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**2020 - SECTION 13**  
**TRENCHLESS TECHNOLOGIES**  
**(AUGER/ BORE)**

**13.1 GENERAL**

The provision of Uncased Augering, Cased Augering and Boring shall be in accordance with these specifications and related specifications. At least 3 attempts at augering must be attempted before open cut will be allowed.

In the event that trenchless technologies are used instead of excavation, trenchless log sheets shall be submitted to Aquatera as part of the test package. The consultant shall confirm depths & sign and submit trenchless log form.

**13.2 MATERIALS****13.2.1 CASING**

Casing shall be steel pipe conforming to CSA Z-245 with a minimum wall thickness of 9.5 mm unless otherwise specified by Aquatera's Engineer. Joints shall be welded as per CSA W59.

**13.2.2 SKIDS AND BLOCKING**

All skids and blocking shall be manufactured from pressure treated lumber in accordance with CSA CAN-080-M1989 (wood preservative treatment). Skids shall be NLGA graded S-P- F. The use of engineered spacers may be allowed as an alternate to banded wood skids. All products must be in accordance with the manufacturer's recommendations for the installation of pipe through borings or casings

**13.2.3 STEEL STRAPPING**

Steel strapping shall be hot dipped galvanized with a minimum coat weight of 600 g/m<sup>2</sup> in accordance with CSA G164-1965 or latest revision thereof. Minimum strap dimension shall be 12.5 mm width and 1.0 mm thickness.

**13.2.4 LINK-SEALS**

Link-Seals shall be of a modular mechanical type consisting of interlocking rubber links shaped to continuously fill the annular space between the casing and carrier pipe. Link-Seals shall be manufactured by the Thunderline Corporation or approved equal.

### 13.2.5 CARRIER PIPE

Carrier pipe refers to the pipe, which is to be installed into the auger hole or casing. Carrier pipe shall be in accordance with the specifications relevant to the type of pipe being installed.

## **13.3 INSTALLATION**

### 13.3.1 BELL HOLES

Bell holes include the excavation and backfill of pits to accommodate augering equipment. All Bell Holes shall be made in accordance with the Trenching and Backfill Specifications and/or Occupational Health and Safety Regulations. Portions of the bell holes below the proposed carrier pipe shall be backfilled with an approved sand or granular material conforming to the bedding specifications for the carrier pipe being installed. The edge of the auger pit shall be no closer than 0.5 m to future concrete roadway and sidewalk structures.

### 13.3.2 UNCASED AUGERING

Uncased augering is not allowed on gravity sanitary mains or sanitary services.

Uncased Augering refers to the augering of a tunnel of suitable size, depth and grade to accommodate the specified carrier pipe or pipes as indicated on the Detailed Engineering Drawings or as specified by Aquatera's Engineer.

Carrier pipe shall be in accordance with the Specifications relevant to the type of pipe being installed. Carrier pipe may be pushed, jacked, or pulled into the tunnel.

### 13.3.3 CASED AUGERING

Cased augering is not allowed on gravity sanitary mains or sanitary services without written approval from Aquatera.

a) Cased Augering refers to the augering of a tunnel and the supply and installation of casing into the tunnel as well as the supply of skids, blocking, strapping, Link-Seals and other materials required to install the carrier pipe into the casing. The tunnel shall be of a suitable size, depth and grade to accommodate the casing and carrier pipe as indicated on the Detailed Engineering Drawings or as specified by Aquatera's Engineer.

b) Casing may be jacked or pushed into the tunnel. Sections of casing shall be joined by a continuous welded seam. The casing diameter shall be such that the clearance between the skids and the casing is a maximum of 25 mm when the carrier pipe is in position.

c) Wooden skids shall be affixed to the carrier pipe with steel strapping as per the Typical

Detail Drawings. Casing spacers are to be installed on the carrier pipe in accordance with the manufacturer's recommendations. The skids shall be of sufficient thickness and number to prevent the belled ends of the carrier pipe from contacting the casing.

d) The carrier pipe may be pushed or pulled into the casing. Insertion may be facilitated by greasing the skids with an approved lubricant. "Drilling Mud" or PVC joint lubricants are approved for use. Petroleum based greases or oils are not permitted in conjunction with PVC pipe.

e) The carrier pipe and pipe bells shall not contact the casing at any point along its length.

f) Install a "Link-Seal" or CCI Pipeline Systems ESC pull-on type seal (or Aquatera approved alternate) at each end of the casing into the annular space between the casing and carrier pipe. Installation and size of the "Link-Seal" to be in accordance with manufacturer's specifications.

