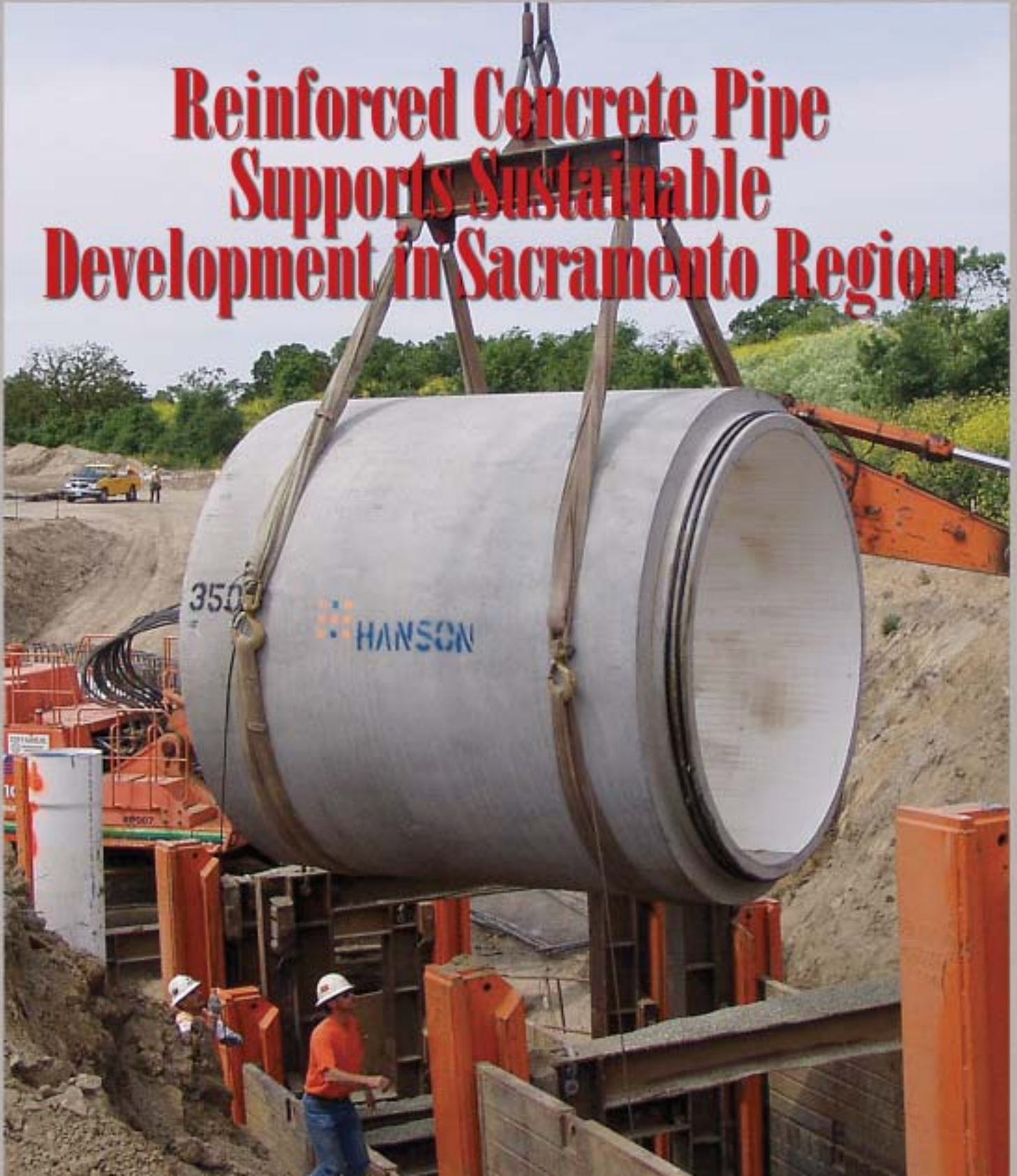


# CONCRETE PIPE NEWS



The Magazine of the American **Concrete Pipe** Association

## Reinforced Concrete Pipe Supports Sustainable Development in Sacramento Region



**This issue:**

Volume 58, Number 2  
 Spring 2006  
*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.

