

PART 1 - GENERAL

- | | | |
|------------------------------------|----|---|
| <u>1.1 RELATED
SECTIONS</u> | .1 | Refer to other specification sections for related information. |
| | .2 | Refer to Section 01 33 00 for Shop Drawing/ Submission requirements. |
| <u>1.2 SOURCE
APPROVAL</u> | .1 | Source of materials to be incorporated into work or stockpiled requires acceptance. |
| | .2 | Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production. |
| | .3 | If, in the opinion of Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet specified requirements, procure an alternative source to demonstrate that materials from source in question can be processed to meet specified requirements. |
| | .4 | Should a change of material source be proposed during work, advise Departmental Representative 4 weeks in advance of proposed change to allow sampling and testing. |
| | .5 | Acceptance of material at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory. |
| <u>1.2 PRODUCTION
SAMPLING</u> | .1 | Aggregate will be subject to continual sampling during production. |
| | .2 | Provide Departmental Representative with ready access to source and processed material for the purpose of sampling and testing. |
-

1.4 MEASUREMENT .1 This item will not be measured separately.
FOR PAYMENT

PART 2 - PRODUCTS

2.1 MATERIALS .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material or other deleterious substances.

.2 Flat and elongated particles are those whose greatest dimension exceeds four times their least dimension.

.3 Fine aggregates satisfying requirements of applicable section shall be one, or a blend of the following:

.1 Natural sand

.2 Manufactured sand

.3 Screening produced in crushing of quarried rock, boulders, gravel or slag

.4 Coarse aggregates satisfying requirements of applicable section shall be one of the following:

.1 Crushed rock or slag

.2 Gravel composed of naturally formed particles of stone.

PART 3 - EXECUTION

3.1 DEVELOPMENT OF .1 Prior to excavating materials for aggregate
AGGREGATE SOURCE production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by the Departmental Representative.

.2 Clear, grub and strip an area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.

.3 When operating in stratified deposits, use excavation equipment and methods that will produce a uniform, homogeneous aggregate.

3.1 DEVELOPMENT OF
AGGREGATE SOURCE
(Cont'd)

- .4 When excavation is completed, provide drains or ditches as required to prevent surface standing water.
- .5 Trim off and dress slopes of waste material piles and leave site in a neat condition.

3.2 PROCESSING

- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .2 Blend aggregate, if required, to obtain gradation requirements specified. Use approved methods and equipment.
- .3 Blending to increase percentage of crushed particles or decrease percentage of flat and elongated particles is permitted.
- .4 Wash aggregates, if required, to meet specifications. Use only equipment accepted by Departmental Representative.

3.3 HANDLING

- .1 Handle and transport aggregates to avoid segregation, contamination and degradation.

3.4 STOCKPILING

- .1 Stockpiling aggregates on stabilized, clean and well drained surfaces.
- .2 To ensure that no material other than stockpiled aggregate is used, do not incorporate bottom 250 mm of stockpile into work, if aggregates are stockpiled on ground.
- .3 Stockpile far enough apart to prevent intermixing.
- .4 Reject intermixed or contaminated materials. Remove and dispose of rejected materials as directed within 48 hours of rejection.
- .5 Stockpile materials in uniform layers of thickness as follows:
 - .1 Max 1 m for coarse aggregate and base course materials.

- 3.4 STOCKPILING .5 (Cont'd)
- (Cont'd) .2 Max 2 m for fine aggregate and sub-base materials.
- .3 Max 1.5 m for other materials.
- .6 Complete each layer over entire stockpile area before beginning next layer.
- .7 Uniformly spot dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
- .8 Coning of piles or spilling of material over edges of pile will not be permitted.
- .9 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

