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INSTRUMENTING AND MONITORING THE PERFORMANCE OF GEOSYNTHETIC REINFORCED SOIL INTEGRATED BRIDGE SYSTEM

Murad Abu-Farsakh[1], Milad Saghebfar[2], Allam Ardah[2], and Qiming Chen[2]

[1]Research Professor, Louisiana Transportation Research Center
Louisiana State University
Baton Rouge, Louisiana, USA e-mail: cefars@lsu.edu

[2]Louisiana Transportation Research Center
Louisiana State University
Baton Rouge, Louisiana, USA

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Abstract. The Geosynthetic Reinforced Soil (GRS) Integrated Bridge System (IBS) is an alternative design method to the conventional bridge support technology. This new technology has a number of advantages including reduced construction time and cost. These advantages have led to a significant increase in the rate of construction of GRS-IBS structures in recent years. This paper presents a case study on instrumenting and short-term performance monitoring of the first GRS-IBS project in Louisiana. The monitoring program consisted of measuring bridge deformations, settlements, strains along the reinforcement, vertical and horizontal stresses within the abutment, and pore water pressures. Measurements from the instrumentations also provide valuable information to evaluate the design procedure and the performance of GRS-IBS bridges. The instrumentation readings showed the overall performance of the GRS-IBS was within acceptable tolerance in terms of measured strains, stresses, settlements and deformations. The magnitude and distribution of strains along the reinforcements vary with depth. The locus of maximum strains in the abutment varied by the surcharge load and time.