Gasketed Reinforced Concrete Boxes Utilized For Raw Water Conduit

Membership Diversity Enriched Through Education

NOW YOU KNOW - Life Cycle Assessment or Least Cost (Life Cycle Cost) Analysis? They are NOT the Same
This issue:
Volume 60, Number 4
Fall 2008

Concrete Pipe News is published four times each year by the American Concrete Pipe Association. It is designed to provide information on the use and installation of precast concrete pipe products for a wide variety of applications, including drainage and pollution control systems. Industry technology, research and trends are also important subjects of the publication. Readers include engineers, specifiers, public works officials, contractors, suppliers, vendors and members of the American Concrete Pipe Association.

Media Task Group
Phillip Gale, Chair
Geneva Pipe Company
Bill Hobson
N C Products
Scott Lander
Hamilton Kent
Mike Leathers
Hanson Pipe & Precast
Rick Phillips
Rinker Materials - Concrete Pipe Division
Robert Powers
Inland Pipe Limited

Contract Editorial Staff
A. Grant Lee
AGL Marketing Limited
Executive Editor
Sheila Clevenger
Production

Published by:
American Concrete Pipe Association
1303 West Walnut Hill Lane, Suite 305
Irving, Texas  75038-3008
Phone: (972) 506-7216
Fax: (972) 506-7682
E-mail: info@concrete-pipe.org
www.concrete-pipe.org

Opinions expressed by authors other than staff of the American Concrete Pipe Association do not necessarily reflect the official positions or policies of the Association. No part of this publication may be reproduced or transmitted by any means without written permission from the publisher.

© Copyright 2008 American Concrete Pipe Association, all rights reserved.

content

Editorial

Membership Diversity Enriched Through Education ......................................................... 3
The ACPA has grown richer in the diversity of its membership by expanding its educational mandate. By offering special training schools, on-line courses, and introducing the biggest show for precasters in North America, ACPA is adding value among its producer members and the professionals who specify, regulate and design sewers and culverts.

Feature Article

Gasketed Reinforced Concrete Boxes Utilized For Raw Water Conduit ............................ 4
Water has become a precious commodity in the arid west, and many water utility organizations are taking the initiative to reduce water loss by piping surface water used for irrigation and potable supplies. Rinker Materials - Concrete Pipe, a division of CEMEX, and Denver Water joined forces to install a 2,000-foot (12-foot x 10-foot) gasketed reinforced concrete box conduit to replace a section of the South Boulder Diversion Canal.

Stories

RCP Supports World’s Largest Single-Kiln Cement Plant .................................................. 6
Ground was broken on March 24, 2006 in Bloomsdale, Missouri to construct the world’s largest single-kiln cement plant. During the first phase of construction, more than 1.65 miles of reinforced concrete pipe were installed. When compared to steel or plastic pipe, strength and durability were the determining factors for using reinforced concrete pipe for the storm drainage system.

New Highway Alignment – New Dawn for Indiana Region .............................................. 11
Reinforced concrete pipe, precast boxes and HY-SPAN® bridge sections were widely used on the reconstruction and alignment for parts of State Route 145. The highway improvement project provides the needed access to major twenty-first century investments including a new casino, entertainment complex, golf courses and renovated hotels in the Patoka Lake Region of southern Indiana.

Town of Westwood, Mass., Opt for RCP on Major LEED-ND Project .............................. 13
Westwood Station is a major transportation project chosen for U.S. Green Building Council’s Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) pilot program. Hanson engineers worked with consulting engineers from Tetra Tech and the town to explain the differences between flexible and rigid pipe design and installation, so that they could make an informed decision about the pipe material for the job.
The ACPA has grown richer in the diversity of its membership by expanding its education mandate. The by-laws were amended in 2007 to open membership to individuals, firms, partnerships or corporations engaged in specifying, designing, or providing consulting or other professional services to the ACPA, its members, or the precast concrete pipe and box industry. This by-law amendment validates the ACPA’s broad-based practice of providing educational programs to professionals within and outside of the Association.