PART 1 - GENERAL

<u>1.1 DESCRIPTION OF WORK</u>	.1	This section includes, but is not limited to, the following: .1 Requirements for the demolition, removal or cutting associated with existing structural material, existing concrete curbs, copewall and slab, timber cribwork and fastening, and all excavation to permit construction and installation of the new wharf. .2 Removal, salvage and reinstallation of existing electrical components and teck cable feeds. .3 Requirements for temporary utilities as per Section 01 51 00. .4 All normal removals as required to complete the work. All items to be verified by a site visit prior to submission of a tender. All available plans of the existing structure are available for viewing at the Project Manager's office, 2nd floor, 1713 Bedford Row, Halifax, NS.
<u>1.2 RELATED SECTIONS</u>	.1	Refer to other specification sections for related information.
	.2	Refer to Section 01 33 00 for Shop Drawing/ Submission requirements.
<u>1.3 SUBMISSIONS</u>	.1	Methodology: .1 When requested, provide methodology for carrying out the work.
	.2	Provide submission in accordance with Section 01 33 00.
<u>1.4 PROTECTION</u>	.1	Prevent movement, settlement or damage of adjacent structures. Provide bracing and shoring as required. In the event of damage, immediately replace such items or make repairs to approval of Departmental Representative and at no additional cost to Departmental Representative.

- | | | |
|----------------------------|----|--|
| 1.4 PROTECTION
(Cont'd) | .2 | Prevent debris from going adrift and becoming a menace to navigation. |
| | .3 | All damage to existing structures, roadways, pipelines, electrical systems not specified for removal to be repaired at the Contractor's cost to the satisfaction of the Departmental Representative. |

- | | | |
|-------------------------------|----|---|
| 1.5 MEASUREMENT
PROCEDURES | .1 | Structure demolition will be measured on a lump sum basis. |
| | .2 | Payment for this item will include operations involved in removing, hauling, reuse/recycling (as applicable) and disposal of all items outlined on plans and in specifications. |
| | .3 | Payment for this item will include all temporary utilities as per Section 01 50 00. |

PART 2 - PRODUCTS Not applicable.

PART 3 - EXECUTION

- | | | |
|-----------------|----|--|
| 3.1 PREPARATION | .1 | Inspect site and verify with Departmental Representative items designated for removal and items to be preserved. |
| | .2 | Locate and protect utility lines. Preserve in operating condition active utilities traversing site. |
| | .3 | Provide temporary power and lighting as shown on the plan or as required by the Departmental Representative. |

- | | | |
|--------------------------------|----|---|
| 3.2 DEMOLITION
AND REMOVALS | .1 | Remove items indicated. |
| | .2 | Do not disturb adjacent structures designated to remain in place. |
| | .3 | Remove existing concrete, timber and hardware. Salvage rock materials for re-use on |
-

3.2 DEMOLITION
AND REMOVALS
(Cont'd)

- .3 (Cont'd)
site. Excess ballast which cannot be utilized within the work or materials which do not meet the new work material and gradation requirements are to be removed from the site.
- .4 The Contractor must ensure timbers are not permitted to go adrift during removal operations. Containment booms and regular cleaning of debris from the harbour bottom must occur in conjunction with the removal operations.
- .5 The Contractor must exercise caution during excavation and removals adjacent to the existing wharf structures, wharf and complete excavation in such a manner as to protect the existing structure from undermining.
- .6 Sawcut existing concrete deck at pile cap at end limits of removals where indicated on the plan.
- .7 Existing concrete materials to be disposed of. Salvage existing electrical teck cable for future use.
- .8 Remove, salvage and reinstate existing electrical equipment and teck cables.

3.3 DISPOSAL OF
MATERIALS

- .1 Disposal of materials not designated for salvage or re-use in work, will be the contractor's responsibility, and must be disposed of off-site.
- .2 The material to be disposed is to be transported and disposed of in an environmentally acceptable manner to the satisfaction of the Departmental Representative, and in accordance with any local, Municipal, Provincial and Federal restrictions and regulations.
- .3 Excavation material is to be disposed of off site.