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**Correction: Winter 2006, Concrete Pipe News**

**Cover Story: Precast Concrete Pedestrian Tunnel Links Residential Districts**

**Photo Credits: Mary Vermeer, Upper Peninsula Concrete Pipe Co.**

**Cover:**  
**120-inch diameter reinforced concrete pipe lowered into position.**



**Photo: Hanson Pipe & Products, Inc.**



## editorial

*Matt Childs, P.E., President  
American Concrete Pipe Association*



### FALLOUT FROM PORTLAND CASE MAY BE FAR REACHING

For more than 15 years, Advanced Drainage Systems (ADS), a manufacturer of corrugated high density polyethylene (HDPE) pipe, pressured the City of Portland, Oregon to approve its product for city projects. Throughout that time, the city repeatedly defended its choice of reinforced concrete pipe, citing concerns about the structural integrity and lifespan of HDPE as compared to concrete. In 2004, Advanced Drainage Systems took an unprecedented step, and sued the city to force the approval of HDPE. Portland fought back and won, successfully defending its engineers' professional opinions.

Portland defended its right to choose quality products for its public works based upon its own analysis of available materials. The decision recognized the credentials and authority of civil engineers working for a municipality and their right to make recommendations to council, based on applied science and performance of materials over a given period.

The fallout from this 2005 decision could have far-reaching affects on the way municipalities choose products and materials to build sustainable infrastructure.

The Governmental Accounting Standards Board (GASB) Statement 34 requires that state and local govern-

ments determine the costs associated with initial construction, subsequent capital improvements and the cost associated with using the asset. GASB 34 requires governments to address whether current-year citizens paid for current-year services (and not shifted to future-year citizens), and whether the government's financial position has improved (or not) because of the year's operations. The purpose of GASB 34 is to place a value on infrastructure assets and report those assets in the municipality's financial report. The assessment provides a measure of the creditworthiness of a local municipality that includes information on its infrastructure.

The long-term view provided by the accounting information will allow trends and changes in infrastructure value and conditions to be determined, thereby enhancing the rating system for the municipality. It is now incumbent upon municipalities to use products and materials that will deliver long-term performance that has a positive impact on a municipality's creditworthiness. A municipality's engineering force will once again play a major role in determining the value of a municipality's infrastructure when councils adopt their recommendations and specifications to deliver the best infrastructure possible for existing and future generations. This action is fully in line with the principles of sustainable infrastructure and construction.

The capability of pipe to perform as expected for the design life of a project is a fundamental engineering consideration, especially in today's economic environment, where life cycle cost analysis and asset management requirements have been set in place to ensure sustainable buried infrastructure. Selecting pipe materials best suited for service as a storm sewer, culvert, sanitary sewer, or small bridge replacement is of primary importance to the design engineer. Selection is based on hydraulic efficiency, structural integrity, durability and cost. When alternate materials are bid, selection is too often based on the initial cost of products. However, the pipe material with the lowest first cost may not be the most economical selection for the design life of the project. Thus, the application of least (life cycle) cost analysis to road and drainage projects has increased dramatically in recent years. Local and state governments have increasingly included some type of analysis in their material selection process. The importance of considering the future of a facility during the design phase has been made clear by the multitude of problems that many authorities are facing as infrastructure wears out. In many instances, engineers and executive officers must approve

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Feature Story

# Reinforced Concrete Pipe Supports Sustainable Development in Sacramento Region

By John E LeGros, Jr., P.E.,  
Senior Engineer  
Hanson Pipe &  
Products, Inc.  
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Reinforced concrete pipe (RCP) and sustainable development are synonymous with quality when it comes to planning for current and future buried infrastructure needs. Hanson Pipe & Product's Florin Road Plant in Sacramento, California has made a significant contribution to the construction of the Lower Northwest Interceptor (LNWI) sanitary sewer system. This system was designed to service about 200,000 households in the Sacramento Region with a liquid waste program. The LNWI sanitary sewer project extends for 19 miles and handles approximately

200 million gallons per day during peak wet weather flows. Hanson is supplying approximately 3.3 miles of lined reinforced concrete pipe for the construction of the Southport Gravity Sewer (SGS), a connecting link between two lengths of force main.

