

GEOTECHNICAL INSTRUMENTATION

****From Bennington AC NH 019-1(53)**

xx. DESCRIPTION. This work shall consist of furnishing, installing, monitoring, and maintaining settlement platforms and survey targets in accordance with the Contract Documents at the locations shown in the Plans and as directed by the Engineer.

xx. MATERIALS. Materials shall meet the requirements of the following Subsections:

- Steel Pipe, Galvanized 740.05
- Ductile Iron Pipe, Cement Lined 740.07

The standpipe for settlement platform shall be 76 mm I.D. standard weight pipe conforming to the requirements of Subsection 740.05. Pipe shall be threaded at both ends with lengths not exceeding 1.5 m per section. Pipe shall be furnished with a threaded pipe cap on the top of each riser pipe.

The casing pipe for settlement platform shall be 150 mm I.D. Class 52 conforming to the requirements of Subsection 740.07.

A survey prism shall be supplied for each installation. The survey prism shall be a SECO Prism Assembly, 6 x 9 in Target, 62mm, PN 6402-02-xx manufactured by:

SECO MFG. CO., INC.
4155 Oasis Road
Redding, CA 96003
(530) 225-8155

or approved equal. The Contractor shall also supply a system for mounting the survey prism to the threaded pipe cap.

The survey targets shall be a Stick-On Reflector Target, 40 x 40 mm, Cat. No. 1000.635318 supplied by:

Butler Survey Supplies Ltd.
236 40th Ave. NW Calgary, AB T2E 2M7
Phone: (403) 276-5587 Fax: (403) 277-8090
Toll Free: 1-800-661-1129
www.butlersurvey.com

or approved equal.

xx. INSTALLATION.

- (a) General. The Contractor shall submit a complete installation schedule of indicated instrumentation, with detailed installation procedures and a complete listing of all materials, to the Engineer for approval at least two (2) weeks prior to the indicated date of installation of the first instrumentation to be placed on the project.

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The Contractor shall survey all geotechnical instrumentation locations and the limits of the bridge pier spread footing, both location and elevation, prior to and immediately after installation of the instrumentation.

- (b) Modified Settlement Platform. Modified Settlement Platforms shall be placed at the locations indicated on the Plans or as directed by the Engineer.

Modified Settlement Platforms shall be constructed in accordance with the details shown on the Plans.

Necessary lengths of standpipes shall be firmly attached to the platforms by means of approved pipe flanges and approved anchors. They shall be of sufficient lengths, with pipe extensions, to reach at least 1200 mm above the top surface of the Type IV Stone Fill.

No extension shall be added to pipes, except in the presence of the Engineer. The uppermost extension of the pipe shall be tightly capped at all times, and the caps shall be removed only in the presence of the Engineer at the time that extensions are added. The interior and the extension pipe down to the platform shall be kept free of dirt and debris in order to allow checking of the length of extensions above the plate. After the last extension and cap are installed and tightened, the cap shall be marked with paint in order to assure that the cap has not been subsequently moved or removed.

The standpipes shall be cased with a 150 mm ductile iron pipe as protection against damage when backfilling the pier with Type IV Stone. Modified Settlement Platforms shall be protected against damage from vehicles and construction equipment.

The Contractor shall maintain and keep in good working order all Settlement Platforms and shall notify the Engineer immediately of all repairs to, or restorations of, damaged or disturbed Settlement Platforms. All embankment construction within 30 m of any location where a Settlement Platform has been disturbed or damaged shall be halted until the Engineer has been notified and the necessary maintenance has been performed. All movement or disturbance of any Settlement Platform not caused by surface consolidation of the compressible foundation soils shall be immediately corrected by the Contractor at the Contractor's expense by resetting or replacing it to the satisfaction of the Engineer.

The exact elevation of the top of the Settlement Platform as installed shall be determined and recorded by the Engineer. No embankment shall be placed within 30 m of such locations before the Settlement Platform elevation has been determined.

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(c) Pier Survey Target. Pier survey targets shall be placed at the locations indicated on the Plans or as directed by the Engineer. Pier survey targets shall be installed in accordance with the manufacturer's instructions or as directed by the Engineer.

xx. MAINTENANCE AND MONITORING. The Contractor shall maintain all geotechnical instrumentation equipment in an acceptable working order for the duration of the project and shall repair or replace any such equipment which fails to function properly, as directed by the Engineer.

Any instrumentation that becomes damaged or inoperable as a result of the Contractor's operations and requires replacement shall be replaced in kind by the Contractor at no cost to the State of Vermont.

Following installation of each piece of instrumentation, the Contractor shall monitor and record elevation data on a daily basis or as directed by the Engineer. Data will be recorded in a format acceptable to the Engineer, and shall be provided on a weekly basis.

xx. METHOD OF MEASUREMENT. The quantity of Special Provision (Modified Settlement Platform) to be measured for payment will be the number of settlement platforms furnished, installed, and maintained in the complete and accepted work.

The quantity of Special Provision (Pier Survey Target) to be measured for payment will be the number of targets furnished and installed in the complete and accepted work.

xx. BASIS OF PAYMENT. The accepted quantity of Special Provision (Modified Settlement Platform) will be paid for at the Contract unit price for each. Payment shall be full compensation for furnishing, transporting, handling, and placing the material specified, including pipe, prism and prism attachment, clamps, fittings, appurtenances, and protective devices, for protecting and maintaining the platform, for monitoring and recording survey data for each platform, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Payment will be made only if the platform remains fully functional during all phases of construction, including the placement of backfill, construction of the bridge pier, loading of the pier with the bridge superstructure, and completion of the superstructure construction, unless otherwise allowed by the Engineer.

The accepted quantity of Special Provision (Pier Survey Target) will be paid for at the Contract unit price for each. Payment shall be full compensation for furnishing, transporting, handling, and placing the material specified, including survey targets, appurtenances, and protective devices, for protecting and maintaining the target, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

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Payment for items under this Section will be made upon completion of the project.

At the completion of the project, all geotechnical instrumentation and appurtenances will become the property of the State of Vermont for continuing to monitor any actual settlement at this location.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
900.620 Special Provision (Modified Settlement Platform)	Each
900.620 Special Provision (Pier Survey Target)	Each