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

PART 1 - GENERAL

1.1 RELATED SECTIONS	.1	Section 01 33 00 - Submittal Procedures
	.2	Section 01 74 21 - Construction/Demolition Waste Management and Disposal
	.3	Section 31 23 33.01 - Excavating, Trenching and Backfilling.
1.2 MEASUREMENT PROCEDURES	.1	Measure geotextiles in square meters of surface covered by material. No allowance will be made for seams and overlaps.
1.3 REFERENCES	.1	American Society for Testing and Materials International, (ASTM): .1 ASTM D4491-99a (latest edition), Standard Test Methods for Water Permeability of Geotextiles by Permittivity. .2 ASTM D4595-86(2001) (latest edition), Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method. .3 ASTM D4716-01 (latest edition), Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head. .4 ASTM D4751-99a (latest edition), Standard Test Method for Determining Apparent Opening Size of a Geotextile.
	.2	Canadian General Standards Board (CGSB): .1 CAN/CGSB-4.2 No. 11.2-M89 (April 1997) (latest edition), Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989). .2 CAN/CGSB-148.1 (latest edition), Methods of Testing Geotextiles and Complete Geomembranes. .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area. .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles. .3 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting

1.3 REFERENCES	.2 (Cont'd)
(Cont'd)	.2 (Cont'd)

Strength of Geotextiles Under No Compressive Load.

.4 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

.5 No.10-95, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

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

- | | |
|----|---|
| .2 | Submit to Departmental Representative the following samples at least 4 weeks prior to beginning work: |
| .1 | Minimum length of 2 m of roll width of geotextile. |
| .3 | Submit to Departmental Representative copies of mill test data and certificate at least 4 weeks prior to start of work, and in accordance with Section 01 33 00 - Submittal Procedures. |

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

1.6 WASTE MANAGEMENT AND DISPOSAL	.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
	.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
	.3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

1.6 WASTE MANAGE-
MENT AND DISPOSAL
(Cont'd)

- .4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
.1 Width: 3.5 m minimum.
.2 Length: 4.0 m minimum.
.3 Composed of: minimum 85% by mass of polyester with inhibitors added to base plastic to resist deterioration by ultra-violet and heat exposure for 60 days.
- .2 Physical Properties:
.1 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 400 g/m2.
.2 Grab tensile strength and elongation: to CAN/CGSB-148.1.
.1 Breaking force: minimum 800 N, wet condition.
.2 Elongation at future: minimum to maximum 70-100%.
- .3 Hydraulic Properties:
.1 Apparent opening size (AOS): 50 to 150 micrometres.
- .4 Securing pins and washers: to CAN/CSA-G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m2 to CAN/CSA G164.
- .5 Factory seams: sewn in accordance with manufacturer's recommendations.
- .6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Place geotextile material by unrolling onto surface in orientation, manner and locations indicated and retain in position with securing pins and washers or weights.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on vertical and sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .5 Pin successive strips of geotextile with securing pins at intervals recommended by manufacturer.
- .6 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .7 After installation, cover with overlying layer within 4 hours of placement.
- .8 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .9 Place neatly around wales and tie rods, ensure full coverage of entire area.
- .10 Place and compact soil layers in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .11 Place geotextile full length and width of inside steel sheet piling wall, along full width and length of type 3 fill (top) and along bottom of type 2 fill on north face.

3.2 CLEANING

- .1 Remove construction debris from project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION .1 Vehicular traffic not permitted directly on
geotextile.

PART 1 - GENERAL

- | | | |
|---|----|---|
| <u>1.1 RELATED SECTIONS</u> | .1 | Section 01 74 21 - Construction/Demolition Waste Management and Disposal |
| | .2 | Section 05 50 00 - Metal Fabrications |
| | .2 | Section 31 62 18 - Steel Sheet Piles |
| <u>1.2 DELIVERY, STORAGE AND HANDLING</u> | .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. |
| <u>1.3 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate waste materials for in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |
| <u>1.4 EXISTING CONDITIONS</u> | .1 | Records of existing structures and geotechnical reports may be available for inspection at the offices of Public Works and Government Services Canada, 1713 Bedford Row, Halifax, NS. This material is not necessarily up to date and is for information purposes only. It should be complemented by site visits and consultation with appropriate expertise. |
| | .2 | Notify Departmental Representative in writing if subsurface conditions at site differ from those indicated and await further instructions from Departmental Representative. |
| <u>1.5 SCHEDULING</u> | .1 | Submit schedule of planned sequence of installing piles to Departmental Representative for review, not less than two weeks prior to commencement of pile installation. |
-

