SP-150875
(New)

SPECIAL PROVISIONS
FOR
INSTRUMENTATION AND MONITORING

Pottawattamie County
IM-NHS-080-1(447)5--03-78

Effective Date
July 19, 2022

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150875.01 DESCRIPTION.

A. Scope of Work.
The work shall consist of installing, maintaining, and monitoring instrumentation designated on theplans and as specified herein, except for piezometers that are addressed separately by Special Provisions for Piezometers. The settlement plates will be installed by the grading contractor; however, the monitoring of the settlement plates, shall be included in this work and monitored in accordance with Article 2526.03, G of the Standard Specifications and the requirements shown in this special provision.

B. Definitions.

Inclinometer: Inclinometers are devices capable of measuring lateral displacement at multiple depths of a casing installed in an embankment sideslope.

C. Subsurface Conditions.

1. Borings completed within the limits of the project encountered varying thicknesses of soft to medium stiff alluvial clay overlaying alluvial sand and bedrock as shown in the Q sheets.

2. The groundwater readings at the time of drilling are shown in the Q sheets. It is anticipated that the groundwater level will fluctuate due to precipitation and changes in the Mosquito Creek water level.

D. Submittals.

1. Provide means and methods for installation of the inclinometer. Means and methods shall include a map with the location of the inclinometer. This information shall be provided to the Engineer at least 20 days prior to installation.

2. Instrumentation type/model including ranges, operating principle, advantages and limitations

shall be submitted to the Engineer at least 20 days prior to installation or with sufficient time tobe able to replace any instrumentation without impacting the construction schedule. No additional time will be granted for any delays due to replacing type or range of instrumentation.

150875.02 MATERIALS.

A. Inclinometer.

1. Inclinometer casing shall be a grooved plastic with 2.75 inches outside diameter casing that iscompatible with the inclinometer being provided. The grooves shall be spaced at 90 degrees. The casing shall be completed with necessary rigid self-aligning couplings and end plugs. The inclinometer casing shall include telescoping couplings that can accommodate up to 26 inches of settlement.

2. The inclinometer monitoring system shall consist of Geokon Model GK-604D Digital Inclinometer System or approved equivalent including any necessary data reduction software to process and present the measurements.

150875.03 CONSTRUCTION.

A. The borehole shall be logged and boring log submitted with the installation log of the inclinometer. The boring log shall be logged per ASTM D2488 standard with sampling at 5 foot intervals.

B. Inclinometer Installation.

1. Drill, sample, and log soil borings drilled for the purpose of installing inclinometer casing. Boring for inclinometer shall be drilled using at least a 6 inch inside diameter casing and water or, where ground conditions permit, using drilling mud in a 6 inch diameter borehole. This boring shall be used as a soil confirmation boring.

2. Install inclinometer casing prior to the embankment fill being placed and extend as the embankment construction progresses. The casing shall protrude 3 feet above finished grade.

3. Flag and protect inclinometer location. Provide the top of inclinometer casing with a protective cap, and with protective metal housing that can be locked extending at least 3 feet below finished grade.

C. Contractor Quality Control.

1. The following describes the minimum inspection and testing required in the Contractor's Quality Control (CQC) Plan and Program for the work described in this provision. The implementationof the Contractor Quality Control Program does not relieve the Contractor from the responsibility to provide the work in accordance with the contract documents, applicable codes, regulations, and governing authorities.

2. The installation of the inclinometer shall be done under the direct supervision of a professional geotechnical engineer registered in the State of Iowa hired by theContractor. The initial readings shall be taken 24 hours after completing the installation of the inclinometer casing. Elevations for the inclinometer shall be determined at the ground surface adjacent to the inclinometer casing and at the top of the inclinometer casing. Inclinometer readings shall consist of manual surveys. Inclinometer surveys shall be completed at surcharge fill heights of 10 feet, 20 feet, and full height, and then on a weekly basis after the surcharge is at full height. Each survey shall consist of a set of readings in

each of the two primary orientations. Process the results, plot them, and furnish the results to the Engineer. The Engineer will determine which survey will represent the initial set of measurements.

3. Settlement plate readings should be completed at fill height intervals not greater than 10 feet and on a weekly basis after the surcharge or embankment fill is at full height.

4. The instrumentation readings shall be submitted to the Engineer at the end of each week. More or less frequent submittals may be required depending on the results of the instrumentation monitoring.

150875.04 METHOD OF MEASUREMENT.

Measurement for Instrumentation and Monitoring will be lump sum.

150875.05 BASIS OF PAYMENT.

A. Payment for Instrumentation and Monitoring will be at the contract unit price per lump sum.

B. Payment is full compensation for:

- Furnishing and installing inclinometer.
- Furnishing and installing protective housing for inclinometer.
- Maintenance and monitoring of instruments, including the inclinometer casing and settlement plates.
- Performing manual readings for the inclinometer and settlement plates.
- Repair and replacement for the instruments and monitoring system.
- Data collection, data reduction, data reporting and engineering time required to present aletter report of the findings.

C. Settlement plate installation shall be compensated per Article 2106.05 of the standard specification.