
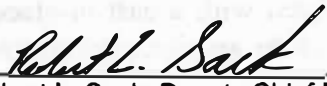


SUPERSEDED BY EB 23-024 EFFECTIVE 8/3/23		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 04-039
Title: SPECIAL SPECIFICATION FOR PREDRILLING HOLES AND INSTALLING PERMANENT STRUCTURAL CASINGS FOR PILES			
Distribution: <input type="checkbox"/> Manufacturers (18) <input type="checkbox"/> Surveyors (33) <input type="checkbox"/> Local Govt. (31) <input checked="" type="checkbox"/> Consultants (34) <input checked="" type="checkbox"/> Agencies (32) <input checked="" type="checkbox"/> Contractors (39) <input type="checkbox"/> _____ ()		Approved:  Robert L. Sack, Deputy Chief Engineer (Research) <u>21 OCT 04</u> Date 	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 5, 2005.
- Superseded issuance(s): This EI does not supersede any previous issuances.
- Disposition of issued materials: The information transmitted by this issuance will reside in the Special Specifications directory of the Toolbox Server.

PURPOSE: The purpose of this EI is to issue a new special specification which requires permanent structural casing for the drilling of holes for the placement of piles.

TECHNICAL INFORMATION:

- Actions by Designers: The designer shall consult with the Regional Geotechnical Engineer (RGE) and Geotechnical Engineering Bureau (GEB) concerning the need for permanent structural casing surrounding the pile(s). The designer, RGE, and GEB shall discuss the anticipated loading, design of the pile(s), and need for permanent structural casing to increase the flexural resistance and reduce deflection of the pile.
- PIN Approval: The special specification is to be approved on a project-by-project basis. Designers will need to send their request for approval to Design Quality Assurance Bureau (DQAB) and the Geotechnical Engineering Bureau through their special specification (SS) coordinator as per Highway Design Manual (HDM) Chapter 21. The Regional designer will incorporate the special specification into the PS&E submission to DQAB as outlined in HDM Chapter 21, Section 21.9.3.2 Submitted Materials.

The special specification is organized by casing size nominal diameter (XX). Some typical casing sizes:

Item 551.0303XX17 M (XX)=	Casing Diameter
24	609.6 mm
30	762.0 mm
36	914.4 mm
42	1066.8 mm
48	1219.2 mm
54	1371.6 mm
60	1524.0 mm

TRANSMITTED MATERIALS:

Attached is the following special specification:

Item 551.0303XX17 M- Predrilling Holes for Piles - Permanent Structural Casing Required.

BACKGROUND: The special specification was created to increase the flexural resistance of cantilevered soldier piles and reduce the overall deflection of permanent soldier pile and lagging walls. An example situation where this special specification would apply is the design of an in-line wingwall to a bridge abutment that will be faced with a cast-in-place concrete finish. It is critical to minimize deflection in order to avoid cracking of the architectural concrete facing.

CONTACT: Questions or comments regarding this issuance should be directed to Randy Romer of the Geotechnical Engineering Bureau at (518) 457-4714, rromer@dot.state.ny.us. Questions or comments regarding the technical aspects of the special specifications should be directed to Steve Borg of the Geotechnical Engineering Bureau at (518) 457-4770, sborg@dot.state.ny.us.

ITEM 551.0303XX17 M PREDRILLING HOLES FOR PILES – PERMANENT STRUCTURAL CASING REQUIRED

DESCRIPTION

The work consists of drilling or boring with augers or approved excavation method and backfilling permanent structural casing for piles at the locations and depths indicated on the contract plans. Prior to pile installation, the casing shall be completely installed at the specified diameter, length, and minimum wall thickness shown on the plans or as ordered by the Engineer.

MATERIALS

Casing

Provide new and unused steel casing along with mill certification that conforms to ASTM A252 for the size and grade shown on the contract plans. Provide splices for permanent casing conforming to the provisions of subsection 551-3.01 C.2.a. Preparation of Piles, Splices, General.

Backfill for Holes

Provide backfill material as shown on the plans conforming to the following:

Concrete Backfill: Provide Class A Structural concrete conforming to the provisions of Section 555-Structural Concrete.

Concrete Backfill (Deposited Under Water): Provide Class G or Class GG concrete to the limits as specified on the contract plans and conforming to the provisions of Section 555-Structural Concrete.

Cement Grout Backfill: Provide cement grout backfill or suitable replacement as approved by the Engineer.

