



RETURN BIDS TO:

RETOURNER LES SOUMISSIONS À:

Bid Receiving Public Works and Government
Services Canada/Réception des soumissions Travaux
publics et Services gouvernementaux Canada
The Cambridge Building
3 Queen Street/ 3, rue Queen
Charlottetown, PEI C1A 4A2
Bid Fax: (902) 566-7514

**SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise
indicated, all other terms and conditions of the Solicitation
remain the same.

Ce document est par la présente révisé; sauf indication contraire,
les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Commercial Acquisitions (PEI)
The Cambridge Building
3 Queen Street/3 rue, Queen
Charlottetown, PEI C1A 4A2

Title - Sujet Breakwater 305 Const.-North Lake,PE	
Solicitation No. - N° de l'invitation ED001-181783/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client R.088162.001	Date 2017-11-07
GETS Reference No. - N° de référence de SEAG PW-\$PWC-023-4217	
File No. - N° de dossier PEI-7-40111 (023)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2017-11-16	Time Zone Fuseau horaire Atlantic Standard Time AST
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Ellis-Herring, Alison	Buyer Id - Id de l'acheteur pwc023
Telephone No. - N° de téléphone (506) 636-3908 ()	FAX No. - N° de FAX (506) 636-4376
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation
ED001-181783/A

Amd. No. - N° de la modif.
002

Buyer ID - Id de l'acheteur
PWC023

Client Ref. No. - N° de réf. du client
R.088162.001

File No. - N° du dossier
PEI-7-40111

CCC No./N° CCC - FMS No./N° VME

This Solicitation Amendment No. two (2) is raised to include the following addendum no. 2.

The following addendum to the tender documents is effective immediately. This addendum shall form part of the contract documents.

All other terms and conditions remain the same.

Addendum No. 2.

1. SPECIFICATIONS

ADD attached Specifications section 01 35 29 Health and Safety and section 31 62 16 Steel Sheet Piles.

- 1.1 Related Work .1 Section 01 35 24: Special Procedures on Fire Safety 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 to perform assigned work in a manner that will ensure the health and safety of persons in the workplace, and;
- .2 Knowledgeable about the provisions of occupational health and safety statutes and regulations that apply to the Work and;
- .3 Knowledgeable about potential or actual danger to health or safety associated with the Work.
- .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.
- .4 PPE: personal protective equipment
- .5 Work Site: where used in this section shall mean areas, located at the premises where Work is undertaken, to perform all of the activities associated with the performance of the Work.
- 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 15 work days of notification of Bid Acceptance. Provide three (3) copies.

- .2 Departmental Representative will review Health and Safety Plan and provide comments.
- .3 Revise the Plan as appropriate and resubmit within ten (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 the 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 & Safety Site Representative and support documentation specified in the Safety Plan.
- .4 Submit building permit, compliance certificates and other permits obtained.
- .5 Submit copy of Letter in Good Standing from Provincial Workers Compensation or other department of labour organization.
 - .1 Submit update of Letter of Good Standing whenever expiration date occurs during the period of Work.
- .6 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
- .7 Submit copies of incident reports.
- .8 Submit WHMIS MSDS - Material Safety Data Sheets.

- 1.4 Compliance Requirements
 - .1 Comply with Occupational Health and Safety Act for Province of Prince Edward Island, and 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 (COSH) as well as any other regulations made pursuant to the Act.
 - .1 The Canada Labour Code can be viewed at the following web address:
[www.http://laws-lois.justice.gc.ca/eng/acts/L-2fulltest.html](http://laws-lois.justice.gc.ca/eng/acts/L-2fulltest.html) .
 - .2 Canadian Occupational Health and Safety Regulations can be viewed at:
<http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/index.html> .
- .3 A copy may be obtained by contacting:
Canadian Government Publishing Public Works & Government Services Canada Ottawa, Ontario, K1A 0S9 Tel: (819) 956-4800 (1-800-635-7943) Publication No. L31-85/2000 E or F) or online at: [www:http://laws.justice.gc.ca](http://laws.justice.gc.ca).
- .4 Observe and enforce construction safety measures of:
 - .1 Part 8 of National Building Code.
 - .2 Provincial Workers Compensation Board.
 - .3 Municipal by-laws and ordinances.
- .5 In case of conflict or discrepancy between above specified requirements, the more stringent shall apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.
- .6 Maintain Workers Compensation Coverage in good standing for duration of Contract. Provide proof of clearance through submission of Letter in Good Standing.
- .7 Medical Surveillance: Where prescribed by legislation or regulation, obtain and maintain worker medical surveillance documentation.

