Midland Country Bridge Upgrade a Huge Success with GRS-IBS and Allan Block

Project Information

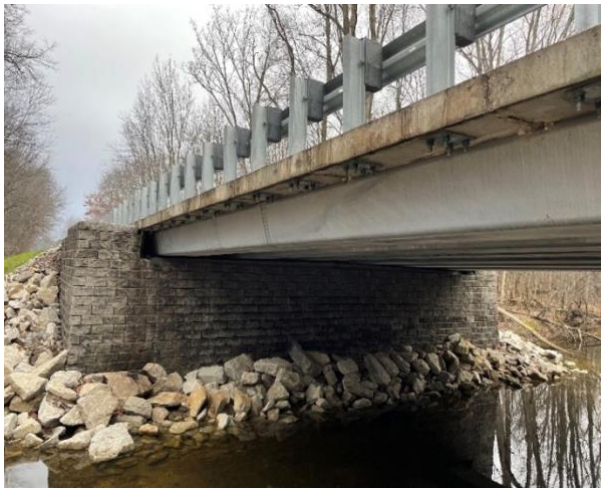
Name: Midland Cty – Grey Rd
Location: Midland, MI
Products: AB Vertical
Size: 1,700 ft² (140 m²)
Contractor:
Midland County Road Commission
AB Fence Designer:
OHM Advisors
Allan Block Manufacturer:
Consumers Concrete Corp, Kalamazoo, MI

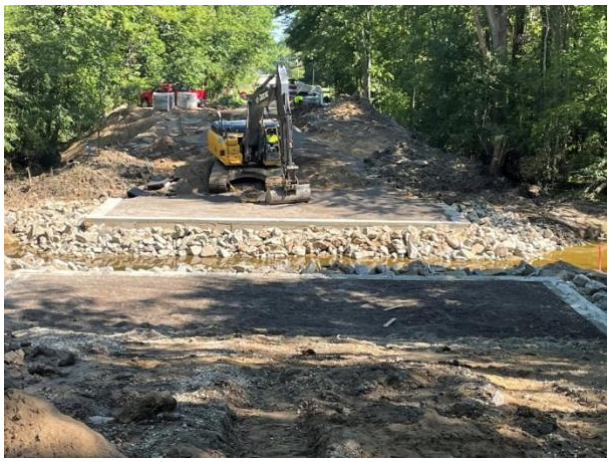
Simplify Rural Creek Crossings with GRS – IBS

Midland is a community in the heart of Michigan about two hours north of Detroit. Small creeks crisscross the landscape with bridges above and the one we are discussing today is Bullock Creek. Small bridges like this connect communities and with money now available to address America's infrastructure backlog it's time these projects get the attention they need.

Plan

Although money was allocated for the project in the county's budget, the Midland County Road Commission knew they needed a solution that would suit the small span without breaking the bank. The area is not heavily developed and wouldn't be able to accommodate a large crew and equipment. The idea of a GRS-IBS solution had been kicked around but since the Federal Highway Association (FHWA) guidelines reference concrete masonry units (CMU) the support was unenthusiastic at best. This is where Sam Jansen with Consumers Concrete Corporation stepped in with a segmental retaining wall alternative and the training necessary to ensure a successful installation. In fact, this was the first GRS-IBS in the county and was used as a test run for several other single span projects that are planned in the future.