ACPA has been educating members since it was established over a century ago. In the mid 1990s, the Association introduced the concept of short course schools in marketing, sales, and production that have now become industry-wide annual events. The Fall Short Course School is an intense training that is designed to include information for all members. Some seminars introduce new technology and research, while others serve as refresher courses. Some are provocative to stimulate discussions about industry issues.

The Production Short Course School educates people who are responsible for manufacturing precast concrete pipe and boxes. By continuing refresher courses and introducing new topics, professional members and staffs of member firms return to their regions armed with the latest information and knowledge about production, health and safety, quality control, and marketing.

On-line courses to help educate members in the design of storm and sanitary sewers and culverts are now available over the ACPA website. These courses are for the benefit of members who may need specific courses to improve their understanding of concrete pipe and box systems. By visiting the ACPA website homepage and opening the link to “Education”, visitors can access the two PowerPoint deck courses currently available. Concrete Pipe 101 and Reinforced Concrete Pipe Basic Hydraulics are free for members and $99 for non-members. Exams are graded and a certificate sent upon completion of a course awarding Professional Development Hours (PDHs). It should also be noted that PDHs are offered for attending sessions at the Association’s short course schools.

The ACPA will head to Houston in February, 2009 for the launch of a new trade show featuring products, services, education and a host of other events designed specifically for concrete pipe manufacturers and other precasters. The National Precast Concrete Association and the American Concrete Pipe Association will sponsor the new trade show, which will bring together precast manufacturers with suppliers. In addition to a trade show floor, NPCA and APCA will hold educational sessions, annual awards, meetings, and special events.

By amending the by-laws of the ACPA, the association has grown richer in the diversity of its membership, so that it could expand its education mandate. By offering special training schools, on-line courses and introducing the biggest show for precasters in North America, ACPA is adding value among its producer members and the professionals, who specify, regulate and design sewers and culverts. It is important to bookmark the ACPA website at www.concrete-pipe.org to stay informed about the products and materials used for America’s buried infrastructure.
Rinker Materials – Concrete Pipe – a division of CEMEX and Denver Water joined forces through the harsh Colorado winter of 2007/2008 to install a 2,000-foot (12-foot x 10-foot) gasketed reinforced concrete box conduit. It was installed to replace a section of the South Boulder Diversion Canal, between siphons 5 and 6, that carries raw water to the Ralston Reservoir. Water has increasingly become a precious commodity in the arid west, and many water utility organizations are taking the initiative to reduce water loss by piping surface water used for irrigation and potable supplies. This was the first phase of a multi-year project to improve Denver’s north collection system.

Denver Water envisioned replacing the open South Boulder Diversion Canal with a closed conduit since blowing and drifting snow, and icing of the canal required frequent and difficult maintenance. Frequent maintenance, combined with the high potential for development in the area, turned the project into a high priority. Working through the winter was strategic, since the canal could be taken out of service during the winter and re-commissioned in time for peak water use during the summer. Rinker and Denver Water raced against time to construct the conduit before water demand reached its peak.

The project marked the first time that Denver Water had installed gasketed reinforced concrete boxes (RCB) for water delivery, and one of the first times their crews had installed RCBs. In terms of both weight per unit and total footage, the project represented the largest concrete box-laying project ever completed by its crews. Among other complicating factors was an extremely flat grade over which the RCBs had to be installed. The existing canal bed allowed for less than 10 inches of fall over 2,000 feet. Manufacturing a joint with tight clearances was critical, because joint misalignment would not be tolerated. Excellent sub grade preparation was necessary, as was the quality and consistency of the boxes. The reputation of the pipe producer for on-time delivery of quality precast concrete pipe and boxes was a critical factor in the selection of the box supplier.

While the crew had to install the boxes with great precision because of the nearly flat grades of the 80-year old canal, horizontal control had to be carefully measured as well. The pipe producer carefully planned the layout so that its products could be installed with utmost precision. Bends were precast so that the centerline of the ditch could be followed through a series of curves and angle points. Any misalignment would have resulted in unnecessary excavation into the sidewalls of the trapezoidal shaped canal.

To prevent water loss to evaporation or infiltration, Denver Water specifications required watertight joints that pass a 5 psi hydrostatic test. This was not an issue, since Rinker Materials requires that joints be designed to achieve adequate gasket compression when the joint is forced fully off-center (concrete to concrete), and full dimensional tolerances are considered. These design assumptions most accurately represent the variables that are present in actual field conditions.

