Project Summary

Herrick Street Bridge

The possible uses for the Allan Block Retaining Wall System continue to grow. The latest success story comes out of Rensselaer, New York. The city of Rensselaer needed a site solution that would not only be aesthetically pleasing, but would also create additional roadway access to one of the busiest rail stations in the state of New York. The design called for an off ramp bridge that would lead traffic from a major highway into the parking lot of the Rensselaer Rail Station. Due to the versatility, durability and aesthetics of Allan Block, the product was chosen to provide the perfect solution.

The project would require a combination of a non-flexible bridge structure, with a segmental block retaining wall that has become a success because of its flexibility. This, coupled with the additional needs of a roadway, would make the project a sizeable task.

PROJECT NAME & LOCATION
Herrick Street Bridge, Rensselaer, NY

PRODUCT
AB Classic

PROJECT SIZE
8900 ft² (825 m²)
26 ft (8 m) maximum height

LOCAL ENGINEER
Reeves Engineering

GENERAL CONTRACTOR & WALL BUILDER
J.H. Maloy, Inc

ALLAN BLOCK MANUFACTURER
Zappala Block, Rensselaer, NY

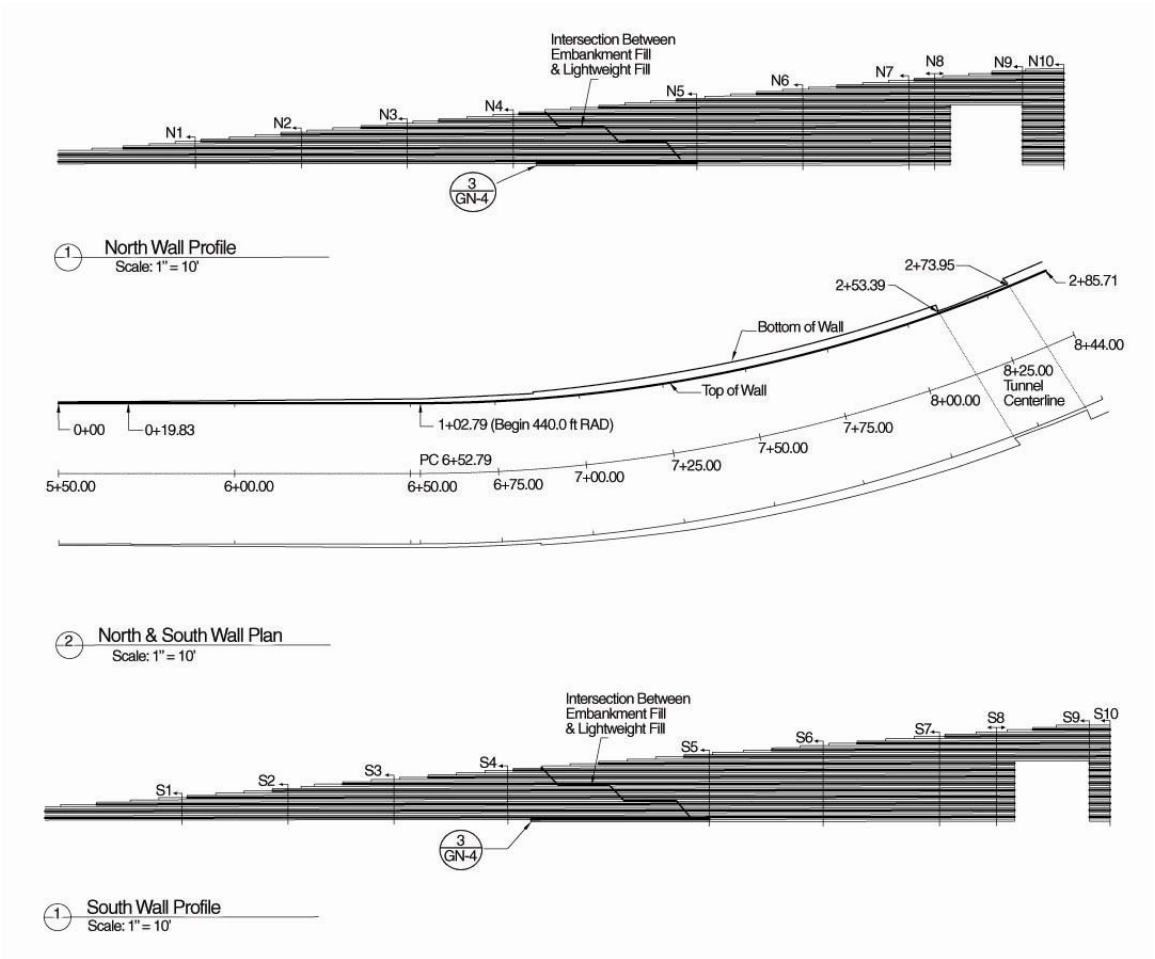
PLAN

Time and performance were valuable. To meet the requirements of the heavy traffic flow, the off ramp became a necessity. The site plan called for two walls that would hold up the ramp and would also allow for traffic and pedestrians to flow underneath it.

Therefore, in addition to designing a ramp, the plan also called for a tunnel design. It was decided that the Allan Block product would be built on either side of the ramp, with the tunnel running through it.