Hanson is producing and supplying 18,230 feet of 120-inch diameter RCP with a 12-foot joint length for the LNWI, one of several projects under contract by the Sacramento Regional County Sewer District (SRCSD). Construction began in the spring of 2005 and has to be completed by the fall 2006 since the City of West Sacramento will run out of treatment capacity at the end of 2006. On completion, the City of West Sacramento will divert all of its sewage into the Southport line and cease operation of its treatment plant.

Of the 9 projects included in the LNWI, only the Southport Gravity Sewer called for the open cut method of construction. The alignment passes through several locations that had been identified as habitat for endangered animal species, including Giant Garter Snakes, Swainson's Hawks, Western Pond Turtles and Valley Elderberry Longhorn Beetles. Since these sections of the alignment required special consideration between October 1, 2005 and April 30, 2006 to accommodate nesting and breeding patterns, construction scheduling covers a two-year period.

Challenges to the construction scheduling did not end with special consideration of wildlife. The SGS project, in addition to the open-cut construction method, is the only alignment within the LNWI program to be a gravity pipeline, and requires trench excavation of 30 to 45 feet to the invert of the pipe. Since the line runs in close proximity to the Sacramento River, as much as 14 MGD of dewatering flows were anticipated by the designer. Environmental regulations required that all groundwater be treated before discharge into the river and dewatering wells were drilled.

The project was bid on July 8, 2004. Hanson received a Letter of Intent from



Pipe moved in yard  
with 40-ton  
LeTourneau lift.





Photos: Hanson Pipe & Products, Inc.

**120-inch diameter RCP is wet cast with-spigot down on open air line.**

the low bidder, Steve P. Rados, Inc., later that month to produce and supply 45,000 tons of pipe. The Notice to Proceed was issued in September and Hanson undertook its design and engineering submission for approval. Pipe production started in December 2004 and approximately 60 percent of the line was installed in 2005. Scheduling called for pipe production through mid June 2006 with installation of the last piece in the early fall. As of publication of this article, the project is on schedule. There are

nine curves over the length of the gravity sewer that require beveled-end pieces. Other non-standard pieces include short pipe lengths, field closures and inline manhole openings.

The 120-inch diameter pipe is wet-cast and made spigot down on an open-air line.

Reinforcement cages are produced on mandrel machines that wrap #4, #5, and #6 rebar (delivered in coils) into helices and then weld pairs of 3/8 inch longitudinals to fix the spacing. The strength classes run from 2000D to 3500D pipe. The pipe is 270 degrees T-Lock lined. Each spigot has two circular gaskets, individually conforming to ASTM C361 requirements. In addition, each pipe is produced with test ports that allow the contractor to pressurize between the

gaskets of an installed pipe before unhooking that unit from the crane. Each standard joint of pipe weighs 30 tons. Hanson uses a 75 ton and 40 ton rail crane on either side of a casting slab to remove pipe from the molds. A 40-ton LeTourneau lift handles the pipe in the yard.

Production started with four pieces per day. In early partnering meetings, Hanson was requested to add new equipment to increase production to six joints per day. Two new form sets were added to the line in August 2005.

Yard tests include daily cylinders, a one time joint shear, a weekly three-edge bearing by class, a biweekly 13 psi hydrostatic test of two assembled pipe, a T-Lock pull test every 500 feet, spark testing of T-Lock on every pipe, and four cores taken from every D-Load test piece to verify steel placement. County inspectors are in the plant several times a week to witness testing and visually inspect each unit of pipe. The \$37 million Southport Gravity Sewer is progressing on schedule with no testing failures

**Concrete pipe arrives onsite for offload.**



Feature Story



**Concrete pipe offloaded and stored along trench alignment for installation.**

through the spring of 2006.

Sustainable development meets the needs of the present without compromising the ability of future generations to meet their needs. Efforts to build a sustainable way of life require the integration of economic growth, conservation of natural resources and the environment and social development. The Southport Gravity Sewer project contributes to all three legs necessary for sustainable infrastructure: The SGS project fosters the economic growth of northern Sacramento County, Natomas and West Sacramento through the provision of effective sewer service, the conservation of resources and ecosystems, and reduction of sewer rates for the homeowners of the serviced areas.

