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Field Report

To:	John Christiansen		
From:	John Charlton	Project:	OPPD FCS 2011 Flood Inundation Inclinometer Installation OPPD Plant, Ft. Calhoun, NE
CC:	Project File, David Rohan	HDR Project No:	164565, Dept. 134
Date:	October 11, 2011	Field Report No:	
RE:	OPPD FCS Facility, Installation of Inclinometer 4 (I-4)		

Team Members:

HDR Representatives

John Charlton – Geotechnical

OPPD FCS Representatives

Phil Turner

Thiele Geotechnical Representatives

Brian Gappa – Driller
Kyle Gappa – Driller's Helper
Ron Epley – Driller's Helper
Jim Gorham – Driller's Helper

Field Activity Objective:

The primary objective of this day's site visit was to oversee the installation of I-4 by Thiele Geotechnical.

Activities Conducted:

This day began with Thiele Geotechnical (Thiele) personnel and HDR representative John Charlton obtaining visitor badges and clearing security. This activity was performed from 0800 to 0830.

Inclinometer installation activities began with drilling 8 inch outer diameter (OD) and 4.25 inch inner diameter (ID) hollow stem auger (HSA) pipe from ground surface to the top of rock at 74.5 feet below ground surface. HSA was then set approximately 0.4 feet into rock to provide a seal at the bottom of the HSA to prevent inflow of sand from the insitu material. This activity was performed from 0830 to 0930.

Drilling bedrock from approximately 75 to 85 feet was accomplished using a 3.75 inch diameter tri-cone bit attached to steel rods lowered through the HSA. The tri-cone bit began flushing cuttings still in the HAS at depth of 45 feet. Significant gravel cuttings were flushed from approximately 65 to 75 feet. Thiele began using bentonite mud as drilling fluid in order to help lift cuttings. Bob Lapke, Geotechnical Engineer from Thiele arrived at the work location at 0950 to assist with operations. Once cuttings were flushed, the tri-cone bit engaged rock and began advancing. Cuttings indicated light gray limestone. Tri-cone bit and rods were tripped out and the borehole was measured 85.2 feet below ground surface. This activity was performed from 0930 to 1130.

Thiele installed the 2.75 inch inclinometer casing with the bottom stabilizer and grout valve attached to the bottom of the inclinometer casing. Inclinometer casing was installed to the full depth of the borehole. Thiele filled the casing with water to overcome buoyancy. Casing was stable and did not require holding in place at the surface. This activity was achieved from 1130 to 1150.

Thiele began mixing grout to grout the annulus between the inclinometer casing and the borehole wall. The original mix contained 30 gallons of water, 94 pounds of Portland Type I cement, and 25 pounds of bentonite. The mix resulted in unit weight of 10.6 pounds/gallon and March funnel time of 29 seconds. Bob Lapke and John Charlton concurred that this mix required higher viscosity (higher Marsh funnel time). The decision was made to add 15 pound of Portland Type I and 9 pounds of bentonite to the mix. The resulting Marsh funnel times on the five grout batches mixed ranged from 35 to 42 seconds. Unit weights ranged from 10.7 to 10.95 pounds per gallon. Batches were mixed for approximately 10 minutes using the CME 55 pump to circulate the batched material. Five batches of grout were placed as HSA was removed with only ten feet of HSA left in the ground. Thiele ran out of Portland Type I so the decision was made to top off the borehole with grout in the morning of 10-12-2011. Ten feet of HSA was left in the ground to prevent collapse of the soil onto the inclinometer casing. These activities were achieved from 1150 to 1550.

Thiele began work site cleanup and filling water tanks in preparation for 10-12-2011 work. These activities were completed from 1550 to approximately 1700.

Data Obtained:

Documentation

The activities conducted as described in this field report were documented in the field in written field notes. Photographic documented was not performed per OPPD requirements. Field notes were taken as the inclinometer installation progressed.

Technology

No special technology was applied during reconnaissance or assessment this day.

Other

No other observations or site details were made or reported this day.

Observations:

Observations made this day, and covered by this Field Report, were of inclinometer installation performed by Thiele Geotechnical.