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.

Create a new Section in Division 700:

DIVISION 700

ABUTMENT DRAINAGE SYSTEMS

1. DESCRIPTION:

Install a geocomposite drainage system consisting of a prefabricated abutment strip drain, and perforated and non-perforated underdrain pipes at the locations designated in the Contract Documents.

Bid Item	**Units**
Abutment Strip Drain	square meter

2.MATERIALS:

Provide abutment strip drains that comply with the requirements of **Section 1700** (Special Provision 90M-15, latest revision).

Provide full circumference perforated pipe for the underdrain and non-perforated corrugated polyethylene tubing for the outlets that comply with the requirements of **Section 1900**.

3.CONSTRUCTION.

Construct abutment drainage systems according to the details in the Contract Documents.

Clean the surfaces against which the geocomposite drains will be placed, remove all soil, debris, and irregularities that will prevent intimate contact between the surface and the drain.

Install the geocomposite drains either vertically or horizontally, according to the details in the Contract Documents. Secure the geocomposite drains using metal stick clips or adhesives. If a waterproofing membrane is applied to the surfaces before the geocomposite drain is installed, do not use nails to attach the geocomposite drain unless the waterproofing membrane is self-healing.

Form all joints by peeling or trimming the fabric off the attached section to expose 75 mm of core. Overlap the core of the second section by 50 mm and interlock the core. Cover the joint with the fabric flap and securely fasten to the lower fabric by means of a continuous strip of 75 mm waterproof plastic tape. Shingle each course overlapping the sections in the direction of water flow. If joints can not be formed by interlocking the cuspations, then the core should be butted together and covered with fabric. Use a 200 mm continuous strip of geotextile fabric, centered over the joint and fastened on both edges with a 75 mm waterproof plastic tape.

Cover all exposed edges of the geocomposite drainage core with fabric. Tuck and secure a minimum of 100 mm of fabric behind the core. This may be done by utilizing the excess fabric at the ends or using a 300 mm strip of fabric in the same manner, taping it to the exposed fabric 200 mm in from the edge with a continuous strip of 75 mm waterproof plastic tape and folding the remaining 100 mm over and tucking behind the core edge.

If the fabric is torn, perforated, or ripped, patch it. The patch consists of a second layer of fabric having a 100 mm overlap and the edges secured with 75 mm waterproof plastic tape. Do not repair damaged core sections, replace them.

Place the underdrain pipes as shown on the Contract Documents. Separate the geotextile filter fabric from the core and wrap it around the circumference of the perforated underdrain pipe and tuck it behind the core.

Do not damage the geocomposite drainage system when backfilling the structure. Use backfill soils with a liquid limit of less than 50.

4.MEASUREMENT AND PAYMENT.

The Engineer will measure abutment strip drains by the square meter (measured to the nearest m^2) of area of wall covered. The Engineer will measure to the limits shown in the Contract Documents.

Payment for "Abutment Strip Drain" at the Contract unit price is full compensation for the specified work.

Create a new Subsection in Section 1700:

SECTION 1700

ABUTMENT STRIP DRAIN

1706.1 DESCRIPTION.

The abutment strip drain is a prefabricated geocomposite system used to provide drainage behind abutment backwalls, wing walls, retaining walls or under slopes.

1706.2 REQUIREMENTS.

a. General. The system is preformed using a lightweight, high impact polymeric core with an attached geotextile (filter fabric). The composite polymer core is bonded to the geotextile at intervals not exceeding 30 mm in any direction. The preformed system permits the flow of water through the core. The geotextile fabric is thermal (heat) bonded or fungicide glue bonded to the polymeric core. The composite product sheets or rolls have a minimum width of 1 m with a minimum area of 3.7 m^2. Store and handle the system in accordance with manufacturer's recommendations, except that in no case may geotextile be exposed to direct sunlight, ultraviolet rays, temperature greater than 60^oC, mud, dirt, dust, and debris. Do not use any core section that becomes torn or punctured. All material delivered to the project must meet or exceed the following physical requirements based on minimum average roll or sheet values:

COMPOSITE SYSTEM PROPERTIES		
TEST	**LIMIT**	**METHOD**
Thickness (mm)	6.35 min., 12.7 max	ASTM D 1777
Peel Strength (N/m)	73 N minimum	ASTM D 1876
Transmissivity (m^3/sec-m) at hydraulic gradient of 1.0 and minimum normal stress of 172 kPa.	0.0020 minimum	ASTM D 4716

b. Core. The core is a lightweight polymer plastic composition of either polystyrene polyethylene, polypropylene, or PVC, with a convexity structure.

CORE PROPERTIES		
TEST	**LIMIT**	**METHOD**
Std. Crush Strength: Wall Drain (kPa) Slope Drain (kPa)	 Min. 480 kPa Min. 862 kPa	 ASTM D 1621 ASTM D 1621
Deflections (%)	Max. 20	ASTM D 1621
Thickness (mm)	Min. 5.8	ASTM D 1777

c. Geotextile Filter Fabric. Provide fabric that complies with the requirements of AASHTO M 288 for subsurface drainage geotextiles with properties for Class 2 geotextile with elongation greater than or equal to 50 percent, and percent in-situ soil passing the 75 µm sieve of greater than 50 percent.

1706.3 TEST METHODS.

Test the composite and individual components according to the standards cited in **subsection 1706.2**.

1706.4 PREQUALIFICATION.

For prequalification, supply samples of the finished product from production to the KDOT Engineer of Tests for testing and evaluation. Also submit separate samples of the core material and the filter fabric. All samples must be 3 m long by nominal roll width. Submit a manufacturer's or independent laboratory test report addressing the properties in **subsection 1706.2**.

When it becomes available, test results for the product will be accepted from the AASHTO National Transportation Product Evaluation Program (NTPEP) without submitting samples. Forward an official copy of the test report to the Chief of Materials and Research for evaluation. Prequalification will be based on satisfactory compliance of NTPEP results with this specification.

If the KDOT test or NTPEP results comply with the requirements of **subsection 1706.2**, the name of the product will be placed on a list of prequalified products maintained by the Bureau of Materials and Research. No geocomposite drainage system will be used on Department projects unless it has been prequalified.

Verification samples will be taken at the rate of 2 per source, per district, per year, and forwarded to the Materials and Research Center for evaluation. Failure of any verification sample to comply with the requirements of this specification may be cause for removal of the manufacturer from the prequalified list.

1706.5 BASIS OF ACCEPTANCE.

a. Prequalification as required by **subsection 1706.4** (note verification sample requirement).

b. A Type C certification in accordance with **Section 2600**.

c. A visual inspection in the field for damage and to ensure compliance with these specifications.

08-08-00 M&R (JLC)