

Twin Cell Precast Concrete Box Culvert **Minimizes Environmental Impact**

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Progress in the application of precast concrete drainage products is evident in North Carolina where twin cell precast concrete box culverts were used in the construction of a new road. It was the first time that Rinker Materials, Hydro Conduit Division (formerly CSR Hydro Conduit) in Thomasville, N.C. produced a twin cell box culvert.

In March 2001, Blue Green Golf Development, Wilmington, N.C., and the CE Group Inc., Apex, N.C., chose the twin cell culvert for use on a large project located 30 minutes outside of Raleigh, N.C. "The Preserve at Lake Jordan" is a new golf and residential community located in the wooded hills of Chatham County. The access road to the development winds through the heavily treed landscape, raising environmental concerns over the construction of the road. Storm water manage-

ment best practices were incorporated into the design of the residential-golf course community, and this included the twin cell structure to accommodate increased wet-weather flows from the completed development.

The structure measured 14-foot wide x 7-foot high, and consisted of twin 7-foot x 7-foot cells. A total of 22 sections were produced for the 170-foot run. After the concrete box



Closed-cell neoprene joint sealant was applied to the bell of each box section prior to shipment to the job site.

Installation of the 170-foot long twin cell reinforced concrete box culvert was completed in one week.

culvert was produced, the bells and spigots were primed to accept a closed-cell neoprene joint sealant, manufactured by Concrete Sealant, Inc., New Carlisle, Ohio. The joint sealant was attached to the bell prior to shipment. The neoprene joint sealant helped speed the

installation of the culverts by Sanford Construction, Sanford, N.C. Work that traditionally may have taken 2 to 2.5 months for construction of a cast-in-place culvert, took only one week using the precast concrete culverts.

The engineer on the project, Mark Ashness, P.E. of CE Group liked the fact that precast concrete culverts can be installed quickly. This was a major consideration by the CE Group since new regulations in North Carolina have targeted environmental impact and erosion control issues. The quick installation reduced the construction time and the possibility of detrimental impacts on the local natural environment – a major consideration since the project is in the watershed of Lake Jordan.

Another major consideration in the CE Group's box culvert recommendation was the pH of the native clay soil. The 1995 study titled Forecasting Service Life of Culverts in North Carolina by the North Carolina Department of Transportation (NCDOT) and Federal Highway Administration (FHWA) determined that precast concrete systems had a service life of 45 to 59 years (no recorded NCDOT installations prior to 1936 were available). The study reported that corrugated metal pipe (CMP) products had an average service life of 20 to 25 years, and that soil pH was one attribute that affects culvert service life. Chatham County is known for its red acidic clay that exhibits low pHs of 4.5 to 5.0 – an acidic soil condition that would affect the service life of a CMP installation.

Use of precast concrete boxes and pipes for cross drains is getting the attention of specifiers and regulators in many parts of the country. Life cycle cost considerations and economy of installation are very important reasons why people specify precast concrete drainage systems. The twin cell concrete culvert under the road leading to The Preserve at Lake Jordan will serve the community for the design life of the road. Rinker Materials, Hydro Conduit Division has played a significant role in introducing a new application that will serve its clients well. ☺

Project:	The Preserve at Lake Jordan Access Road - Twin Cell Culvert
Owner:	Blue Green Golf Development Wilmington, N.C. David Edwards, Vice President Donnie Longecker, Construction Coordinator
Designer:	CE Group, Inc Apex, N.C. Mark Ashness, P.E. Rinker Materials, Hydro Conduit Division Wayne Hodge, P.E. - Houston, Texas
Contractor:	Sanford Construction, Inc. Sanford, N.C. Richard Holshouser, Vice President & General Manager of Bridge Division
Quantities:	22 (14-foot x 7-foot) twin cell reinforced concrete box units
Producer:	Rinker Materials, Hydro Conduit Division Thomasville, N.C. John Peter, General Manager Tom Lester, Production Manager David Horning, Sales Representative

Rinker Materials, Hydro Conduit Division, Thomasville, a long-time member of the American Concrete Pipe Association, has been manufacturing and supplying precast box culverts for the North Carolina area since the early eighties. Florida-based Rinker Materials operates manufacturing plants nationwide. With four Carolinas facilities, the Hydro Conduit Division maintains a comprehensive line of precast products, utilizing the latest in manufacturing and production technologies for the creation of reinforced concrete pipe (round and elliptical), precast box culverts, and a variety of associated products including, catch basins, flared inlets, and end treatments. For information on Rinker Materials, Hydro Conduit Division, visit www.csra.com.