

Part 1 General

1.1 SECTION INCLUDES

- .1 This specification shall cover all Work associated with general site preparation and rough grading. The Contractor shall furnish all superintendence, overhead, labour, materials, equipment, tools, supplies and all things necessary for and incidental to the satisfactory performance and completion of all Work hereinafter specified. This specification shall supplement CW3170-R3.

1.2 RELATED SECTIONS

- .1 Section 32 14 10 - Unit Paving on Sand Bed
- .2 Section 32 12 16 - Asphalt Paving
- .3 Section 32 93 10 - Tree and Shrub Preservation

Part 2 Products

2.1 MATERIALS

- .1 Materials shall be supplied in accordance with CW 3170-R3

Part 3 Execution

3.1 GENERAL

- .1 Unless otherwise stated herein, work shall be carried out in accordance with CW 3170-R3.
- .2 The Contractor shall grade to the levels and contours allowing for surface treatment as shown on the drawings. Existing topsoil shall be stockpiled on-Site as directed by the Contract Administrator. Prior to placing any fill over existing ground the Contractor shall scarify to surface to a depth of 150mm. Moisture content of filling and existing surface material shall be the same in order to facilitate proper bonding.
- .3 All fill shall be clean fill.

3.2 COMPACTION

- .1 Compact fill and undisturbed areas to Standard Proctor Density to ASTM D698-78 as follows:
 - .1 Landscaped Areas - 85%
 - .2 Paved Areas - 95%

3.3 APPROVALS

- .1 The Contractor shall stake grades and receive approval from the Contract Administrator prior to any construction.
- .2 The Contract Administrator shall approve grading work prior to installation of topsoil and/or surfacing materials.

3.4 TESTING

- .1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by ULC. Costs of tests will be paid by the City.
- .2 Submit testing procedure, frequency of tests, testing laboratory as designated by ULC or certified testing personnel to Contract Administrator for approval.

3.5 SURPLUS MATERIAL

- .1 Remove surplus material and material unsuitable for fill, grading or landscaping off site as directed by the Contract Administrator.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 331117 – Watermains
- .2 Section 333113 – Public Sanitary Utility Sewerage Piping
- .3 Section 334100 – Storm Utility Drains

1.2 DESCRIPTION OF WORK

- .1 The work performed and materials supplied under this section shall conform to the City of Winnipeg Standard Construction Specifications CW 2030, CW 2110 and CW 2130 - latest editions, except as amended in these Specifications.
- .2 The work described herein shall consist of the excavation of trenches (or excavation of tunnels); the supply and placing of bedding and backfill materials; the disposal of all surplus and unsuitable materials; and the restoration of the site.
- .3 The work shall also include shoring and other protective works including cages necessary for and incidental to the safe and proper execution of the work as well as drainage and dewatering of all excavations.

1.3 QUALITY ASSURANCE

- .1 The Contract Administrator shall carry out such tests on the gradation of bedding sand and backfill materials as he considers necessary in accordance with the current CSA Standard A23.2.2, Test for Sieve Analysis of Fine and Coarse Aggregate.

1.4 JOB CONDITIONS

- .1 **OBSTRUCTIONS PROHIBITED** - Hydrants under pressure, valve boxes, curb stop boxes and other existing utility controls shall be unobstructed and accessible during the construction period.
- .2 **DISRUPTIONS OF SERVICES** - No valve, switch or other control on existing utility systems shall be operated for any purpose by the Contractor without the approval of the Contract Administrator and the respective Utility. At least 12 hours prior to the disruption, all affected consumers shall be notified by the Contractor in a manner as directed by the Contract Administrator and the Utility and advised of the probable time when service will be restored.
- .3 **EXISTING WORKS** - Prior to the commencement of construction, the Contractor shall inspect the site and examine all available records and contact all relevant utilities to determine the location of all existing surface and underground works. The Contractor shall provide temporary support, adequate protection and maintenance of all existing works, such as surface and underground utilities and structures, which may be encountered in the progress of the work. Where the proposed grade, alignment or location of the work covered by this Contract cannot be altered but is obstructed by existing works, the obstruction shall be permanently supported, relocated, removed or

reconstructed by the Contractor in cooperation with the owner of such utilities or by the owner of the utility if the owner chooses.

