

Product:
LondonBoulder

Wall Design Engineer:
Civil Solutions Group
Minneapolis, MN

Site/Wall Contractor:
E. F. Possinger & Sons
Stroudsburg, PA

Manufacturer:
Bethlehem Precast, Inc.
Bethlehem, PA

Construction Manager:
Nu Cor Management, Inc.
Pen Argyl, PA

Wall Dimensions:
Height varies from 2' - 32'
4,300 square feet



The Challenge:

The Abeloff Nissan Dealership entrance was located atop a mix of solid rock and native soils. The change in grade from this roadway to the finished grades surrounding the dealership building varied from a low elevation of 1.5' to 31.5' at its maximum height. The solid rock layer located behind the lower portion of the wall made excavation for normal geogrid reinforcement prohibitively expensive.

The Solution:

The first wall system proposed for this site was a competing "Big Block" system using geogrid reinforcement. This concept was not feasible due to the retained rock embankment and the excavation costs required to install the geogrid reinforcement. Consequently, a smaller block (SRW) system was proposed using a concrete and anchoring system. It was at this point that Civil Solutions Group (CSG) was contacted by Bethlehem Precast to review the project and look for a more economically feasible solution.

After a comprehensive assessment of the site conditions and parameters, Civil Solutions devised a hybrid resolution to meet this challenge. The LondonBoulder Retaining Wall System was at the core of this resolution. It consisted of a concrete reinforced wall base installed in conjunction with a gravity wall application on the upper half of the retained face.

To facilitate this unique hybrid solution, a concrete leveling pad was poured at a 6 degree angle to achieve the required batter for the gravity wall design. The lower half of the wall was then backfilled with lean concrete to solidify the base. This was accomplished by placing the concrete in 4.5' maximum lifts and reinforcing each lift with rebar. These concrete lifts were then anchored at both ends - on the back using rebar to anchor into the shale rock face embankment, and in the front using rebar hooks which connected perpendicularly to rebar laying along the bottom of the keyway in each LondonBoulder unit. An epoxy grout was added to the rebar extending into the shale rock face to provide the wall with the long term stability required to resist natural destabilizing forces. Finally, the various sizes of the LondonBoulder units provided the mass needed in order to make the gravity wall design work as efficiently as possible.

