
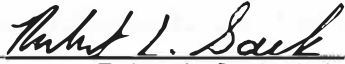


<b>SUPERSEDED BY EB 23-024 EFFECTIVE 8/3/23</b>		New York State Department of Transportation <b>ENGINEERING INSTRUCTION</b>	<b>EI</b> <b>09-028</b>
<b>Title: SPECIAL SPECIFICATION FOR SUBSURFACE SETTLEMENT GAUGE</b>			
<b>Distribution:</b> <input type="checkbox"/> Manufacturers (18) <input type="checkbox"/> Surveyors (33) <input checked="" 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"/> _____ ( )		<b>Approved:</b> <div style="text-align: center; margin-top: 10px;">           Robert L. Sack, P.E.          Deputy Chief Engineer (Research)       </div> <div style="text-align: right; margin-top: 10px;">         21 Dec 09          Date       </div>	

**ADMINISTRATIVE INFORMATION:**

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 6, 2010.
- Superseded issuance(s): This EI does not supersede any previous issuances.
- 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 special specification for a subsurface settlement gauge.

**TECHNICAL INFORMATION:**

- The item for the subsurface settlement gauge is being removed from the Standard Specifications due to limited use. Item 203.11 Subsurface Settlement Gages is being removed from the Standard Specifications by EI 09-024 which is being issued concurrently. A special specification is being created to maintain the ability to specify the item on future contracts.
- PIN Approval: The subsurface settlement gauge special specification is to be approved on a project-by-project basis. Designers must send their request for approval to the Design Quality Assurance Bureau (DQAB) and the Geotechnical Engineering Bureau (GEB) through the Regional Special Specification Coordinator as per Highway Design Manual (HDM) Chapter 21.

**TRANSMITTED MATERIALS:**

Attached are the following revised Metric and US Customary special specifications:

Metric:

Item 203.1101--17: Subsurface Settlement Gauge.

US Customary:

Item 203.11010017: Subsurface Settlement Gauge.

**BACKGROUND:** A subsurface settlement gauge is typically used to monitor settlement during the construction of an embankment. The gauge is installed below the existing grade, prior to embankment construction, to isolate the settlement in a layer of soft material.

**CONTACT:** Questions or comments regarding this issuance should be directed to Randall J. Romer, P.E. of the Geotechnical Engineering Bureau at (518) 457-4714, [rromer@dot.state.ny.us](mailto:rromer@dot.state.ny.us). Questions or comments regarding the technical aspects of the special specification should be directed to John Iori, P.E., of the Geotechnical Engineering Bureau at (518) 457-2720, [jiori@dot.state.ny.us](mailto:jiori@dot.state.ny.us).

### **DESCRIPTION**

This work shall consist of furnishing, installing and maintaining an embankment control device, subsurface settlement gauge, used specifically for controlling earthwork construction.

### **MATERIALS**

Provide materials for the embankment construction control device, subsurface settlement gauge, in conformance with the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" including:

#### **A. PIPE GAUGE.**

1. **Pipe.** Provide a 25 mm diameter outer casing meeting the requirements of §732-02 *Drive Pipe*. Provide a 6.3 mm diameter inner pipe meeting the requirements of §732-02 *Drive Pipe*. Provide a sufficient amount of casing and pipe extensions to meet the rise requirements identified in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*".
2. **Subsurface Anchor Post.** Provide a 0.4 m tall Borros-Type anchor. The Borros-Type anchor shall contain three prongs capable of extending approximately 150 mm from the anchor body at three places, spaced 120° from one another.
3. **Protective Cover.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.

**B. MANOMETER GAUGE.** Provide materials specified for A. *Pipe Gauge* with the exception of the casing and pipe extensions. To obtain readings from the buried device, provide the following connection:

1. **Interconnection.**
  - a. **Tubing.** Provide 12.7 mm O.D. polyethylene tubing indicated in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*".
  - b. **Sand.** Provide sand conforming to the requirement of §703-07 *Concrete Sand*.
  - c. **Fluid.** Provide a 50-50 mixture of ethylene glycol and water.
2. **Readout Box.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.
3. **Base.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.

