

Massive Omaha Waterfront Project Continued With

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Valley, Nebraska

LARGE DIAMETER RCP

The Rinker Material/Hydro Conduit Division plants in LaPlatte and Valley, Nebraska, are already on record for providing the largest precast concrete storm sewer pipe in Omaha. The 144-inch diameter storm sewer was installed in 2001 to drain the area surrounding the site of the city's new convention center and arena. This installation was published in the spring, 2002 issue of *Concrete Pipe News*. But the story about specifying large diameter reinforced concrete pipe (RCP) for the project fronting the Missouri River did not end there. A portion of the storm and sanitary sewer infrastructure for the convention center and arena complex consists of triple lines of 108-inch diameter RCP. The contractor, Kiewit Western Co., selected RCP instead of triple cast-in-place reinforced concrete boxes because of tight contract scheduling, the ability of crews to install RCP quickly, and, for a portion of the project, the reliability of the supplier to provide product as required for installation.

Ehrhart Griffin and Associates was retained by the City of Omaha Planning Department to provide site design, culvert design and analysis, construction staking and construction management services

for the extension of existing triple 108-inch diameter concrete pipes beneath Abbott Drive. Existing 108-inch diameter pipes were laid in 1980, and were in such excellent condition that the City decided that many more years of service life were not unreasonable. The existing 3,000-foot long ditch and pipes allowed excess fluids to overflow from the combined system of the Grace Street Storm Drain and North Interceptor Sanitary Sewer into the Missouri River. As the existing system is part of the Missouri River Levee System, the project required a design that met or exceeded the US Army Corps of Engineers design criteria.

The outlet invert of the new storm sewer is slightly submerged under normal navigation river levels. However, during a one hundred-year flood event, the high-water level of the Missouri River would be approximately 20 feet above the storm sewer system. The hydraulics of this flood event required **Ehrhart Griffin and Associates** to design the 108-inch diameter pipes as low head pressure pipe in accordance with ASTM C 361. This ASTM specification is applicable for low pressure pipes up to 125 feet of head. Rinker's Valley, Nebraska plant produced the confined O-ring joint, straight wall pipe to meet the C 361 specification.

The extension was comprised of an east section between the Missouri River and Abbott Drive and another section west of Abbott Drive. Due to poor soil conditions, the easterly extension required triple barrel 8-foot x 8-foot cast-in-place reinforced concrete boxes founded on concrete encased steel piles. Improved soil conditions west of Abbott Drive gave the contractor the option of using triple 108-inch diameter concrete pipes or triple barrel 8-foot x 8-foot cast-in-place

The confined O-ring, straight wall 108-inch diameter reinforced concrete pipe was manufactured to meet ASTM C 361 specifications.



A portion of the storm and sanitary sewer infrastructure for Omaha's waterfront project consists of a triple line of 108-inch diameter RCP.

reinforced concrete boxes founded on granular bedding. As low bidder, Kiewit was awarded the contract and elected to construct the 700-foot section using 108-inch diameter concrete pipes. Kiewit Western Co. is a subsidiary of Peter Kiewit & Son's Inc. headquartered in Omaha, Nebraska, and is recognized as a national contractor for all types of construction projects.

The contract schedule required the contractor to complete either option prior to April 30, 2002, with a start date of January 14. The contractor realized that exposure to Nebraska's harsh winter weather could delay the completion date, and therefore decided to install concrete pipe because of its known benefit of speedy installation and timely delivery from a reliable source. All 255 eight-foot sections of pipe were laid in 14 days. The contractor accomplished this by using a 200-ton crane set on an excavated bench built between a haul road and the trench. This allowed the crane operator to pick and set the pipe in one motion without handling the pipe twice. Just-in-time delivery of product was a critical factor in the installation schedule. This allowed continuous pipe installation while limiting on-site storage. The crane set approximately 75 feet of pipe before moving. Kiewit's excellent workmanship resulted in the pipes being only 0.02-foot low in grade. The City of Omaha specifications allow a tolerance of no more than one inch off grade and three inches off line.

The Omaha Convention Center and arena complex is located on 104 acres of a 422-acre redevelopment site near the Union Pacific rail yards. The facility will feature 194,000 square feet of total exhibition space, an arena that can accommodate 14,600 to 17,000 spectators, a 30,000 square foot

ballroom, 40,000 square feet of meeting room space, and 5,300 parking spaces. Completion of the project is scheduled for the fall of 2003. Omaha has joined the growing national trend of rebuilding along riverfront areas to revitalize old industrial spaces as well as control urban sprawl. In addition to the convention center and arena, these once heavily industrialized areas are being developed for uses including parks, recreation areas, and office space.

Continued use of reinforced concrete pipe to service major portions of Omaha's waterfront development demonstrates clearly why concrete pipe is an appropriate choice when there are very tight construction schedules. Producing buried structures offsite, while excavation and grading operations are completed, saves valuable construction time. Project designers have a choice to specify concrete pipe as an alternate when cast-in-place concrete boxes are the customary design consideration. Kiewit Western Company and Rinker Materials/Hydro Conduit Division, both large national companies dedicated to quality products, joined forces once again to deliver an infrastructure facility built to last. ☺

Project:	Omaha Convention Center and Arena Storm Sewer
Owner:	City of Omaha
Designer:	Ehrhart Griffin and Associates Omaha, Nebraska
Contractor:	Kiewit Western Co. Omaha, Nebraska
Quantities:	700 feet – triple 108-inch diameter RCP
Producer:	Rinker Materials, Hydro Conduit Division Valley, Nebraska Michael W. Beacham, P.E.

Rinker Materials/Hydro Conduit has been manufacturing and supplying reinforced concrete pipe for the Omaha area since 1965. The Omaha plants manufacture round RCP and manholes up to 144-inch inside diameter, box culverts, flared end sections along with reinforced concrete elliptical and arch pipe. Florida-based Rinker Materials is a major supplier of construction materials, aggregates, and ready-mixed concrete throughout the United States. For more information on Rinker Materials, Hydro Conduit Division, visit www.rinker.com.