



Case Study

application

Subgrade Improvement & Base Reinforcement

location

Palisade, CO

product

Mirafi® RS580i & RS280i

job owner

engineer

contractor

date of installation

Town of Palisade

Huddleston Berry and the

City of Grand Junction

Ben Dowd Construction

May - June, 2015

TenCate develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

THE CHALLENGE

The town of Palisade, located in Mesa County, needed to rebuild its Main Street to keep up with the growing diversity and increased traffic loading, in an expedient and cost-effective manner. During the reconstruction of Main Street, soft soils and shallow utilities were expected, which would make construction difficult. The geotechnical investigation concluded soil characteristics would vary, with the first borings indicating a moist, dense, sandy gravel, and the remainder of the borings indicating a moist, soft to stiff, lean clay. Laboratory testing results indicated that the native clay soils were moderately plastic and had a tendency to consolidate under loading at their existing density. The California Bearing Ratio (CBR) was determined to be less than 2%.

THE DESIGN

Anticipating soil stability issues, the engineer included a stabilization design in the Plans, so the contractor would know how to handle soft spots. This design originally entailed removal of 24 inches of subgrade material and replacement with 24 inches of sub-base material. By redesigning this stabilization section with one layer of TenCate Mirafi® RS280i woven geosynthetic, using TenCate's Miraspec software, the engineer reduced the sub-base thickness to 13 inches. This was appealing due to the sheer reduction in aggregate thickness, but also as a means of keeping construction above the utilities.

In addition to including a layer of Mirafi® RSi geosynthetic for stabilization, the engineer also redesigned the unreinforced pavement section,



Laying down Mirafi® RS580i on the native subgrade.



Placing subbase course on Mirafi® RS280i geosynthetic.

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Geosynthetics

Industrial Fabrics

Synthetic Grass

in order to speed up construction and provide the town with cost savings. The unreinforced design, based on 420,500 ESALs, was 4 inches of asphalt over 15 inches of aggregate base course. The reinforced design, also generated by using MiraSpec software, was 4 inches of asphalt over 9 inches of aggregate base course over one layer of Mirafi® RS580i.

By utilizing Mirafi® RSi geosynthetics in the design, the engineer was able to reduce the thicknesses of both the stabilization section and the actual pavement section. This provided a total aggregate thickness reduction of 17 inches, while maintaining the structural integrity of the roadway section.

THE CONSTRUCTION

Persistent rainfall was experienced in Colorado for the duration of the project. This resulted in the Contractor needing to stabilize nearly the entire alignment with Mirafi® RS280i and 13 inches of aggregate. Had the unreinforced stabilization design been utilized, the contractor would have needed to install an additional 11 inches of aggregate across the entire project.

THE PERFORMANCE

Utilizing a geosynthetic-reduced section on this project resulted in both time and cost savings. The contractor installed Mirafi® RSi-Series geosynthetics with ease, maintaining a minimum of one foot of overlap. The geosynthetic-reinforced sections provided for faster construction, due to less excavation, less aggregate to transport and install, and not having to excavate into utilities. Additionally, this shortened the construction schedule and created fewer disruptions for local businesses. Accounting for the reduction in excavation and the reduction of the aggregate section thicknesses, it is estimated that the geosynthetic-reinforced designs provided approximately \$60,000 in construction cost savings. The cost savings options presented by the engineer and utilization of these cost savings by the community saved tax-payer's dollars.



Pushing the aggregate base course onto Mirafi® RS580i.



Placement of aggregate base course and compaction.

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