- 1.5 Responsibility
- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons and environment adjacent to the site to extent that they may be affected by conduct of Work.
 - .2 Comply with and enforce compliance by all workers, subcontractors and other persons granted access to Work Site with safety requirements of Contract Documents, applicable federal, provincial, and local by-laws, regulations, and ordinances, and with site-specific Health and Safety Plan.
- 1.6 Site Control And Access
- .1 Control the Work and entry points to Work Site. Approve and grant access only to workers and authorized persons. Immediately stop and remove non-authorized persons.
 - .1 Departmental Representative will provide names of those persons authorized by Departmental Representative to enter onto Work Site and will ensure that such authorized persons have the required knowledge and training on Health and Safety pertinent to their reason for being at the site, however, Contractor remains responsible for the health and safety of authorized persons while at the Work Site.
 - .2 Isolate Work Site from other areas of the premises by use of appropriate means.
 - .1 Erect fences, hoarding, barricades and temporary lighting as required to effectively delineate the Work Site, stop non-authorized entry, and to protect pedestrians and vehicular traffic around and adjacent to the Work and create a safe environment. See Section 01 51 00 for minimum acceptable requirements.
 - .2 Post signage at entry points and other strategic locations indicating restricted access and conditions for access.

.3 Use professionally made signs with bilingual message in the 2 official languages or international known graphic symbols.

- .3 Provide safety orientation session to persons granted access to Work Site. Advise of hazards and safety rules to be observed while on site.
- .4 Ensure persons granted site access wear appropriate PPE. Supply PPE to inspection authorities who require access to conduct tests or perform inspections.
- .5 Secure Work Site against entry when inactive or unoccupied and to protect persons against harm. Provide security guard where adequate protection cannot be achieved by other means.

1.7 Protection

- .1 Give precedence to safety and health of persons and protection of environment over cost and schedule considerations for Work.
- .2 Provide temporary facilities for protection and safe passage of public pedestrians and vehicular traffic around and adjacent to work site.
- .3 Provide safety barricades, lights and signage on work site as required to provide a safe working environment for workers.
- .4 Should unforeseen or peculiar safety related hazard or condition become evident during performance of Work, immediately take measures to rectify situation and prevent damage or harm. Advise Departmental Representative verbally and in writing.

1.8 Filing Of Notice

- .1 File Notice of Project with pertinent provincial health and safety authorities prior to beginning of Work.

- .2 Upon request, Departmental Representative will assist in locating address if needed.

1.9 Permits

- .1 Post permits, licenses and compliance certificates, specified in section 01 10 10, at Work Site. Submit copies to Departmental Representative.
- .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 of work.

1.10 Hazard Assessments

- .1 Perform site specific health and safety hazard assessment of the Work prior to commencement of work.
- .2 Carryout initial assessment prior to commencement of Work with further assessments as needed during progress of work, including when new trades and subcontractors arrive on site, the scope of work has been changed by Change Order or when a potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety representative.
- .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 Existing hazardous substances or contaminated wharf materials:
 - .1 Pressure treated and/or creosote treated timber.
 - .2 Overhead wiring
 - .3 Vehicle traffic

- .4 Uneven road conditions
- .5 Working over water
- .6 Unstable ground conditions
- .7 Unknown current load limits off all harbour structures including harbour bridge
- .8 Boat traffic
- .9 Inclement weather
- .10 Working in a marine environment
- .11 Active harbour fishers and public
- .12 Heavy lifts
- .13 Overhead lifts
- .14 Long reach bucket work
- .15 Unloading/loading heavy materials
- .16 Tidal conditions
- .17 Pile driving

- .2 Above items shall not be construed as being complete and inclusive of potential health and safety hazard encountered during Work.
- .3 Include above items in the hazard assessment of the Work.
- .4 MSDS data sheets of pertinent hazardous and controlled products stored on site can be obtained from Departmental Representative.

1.12 Meetings

- .1 Attend pre-construction health and safety meeting, convened and chaired by Departmental Representative, prior to commencement of Work, at time, date and location determined by Departmental Representative. Ensure attendance of:
 - .1 Superintendent of Work
 - .2 Designated Health & Safety Site Representative
 - .3 Subcontractors
- .2 Conduct regularly scheduled tool box and safety meetings during the Work in conformance with Occupational Health and Safety regulations.
- .3 Keep documents on site.

1.13 Health And

.1 Prior to commencement of Work, develop

Safety Plan

written Health and Safety Plan specific to the 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 On-site Contingency and Emergency Response Plan as specified below.
- .3 On-site Communication Plan as specified below.
- .4 Name of designated Health & Safety Site Representative and information showing proof of his/her competence and reporting relationship within the company.
- .5 Names, competence and reporting relationship of other supervisory personnel used in the Work for occupational health and safety purposes.