The Denver Water installation crew quickly achieved an efficient installation pace once it gained experience in installing the large rubber gasketed boxes. Challenges included withstanding high winds up to 90 mph and avoiding overhead power lines with the tall cranes. At areas along the alignment where the cranes could not be used because of low overhead power lines, the crew used a forklift in the trench.
The new precast conduit that replaced the South Boulder Diversion Canal feeds the Ralston Reservoir, which provides drinking water for most of the Denver metropolitan area’s northern suburbs. Because of the small capacity of the reservoir, the canal could be out of service for only several weeks, even during periods of low water consumption. It took the skill and dedication of both the Denver Water crews and Rinker Materials to complete the project on time and within budget, in spite of the challenges.

Denver Water’s District Foreman, Rusty Christensen, reported that he was pleased with both the quality of the products and the commitment to customer service by Rinker representatives, including their Field Coordinator, Roger Sable, who was regularly onsite to help avoid potential problems and answer questions.

The project’s success has resulted in plans to replace more sections of the canal. Jonathon Fisher, Denver Water’s Project Manager said that ultimately as many as 11,000 feet of the South Boulder Diversion Canal will be replaced with runs of reinforced concrete box conduit during winter. Fischer looks forward to the next phase saying, “It’s been a successful project and we’re excited about doing more of it.”

Following CEMEX’s acquisition of Rinker Materials in July 2007, the global company is now one of the top building materials producers worldwide for cement, aggregates, and ready-mix concrete and concrete products. CEMEX has grown rapidly over the last decade with acquisitions and integrations of Southdown, RMC and Rinker, producing a company which operates in 35 states. Currently, CEMEX USA operates 14 cement manufacturing facilities, more than 370 ready-mixed concrete plants, more than 115 aggregate quarries, and approximately 30 fly ash, 60 block and 50 concrete pipe plants.
RCP Supports World’s Largest
Single-Kiln Cement Plant

By Janice Richards, Manager, Communications
Holcim (US)
781-647-2503

Ground was broken on March 24, 2006 in Bloomsdale, Missouri to construct the world’s largest single-kiln cement plant. The new plant is being built by Holcim (US), one of the nation’s leading manufacturers and suppliers of cement and mineral compounds. When completed in 2009, the plant will have a harbor and barge-fleeting facility on the Mississippi River, with a capacity to produce four million metric tons annually, some of the largest silos ever built, and will be one of the most environmentally efficient cement manufacturing facilities. In 2006, during the first phase of construction, Bloomsdale Excavating installed more than 1.65 miles of reinforced concrete pipe.

The project was first announced in 1999, followed by a long and detailed environmental approval process. Now in its second year of construction, the project spans 3,900 acres along the Mississippi River, north of Ste. Genevieve. Approximately 2,200 acres surrounding the plant and quarry, representing more than 55 percent of the property’s total acreage, will be managed for wildlife habitat and will not be disturbed. No more than approximately 200 acres will be actively quarried at any time. Throughout the life of the quarry, Holcim will continue to restore land that has been impacted.

The $1 billion that Holcim is investing to construct the Ste. Genevieve plant supports economic growth throughout the region. The construction project currently involves a daily workforce of over 1,400 contract employees, over 150 Holcim employees, and a continuous stream of trucks and heavy equipment hauling everything from concrete to steel girders.

Special Pipe for Special Applications

Holcim’s Plant Manager, Jeff Ouhl, is a strong advocate for concrete pipe. He notes, “When compared to steel or plastic pipe, strength and durability were the main determining factors for the use of reinforced concrete pipe for the storm drainage system.”

