KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2007

Add a new SECTION in DIVISION 800.

PREFABRICATED VERTICAL DRAIN

1.0 DESCRIPTION

Excavate for and place geosynthetics to provide a drainage pathway for consolidating embankments and foundation soils as shown in the Contract Documents.

BID ITEM	**UNITS**
Prefabricated Vertical Drain	Linear Foot

2.0 MATERIALS

a. Prefabricated Vertical Drain.

(1) Requirements. Provide a prefabricated polypropylene channeled core wrapped in a non-woven polypropylene continuous filament geotextile complying with the minimum average roll values in **TABLES 1 and 2**.

TABLE 1: PREFABRICATED VERTICAL DRAIN FABRIC, MINIMUM AVERAGE ROLL VALUES		
Property	**Requirement**	**Test Method**
Grab Tensile Strength	130 lbs	ASTM D4632
Grab Elongation at Failure	> 50%	ASTM D4632
Trapezoidal Tear	60 lbs	ASTM D4533
Permittivity	0.5 sec^{-1}	ASTM D4491
Apparent Opening Size (AOS)	≤ 0.3 mm	ASTM D4751

TABLE 2: PREFABRICATED VERTICAL DRAIN COMPOSITE, MINIMUM AVERAGE ROLL VALUES		
Discharge Capacity	**Requirement**	**Test Method**
1.5 gpm	1.5 psi	ASTM D4716
1.5 gpm	43.5 psi	ASTM D4716

(2) Test Methods. As specified in the various ASTM standards cited in this specification.

(3) Prequalification. None required.

(4) Basis of Acceptance. The Engineer will accept the geosynthetic material upon the basis of satisfactory test results for each lot. A lot is defined as 10,000 feet. If the material fails to comply with the requirements, the entire lot will be rejected.

Any geosynthetic material proposed for use must be evaluated by KDOT's Bureau of Materials and Research, Geotechnical Unit, Soils Section. The entire lot of geosynthetic material shall be on site before samples are taken and laboratory testing performed.

Allow a minimum of 15 working days for the approval process. After sufficient data has been collected, the testing frequency may be modified upon approval by the Geotechnical Soils Engineer.

3.0 CONSTRUCTION REQUIREMENTS

a. Qualification of the Prefabricated Vertical Drain Contractor. At least 1 month before the construction of the Prefabricated Vertical Drains, provide KDOT's Bureau of Materials and Research, Geotechnical

Unit with evidence of successful installation of prefabricated vertical drains on 3 or more projects under similar conditions using the same installation technique. For the completed projects, include the location, description, size, the owner's name, address and telephone number, and the project engineer's name.

KDOT's Bureau of Materials and Research, Geotechnical Unit will approve (or deny) the Contractor's qualifications. No adjustment in contract price will be allowed if the submittal is rejected.

Before installing drains, satisfactorily install 3 test prefabricated vertical drains to the maximum anticipated depth shown in the Contract Documents at locations designated by the Engineer.

b. Construction of Prefabricated Vertical Drain. Survey, number and stake the drains within 6 inches of the locations indicated in the Contract Documents, or as directed by the Engineer.

Install drains from the working surface to the depth shown in the Contract Documents, or as specified by the Engineer.

Do not vary the installed drains from the vertical by more than 1 inch per 4 feet.

Provide a suitable means of determining the quantity of prefabricated vertical drain material used, and the depth of the drain.

Splice or connect the drain material in a workmanlike manner for continuity of drain material. Leave a 4 to 8 inch length of drain material protruding above the natural ground surface at each drain location. Cut the drain material neatly at its upper end.

If obstructions are encountered below the working surface that cannot be penetrated using normal and accepted procedures, complete the drain from the elevation of the obstruction to the working surface and notify the Engineer. At the direction of the Engineer, install a new drain within 2 feet from the obstructed drain. The injection of limited amounts of water will be allowed to facilitate the anchoring of drains. Make a maximum of 2 attempts to install the replacement prefabricated vertical drain as directed by the Engineer. If the drain still cannot be installed to the design tip elevation, abandon the drain location.

4.0 MEASUREMENT AND PAYMENT

The Engineer will measure prefabricated vertical drains by the linear foot.

The Engineer will pay for "Prefabricated Vertical Drain" at the contract unit price which is full compensation for the specified work.

Satisfactory test drain installations will be paid for at the contract unit price per foot for "Prefabricated Vertical Drain". The Contractor will be paid for all obstructed drains properly completed at the contract unit price.

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