

**KANSAS DEPARTMENT OF TRANSPORTATION  
SPECIAL PROVISION TO THE  
STANDARD SPECIFICATIONS, 1990 EDITION**

NOTE: This special provision is generally written in the imperative mood. The subject, "the Contractor" is implied. Also implied in this language are "shall", "shall be", or similar words and phrases. The word "will" generally pertains to decisions or actions of the Kansas Department of Transportation.

**PREFABRICATED EDGE DRAIN**

**1.0 DESCRIPTION.**

Install a prefabricated geocomposite pavement drainage system as detailed in the Contract Documents.

**BID ITEM**

Edge Drain (Prefabricated)  
Outlets

**UNIT**

Linear Foot  
Each

**2.0 MATERIALS.**

**a. Prefabricated Edge Drain.** Provide a prefabricated drain conduit that is a flexible, rounded rectangular shaped, composite product. Provide a prefabricated drain conduit with a core of high-density polyethylene or polystyrene that complies with these minimum average roll values (MARV):

Property	Test Method	MARV
Compression Strength (lbs./sq. ft.)	ASTM D 1621	8000
Flow Capacity (gals./min./ft. width)	ASTM D 4716	20
Thickness (inch)	ASTM D 1777	1

Wrap the drain conduit with a geotextile of a non-woven needle-punched construction, consisting of long-chain polymeric fibers composed of polypropylene, polyethylene or polyamide. Orient the fibers into a multi-directional stable network whereby they retain their positions relative with each other and allow the passage of water as specified. Chemical treatments or coatings that reduce permeability are not permitted on the fabric. Provide a fabric that is inert to chemicals commonly found in soil. Provide a geotextile that conforms to these minimum average roll values (MARV):

Property	Test Method	MARV
Grab Tensile Strength (lbs.)	ASTM D 4632	100
Elongation (%)	ASTM D 4632	50
Puncture Strength (lbs.)	ASTM D 4833	60
Burst Strength (psi)	ASTM D 3786	230
Trapezoid Tear (lbs.)	ASTM D 4533	40
Permeability (cm/sec)	ASTM D 4491	0.20
Apparent Opening Size (U.S. Std. Sieve)	ASTM D 4751	70 – 100
Permittivity (sec <sup>-1</sup> )	ASTM D 4491	1.9
Ultraviolet Degradation (% Retained Strength)	ASTM D 4355	70 @ 150 hrs

The Engineer will accept the prefabricated edge drain based on the receipt and approval of a Type D Certification according to the requirements of **Section 2600** of the **Standard Specifications**.

**(b) Outlets.** Provide an outlet pipe with a smooth-walled interior. Provide polyvinyl chloride (PVC) pipe that complies with the requirements of ASTM D 3034. A minimum pipe

stiffness (PS) of 115 psi at 5% elongation when tested according to ASTM D 2412 is required. Provide the outlet pipe in the diameter designated in the Contract Documents. Provide pipe couplings (with cement or gaskets) recommended by the pipe manufacturer.

The Engineer will accept the outlet pipe based on the receipt and approval of a Type D Certification according to the requirements of **Section 2600** of the **Standard Specifications**.

**(c) Aggregate for Permeable Backfill.** Provide aggregate for permeable backfill, UD-1, that complies with the requirements of **Section 1100** of the **Standard Specifications**.

**(d) Concrete for Outlet Flumes.** Provide either Grade 25 concrete or commercial grade concrete that complies with the requirements of **Section 402** of the **Standard Specifications**.

### **3.0 CONSTRUCTION REQUIREMENTS.**

Excavate a trench at the outside edge of the traveled way. Excavate the trench 4 inches±1 inch wide and deep enough that the top 2 inches of the prefabricated edge drain (when placed in the trench) will extend above the boundary formed by the bottom of the pavement and the subbase. Remove all loose material from the trench. If the trench is over-excavated, backfill the trench to the proper grade using the excavated material or the aggregate. Excavate only the length of trench that can be backfilled completely within 1 working day.

Place the prefabricated edge drain in the trench in the vertical position, flush to the outside face of the trench. Install fittings for the prefabricated edge drain according to the manufacturer's recommendations. Install end caps at all terminal points to prevent soil infiltration. Replace damaged prefabricated edge drain by splicing in an undamaged section of prefabricated edge drain according to the manufacturer's recommendations.

While keeping the prefabricated edge drain vertical and flush to the outside face of the trench, place the aggregate in the trench between the edge of the pavement and the prefabricated edge drain. Place the aggregate from the bottom of the trench to a minimum of 2 inches above the prefabricated edge drain. Seat the aggregate using a method approved by the Engineer. Use an appropriate seating operation to ensure that the prefabricated edge drain or geotextile is not damaged and the aggregate is not contaminated with foreign debris such as soil.

Place the outlet pipe on a minimum 2% grade unless otherwise shown in the Contract Documents. Join sections of the pipe with couplings provided by the manufacturer of the pipe. Make all connections water tight and bonded with an appropriate cement or gasket. Place outlet pipes only on stable impermeable material and backfilled with only impermeable material. Impermeable material is defined as any soil classified as clay, silty clay, or clay loam having a Plastic Index greater than 15. Do not use waste material from the trench.

Construct a concrete flume at the outlet end of the pipe as indicated in the Contract Documents. Construct and adjust the outlet flume flush even with the finished slope with the invert slopes at a minimum of 3% slope. Construct concrete outlet flumes of either Grade 25 Concrete or Commercial Grade Concrete. The lower end of each outlet is to be fitted with a screen to prevent the entrance of rodents. Use ¼ inch mesh galvanized hardware cloth. Provide a removable screen that can be replaced without damaging the screen, outlet, or pipe. Inspect each completed outlet pipe and flume for obstructions. These obstructions may be soil, aggregate, a crushed or bent outlet pipe, or other construction debris. Remove the obstructions and repair or replace the outlet pipe as necessary to restore full flow capability to the pipe. If the roadway is not open to the traveling public, as a minimum maintain drainage through every fourth outlet, outlets at low points and each outlet adjacent to the low point. If the roadway is

open to the traveling public, or if the project is in a winter shutdown, maintain drainage through all outlets.

**4.0 MEASUREMENT AND PAYMENT.**

The Engineer will measure the accepted prefabricated edge drain by the linear foot (to the nearest lin. ft.), measured according to the dimensions shown in the Contract Documents.

The Engineer will measure the number of installed and accepted outlets.

Payment for "Prefabricated Edge Drain" and "Outlets" at the Contract unit prices is full compensation for the specified work.

04-10-03 M&R(SP) (RB)