

Geosynthetic Enabled with Fiber Optic Sensors for MSE Bridge Abutment Supporting Shallow Bridge Foundation

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Integrating fiber optic sensors into a geosynthetic reinforcement geotextile is an innovative system for strain and temperature measurement of soil structures. Using this technology allowed for the monitoring of a geosynthetic reinforced bridge abutment supporting shallow bridge foundations in St. Saturnin, France. Integrating the fiber optic sensor into the geotextile creates an intimate bond with the soil and allows for an accurate monitoring of civil engineering works. This allows engineers to evaluate the actual safety level and optimize their design or to survey the behavior of a structure which may be susceptible to change during time. Today, the need for instrumentation justifies the research and development of more accurate tools that are easy to install and allow for long term performance. In this context, a new type of geosynthetic was developed for civil engineering applications. It combines the performance of the technical geosynthetic and optical technology for measurement of strain in soil and for the survey of foundation and earth construction. This paper will discuss the geosynthetic enabled fiber optic sensor system and the case history of its use to monitor the bridge abutments for 5 years for the project in St. Saturnin, France.