



136-inch diameter pipe designed with an 8.25-inch wall.



Heavy-wall 36-inch diameter reinforced concrete pipe culvert under 80 feet of fill.



Assembly of precast outfall at base of 80-foot bury.

Photos: Charles Black Construction Company, Inc.

Built To Last Under 80 Feet

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A culvert constructed to perform as a bridge structure and conduit, at least 80 feet below the surface of a road, must be comprised of specially designed products and a material that will perform over very long period. Such a culvert exists in the northeast corner of Georgia in the Blue Ridge Mountains of Rabun County, Georgia.

Wesley Taylor, Facilities Manager for Rabun County School System, reported that the purchase of 137 acres of National Forest land on Boggs Mountain Road in 2010 enabled the connection of the high/middle school site and elementary site into one contiguous 263 acre campus to house all Rabun County Schools. Development of the campus required the extension of Wildcat Hill Drive to allow buses to access US 441, a four lane divided highway at Boggs Mountain Road, via an overpass located at the high school. With the extension, buses would not have to make at-grade crossings on US 441, thereby increasing the level of safety for the students and bus drivers. Construction of the Wildcat Hill Drive extension required a considerable amount of fill, because of the mountainous topography of the region characterized by open valleys, swift streams, the Chattooga River, the Little Tennessee River, waterfalls and lakes.

David Spivey, Landscape Architect with [Southern A&E in Austell](#)¹, Georgia specified [reinforced concrete pipe \(RCP\)](#)² to provide the drainage under the road extension. RCP was the only option because it would be produced with a concrete mix and reinforcement that would provide the strength and long-term performance to handle an eighty foot backfill in the valley of Boggs Mountain near Tiger, Georgia. Concrete was considered to be the safest, most reliable and proven material. This, combined with the cost effectiveness of precast concrete pipe, made a RCP culvert the right choice on behalf of the client, Rabun County School System.

[Rinker Materials Concrete Pipe Division – CEMEX \(Stockbridge, GA\)](#)³ was awarded a contract in the spring 2011 by [Simpson Grading and Trucking](#)⁴ to provide concrete pipe for a storm drain structure that would meet the challenge posed by 80 feet of fill. Rinker's design team in Houston delivered the [design of a reinforced concrete pipe](#)⁵ that would meet the special design parameters. It was submitted and approved in June 2011. The 36-inch diameter pipe design included double circular cages, an 8.25-inch wall dry cast pipe, flush bell gaskets, and 8 foot lengths with a minimum concrete design strength of 6,000 psi. Rinker began producing the pipe at its Stockbridge GA plant in late July and finished in early August.

Before delivery of the pipe, Simpson was moving 15,000 to 18,000 cubic yards of material at the primary school site per day to prepared the site for delivery and installation. Some cuts were greater than 100 feet to achieve the initial elevation where the specially designed RCP would be installed. In less than 2 days after the pipe was installed, there was 30 feet of soil compacted over the concrete pipe. The 36-inch diameter heavy wall double reinforced concrete pipe was performing as designed. The pipe installation began in early October and was completed by the end of the same month.

The new Rabun County Primary School with a finished floor elevation is 2,268 feet above sea level was under construction in the spring, 2012. [Charles Black Construction Company, Inc.](#)⁶ from Cleveland, GA is the Construction Manager-At-Risk for the project. The school is scheduled for occupancy in August, 2013.

LINKS

1. www.southernae.com
2. www.concrete-pipe.org/pages/why.html
3. www.rinkerpipe.com
4. <http://simpsontrucking.com>
5. www.concrete-pipe.org/pages/design-manual.html
6. www.charlesblackconstruction.com

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