miscellaneous steel: to CSA G40.20-13/G40.21-13, Grade 300W.

.5 Tie rods, sleeve nuts and turnbuckles:

.1 Tie rods: to ASTM A 615/A 615M-15A, Grade 400W. , Grade 400W.

.2 Tie rods: to continuously threaded bar with single double corrosion protection.

.3 Sleeve nuts, and connector sleeves: to have service load capacity in excess of capacity of tie rod.

.4 Preassemble, mark and test tie rod assemblies in shop. Align threaded connection to following tolerances at sleeve nut or connector sleeve: 1/80 of normal rod diameter, deviation of centre line, 1 in 160.

.6 Nuts and bolts: hexagon nuts, bolts, and washers: to ASTM A 307-14.

.7 Backfill material: to Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3 EXECUTION

3.1 Installation

.1 Do welding in accordance with CSA W59-13 and CSA W59S1-M1989(R1998), except where specified otherwise.

.2 Do pile installation Work in accordance with Section 31 61 13 - Pile Foundations, General Requirements except where otherwise specified.

.3 Submit full details of method and sequence of installation of piling to Departmental Representative for approval prior to start of pile installation work. Details must include templates, bracing, setting and driving sequence and number of piles in panels for driving.

.4 When installing sheet piles in bulkhead wall, use following procedure:

.1 Provide temporary templates or bracing to hold piles in alignment during setting and driving.

.2 Drive piles two at a time. Drive first double pile to full depth, then place panel of five to eight double sheet piles in templates and secure last (end) double pile in location to prevent spreading of piles in panel.

.3 Drive end double pile in panel sufficiently deep into ground to ensure that it will remain plumb, then, drive remaining double piles in panel to full depth beginning with double pile next to end double pile and finishing with double pile next to double pile first driven.

.4 After one panel has been driven, place and drive succeeding panels in similar manner. Complete the driving of end double pile of first panel after double piles of second panel have been driven.

.5 When installation is complete, face of wall at top of sheet piles to be within 75 mm of location as indicated and deviation from vertical not to exceed 1 in 100.

3.2 Obstructions

.1 If obstruction encountered during driving, leave obstructed pile and proceed to drive remaining piles. Return and attempt to complete driving of obstructed pile later.

.2 Advise Departmental Representative immediately if impossible to drive pile to full penetration, and obtain direction from Departmental Representative on further steps required to complete Work.

3.3 Holes

.1 Patch holes in sheet pile wall, except where permanent holes are indicated.

.1 Use 12 mm thick plate of material to patch holes and overlap not less than hole diameter.

.2 Weld to develop full strength of plate.

.2 Drill any required holes in piling. Do not use flame cutting.

3.4 Cutting

.1 When flame cutting tops of piles, and flame cutting holes in piles approved by Departmental Representative, use following procedure:

.1 When air temperature is above 0 degrees C, no pre-heat is necessary.

.2 When air temperature is below 0 degrees C, pre-heat until steel 25 mm on each side of line of cut has reached a temperature very warm to hand (approximately 35 °C).

.3 Use torch guiding device to ensure smooth round holes or straight edges.

.4 Make cut smooth and free from notches throughout thickness. If grinding is employed to remove notch or crack, finished radius to be minimum 5 mm.

3.5 Splicing

.1 Use full length piles.

3.6 Tie Rod Anchorage System

.1 Do not place backfill behind anchored bulkhead or remove material from in front of bulkhead until piles have been completely driven, adjusted and secured in final position by anchorage system.

.2 Fit and adjust tie rod systems so that connections at waling and anchor end of tie rods are tight before backfilling.

3.7 Backfilling

.1 Backfill in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling and as indicated.

.2 Protect piling tie rods and anchorage systems from damage or displacement during backfilling operations.

End of Section

1 GENERAL

1.1 References

.1 ASTM C117-13, Test Method for Material Finer Than 0.075 mm Sieve in Mineral Aggregates by Washing.

.2 ASTM C131/C131M-14, Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

.3 ASTM C136-14, Method for Sieve Analysis of Fine and Coarse Aggregates.