- .4 PAVEMENT - Where it is required to install works under existing oiled surface, asphalt or concrete pavement (including roads, driveways and sidewalks) by means of an open cut trench, the Contractor shall saw cut the pavement to ensure that when the trench is excavated, the excavated portion of the pavement breaks cleanly away from the portion of the pavement which is not to be disturbed. The trench shall be excavated with vertical walls. The Contractor shall not permit the width of the trench to exceed the dimensions specified in Clause 3.2 and 3.3 of this Section.

Damage to pavement shall be restored to the original condition by the Contractor at his own expense.

The Contractor shall be required to replace asphalt or concrete pavement or sidewalks. The Contractor shall backfill trenches through pavement, roads and driveways with Class 3 backfill material. The Contractor may, at his option and subject to the approval of the Contract Administrator, use tunnelling methods to reduce the damage (and hence the amount of restoration required) to roads.

- .5 GRADING AND SOD - The Contractor shall restore all areas affected by the construction to original grade and condition. Boulevards, drainage ditches and side slopes of roadways and driveways shall be topsoil and sodded in accordance with these Specifications.
- .6 SETTLEMENT - the Contractor shall assume responsibility to correct settlement of trenches for a period of one year from the date of Total Performance.

PART 2 PRODUCTS

2.1 BEDDING & BACKFILL

- .1 Bedding and backfill shall be as specified in Sections CW 2030, CW 2110 and CW 2130 – latest editions. Class of backfill as specified in sub-section 3.6 of of this Specification.

PART 3 EXECUTION

3.1 ALIGNMENT

- .1 The pipe centreline shall follow the line and grades as shown on the drawings. The pipe centreline shall not deviate from the required alignment by more than 100 mm. The watermain and sewermain shall have a minimum of 2.75 m of cover, unless indicated otherwise on the plan. In cases where the watermain pipe crosses a road or driveway, the pipe shall be laid at a uniform gradient between the elevations of the pipe on either side of the road or driveway.

3.2 TRENCH EXCAVATION

- .1 The excavation of trenches shall be carried out in accordance with the plans and specifications. Where in the opinion of the Contract Administrator, the subgrade is found to be unstable, unsuitable material shall be removed and replaced with approved

materials. Trench walls shall be kept vertical to minimize surface disruption. Contractor shall utilize shoring and bracing necessary to meet these requirements. The trench width shall be not less than twice the outside diameter of the pipe and not greater than 900 mm plus the outside diameter of the pipe. The minimum clear width shall be available between any shoring or bracing that is required. The trench shall not be open more than 30 m ahead of or behind the pipe-laying operations, unless otherwise directed by the Contract Administrator.

- .2 Where excavation is made in bedrock, hard till, or where excavation is made in a material which cannot provide an even, uniform and smooth surface, or where large boulders are encountered in the trench, such material shall be removed to provide a clear distance between any part or projection of such material and the surface of all pipe and fittings of not less than 150 mm for 300 mm O.D. pipe or less. The trench bottom shall be brought to proper elevation (to receive bedding material) by backfilling with compacted granular backfill material or as approved by the Contract Administrator.

3.3 TRENCH WALLS

- .1 Excavation of trench walls due to limitations on available right-of-way, existing utilities, structures, roads, pavements or other works, shall be excavated with walls as nearly vertical as possible, and with shoring or bracing, where required to prevent falling, slipping or caving in of the trenches. Bracing and shoring shall be constructed at the Contractor's expense and in accordance with the current regulations of the appropriate provincial government department. Placing and removal of shoring, bracing, sheet piling or cages shall be undertaken in a manner that permits proper backfilling.

3.4 BEDROCK/ HARD TILL EXCAVATION

- .1 Loose rock shall be excavated by normal open trench methods. Excavated rock shall not be used for backfill.

3.5 DEWATERING

- .1 The bottom of the excavation shall be maintained in a condition to permit the proper installation of the pipe. The installed pipe shall not be used as a drain. The Contractor shall provide, at his own expense, all portable dewatering equipment (including power, pumps and discharge hose) to drain the excavation.

