

**Disapproved**

**Use 551.9945--17**

**DISAPPROVED**

**DESCRIPTION**

**General**

This work shall consist of installing permanent casing for micropiles with the specified diameter, length, and minimum thickness at all micropile locations indicated in the contract documents or as directed by the Engineer.

The Contractor performing this work shall be the same one who installs the micropiles.

**MATERIALS**

**A. Permanent Casing**

Permanent casing shall be of flush-joint or welded type and shall be of appropriate thickness to withstand the stresses associated with advancing it into the ground. Provide permanent casing as indicated in the contract documents and:

- a. Conforming to ASTM A252 with the exception that spiral-welded pipe shall not be allowed or;
- b. May be new or unused "Structural Grade" American Petroleum Institute (API).

Approval of the structural casing shall be done in accordance with the following procedure:

**1. Requirements for Micropile Structural Casing**

Structural casing that is installed in coupled (spliced) sections shall meet the following requirements:

The casing shall be flush joint and the pipe joint shall be completely shouldered and with no stripped threads.

All welded connections shall be performed by a NYSDOT Certified Welder in conformance with NYSDOT Steel Construction Manual (SCM), the approved Welding Procedure Specification (WPS) and the Approved Welding Procedure Qualification Record (WPQR). Welds shall be full penetration welds for full structural load capacity. For piles with bending or tension stress, welds shall be Ultrasonic (UT) or Radiograph Tested (RT). These requirements do not apply to minor welding that does not carry structural load, such as cutting teeth and tacking on bearing plates.

If significant tension loads are being considered, the Department will require the Contractor to provide data demonstrating the adequacy of the proposed detail.

The design shall limit the maximum yield stress of steel (Fy) to 600 MPa.

Permanent structural steel casing for micropiles must meet the Buy America Provisions in Section 106-11 of the Standard Specifications.

Mill certificates are to be provided for the permanent casings.

**B. Water**

Provide water conforming to §712-01 for any drilling fluid.

**C. Grout**

Provide a pumpable grout consisting of, as a minimum, Portland Cement - Type 2 and Water meeting the following Specification requirements:

<b>Material</b>	<b>Subsection</b>
Portland Cement, Type 2	§701-01
Grout Sand	§703-04
Fly Ash	§711-10
Water	§712-01

The use of Grout Sand and Fly Ash in the mix is optional. The mix design for the grout shall be approved in the submittal process for the installation methods in the respective micropile specification.

**CONSTRUCTION DETAILS**

**General**

**A. Submittals**

Submit the following information in accordance with the requirements in the contract documents to the Engineer for approval by the D.C.E.S. The D.C.E.S. will require twenty (20) work days for review. Include in the submittal:

1. Details of equipment for permanent casing installation.
2. Details of procedures for permanent casing installation.
3. Procedures for advancing through boulders and other obstructions.
4. Procedures for containment of drilling fluid and spoil and disposal of spoil.
5. Where applicable, drawings that show the specific work can be performed under limited headroom conditions and as close to obstructions, as site conditions warrant, to install the permanent casing at the locations and to the depths indicated in the contract documents. Provide information on the length of the casing sections to be used, as dictated by the length of the drill mast and by the available overhead clearance and the resulting location of joints.
6. Layout drawings which show the proposed sequence of permanent casing installation and how it will be coordinated with micropile installation.

**B. Permanent Casing Installation and Soil Removal**

Install the permanent casing prior to or in conjunction with the micropile installation. Install the permanent casing so that the center of each casing does not vary from the plan location by more than 75 mm. Do not allow the permanent casing to vary from the vertical or established batter by more than 20 mm per meter as measured above ground. Install the top of the permanent casing to the elevation indicated in the contract documents.

Advance the hole using a duplex drilling method. Do not drill or flush ahead of the drill casing by more than 0.3 m. Perform drilling and excavation in such a manner as to prevent

the collapse of the hole. Use of bentonite slurry is not permitted. Use of polymer slurry to remove cuttings from the cased hole must be approved by the Engineer.

If obstructions are encountered during excavation for a permanent casing, progress through them by means of coring or a tricone roller bit. Use of drop-type impact hammers or blasting is not permitted. Use of a down-the-hole hammer must be approved by the D.C.E.S.

Control the procedures and operations so as to prevent mining, damage or settlement to adjacent structures, tunnels, utilities or adjacent ground. If any mining, damage or settlement occurs, halt operations. Provide a written plan to the Engineer for review with procedures to avoid reoccurrence. Resume work only after the Engineer has approved the plan in writing. Repair all damage and settlement at no additional cost to the State.

Control the procedures and operations so as to prevent the soil at the bottom of the hole from flowing into the hole at all times during installation and cleaning out.  
Control drilling fluid water and dispose of spoil in accordance with the approved procedure.

Fill annular space between the permanent casing and the micropile with the grout meeting the requirements of the approved mix design.

**METHOD OF MEASUREMENT**

The permanent casing for micropiles will be measured by the number of linear meters satisfactorily installed below cut off elevation as indicated in the contract documents.

**BASIS OF PAYMENT**

The unit price bid for permanent casing for micropiles shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work including the placement of grout in the annular space between the permanent casing and the micropile.