Through the site preparation contract, Independent Concrete Pipe Company of St. Louis, Missouri supplied the materials and designed special pipes in deep fill areas. The work to install the pipe was completed early in the project to ensure excellent site drainage of construction areas, and access roads. This provided a clear, safe, and secure working environment for subsequent construction phases.
More than half of the storm drain pipe installed in the wetlands, and under the main access roads in and around the plant was standard Class 3, but the 1,725 feet of pipe along the railroad was Class 5. Nine hundred feet of specially designed pipe was installed under deep fills in the quarry roads. Another 156 feet of precast boxes were installed as culverts in a shallow trench under the crusher conveyor and a side access road. Independent Concrete Pipe specially designed the double 8-foot x 4-foot boxes, which were installed side-by-side, to withstand the anticipated load of 100-ton trucks during the construction and operation of the plant.

Holcim worked with Komatsu, its selected quarry mobile equipment supplier, to specify the traffic patterns and weight limits for the mining haul roads, which in turn led to final engineering of the roads and storm drain pipe. This length of more than 900 feet of pipe was also specially designed for deep fill installation. The drainage system was installed on a deep pipe bedding, covered with flowable fill to the spring line, and then backfilled for a total of 100 feet of fill. This will support the 100-ton trucks working in the quarry that will haul limestone to feed the plant’s 2,000 ton-per-hour primary crusher.

When considering the tremendous weight, as well as traffic flow over the lifetime of the facility, the strength and long-term performance characteristics of the building materials are mission critical.
Weathering the Storm

The plant’s storm drainage system was built to withstand Missouri’s weather patterns that can be very persistent or dominant for weeks or even months, including the historic 500-year flood event of 1993. In the course of construction, the drainage system accommodated record rainfall throughout the spring of 2008, as well as a flood in the summer of the same year.

The construction manager/general contractor for the project is a joint venture between Washington Group International, headquartered in Boise, Idaho and Alberici Constructors, headquartered in St. Louis, Missouri. Together, they bring to the project one of the largest and most experienced St. Louis construction companies with one of the largest engineering, construction, and management companies in the world. In addition to the 1.65 miles of concrete reinforced pipe on the project, the construction project involved excavation of approximately 5,000,000 m$^3$, placement of more than 180,000 m$^3$ of concrete, and more than 30,000 tons of equipment.

A Concrete Foundation for the Future

Once operational, the plant will help meet the growing demand for cement in Missouri and the Midwest along with a second Holcim plant in Missouri, which has been operating at Clarksville for more than 35 years. When considering the expected life span of the Ste. Genevieve cement plant, the infrastructure of concrete pipe will meet the needs of the operations for generations.

### Project Information

- **Project:** World’s Largest Single-Kiln Cement Plant
  - Bloomdale, Missouri
- **Owner:** Holcim US
  - Waltham, Massachusetts
- **Construction Manager:** Washington Group International
  - Boise, Idaho
- **General Contractor:** Alberici Constructors
  - St. Louis, Missouri
- **Site Servicing Contractor:** Bloomdale Excavating Company, Inc.
  - Bloomdale, Missouri
- **Producer:** Independent Concrete Pipe Company
  - St. Louis, Missouri
- **Quantities:**
  - More than 1.65 miles of reinforced concrete pipe of different sizes and class.
  - 156 feet of precast concrete box sections used for culverts.

Holcim (US) is one of the nation’s leading manufacturers and suppliers of cement and mineral components. The company operates 16 manufacturing plants and over 75 distribution facilities in the United States. Holcim (US) is a subsidiary of Holcim Ltd of Switzerland. Holcim Ltd is one of the world’s leading suppliers of cement and aggregates (crushed stone, gravel, and sand) as well as ready-mixed concrete and asphalt including services. The Group holds majority and minority interests in more than 70 countries on all continents and employs almost 90,000 people.
Concrete Pipe News Reader Survey

To provide you with the most interesting and useful information, we need your input regarding CP News. Please take a few moments to complete the following survey and mail it back, or visit our website at http://www.zoomerang.com/Survey/?p=WEB228AKSS7BQU to complete an online survey. Thank you for taking the time to complete this survey.

