

MONITORING DEVICES - PIEZOMETER**1.0 DESCRIPTION**

This work consists of furnishing, installing, and maintaining vibrating wire piezometers in accordance with this provision, as shown on the plans, and as directed by the Engineer. The work also includes furnishing the piezometer readout system.

2.0 CONSTRUCTION METHODS - GENERAL

Prior to installation of the piezometers at the designated locations, the Contractor shall demonstrate that his equipment, method and materials produce a satisfactory installation in accordance with this special provision. Payment will be at the unit price bid for the "Monitoring Devices-Piezometer". Payment will not be made for installing unsatisfactory piezometers. If at any time the Engineer determines that the method of installation does not produce a satisfactory piezometer, the Contractor shall alter his method and/or equipment as necessary to comply with this special provision. The piezometer shall be located in such a way not to harm other embankment instrumentations.

Piezometer shall be installed from the working surface to the depths shown on the plans. These depths refer to the middle of the piezometer referenced to the original ground surface. The piezometer cables shall be protected as successive layers of embankment are placed.

During roadway construction and any delay period for settlement, the piezometers will be read and analyzed weekly by the Engineer. If the piezometers indicate excessive excess pore pressures at a given location during embankment placement operations, the placing of embankment material shall be suspended.

The piezometer shall be installed per any recommendations of its manufacturer or supplier. As a general guideline, use a 4 -inch diameter pilot hole. Eight inches of clean sand shall be placed below and above the piezometer; then the borehole shall be sealed with a 2 FT layer of bentonite. The remaining section of the borehole shall be backfilled to the embankment level with a sealing grout consisting of a sand-bentonite mixture. The Contractor shall protect the piezometer cabling at all times from damage by construction equipment. Damaged cables shall be replaced at Contractor's expense. A sketch showing the vibrating wire piezometer and the cabling is attached (Figure 1).

The Contractor will obtain any and all permits required for the installation of the piezometers in the ground from the appropriate government agency, whether federal, state or local. Piezometers are to be installed by a South Carolina licensed well driller.

3.0 MATERIALS

The contractor shall provide a piezometer installation plan, which shall include the manufacturer name, the manufacturer cut sheets for the specific piezometer, cables and data loggers to be used and the manufacturers operations manuals for both the piezometer and data logger. The plan shall be approved by the Department prior to purchasing any piezometer equipment. At the conclusion of the project the data logger equipment shall become the property of the contractor. All other items placed in the field shall become the property of the Department.

4.0 BASIS OF PAYMENT

Unit price bid for "Monitoring Devices-Piezometer" shall include all costs associated with supplying, installing, and maintaining the monitoring devices. The Engineer will monitor the devices throughout construction of the embankment and for a period of one year after the final delay period for settlement when embankment construction is completed. The Contractor will be responsible for ensuring the slope indicators are in working order and accessible once the embankment is complete.

Payment will be made under:

Item No.	Pay Item	Pay Unit
2038130	Monitoring Device - Piezometer	EA

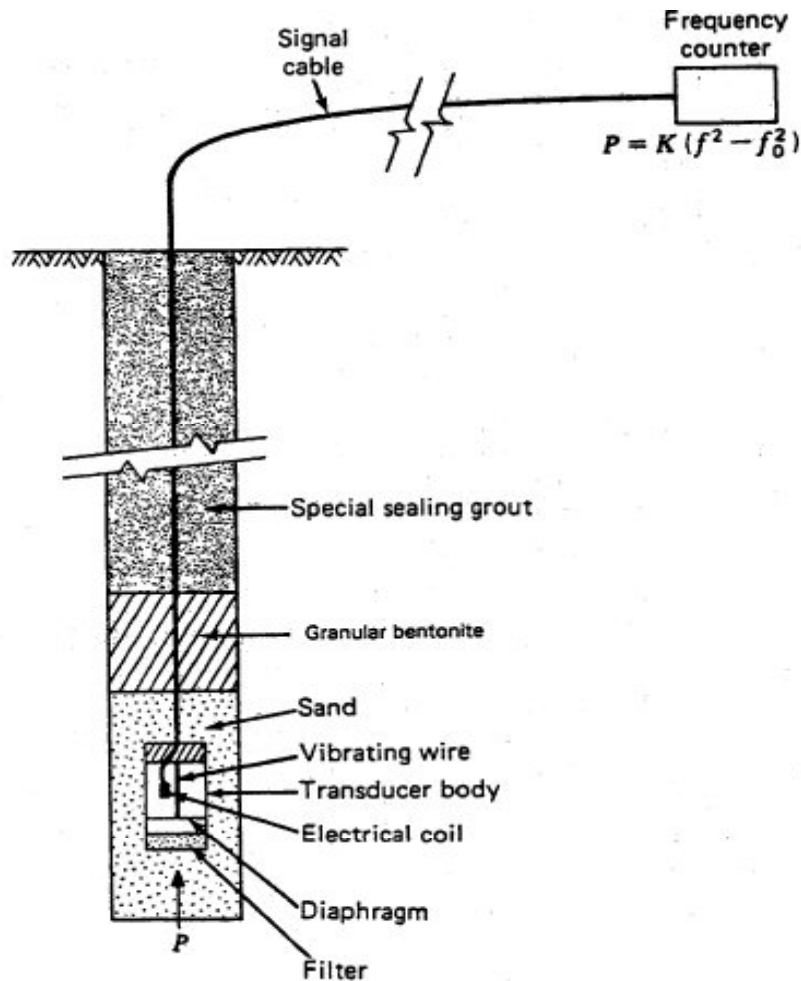


Figure 1 - Schematic of Vibrating Wire Piezometer Installed in a Borehole.
(After Dunicliff, 1988, 1993) (FHWA HI-98-034)