The seams between the Allan Block system and the transportation system needed to be flawless, therefore the layout tolerances were kept to a minimum.

The Allan Block manufacturer, Zappala Block, successfully proposed the Allan Block Retaining Wall System as the cost effective and aesthetically pleasing choice that would meet the high demands of the project. The Allan Block engineering department joined forces with Zappala Block, the engineer of record; Russ Reeves C Eng., and the reviewing team of engineers at Ryan-Biggs Associates to make the project a triumphant one.



Site Plan

DESIGN

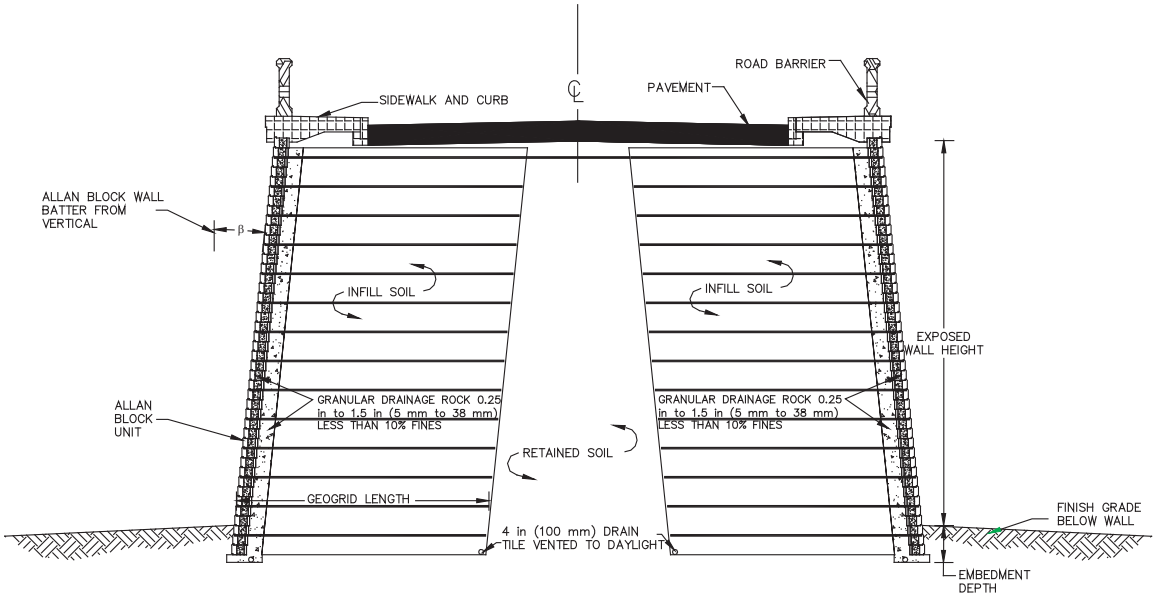
The stiff requirements for the roadway made the design of the off ramp a challenge. The retaining wall design needed to meet the specifications of the American Association of State Highway and Transportation Officials (AASHTO). The city requires that all retaining walls with state roads above them must be designed according to these standards. AASHTO design specifications require that the minimum geogrid reinforcement lengths must be 70% of the wall height.

These length requirements are much longer than the typical retaining wall industry standards. The design of the walls also included seismic activity analysis. Rensselaer, New York is generally not considered a seismically active area; therefore seismic analysis would typically not be required. However, since the state required that a seismic analysis be done, the retaining wall design became even more analytically challenging.

The greatest design hurdle came from a combination of a large surcharge and multiple soil conditions. Vehicle traffic, paving materials, and an impact barrier were the factors considered as a surcharge. The added surcharge called for increased geogrid lengths compared to a typical retaining wall without a surcharge. Most of the retaining wall called for a gravel backfill with a unit weight of 130 pcf (20.4 kN/m^3).

However, the portion over the tunnel called for a lighter weight material to decrease the weight of the structure over the tunnel. Therefore lightweight expanded shale was used with a unit weight of only 75 pcf (11.7 kN/m^3). The shale

backfill required more geogrid reinforcement, than the gravel backfill. Additional grid was used where the tunnel and wall met to compensate for differential settlement. This grid was not connected to the block.



Allan Block Typical Section

BUILD

The construction of the Herrick Street Bridge needed to be very well thought-out. The surveying team spent many hours laying out the placement of the walls and accounting for the block setback. This was especially critical since the design required the two walls to have 31 feet (9.45 m)of spacing between them at the top.

During the placement of the block there were several things that needed to be considered. Since there were manholes and storm drains behind the wall, the geogrid reinforcement could not be laid in the soil in the typical fashion. AASHTO required that the geogrid be fastened to all the manholes and storm drains.

The geogrid also needed to be cut and placed around and behind the obstructions. In addition, the construction crew had to build around the tunnel that went through the retaining walls.

Prior to constructing the wall the top two courses of Allan Block were grouted together, the top course of geogrid reinforcement extended from one wall to the other, and the cap blocks were added to keep the step downs less than 6 in. (15 cm).

They also constructed a Texas barrier and sidewalks at the top of the retaining wall followed by paving the road. The cooperation and dedication of the many individuals involved in the project made the Herrick Street Bridge a success.