GRS-IBS Technology used for Hartland Bridge Replacement Project

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Introduction

Bridge D37 was a six-span bridge that carried TH 41 in Hartland over Interstate 91. During the design of a superstructure replacement, the project's scope evolved to a full bridge replacement using an innovative technology: Geosynthetic Reinforced Soil-Integrated Bridge System (GRS-IBS). With FHWA support, this technology is being used for the first time in Vermont.

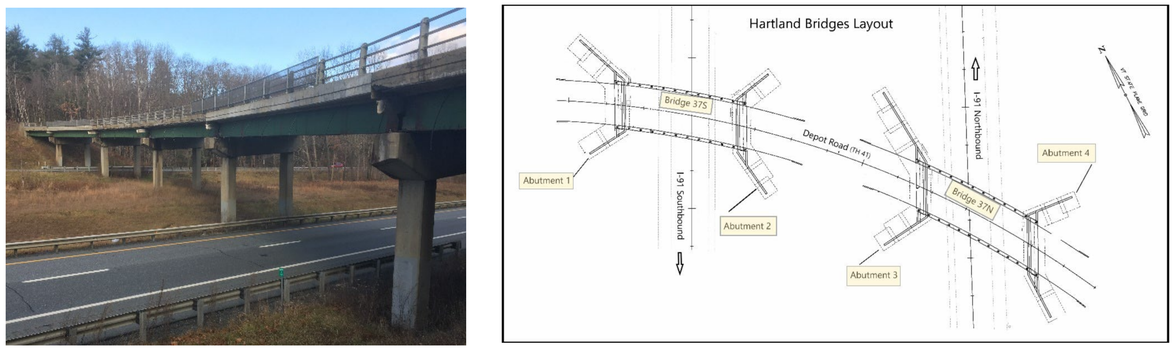

Figure 1. (Left) Existing 6-span bridge, and (Right) Plan of Proposed Bridges

What is GRS-IBS Technology?

Geosynthetic Reinforced Soil (GRS) consists of alternating layers of compacted fill and closely spaced geosynthetic reinforcement. The Integrated Bridge System (IBS) consists of three main components: the Reinforced Soil Foundation, the GRS Abutment, and the Integrated Approach. This robust system blends the roadway into the superstructure for a jointless interface.

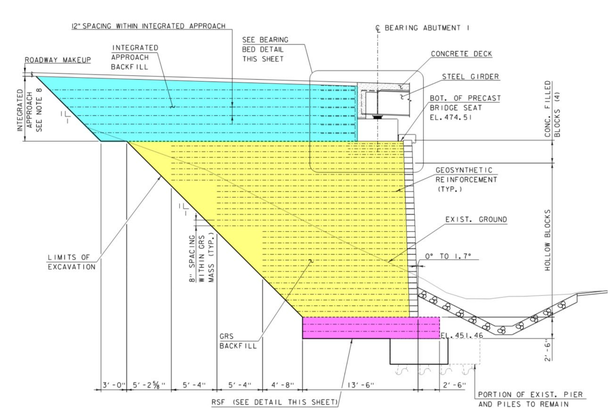

Figure 2. (Left) GRS-IBS Abutment Section, and (Right) First layer of GRS Abutment

Results

GRS-IBS technology will extend the life of the bridge while reducing the project construction duration and cost. The existing six span bridge is being replaced with two shorter single-span bridges. Each bridge will span one barrel of the interstate and will be supported on GRS-IBS abutments with an earthen embankment in the median between abutments. By replacing the existing six-span bridge with two single spans over each barrel of the interstate, VTrans eliminated 190 linear feet of structure that would require future maintenance.

Figure 3. GRS-IBS Abutment #3 Construction Progress.

Project Benefits

- **Extended Service Life**
- **Minimal maintenance**
- **Rapid Construction**
- **Additional Funding share from FHWA**
- **Potential use of GRS-IBS technology on future VTrans projects**

Acknowledgments

Federal Highway Administration (FHWA) – Daniel Alzamora, PE

More Information

The FHWA Publication No. FHWA-HRT-17-080

https://www.fhwa.dot.gov/publications/research/infrastructure/structures/bridge/17080/17080.pdf