3.6 PIPE BEDDING AND BACKFILL

- .1 The bedding and backfill for pipelines installed in open trenches in boulevard areas shall be Class 4 as shown on Standard Drawing SD-002 and specified in Sections CW 2030, CW 2110 and CW 2130 – latest edition.
- .2 The bedding and backfill for pipelines installed in open trenches under existing pavement or shafts for coring or tunnelling shall be Class 3 as shown on Standard Drawing SD-002 and specified in Sections CW 2030, CW 2110, and CW 2130 – latest edition.
- .3 The bedding and backfill for pipelines installed in open trenches under proposed pavement shall be Class 2 as shown on Standard Drawing SD-002 and specified in Sections CW 2030, CW 2110, and CW 2130 – latest edition.

- .4 Governed by his compaction equipment and the type and strength of pipe, the Contractor shall ensure that there is adequate cover on the pipe to prevent damage during compaction operations.

3.7 TUNNELLING

- .1 Tunnelling shall be done in accordance with Section CW 2130 – latest edition. At each end of the proposed tunnel, the Contractor shall excavate pits such that adequate space is allowed around the proposed tunnel openings for the equipment to construct the tunnel at the required elevation and grade. Tunnels shall be straight. The method of tunnelling shall be subject to the prior approval of the Contract Administrator. The excavated pits shall be backfilled in the same manner as required for open trench pipe backfill installation. Where the pit bottom at subgrade is found to be unstable, the unstable material shall be removed and replaced with compacted granular backfill or as required by the Contract Administrator.

3.8 REMOVAL OF BRACING

- .1 In the event that the trench is braced or shored, the Contractor shall remove all bracing or shoring slowly and uniformly, keeping pace with backfilling so that the trench wall does not collapse.

3.9 DISPOSAL OF SURPLUS AND UNSUITABLE MATERIALS

- .1 Surplus excavated material and material which is unsuitable for backfill shall be hauled to, and spread at locations approved by the Contract Administrator and at the Contractor's expense.

PART 4 MEASUREMENT AND PAYMENT

4.1 EXCAVATION, TRENCHING AND BACKFILL

- .1 Measurement and payment for Section 312310, Excavation, Trenching and Backfill shall be included with the project total Lump Sum Price and in accordance with Part A – Bid Submission of the Contract documents for Bid Opportunity No. 832-2007 – Construction of Bronx Park Community Centre and Home of Good Neighbours Senior Centre Winnipeg Manitoba.

END OF SECTION

PART 1 General

The piling contractor is responsible for the design and installation of the foundation system to safely support the loads shown on the foundation drawings. The foundation design is to be generally in accordance with the recommendations presented in the geotechnical report and consistent with good industry practise. The piling contractor shall prepare a drawing depicting the layout and foundation design including a seal by a Professional Engineer. This drawing shall be submitted to Contract Administrator for review and approval prior to commencement of work on site.

1.1 RELATED SECTIONS

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| .1 | Concrete Reinforcement | Section 03 20 00 |
| .2 | Excavation and Backfilling | Section 31 23 10 |
| .3 | Drilled Cast in Place Concrete Piles | Section 31 63 32 |

1.2 DELIVERY, HANDLING AND STORAGE

- .1 Repair or replace damaged piles to satisfaction of Contract Administrator.
- .2 If material is stockpiled on a structure, ensure that structure is not overloaded.

1.3 PROTECTION

- .1 Protect public, construction personnel, adjacent structures, and work of other sections from hazards attributable to pile operations.

PART 3 Execution

3.1 PREPARATION

- .1 Ensure that the ground conditions at pile locations are adequate to support pile installation operation. Make provision for access and support of piling equipment during performance of work.

3.2 FIELD MEASUREMENT

- .1 Maintain accurate records of installation for each pile.
- .2 Provide Contract Administrator with three copies of records.

3.3 INSTALLATION TOLERANCES

- .1 Install piles to following tolerances:
 - .1 Pile heads within 50 mm of locations indicated.
 - .2 Piles not more than 2% of length out of alignment.

3.4 DAMAGED OR DEFECTIVE PILES

- .1 No extra compensation will be made for removing and replacing or other work made necessary through rejection of a defective pile.

PART 1 General

1.1 RELATED SECTIONS

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|----|------------------------|------------------|
| .1 | Quality Control | Section 01 45 00 |
| .2 | Concrete Reinforcement | Section 03 20 00 |
| .3 | Cast in Place Concrete | Section 03 30 00 |

1.2 DESIGN CRITERIA

- .1 Maximum allowable soil skin friction for drilled piles is indicated on the drawings.
- .2 Pile lengths to be measured from finished contours of excavation.