### **CONSTRUCTION DETAILS**

Subsurface settlement gauge(s) shall be constructed, installed, and maintained where shown in the contract documents and in accordance with the details contained in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" covering construction, installation, maintenance, and abandonment of these devices.

**ITEM 203.1101 17: SUBSURFACE SETTLEMENT GAUGE**

Where subsurface settlement gauges are called for, it will be the Contractor's option to install pipe gauges or manometer gauges, unless a definite type is specified in the contract documents. Subsurface settlement gauges will be accepted for conformance with the specification requirements on the basis of an inspection of the installation by the Departmental Geotechnical Engineer.

**METHOD OF MEASUREMENT**

Subsurface settlement gauges will be measured by the number of devices satisfactorily installed and maintained.

**BASIS OF PAYMENT**

The unit price bid shall cover all costs of providing, installing and maintaining each device, including excavation, trenching and backfill during the course of the work. No payment will be made under any other item of the contract for any work associated with these items.

When each installation is completed, 75% of the item unit price will be paid. The remaining 25% will be paid when each device has been properly maintained and is abandoned according to the procedures contained in the geotechnical control procedure "Settlement Gauges and Settlement Rods". Unless otherwise specified in the proposal, the unit price shall also include the costs of removal.

***Payment will be made under:***

<b>Item No.</b>	<b>Item</b>	<b>Pay Unit</b>
203.1101 17	Subsurface Settlement Gauge	Each

## ITEM 203.11010017: SUBSURFACE SETTLEMENT GAUGE

### DESCRIPTION

This work shall consist of furnishing, installing and maintaining an embankment control device, subsurface settlement gauge, used specifically for controlling earthwork construction.

### MATERIALS

Provide materials for the embankment construction control device, subsurface settlement gauge, in conformance with the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" including:

#### A. PIPE GAUGE.

1. **Pipe.** Provide a 1 in. diameter outer casing meeting the requirements of §732-02 *Drive Pipe*. Provide a ¼ in. diameter inner pipe meeting the requirements of §732-02 *Drive Pipe*. Provide a sufficient amount of casing and pipe extensions to meet the rise requirements identified in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*".
2. **Subsurface Anchor Post.** Provide a 14 in. tall Borros-Type anchor. The Borros-Type anchor shall contain three prongs capable of extending approximately 6 in. from the anchor body at three places, spaced 120° from one another.
3. **Protective Cover.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.

B. **MANOMETER GAUGE.** Provide materials specified for A. *Pipe Gauge* with the exception of the casing and pipe extensions. To obtain readings from the buried device, provide the following connection:

1. **Interconnection.**
  - a. **Tubing.** Provide ½ in. O.D. polyethylene tubing indicated in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*".
  - b. **Sand.** Provide sand conforming to the requirement of §703-07 *Concrete Sand*.
  - c. **Fluid.** Provide a 50-50 mixture of ethylene glycol and water.
2. **Readout Box.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.
3. **Base.** Provide wood to the sizes shown in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" conforming to the requirements of §712-14 *Stress Graded Timber and Lumber*. Treat wood in accordance with §708-31 *Wood Preservative - Waterborne* and applied in conformance with American Wood Preservers Association (AWPA) Use Category Designation UC4B.

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Subsurface settlement gauge(s) shall be constructed, installed, and maintained where shown in the contract documents and in accordance with the details contained in the geotechnical control procedure "*Settlement Gauges and Settlement Rods*" covering construction, installation, maintenance, and abandonment of these devices.

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*Payment will be made under:*

<b>Item No.</b>	<b>Item</b>	<b>Pay Unit</b>
203.11010017	Subsurface Settlement Gauge	Each