#### 13.3.4 BORING/DIRECTIONAL DRILLING

Boring/directional drilling is not allowed on gravity sanitary mains or services.

Boring/directional drilling is when a pilot hole is drilled to a bell hole or exit location and a reamer bit is pulled back through the pilot hole, enlarging the hole and pulling the attached pipe product back to the entry location at the same time.

### **13.4 TESTING REQUIREMENTS OF THE CONTRACTOR**

#### 13.4.1 PRE-INSTALLATION

##### a) Materials

The Contractor shall satisfy himself as to the suitability of the soils to accommodate augering or boring. Should such determination reveal that the soil will/may not withstand augering; the Contractor shall notify the Engineer as soon as such a determination is made.

##### b) System

The Contractor shall locate and/or expose by hydro-vac excavation all existing underground utilities and structures being crossed by the auger. Particular attention shall be given to pressurized conduits (gas and water) and primary power lines. Any utilities within 1.0 m of the trenchless crossing alignment (vertically or horizontally) shall be exposed by hydro-vac exaction and surveyed for both location and elevation by the Engineer.

The contractor shall undertake a CCTV inspection of all gravity sewer mains and/or

services that are within 1.0 m of the trenchless alignment 72 hours prior to undertaking trenchless work. A copy of the CCTV inspection shall be provided to Aquatera.

#### 13.4.2 INSTALLATION

##### a) Materials

The Contractor shall satisfy the consultant and/or Aquatera as to the quality of the welds in the situation of cased augering.

No other testing is required.

##### b) System

None required.

#### 13.4.3 POST-INSTALLATION

##### a) Materials

None required.

##### b) System

Any utilities within 1.0 m of the auger or bore crossing alignment (vertically or horizontally) shall be exposed by hydro-vac exaction and surveyed for both location and elevation by the Engineer. These elevations and locations shall be compared to the pre-installation survey. Any changes to existing utilities based on these surveys shall be reported to Aquatera's Engineer.

The contractor shall undertake a CCTV inspection of all gravity sewer mains and/or services that are within 1.0 m of the trenchless alignment within 72 hours after undertaking trenchless work.

### **13.5 PAYMENT**

Payment shall be full compensation for the procurement of all permits and processes, the supply and the installation of all materials, equipment, labour and incidentals necessary to complete the work to specifications at the construction site. Only one payment shall be made for augering or boring, if the outcome is successful within 3 attempts. If open cut is required, the payment shall be as per the specifications for open cut trenches.

#### 13.5.1 BELL HOLES

All work and materials required to construct the Bell Holes shall be considered as incidental to Uncased, Case Augering, or Boring. No separate payment for Bell Holes.



**13.5.2 UNCASED AUGERING**

Payment for Uncased Augering shall be at the unit price per lineal meter shown in the tender. Uncased Augered lengths shall be measured as the completed length of the augered carrier pipe.

**13.5.3 CASED AUGERING**

Payment for Cased Augering shall be at the unit price per lineal meter shown in the tender including the casing. Cased augered lengths shall be measured as the completed length of carrier pipe and casing.

**13.5.4 BORING/DIRECTIONAL DRILLING**

Payment for Boring shall be at the unit price per lineal meter shown in the tender. Boring lengths shall be measured as the completed length of the installed pipe product.

**13.5.5 SKIDS, BLOCKING, STEEL STRAPPING, AND LINK-SEALS**

Payment for skids, blocking, steel strapping and Link-Seals shall be considered incidental to the supply of cased augering and no separate payment will be made for the supply and installation of these items.

**13.5.6 TESTING REQUIREMENTS OF THE CONTRACTOR**

There shall be no separate payment for Testing or Surveying required by the Contractor.