.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 plan layouts showing escape routes, marshalling areas. Details on alarm notification methods, fire drills, location of firefighting equipment and other related data.
- .3 Name, 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 organizations.
- .5 Harmonize 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 Procedures 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 of 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 subcontractor 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.
- .9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information only. Its submission shall not be construed

to imply approval by Departmental Representative, be interpreted as a warranty of being complete, accurate and legislative compliant and shall not relieve Contractor of their legal obligations for the provision of Health and Safety on the construction project.

- 1.14 Safety Supervision .1 Employ Health & Safety Site Representative responsible for daily supervision of health and safety of the Work.
- .2 Health & Safety Site Representative may be the Superintendent of the Work or other designated person 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 the 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.

.2 Follow up and confirm corrective measure are taken.

.6 Cooperate with Facility's Occupational Health and Safety representative should one be designated by Departmental Representative.

.7 Keep inspection reports and supervision related documentation on site.

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 Ensure that workers, subcontractors and other authorized persons granted access to site are trained and have been fully instructed by a competent instructor, on:

.1 Safe operation of tools and equipment.

.2 Proper wearing and use of personal protective equipment (PPE) as applicable to the purpose and activities to be conducted on site.

.3 Safe work practices and procedures to be followed during the performance of their given work tasks or function on site.

.4 Site conditions and minimum site safety rules provided through site orientation sessions.

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

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

Departmental Representative verbally and in writing.

- 1.16 Minimum Site Safety Rules .1 Notwithstanding requirement to abide by federal and provincial health and safety regulations; 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, hearing protection and personal floatation device (PFD).
 - .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 workers on site safety rules, and on the disciplinary measures to be taken for violation or non-compliance of such rules. Post such information on site.
- 1.17 Correction of Non-Compliance .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative will stop Work if non-compliance of health and safety regulations is not corrected in a timely manner.
- 1.18 Incident Reporting .1 Investigate and report the following incidents to Departmental Representative:
- .1 Incidents requiring notification to Provincial Department of Occupational

- Safety and Health, Workers Compensation Board or to other regulatory Agency.
- .2 Medical aid injuries.
 - .3 Property damage in excess of \$10,000.00,
 - .4 Interruptions to Facility operations resulting in an operational lost to a Federal department in excess of \$5,000.00.
- .2 Submit report in writing.
- 1.19 Hazardous Products .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).
- .2 Keep MSDS data sheets for all products delivered to site.
 - .1 Post on site.
 - .2 Submit copy to Departmental Representative.
- 1.20 Blasting .1 Blasting or other use of explosives is not permitted on site
- 1.21 Powder Actuated Devices .1 Use powder actuated fastening devices only after receipt of written permission from Departmental Representative.
- 1.22 Confined Spaces .1 Abide by occupational health and safety regulations regarding work in confined spaces.
- 1.23 Site Records .1 Maintain on Work Site copy of safety related documentation and reports stipulated to be produced in compliance with Acts and Regulations of authorities having jurisdiction and of those documents specified herein.

- .2 Upon request, make available to Departmental Representative or authorized Safety Officer for inspection.

1.24 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.
- .2 Maintain on site copy of safety documentation as specified in this section and other safety related reports and documents issued to or received from authorities having jurisdiction, including:
 - .1 Site specific Health and Safety Plan.
 - .2 WHMIS data sheets.
- .3 Make available to Departmental Representative, or authorized safety representative, for inspection upon request.

END OF SECTION

PART 1 - GENERAL

- 1.1 Description .1 This section specifies the requirements for the installation of supply and install of Z section hot rolled steel sheet piles and all other hardware.
- 1.2 References .1 American Society for Testing and Materials International, (ASTM):
- .1 ASTM A6/A6M-16, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
 - .2 ASTM A572/A572M-15, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 - .3 ASTM A1011/A1011M-15, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - .4 ASTM A328/A328M-13, Standard Specification for Steel Sheet Piling.
 - .5 ASTM A325M-14, Standard Specification for Structural Bolts, Steel, Heat Threaded 830MPa Minimum Tensile Strength (Metric).
- .2 American Welding Society:
- .1 AWS D1.1:2015, Structural Welding Code - Steel, Includes Errata.
- .3 Canadian Standards Association (CSA International).
- .1 CSA G40.20/G40.21-2013, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-2013, Welded Steel Construction (Metal Arc Welding).
 - .3 CSA W47.1-09(R2014), Certification of Companies for Fusion Welding of Steel.
 - .4 CSA G30.18-09 (R2014), Carbon Steel Bars for Concrete Reinforcement.