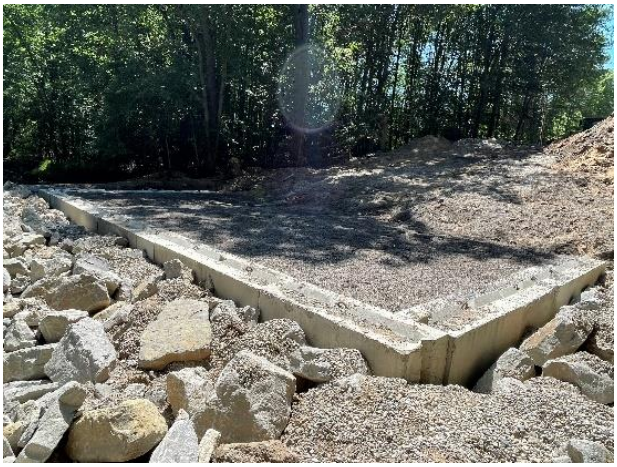


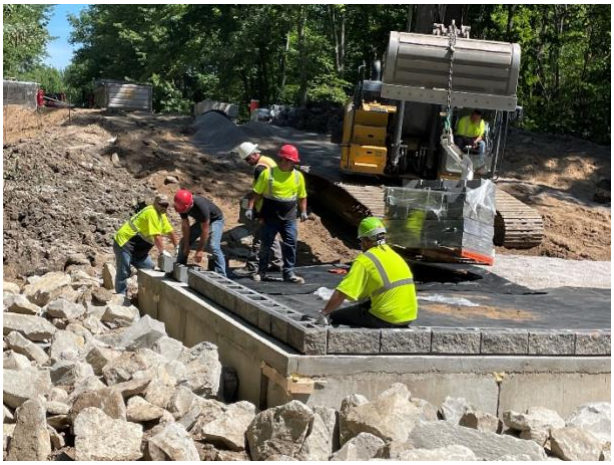
Segmental Retaining Walls (SRW) units have several advantages over a CMU especially with regards to durability and dimensional tolerances which was also a factor. Midland like most of the northern US, experiences harsh winters and the county needed a product that would last over the long term. Consumers Concrete was able to provide a block mix design already approved by Michigan DOT with the strength needed to survive the freeze/thaw cycles the state goes through annually and be repeatable to stack up and install evenly. Combined with Allan Block's front lip that provides a guide to installers, the

choice to use SRW units was a no-brainer. The ability to construct these types of structures quickly is so important to these rural areas since multiple access roads are limited.

Design

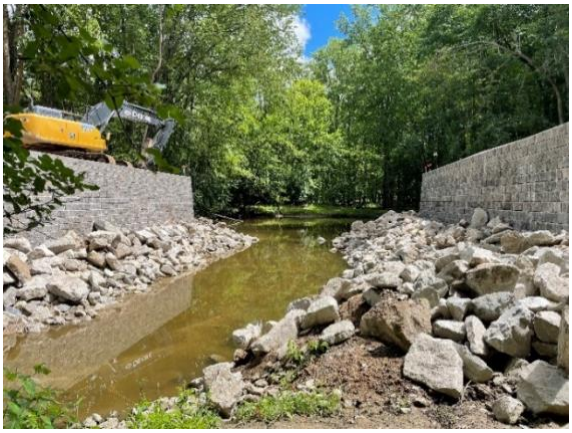
The Midland office for OHM Advisors was involved with the design of the bridge. The goal was to create a recipe that would provide the framework to approach similar crossings in the county like this one over Bullock Creek. What made this project unique was the use of a tongue and groove concrete foundation. There were concerns about the bearing capacity of the local soils based on the geology of the region and the presence of Bullock Creek running between the abutments. Instead of the traditional wrapped aggregate foundation the choice to use the concrete pad provided the bearing capacity and level surface for the abutment to be constructed. Additionally, this design choice would allow excavation to be completed without diverting the creek, reducing the construction time.





OHM Advisers eventually settled on the AB Vertical that would keep the structure's footprint closely in line with the existing road further reducing the amount of excavation for the project.

Build



Once the plans were finalized it was turned over to the crew at Midland County Road Commission who had just completed AB Contractor Certification training. In fact, this was the first SRW project they had worked on, allowing them to complete their first level of certification. The choices made by the design team allowed the construction of the abutments with minimal delays. No time was lost dewatering the foundation because of the tongue and groove concrete pad. Construction on the abutments began the second week of June and was completed before the end of the

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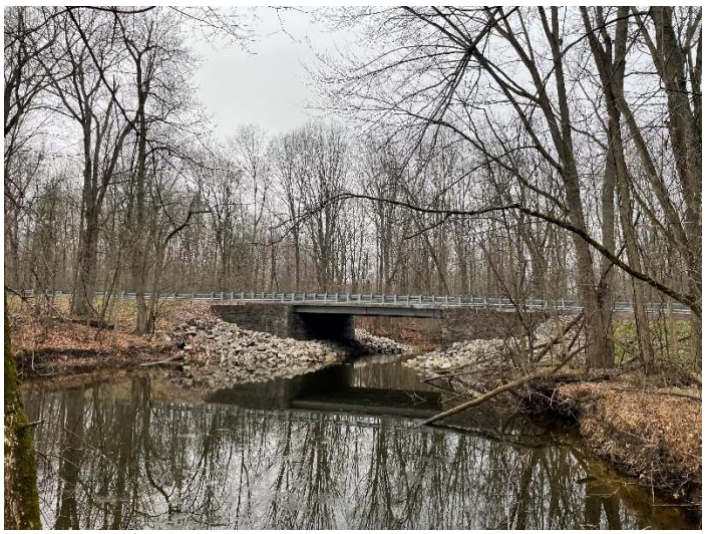
month. Art Buck with the Midland County Road Commission even commented, 'We put these projects off for years, but this ended up being a very smooth project.' He added, 'Allan Block helped us with an effective solution we could construct with the crew we had. It keeps the line well with the built-in front lip and provides an upgraded aesthetic when compared to CMU blocks.'



GRS-IBS made with SRW units provide a cost-effective solution to the multitude of single span bridges that are structurally deficient or need to be replaced. The FHWA indicates that 24% of the bridges across the US need immediate attention. The hope is that more counties will utilize this technology and that designers will recognize the value of using SRW units as the facing element instead of CMUs.

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