

Part 1 General

1.1 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 Contract Administrator and await further instructions.
- .4 Equipment:
 - .1 Submit prior to pile installation for approval by Contract Administrator, 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.

1.2 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's instructions.
- .2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.
- .3 Replace damaged piles as directed by Contract Administrator.

1.3 EXISTING CONDITIONS

- .1 Sub-surface investigation report is available for.
- .2 Notify Contract Administrator in writing if subsurface conditions at site differ from those indicated and await further instructions from Contract Administrator.

1.4 SCHEDULING

- .1 Provide schedule of planned sequence to Contract Administrator for review, not less than two weeks prior to commencement of pile installation.

Part 2 Products

2.1 MATERIALS

- .1 Material requirements for piles are specified in Division 3

Part 3 Execution

3.1 PREPARATION

- .1 Protection:
 - .1 Protect adjacent structures, services and work of other sections from hazards due to pile operations.
 - .2 Arrange sequencing of pile 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 operation and load testing operation.
 - .1 Make provision for access and support of piling equipment during performance of Work.

3.2 INSTALLATION

- .1 Allowable design load capacity of pile as indicated.
- .2 Installation of each pile will be subject to approval Contract Administrator.
 - .1 Contract Administrator 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.

3.3 INSTALLATION TOLERANCES

- .1 Install piles to following tolerances:
 - .1 Out of position: +/- 75 mm.
 - .2 Out of vertical: +/- 2% to a maximum of +/- 50 mm.

3.4 OBSTRUCTIONS

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

3.5 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.

3.6 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.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.2 QUALITY ASSURANCE

- .1 All piling work shall confirm to the following standards:
 - .1 Current edition of applicable Building Code
 - .2 CSA A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 Qualifications of Contractor: Piling shall be performed by firms that have no less than 3 years experience in the installation of the type of piles specified for this project.

1.3 SOILS INVESTIGATION

- .1 A report on the soil conditions of the site is available.
- .2 Examine the Soils Report and note all conditions affecting this work.
- .3 Soil investigation data is provided only for information and the convenience of bidders. The Owner and Contract Administrator disclaim any responsibility for the accuracy, true location and extent of the soils investigation that has been prepared by others. They further disclaim responsibility for interpretation of that data by bidders, as in the project soil bearing values, rock profiles, soil stability and the present level and extent of underground water.
- .4 The Contractor shall inspect the site and satisfy himself as to the nature and location of the Work. Verify all dimensions at the site.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit design drawing depicting layout and design of foundation system to Structural Engineer for review and approval.
- .3 Design drawings shall indicate pile location, base and head elevations, drilled shaft diameters and reinforcing requirements.
- .4 Keep a log of all piles. Submit record drawings (in reproducible format) showing the accurate locations and details of as built piles in accordance with the General Requirements.

1.5 INSPECTION

- .1 A soils engineer in the employ of the Contract Administrator shall inspect and approve all borehole depths and conditions before the Contractor is allowed to place concrete. Failure to comply with this clause may be cause for rejection of the pile. If removal is required it shall be done at the Contractor's expense.
- .2 Notify Contract Administrator and secure approval before placing reinforcing steel and concrete. Issue at least 72 hours notice to Contract Administrator or his appointed Inspection Engineer, when Inspection is required.
- .3 Concrete tests will be required in accordance with CSA Standard A23.2-09. If concrete at 28 days is less than required strength, provide whatever additional foundation is required, as directed, to satisfactorily support same load at same point as called for on drawings without additional cost to the Contract Administrator.

1.6 DESIGN CRITERIA

- .1 Refer to the geotechnical report for recommended design criteria. Piling contractor assumes design responsibility and risk of interpretation of geotechnical report.

1.7 SPECIAL PROTECTION

- .1 If ambient temperature during seven days after placing may fall below 5 °C, cover top of each unit with 300 mm depth of loose straw or approved equivalent and comply with protection requirements of CSA A23.1-09.

1.8 FIRM BID

- .1 This section of the contract shall be quoted as a firm price for design and installation of the piles through and under any subsurface conditions encountered. All information given on drawings or in this specification is for Contractor's information only and he is to satisfy himself as to existing conditions.

Part 2 Products

2.1 MATERIALS

- .1 All materials forming part of the piles shall conform to the requirements specified under Section 03 30 00 'Cast in Place Concrete', Section 0 320 00 'Concrete Reinforcement' and the General Notes found on drawing S.1

Part 3 Execution

3.1 GENERAL

- .1 All boreholes shall be placed to dimensions and depths indicated on the drawings. Depths are measured from existing grade.

- .2 Sloughing and/or groundwater seepage can be anticipated during the drilling operation. The Contractor must review the geotechnical report and make his own estimate of casing requirements to maintain the boreholes in an acceptable condition for concrete placing.
- .3 All concrete shall be placed so to avoid segregation and displacement of reinforcing. Placement of concrete shall be in one continuous operation.
- .4 Piles shall be installed with a maximum of 2% off plumb and not more than 75mm off location.
- .5 Concrete cut-off elevation shall be to the following tolerances: plus 25mm minus 75mm.

3.2 BORING

- .1 All boreholes shall be placed to dimensions and depths indicated on the drawings. Depths are measured from existing grade. Follow geotechnical recommendations. Remove stones (up to 200 mm greatest dimension), boulders over 300 mm and rock in whole or in part, before boring. Tool and clean hole to ensure that machine auger has reached required depth.

3.3 PLACING CONCRETE AND STEEL

- .1 Securely fasten steel during concrete placement. Allow for 75 mm cover.
- .2 Bring top of each unit to level but roughened surface at elevation shown on plans and form proper seating for structural work it is intended to support. Each unit shall be vibrated with approved mechanical vibrator.

3.4 FIRM BID

- .1 Field Records: maintain driving record for each shell, including elevation of bedrock, driven depth of pile, cut-off elevation of shell and protruding core.

3.5 EXCAVATED MATERIAL

- .1 As work proceeds, clean up and remove all excavated materials and debris. Leave site and all roads or other means of access to site clean and clear of spillage.

3.6 CLEANING

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

END OF SECTION