- 1.3 Related Sections .1 Pile Foundations - General: Section 31 61 13
.2 Pile Driving Templates: Section 31 09 16.01
- 1.4 Submittals .1 Submit shop drawings for the following items:
.1 Wale systems, including all connectors and hardware.
- 1.5 Certificates .1 At least two (2) weeks prior to fabrication, submit to Departmental Representative, two (2) copies of steel producer certificates in accordance with ASTM A1011/A1011m-05c, and mill test reports in accordance with CAN/CSA-G40.20.
- 1.6 Source Quality Sheet Steel Piling .1 Provide results of tests of sheet piling material to be used on project as follows:
.1 One (1) tension test and one (1) bend test from each heat for quantities of finished material less than fifty (50) tonnes.
.2 Two (2) tension tests and two (2) bend tests from each heat for quantities of finished material exceeding fifty (50) tonnes.
- 1.7 Existing Sub-Surface Conditions .1 Notify the Departmental Representative immediately if subsurface conditions at site differ from those indicated.
- 1.8 Protection .1 Protect public and construction personnel, adjacent structures and work of other sections from hazards due to pile driving operations or any other operations.
- 1.9 Quality Assurance .1 Inspection and testing of piling material may be carried out by testing laboratory designated by Departmental Representative at any time during course of Work.
.2 Materials inspected or tested by the

Departmental Representative which fail to meet specified requirements will be rejected.

- .3 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, costs for additional tests or inspections will not be measured for payment. Departmental Representative to approve corrected Work.
 - .4 Conduct all shop welding in accordance with CSA W59, AWS D1.1 or other equivalent international standard. Use welders certified to CSA W47.1 or other equivalent international standard.
- 1.10 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.
 - .4 Do not allow stored piling sections to be in contact with the ground.
 - .3 If material is stockpiled on structure, do not overload structure.
- 1.11 Waste Management and Disposal
- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .2 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Provincial disposal regulations.
- 1.12 Measurement for Payment
- .1 Steel Sheet piling will be measured in accordance with Section 01 29 00.

PART 2 - PRODUCT

- 2.1 Steel Sheet Piles .1 Steel sheet piles: to ASTM A572, Grade 55 and as specified below (380 MPa).
- .2 Continuous interlocking Z section consisting of the following minimum section properties:
- .1 Minimum effective elastic section modulus of 3800 cm³ per metre of wall.
 - .2 Minimum flange thickness of Z section of 16.0mm.
 - .3 Minimum web thickness of Z section of 12.0mm
 - .4 System width of 1400mm per steel sheet pile pair.
 - .5 Z Sections to be delivered to site assembled in pairs whenever possible.
- 6 Fittings: provide fittings and connectors fabricated by the pile manufacturer as required to connect pile to existing H-pile and to connect piles at corners in closure wall as shown on the drawings.
- .3 Mark each piece of sheet piling legibly by stenciling or die-and-stamping with the 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.
- .5 Special fabricated piles: provide special fabricated piles to angle shown as specified by pile manufacturer for specific pile being installed.
- .6 Fittings: provide fittings, connectors and custom piles fabricated by the pile manufacturer as required to connect steel sheet pile to existing H-pile and to connect steel sheet piles at corner(s) in closure wall as shown on the drawings. Clean existing steel as required to install fittings and connectors and to provide welds.

- 2.2 Tie Rods, Wales and Connection Hardware .1 Structural steel for wales, bearing plates, wale splices, support angles and miscellaneous steel: to CSA G40.21, Grade 350W.
- .2 Tie rods, sleeve nuts and turnbuckles:
.1 Tie rods: to CSA G30.18, 517 MPa yield strength, unless noted otherwise.
.2 Tie rods: to be continuously threaded bar, 57mm nominal diameter with upset threads, unless noted otherwise.
.3 Sleeve nuts, connector sleeves, articulating connectors and all other hardware: to be capable of developing 125% of the yield strength of the bar. Acceptable product Dywidag 75 grade threadbar.
.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 centerline, 1 in 160.
- .3 Nuts and bolts: hexagon nuts, bolts, and washers: 25mm diameter to ASTM A325 unless noted otherwise.
- .4 Tie bolts: 47.6mm diameter ASTM A449 threaded rod Type 1 complete with A563DH heavy hex nuts.
- 2.4 Fabrication Steel Sheet Piles splicing .1 Fabricate full length piles to eliminate during installation.
- .2 Full length piles may be fabricated from piling material by splicing lengths together where approved by the Departmental Representative. Use complete joint penetration groove welds. Conform to requirements of piling system manufacturer.
- .3 Submit details of planned use of pile material stock to the Departmental Representative for approval prior to start of fabrication. Re-use cut-off lengths as directed by the Departmental Representative.
- .4 Allowable tolerance on axial alignment to be as

required by the piling system manufacturer.