.4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft -lbf/ft3 (600 kN -m/m3)).

.5 ASTM D4318-10e1, Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

.6 CAN/CGSB 8.2-M88 , Sieves Testing, Woven Wire, Metric.

.7 ASTM D1557-12e1, Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 4.54 kg Rammer and 457 mm Drop.

.8 ASTM D1883-14, Test Method for CBR (California Bearing Ratio) of Laboratory Compacted Soils.

.9 ASTM D6938-15, Standard Test Method for In-Place Density and Water Content of Soil and Soil Aggregate in Place by Nuclear Methods.

2 PRODUCTS

2.1 Materials

.1 Granular base: to meet PEI DOT & PW Class A and Class B and the following requirements:

Sieve Size	Granular Class A	Granular Class B	Granular Class C	Drainage Class D	Drainage Class E
50.0mm	-	-	-	100	100
45.0mm	-	-	-	-	-
38.0mm	-	-	-	60-100	60-100
31.5mm	100	100	87-100	50-100	50-100
25.0mm	95-100	95-100	80-96	35-70	35-70
19.0mm	-	-	-	20-50	20-50
12.5mm	50-83	50-83	45-83	10-35	10-35
9.5mm	-	-	-	5-25	5-25
4.75mm	30-60	30-60	25-65	0-10	0-10
1.18mm	15-40	15-43	-	-	-

Sieve Size	Granular Class A	Granular Class B	Granular Class C	Drainage Class D	Drainage Class E
600μm	10-32	10-35	-	-	-
300μm	5-22	5-26	5-22	-	-
75μm	3-9	3-7	3-10	-	-

.2 Granular base: Class A material.

.3 Shouldering: Class B material

3 EXECUTION

3.1 Inspection of Underlying Sub-Base

.1 Place granular base after surface is inspected and approved by Department Representative.

.2 Underlying material to be compacted to 100% of Standard Proctor Density to ASTM D698-12e2.

3.2 Placing

.1 Ensure no frozen material is used in placing.

.2 Place material only on clean unfrozen surface, properly shaped and compacted and free from snow and ice.

.3 Place aggregate to fill patch where required and in uniform layers not exceeding 150 mm compacted thickness or as directed by the Department Representative.

.4 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.5 Remove and replace that portion of layer in which material becomes segregated during spreading.

.6 Place and compact shouldering to 3% cross slope in reconstruction areas. In overlay sections, feather new shoulder material from top of new asphalt to existing hinge point of shoulder slope.

.7 Compacted shouldering to be flushed with asphalt concrete surface.

3.3 Compaction Equipment

.1 Vibratory compaction equipment must be used and capable of obtaining required densities on

aggregates on project.

3.4 Compacting

.1 Compact to density not less than 100% corrected maximum dry density.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compacting to obtain specified density. If aggregate is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

.4 In areas not accessible to rolling equipment, compact to specified density with vibratory mechanical tampers approved by Department Representative.

.5 Density will be determined according to ASTM D6938-15.

3.5 Finish

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

.2 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.6 Maintenance

.1 Maintain finished base in condition conforming to this section until succeeding material is applied or until acceptance by Department Representative.

End of Section

1 GENERAL

1.1 Measurement Procedures

.1 Cleats: measure in number of units of each type installed.

1.2 References

.1 Canadian Standards Association (CSA International)

.1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

1.3 Action and Informational Submittals

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

.2 Product data: submit manufacturer's printed product literature, specifications and datasheet.

1.4 Closeout Submittals

.1 Include cleats on record drawings.

2 PRODUCTS

2.1 Materials

.1 Cleat assemblies:

.1 Cast iron.

.2 Minimum weight is 13 kg.

.3 Finish, hot dip galvanized.

.4 2 - 24 M galvanized anchor bolt assembly.

.2 Other metal parts: structural steel to CSA G40.20-13/G40.21-13.

3 EXECUTION

3.1 Application

.1 Install cleats in accordance with manufacturer's instructions.

3.2 Setting and Grouting

.1 Set cleats at locations and elevations as indicated.

End of Section