Name: ___________________________ City/State/Zip: ___________________________

Company: ___________________________ Telephone: ___________________________

Address: ___________________________ Email: ___________________________

1. I work for: ☐ engineering firm ☐ contractor ☐ government agency / other ☐ concrete pipe producer
2. I am involved with (check all that apply) ☐ design ☐ specifying ☐ construction ☐ company management
3. How many years have you been working with pipe products?
   ☐ 1 – 5 years ☐ 6 – 10 years ☐ 11 – 15 years ☐ 16 – 20 years ☐ over 20 years
4. Of the 4 issues of Concrete Pipe News published annually, how many issues do you typically read?
   ☐ 4 issues ☐ 3 issues ☐ less than 3 issues ☐ don’t read
5. Over the past four issues, please check how often you read the following:

<table>
<thead>
<tr>
<th>Editorial</th>
<th>Read 3 or 4</th>
<th>Read 1 or 2</th>
<th>Rarely read</th>
<th>Never read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Stories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research Stories</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. What do you do with Concrete Pipe News when you are finished with them?
   ☐ Pass on to co-workers ☐ Save as reference material ☐ Discard
7. If we give a new look to Concrete Pipe News, please check the topics you would like to read about.

<table>
<thead>
<tr>
<th>Most Important</th>
<th>Somewhat Important</th>
<th>No Opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classified Ads</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company Profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economy and Finance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editorial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry Issues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People Profile - i.e., Engineer, Municipal, Contractor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem Clinic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Stories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question and Answer Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional / State - i.e., what is being considered, specified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Articles - i.e., design, testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other - Please Specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Should ACPA publish an online version of Concrete Pipe News? ☐ Yes ☐ No
9. Which version would you read? ☐ Online ☐ Magazine ☐ Both Versions
10. How likely are you to use or revisit precast concrete pipe and box applications based on information you read in Concrete Pipe News? ☐ Very likely ☐ Likely ☐ Not likely
11. Additional Comments: ___________________________

Tel: 972-506-7216  info@concrete-pipe.org  www.concrete-pipe.org
The winning survey will be drawn at random from all entries submitted. It is not necessary to complete the questionnaire to enter into the drawing. Contact information must be completed in order to enter into the drawing. Prize is not transferable. The retail value of the Apple iPod touch 8GB is $229.00. The odds of winning depend on the number of entries received. The winner is responsible for all applicable income taxes. The drawing is void where prohibited by law. All federal, state, and local laws and regulations apply. The contest period runs from October 15 to November 30, 2008. The drawing is sponsored by the American Concrete Pipe Association (ACPA). Winners will be notified by telephone or email. The drawing will be held in December, 2008 by ACPA at their headquarters location and all inquiries regarding this drawing should be directed to American Concrete Pipe Association, 1303 W. Walnut Hill Lane, Suite 305, Irving, TX 75038-3008.
New Highway Alignment – New Dawn for Indiana Region

By Steven Smart
Independent Concrete Pipe Company
800-875-4920

One of the top vacation destinations in the Midwest during the early 1900s was the Patoka Lake Region of southern Indiana. Home to the Hoosier National Forest and the Town of French Lick, which derived its name from the salt springs that attracted wildlife and a French fort, the region entered into a slow and steady decline after the Great Depression. New life was given to the area toward the end of the twentieth century, when plans were drawn for reconstruction and new alignment of parts of State Route 145. The highway improvement project would provide the needed access to major twenty-first century investments including a new casino, entertainment complex, golf courses and renovated hotels. The highway was designed to last for decades and bring a new dawn of prosperity to the region.

Reinforced concrete pipe, precast boxes and HY-SPAN® bridge sections were widely used on the project, which was divided into two sections. The project was led by Indiana State Department of Transportation (INDOT) designers John Jordan and Tom Seeman, who were responsible for providing the plans and specifications. The first 8-mile section started at Interstate 64 and SR 37, following County Road 41 for approximately one mile. The alignment then turned north along a new route through some of the roughest terrain in southern Indiana to a point just past Golden Hollow Road. The second 10-mile section continued north to SR 64 then westerly to a new intersection with existing SR 145. At this point, the existing SR 145 was widened and 12-foot shoulders added. Existing structures were replaced or extended.

Drainage under areas of deep fill, shallow bury installations, movement of equipment and materials through rough terrain, ease of installation and the known service life of precast concrete products were factors that favored the use of concrete pipe and boxes on the project. Pipe fill heights ranged from one to 57 feet. A box culvert with a 6-foot span and 5-foot rise had a cover of 57 feet, while a 10-foot x 5-foot box culvert had 59 feet of cover.