- .5 Allowable deviation from straight line over total length of fabricated pile to be 30mm.
- .6 Repair defective welds as approved by the Departmental Representative. Repairs to CSA W59. Unauthorized weld repairs may be rejected.

PART 3 - EXECUTION

3.1 Installation of Steel Sheet Piles

- .1 Install piling in accordance with Section 31 61 13 - Pile Foundations General.
- .2 If approved by the Departmental Representative, splice piles in place during installation by welding. To prevent distortion of sheet pipe piles. Hold members in alignment during splicing operation. Make splice by complete joint penetration groove welds as indicated on shop drawings.
- .3 Do welding in accordance with CSA W59.
- .4 Submit shop drawings and full details of method and sequence of installation of piling to the Departmental Representative for review prior to start of pile installation work. Details must include templates, bracing, handling, setting and driving sequence and number of piles in panels for driving. Details must also include a temporary shoring plan, stamped by a Professional engineer registered in New Brunswick, required to safely install tie rods between new west wall and new SSP anchor wall, specifically addressing conflict with existing reinforced concrete anchor block and stability of existing structure during construction.
- .5 Do not commence pile installation until all quality control tests have been completed and test results approved by Departmental Representative.
- .6 Do pile installation work in accordance with Section 31 61 13 except where otherwise

specified.

- .7 Drive sheet piles to the depths and dimensions shown on the Drawings using vibratory or impact hammers. As a general guideline, vibratory hammers should have a minimum dynamic force of nine (9) times the combined weight of the pile, hammer and clamp. The rated energy of impact hammers should be a minimum of 4.18MJ per square metre (2700J (2000 ft.lbs) per square inch) of steel cross-sectional area. Coordinate driving energy requirements on site with pile inspector in conjunction with the Departmental Representative to ensure the piles are not damaged during installation, confirm refusal criteria and seating into bedrock. Review all pile penetration depths. Report anomalies to the Departmental Representative. The Departmental Representative will determine acceptance or rejection.
- .8 When installing steel sheet piles, use following procedure:
 - .1 Provide temporary guide frames or bracing to hold piles in alignment during setting and driving.
 - .2 Drive piles two at a time whenever possible. Drive first double pile to depth as indicated on the contract drawings, then place panel of five to eight double sheet piles in guide frames and secure last (end) double pile in location to prevent spreading at piles in panel.
 - .3 Drive end double pile in panel sufficiently deep into the ground to ensure that it will remain plumb, then drive remaining double piles in panel to full depth commencing 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.
- .9 When installation is complete, face of wall at top of sheet piles to be within driving tolerances specified in Section 31 61 13.

- 3.2 Obstructions
- .1 If obstruction encountered during driving, leave obstructed pile and proceed to drive remaining piles. Return and attempt to complete driving at obstructed pile later.
 - .1 Advise Departmental Representative immediately if impossible to drive pile to full penetration and obtain direction from Departmental Representative on further steps required to complete the work.
- 3.3 Holes
- .1 Patch holes in sheet pile wall, except where permanent holes are indicated.
 - .2 Use material equal to that of piling to patch holes and overlap not less than hole diameter.
 - .3 Weld to develop full strength of plate.
 - .4 Drill any required holes in piling. Do not use flame cutting without permission of the Departmental Representative.
- 3.4 Welding
- .1 Weld in accordance with CSA W59 and CSA W59S1.
 - .2 Welding certification of companies must be in accordance with CSA W47.1 and CSA W47.1S1.
- 3.5 Cutting
- .1 When flame cutting tops of piles, and flame cutting holes in piles approved by the Departmental Representative, use the 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 degrees C). Temperature indicating crayon marks may be used to measure temperature.
 - .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 5mm.

- 3.6 Tie Rod Anchorage System
- .1 Backfill in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling and as indicated.
 - .2 Do not place backfill behind steel sheet pile wall until piles have been completely driven, adjusted and secured in final position by anchorage system as indicated on the drawings.
 - .3 Support tie rods directly on existing fill. Supplement with new gravels as required to ensure continuous bearing under tie rods.
 - .4 Fit and adjust tie rod systems so that connections at waling and anchor ends of tie rods are tight before backfilling.
 - .5 Protect tie rods and anchor systems from damage during backfill operations.
 - .6 Confirm articulating joints, as noted on drawings, area sleeved to allow for vertical movement as indicated.

END OF SECTION