Grout Backfill: Provide a workable mixture of cement, concrete sand, and water capable of stabilizing the hole and being excavated to place lagging when permanent structural casing is used to construct a soldier pile and lagging wall. The limits of the Grout Backfill are as shown on the contract plans. Use cement, concrete sand, and water conforming to the following provisions:

Material	Subsection
Portland Cement	701-01
Concrete Sand	703-07
Water	712-01

The current Departmental-Controlled, Low-Strength Material specification is an acceptable alternative to grout backfill.

CONSTRUCTION DETAILS

A. Submittals

Submit installation details to the Director, Technical Services Division for approval at least thirty (30) days prior to starting the work. Provide the following:

ITEM 551.0303XX17 M PREDRILLING HOLES FOR PILES – PERMANENT STRUCTURAL CASING REQUIRED

1. Details of equipment and procedures for all work involving the installation of permanent casing.
2. Drawings which show the proposed sequence of installing permanent casing and how it will coordinate with pile installation.
3. Where applicable, drawings that show that the specific work can be performed under limited headroom conditions and as close to obstructions as site conditions warrant without damage to the permanent casing.
4. Where subsurface information warrants, procedures for advancing through boulders and other obstructions.
5. Procedures for containment of drilling fluid and disposal of excavated material.
6. Procedures for backfilling outside the permanent casing should the annular space between the soil and the casing require filling in the opinion of the Engineer and Regional Geotechnical Engineer (RGE).

B. Permanent Casing Installation and Soil Removal

Install the permanent casing within the elevation limits shown on the plans prior to the pile 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.

Prior to the start of work, consult with the Engineer and the RGE on means to avoid noticeable subsidence of the surrounding ground surface during the progression of the work. This will also be addressed in the Contractor's original installation submittal. Should noticeable subsidence occur, work shall be stopped and the RGE will be contacted by the Engineer.

Advance the casing no more than 1.5 m ahead of the excavated bottom of the hole. Do not drill or otherwise excavate by more than 300 mm ahead of the permanent casing. Holes shall be cleaned out to the elevation and method required by the contract documents, or to the elevation established by the Engineer. Installation of the permanent casing by any water method is prohibited.

If obstructions are encountered during excavation, progression by means of coring, tricone roller bit, drop-type impact hammers, down-the-hole hammer, or other drilling methods must be approved by the Director, Technical Services Division. The vibration level induced by any approved method must not exceed the ambient vibration level.

Do not drill or progress an adjacent casing until the backfill in any permanent casing has cured as follows:

Backfill Material	Minimum Curing Time
Class A, G, GG Concrete	3 Days
Cement Grout	1 Day
CLSM	No Restriction

**ITEM 551.0303XX17 M PREDRILLING HOLES FOR PILES – PERMANENT
STRUCTURAL CASING REQUIRED**

Control the procedures and operations to prevent soil from flowing into the bottom of the excavation. If in the opinion of the Engineer, such inflow causes mining, damage, or settlement to surrounding structures, tunnels, utilities, or adjacent ground, all operations are to be halted. Provide a written plan to the Engineer for review and approval that will prevent a recurrence. All repairs shall be made to the satisfaction of the Engineer at no additional cost to the State.

The outside surface of the casing shall remain in contact with the existing soil so that voids or loose soil do not adversely affect the lateral support capability of the casing. If existing field conditions and/or soil borings indicate that the above cannot be achieved, the Contractor shall address that in the original installation submittal details.

Disposal of excavated materials and control of drilling fluid shall be in accordance with the approved submittal procedure or as ordered by the Engineer.

C. Backfilling

Place Structural Concrete (Class A) conforming to the provisions of Section 555-3.04, Handling and Placing of Concrete.

Place Concrete (Class G or GG) conforming to the provisions of Section 555-3.05, Depositing Structural Concrete Underwater.

Place cement grout material as per the approved installation submittal procedure or as ordered by the Engineer.

Place Controlled, Low-Strength Material (CLSM) to the provisions of Section 204 - CLSM or as ordered by the Engineer.

METHOD OF MEASUREMENT

The number of linear meters of casing satisfactorily installed to the limits shown on the contract plans or revised by order of the Engineer.

For holes requiring rock sockets, payment for rock sockets will be made under a separate item.

BASIS OF PAYMENT

The unit price bid shall include the cost of furnishing all labor, materials, and equipment necessary to satisfactorily complete the work, including progressing the hole through obstructions and partial removal of the casing above the dredge line when used for a soldier pile and lagging wall.

NOTE: XX denotes casing size nominal diameter. Refer to EI for a full item description.