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Provide equipment to handle full length piles without cutting and splicing.
 - .2 Do not splice piles without written approval of Departmental Representative. When permitted, provide details for Departmental Representative's review. Design details of splice to bear dated signature stamp of Professional Engineer registered or licensed in the Province of Nova Scotia, Canada.

PART 3 - EXECUTION

- 3.1 EQUIPMENT
- .1 Prior to pile installation, submit to Departmental Representative for review, 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 Non-impact methods of installation such as augering, jacking, vibratory hammers or other means: provide full details of characteristics necessary to evaluate performance.
 - .2 Hammer:
 - .1 When required criteria cannot be achieved with the proposed hammer, use larger hammer and take other measures as required.
 - .3 Leads:
 - .1 Construct pile driver leads to provide free movement of hammer. Hold leads in position at top and bottom with guys, stiff braces, or other means to ensure support to pile while being drive.

-
- 3.1 EQUIPMENT
(Cont'd)
- .3 Leads: (Cont'd)
- .2 Length: except for piles driven through water, provide sufficient length of leads to ensure that use of follower is unnecessary.
- .3 Swing Leads: Obtain approval from Departmental Representative prior to using swing leads. Firmly guy top and bottom to hold pile in position during driving operation.
- 3.2 PREPARATION
- .1 Ensure that ground conditions at pile locations are adequate to support pile installing operation. Make provision for access and support of piling equipment during performance of work.
- 3.3 FIELD 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 meter for entire length of pile and number of blows per 25 mm for last 1,000 mm.
- .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 Provide Departmental Representative with three (3) copies of records.
- 3.4 DRIVING
- .1 Use driving caps and cushions to protect piles. Reinforce pile heads as required by Departmental Representative. Piles with damaged heads as determined by Departmental Representative will be rejected.
-

3.4 DRIVING
(Cont'd)

- .2 Hold piles securely and accurately in position while driving.
- .3 Deliver hammer blows along axis of pile.
- .4 Re-strike already driven piles lifted during driving of adjacent piles to assure set.
- .5 Cut off piles neatly and squarely at elevations as indicated.
- .6 Remove cut off lengths from site on completion of work.

3.5 DESIGN
LOAD CAPACITY

- .1 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.
 - .2 Install each pile to pile tip elevation as indicated.

3.6 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.

3.7 REPAIR/
RESTORATION

- .1 Pull out rejected piles and replace with new piles.
- .2 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

- 3.8 PROTECTION .1 Arrange pile installation operations and methods to avoid damages to adjacent existing structures. When damages occur, remedy damaged items to restore to original or better condition at own expense.

PART 1 - GENERAL

1.1 RELATED SECTIONS	.1	Section 01 33 00 - Submittal Procedures
	.2	Section 01 45 00 - Quality Control
	.3	Section 31 61 13 - Pile Foundations, General Requirements
1.2 MEASUREMENT PROCEDURES	.1	Measure installation of piles in metres of pile acceptably incorporated into work following trimming and cutting of the piles. Measurement will be taken from the final pile tip elevation to the top of pile elevation remaining in the work.
	.2	Supply and installation of pile shoes will be considered incidental to the work.
	.3	Extra piling to replace damaged piles will be considered incidental to the work and will not be measured for payment.
1.3 REFERENCES	.1	Canadian General Standards Board (CGSB): .1 CAN/CGSB-1.171M-98, Inorganic Zinc Coating.
	.2	Canadian Standards Association (CSA): .1 CSA W47.1-92(R1998), Certification of Companies for Fusion Welding of Steel Structures. .2 CSA W47.1S1-M1989, Supplement No.1-1989 to W47.1-1983, Certification of Companies for Fusion Welding of Steel Structures. .3 CSA W48-01, Filler Metals and Allied Materials for Metal Arc Welding. .4 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding) (Metric Version). .5 CSA W59S1-M1989, Supplement No.1-M1989, Steel Fixed Offshore Structures, to W59-M1989, Welded Steel Construction (Metal Arc Welding).

