

CASE STUDY

# SH105 Grimes County

Grimes County, Texas



## PROJECT OVERVIEW

**PRODUCT:**

Mirafi H2Ri

**CUSTOMER:**

Texas Department of Transportation (TxDOT)

**ENGINEER:**

TxDOT & CP&Y, Inc.

**CONTRACTOR:**

Knife River

**CHALLENGE:**

The widening of State Highway 105 at the FM1774 crossing in Plantersville, TX, presented construction and long-term performance challenges. The project consisted of widening the east-west, one-by-one lane to a two-by-two lane roadway. During the earthwork cuts into the natural hillside, several springs were encountered in the westbound portion of the project, which made working the already less-than-ideal subgrade conditions more challenging by increasing the moisture content to a near-saturated state.

**SOLUTION:**

The project team eliminated the need to cement and stabilize the subgrade. It installed a geosynthetic reinforced pavement with Mirafi H2Ri, a high-strength, moisture-management geotextile, without adding any additional thickness to the original section, which included 7" of flex base and 8" of asphalt.

## **PROJECT GOALS:**

Provide a cost-effective solution to stabilize soft soils below a highway lane widening area.

## **CONSTRAINTS:**

The original project pavement design consisted of a cement stabilized subgrade to treat the existing subgrade with CBR=1.5%. In addition, the section included 7 inches of flexbase and 8 inches of asphalt. The project team wanted to consider alternate stabilization for the project since the constructability of the cement stabilized base during saturated conditions would be problematic.

## **OPTIMIZATION HIGHLIGHTS:**

### **Moisture Management / Enhanced Lateral Drainage**

Wicking nylons are incorporated into the geotextile during the manufacturing process, which adds the unique ability to remove water from both saturated and unsaturated subgrades laterally.

### **Separation**

To maintain the integrity of the existing soils and the crushed aggregate fill, which will be used above the geosynthetic to prevent migration of fines from the subgrade soils into the fill section. A small percent migration of fines can have an enormous negative impact on overall strength.

### **Filtration**

To allow movement of water through the geosynthetic while retaining soil on the upstream side. The unique double-layer construction provides a wide range of pore sizes for an excellent separation factor, superior filtration, and flow characteristics of a fine to coarse sand layer.

### **Confinement**

To prevent lateral movement (spread) of the aggregate fill. Mirafi H2Ri has excellent soil and base course confinement resulting in greater load distribution.

### **Reinforcement**

To include a tensile element to improve the bearing capacity of the section. Mirafi H2Ri has higher tensile modulus properties than the leading stabilization products.

### **Durability**

Robust damage resistance for moderate to severe stress installations. The stabilized section using Mirafi H2Ri passed the 95% compaction requirement in all areas.

For more information, ask an expert: [infogeo@ferguson.com](mailto:infogeo@ferguson.com)