The BOXCAR software design program was used for box culverts which were not covered by the design tables. INDOT culvert design required a long-hand methodology to verify each BOXCAR design.

The first section contract was awarded in February 2004 to Smith-Johnson of Columbus, Ohio. Gohmann Asphalt of Clarksville, Indiana was awarded the contract for the second section in February 2005, and completed the final requirements of both sections. Several crossings of the alignment required box culverts with spans greater than the 12-foot standard. Oversized precast boxes ranging from 13 to 20 foot spans are now more often specified by INDOT to speed up construction. Multiple cell box culverts...
and alternative concrete pipe product installations can reduce the construction time of major earth moving projects. Precast concrete pipe, boxes and HY-SPAN® bridges allowed the contractor to quickly install structures and use the time saved for the earthmoving and filling of the deep ravines of the project.

The improved highway access to the region was opened to the public at the end of December, 2007. Once again, the area is enjoying economic prosperity by drawing tourists to the region to enjoy its natural beauty and attractions. French Lick includes the home of Hall-of-Famer Larry Bird and the West Baden Springs Hotel and its massive unsupported dome, the largest in the world. Tourists are following the footsteps of notaries like Henry Ford and Al Capone to the mineral springs, celebrated for their healing powers. Even greater promise is afforded to the region with the eventual reconstruction of US 150 as an east-west connector. Precast concrete pipe, boxes and bridges are expected to provide the lasting infrastructure for these key access routes.

Project: Reconstruction and New Alignment of State Route 145, Indiana
Contracts R-27205, Crawford and Perry Counties
R-27662, Crawford County, SR 145

Designer/Owner: Indiana Department of Transportation
Indianapolis, Indiana
John Jordan and Tom Seeman

Contractors: Smith-Johnson
Columbus, Ohio
Gohmann Asphalt
Clarksville, Indiana
Dave Hardin

Producer: Independent Concrete Pipe Company
Louisville, Kentucky
Mike Pepper

Quantities:
6,951 feet of Reinforced Concrete Pipe of various strength classes and sizes ranging from 15 to 60-inch diameter used for culverts and storm sewers.
56 feet of 19-inch x 30-inch Horizontal Elliptical Concrete Pipe
4,740 feet of precast concrete boxes used for box culverts ranging in size from 5-foot x 3-foot to 14-foot x 5 foot under various depths of cover.
Four HY-SPAN® bridges ranging in size from 13-feet x 7-feet to 30-feet x 10 feet.

Independent Concrete Pipe Company has eight plants located in Kentucky, Indiana, Missouri, Ohio and Illinois. Established in 1912, the Indianapolis, Indiana plant supplies reinforced concrete pipe and manholes, precast concrete box units and HY-SPAN® bridges to regions throughout Indiana.
Town of Westwood, MASS Opt for
RCP on Major LEED-ND Project

Hanson Pipe & Precast
www.hansonpipeandprecast.com

Westwood, Massachusetts is a town located southwest of Boston. It is making environmental news because of a major transportation project recognized by the U.S. Green Building Council (USGBC) for sustainable design. The project has been chosen for USGBC’s Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) pilot program. Hanson engineers worked with consulting engineers from Tetra Tech and the town to explain the differences between flexible and rigid pipe design and installation, so that they could make an informed decision about the pipe material for the job. Subsequently, the decision was made by the town and consulting engineers to specify reinforced concrete pipe (RCP) from 12-inch to 60-inch diameter on all major drainage applications associated with the transportation infrastructure. Alternative pipe materials may be used for off-road applications only.

Westwood Station is a 4.5-million-square-foot master-planned community at the Route 128 Amtrak/Massachusetts Bay Transportation Authority (MBTA) commuter rail station. The station-focused development will boost the region’s economy and stimulate growth. Boston’s Back Bay and the Financial District are just 15 minutes away by commuter rail, and the Amtrak trains provide express access to Providence, New York and Washington D.C.

The project incorporates Smart Growth principles by clustering density and a mix of land uses next to the Amtrak/MBTA commuter rail station, encouraging greater transit use and creating a pedestrian-friendly environment.