1.4 SHOP DRAWINGS .1 Submit shop drawings for the pile shoes in accordance with Section 01 33 00 - Submittal Procedures.

1.5 WASTE MANAGEMENT AND DISPOSAL .1 Separate and recycle waste materials in accordance with Section 01 74 21 -Construction /Demolition Waste Management and Disposal.

.2 Divert unused metal materials from landfill to metal recycling factory as approved by Departmental Representative.

.3 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Departmental Representative.

.4 Unused paint and coating materials must not be disposed of into sewer system, into streams, lakes, onto ground or in any other location where it will pose a health or environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Welding Materials: to CSA W48.

.2 Steel Plates: to CSA-G40.20/G40.21, Type and Grade 350.

.3 Pile Driving Shoes: to CSA-G40.20/G40.21, Grade 300.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install piling in accordance with Section 31 61 13 - Pile Foundations, General Requirements.
- .2 Install driving shoes on each H-pile.
- .3 Hold piles securely and accurately in position while driving.
- .4 Deliver hammer blows in direct axis of pile.
- .5 The steel H-piles are to be driven vertically or by pre-drilling into the sandstone bedrock if the pile tip elevation cannot be achieved by impact hammer.
- .6 If the Contractor discovers that he cannot achieve pile tip criteria by the impact method, he will be responsible for the additional cost associated with the installation of the H-piles by pre-drilling 500mm diameter holes into the sandstone bedrock to a minimum depth of 2.5 metres into the bedrock, including the supply and installation of the underwater concreting and any additional excavation required.
- .7 All piles are to be installed a minimum of 2.5 metres into the bedrock as shown on the drawings. The bottom elevations may vary depending on the exact elevation of the bedrock.
- .8 Prior to commencement of pile installation submit to Departmental Representative for approval details of equipment and method to be used for the installation of the piles.
- .9 Cut off piles squarely at required elevation.
- .10 Touch up scratches on uncoated surfaces with two applications of coal tar epoxy before and after driving.

3.2 TOLERANCES

- .1 H-piles are to be installed to the elevation shown on the plan and specified herein.
- .2 Deviations from the vertical in any direction shall not exceed 1 in 50.
- .3 Twisted piles must be pulled and re-driven in such a manner so the face of the H-pile is square with the face of the wall. Maximum rotation tolerance about the axis of the pile layout to be +/- 1 degree.
- .4 At the mud line, the piles are to be +/- 30mm of the location indicated on the drawings for the direction parallel to the wharf, with no two adjacent piles having a centerline spacing less than 2,500mm. Tolerance at the top of the wharf will be +/- 15mm.

3.3 WELDING

- .1 Weld to CSA W59 and CSA W59 S1.
- .2 Welding certification of companies: to CSA W47.1 and CSA W47.1S1.

3.4 ACCEPTANCE
CRITERIA

- .1 Installation of each pile will be subject to approval of Departmental Representative. Departmental Representative will be sole judge of acceptability of each pile with respect to final depth of penetration or other criteria used to determine bearing capacity or pile stability. Departmental Representative to approve final driving of each pile prior to removal of pile driving equipment.
- .2 Any pile which becomes displaced as the result of the setting of adjacent piles shall be reset as per pile setting criteria.

3.4 ACCEPTANCE CRITERIA <u>(Cont'd)</u>	.3	Piles shall be reset after 24 hours of the end of installation of that pile until it can be demonstrated that the permanent pile capacity meets the specified capacity criteria.
---	----	--