1.3 EXAMINATION AND SITE CONDITIONS

- .1 Visit site to determine existing conditions and requirements for protection of adjacent work and accept site and existing work as it exists at time of commencement of work. Verify all dimensions at the site.
- .2 Geotechnical investigation report is available for perusal in the Contract Administrator's office.
- .3 Existing survey information is available for perusal in the Contract Administrator's office.
- .4 Contractor to confirm with authorities, location of all utilities prior to commencing with work.

1.4 INSPECTION AND TESTING

- .1 Notify Contract Administrator and secure approval before placing reinforcing steel and concrete. Issue at least 72 hours notice to Contract Administrator or his appointed Engineer, when inspection will be required.
- .2 Concrete tests will be required in accordance with CSA Standard CAN 3-A23.2-M00. 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 City.

1.5 PROJECT CONDITIONS

- .1 Protect nearby structures from damage.
- .2 This trade shall take adequate precautions to protect all existing properties against damage. This Contractor shall carry adequate insurance to cover cost of glass breakage

or damage to any surrounding building, etc. Any glass damage or breakages attributable to the work of this trade shall be made good at the expense of this Contractor.

- .3 The contractor shall provide either a photographic or VHS video record of the existing building areas adjacent to the addition. The photography shall show any existing cracks or other damage to glass and wall systems.

1.6 QUALITY ASSURANCE

- .1 **Qualifications:** a Contractor experienced in the related type of work and having at his disposal all necessary equipment shall perform all work.
- .2 **Allowable Tolerances:**
 - .1 Piles shall not be more than 2% out of plumb; and no more than 50mm out of alignment.
 - .2 Pile shall be made at elevations indicated plus or minus 25mm.
 - .3 **Performance Requirements:** All units shall be installed to develop the loads as indicated on the drawings.
 - .4 **Safety Requirements:** All work shall comply with all local and provincial safety regulations.

1.7 DELIVERY, STORAGE & HANDLING

- .1 **Acceptance at the site:** All reinforcement and concrete for the foundation units delivered to the site that do not conform to the terms of this specification may be rejected by the Contract Administrator or his representative.
- .2 **Storage:** Store all materials at the site in such a way as to avoid undue damage to material before installation.

1.8 SPECIAL PROTECTION

- .1 If ambient temperature during seven days after placing may fall below 5°C, cover top of each unit with 300mm depth of loose straw or approved equivalent and comply with protection requirements of CSA Standard CAN 3-32.1-M77.

PART 2 Products

2.1 MATERIALS

- .1 **Reinforcing Steel:** CSA Standard GSA W186-190 for 400 grade. Ties may be intermediate grade. Size of reinforcing steel shall be as shown on drawings.
- .2 **Concrete:** generally in accordance with CSA Standard CAN 3-A23.1.M00. Strength at 28 days 32 MPa, slump 120 mm. Maximum aggregate 40mm. Concrete to be well vibrated full height of pile. Type 50 cement shall be used. Concrete to be air entrained, with a water cement ration of 0.5. Rear to code requirements.

PART 3 Execution

3.1 ACCEPTANCE OF CONDITIONS

- .1 The Contractor shall examine the existing conditions and the work already performed by other trades, upon which, the work of this section depends on and ensure that these are satisfactory for the continuing work of this trade. Commencement of work implies acceptance of all existing conditions.

3.2 INSTALLATION

- .1 Do pile installation work in accordance with best industry practice. Piles to support loads shown on drawings
- .2 Installation process shall be supervised by Geotechnical Engineer in the employ of the City.

3.3 LOCATION

- .1 Install within 50 mm of exact centres set out, 2% out of plumb alignment and 25 m in elevation. If these conditions are not met, remove same and/or install whatever additional the Contract Administrator directs to correct the error, to support same load satisfactorily, at location shown on drawings, and pay for any additional design costs due to such errors.

3.4 BORING

- .1 Machine-bore piles to depth required, circular and full diameter noted. Remove stones (up to 300 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.

3.5 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.

3.6 PILE CAPS

- .1 Supply and install pile caps as indicated on drawings.

3.7 FIRM BID

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

3.8 PILE LOG

- .1 Keep a log of all piles drilled stating locations, diameter, depth and date placed. Forward triplicate copies of pile log records, in neat and legible form, to Contract Administrator on completion of piling work.

3.9 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.