Westwood Station’s overall infrastructure investment totals approximately $125 million. The developers have committed to build two new highway exit ramps, including the Route 128/Blue Hill Drive off-ramp and the I-95/Dedham Street northbound off-ramp, as well as a complete overhaul of the I-95/Dedham Street Bridge and corridor. The project specifies concrete pipe for basic buried infrastructure, including storm and sanitary sewers, underground storage of rainwater, and oil/sediment separators to treat storm water. Over 3 miles of concrete pipe is being shipped to the project with a total value of approximately $500,000.
RCP and LEED

Reinforced concrete pipe (RCP) has a proven record of accomplishment for over a century by providing a strong and durable structure, and is one of the most versatile green building materials available. To encourage builders and developers to use natural resources efficiently, while creating healthier buildings and sustainable development, the USGBC introduced the LEED rating system. LEED is the USGBC’s effort to create and provide a national standard for what constitutes a green building and sustainable building practices. It’s important to note that the USGBC LEED system does not certify products to be used in LEED projects; rather the system sets forth a design and construction process in which a product can help the project achieve LEED points if the product has specific qualities that are considered sustainable or green.

Unlike other LEED projects that focus primarily on green building practices, with relatively few credits given for site selection and design, LEED for Neighborhood Development (as chosen for Westwood Station) places emphasis on the design and construction elements that bring buildings together into a neighborhood, and relate the neighborhood to its larger region and landscape. LEED for Neighborhood Development creates a label, as well as guidelines for design and decision-making, to serve as an incentive for better location, design, and construction of new residential, commercial, and mixed-use developments. (Pilot Version: LEED for Neighborhood Development Rating System Updated June 2007).

Under LEED-ND, an aging and underperforming industrial park is being transformed into the Westwood Station development.

The key to maximizing LEED points is to design for energy efficiency, minimize the project waste streams, and use renewable materials to create a green project. One of the best green materials that can be used on a project is reinforced concrete pipe. The key products made with reinforced concrete is reinforced concrete pipe.

Due to RCP’s versatility, there are numerous applications where it can be used in the LEED process, such as stormwater control, or as a building material. As a material, RCP will receive LEED credits in the Materials and Resources (MR) section, but the RCP will be used as a building material in other LEED categories. In other words, by using more RCP throughout the project, RCP can help the project gain LEED points under the MR credit. While RCP and other pipe materials can be used in stormwater applications, RCP...
should be the sustainable choice, due to its durability and reduced bedding requirements. Additionally, RCP through its “construction materials” can directly help the project achieve LEED points through the MR credits. For example, under MR Credit 4 Recycled Content, if the RCP used on the project contains more that 10% recycled content it will help the project obtain LEED-NC points. Studies by the supplier of steel for the pipe used on the Westwood Station project have shown that the recycled steel used for their steel products consists of approximately 83% postconsumer scrap. The remaining 17% typically consists of pre-consumer scrap generated by manufacturing processes for products made with steel.

The concrete pipe industry welcomes the proposed LEED-ND rating system and the standards for helping clients achieve LEED-certified projects. Although concrete pipe is a product that civil engineers know will perform as specified for the design life of a project, with or without the influence of LEED, owners of LEED-certified projects will understand that the right choice was made, long after the need for LEED-rated projects has passed. The decision to include large quantities of reinforced concrete pipe on the Westwood Station development, may well turn out to be a model for projects designed to the LEED-ND rating system.
The American Concrete Pipe Association and National Precast Concrete Association is sponsoring *The Precast Show*, which debuts February 20-22 2009 at the George R. Brown Convention Center in Houston.

Developed by leading precast and pipe suppliers and manufacturers in the industry, *The Precast Show* will feature the latest equipment, products, and services. In addition to a huge trade show floor, the event will include technical education programming, plant tours, networking events and much more.

The 2009 Precast Show is the ONLY trade show in North America specifically for precast and reinforced concrete pipe manufacturers. NPCA and APCA will hold all their educational sessions, annual awards, meetings, and special events in conjunction with the show.

Register now at www.concrete-pipe.org, or www.precast.org/show/show.htm.