In addition to supplying pipe for the Southport Gravity Sewer, Hanson’s Florin Road plant is supplying wet-cast, 270 degree T-Lock lined product to other major projects that add to the infrastructure assets of the Sacramento Regional County Sewer District. These include 9,000 feet of 108-inch and 2,500 feet of 84-inch

diameter RCP for the Bradshaw Interceptor (Contract 6B) and 6,800 feet of 72-inch diameter RCP for the tunneled section of the Bradshaw Interceptor (Contract 8). In addition, the plant supplied 5,000 feet of 54-inch diameter RCP for the Fruitridge Road Sewer. By meeting the rigorous construction schedule of the Southport Gravity Sewer project, while supplying other major projects for the County, Hanson continues to demonstrate its capability and commitment to help with the construction of a sustainable buried infrastructure in Sacramento. ☺

Sources: Sacramento Regional County Sanitation District, [www.srcsd.com](http://www.srcsd.com)  
Lower Northwest Interceptor, [www.lowernorthwest.com](http://www.lowernorthwest.com)

<b>Project:</b>	Southport Gravity Sewer Sacramento, California
<b>Owner:</b>	Sacramento Regional County Sewer District Tracey Gee, M.I.C.E. Project Coordinator
<b>Designer:</b>	Brown and Caldwell, Walnut Creek, California Charlie Joyce, P.E., Manager
<b>Construction Manager:</b>	Harris & Associates, Sacramento, California Eric Strickland, Resident Engineer
<b>Contractor:</b>	Steve P. Rados, Inc., Santa Ana, California Rob Wojcik, Project Manager
<b>Producer:</b>	Hanson Pipe & Products, Inc. Florin Road Plant, Sacramento, California Shaun Slotterback, Area Plant Manager Heather Knutson, P.E., Project Engineer
<b>Quantities:</b>	18,230 feet of 120-inch diameter x 12 foot joint length RCP

Hanson Pipe & Products, Inc. is a diversified manufacturer of concrete pipe and a variety of supporting products including manholes, drainage structures, boxes, bridge components, retaining walls and concrete block. Its plant locations throughout North America enable the company to serve the most rapidly growing parts of the U.S. and Canada. Hanson is an international building materials company. It is one of the world’s largest producers of construction aggregates, and concrete gravity and pressure pipe, precast concrete, and is the leading manufacturer of facing bricks in Europe. See [www.hansonconcreteproducts.com](http://www.hansonconcreteproducts.com) for details.



# Concrete Pipe Producer Stands Firm in Juventino Rosas, Guanajuato

By *Fernando Mondragon Sandoval*  
*Tubos y Construcciones de Queretaro, S.A. de C.V.*  
*grupomondragon@yahoo.com*



Photos: Mondragon

It may be described by some in Mexico as a quiet invasion by high density polyethylene (HDPE) pipe manufacturers, since their products have been used on most housing projects and urban sanitary and storm sewer systems in the country over the past 10 years. Concrete pipe producers believe that as much as 80 percent of the sanitary, storm sewer and culvert market has been taken by HDPE pipe. This loss has had a devastating effect on the country's concrete pipe industry over the past four years because numerous small construction material houses that produced 150 mm diameter pipe have disappeared, taking local jobs with them. Some of the larger construction material houses had concrete pipe machines, but these facilities have also disappeared with the emergence of the HDPE pipe industry that controls the small diameter pipe market. HDPE pipe manufacturers now have their eyes set on the remaining producers of large diameter concrete pipe.

The Mondragon Group has the most concrete pipe facilities in Mexico, with nine independently run plants. The company is an old family-run business, now in its third generation. Without any association of concrete pipe

producers in Mexico able to support the concrete pipe industry in the same way that the American Concrete Pipe Association supports its members, Mondragon has taken a stand in the Town of Juventino Rosas, Guanajuato. The renowned concrete pipe producer is determined to regain market share using strategies of the American concrete pipe industry and the resources of the American Concrete Pipe Association. A project requiring 1,925 meters of 750 mm diameter and 822 meters of 900 mm diameter circular pipe with rubber compound gasketed joints was first specified as high density polyethylene. Collaboration with a well-informed local contractor resulted in a high quality sewer system that will service the town for decades.

HDPE producers have been very successful in entering the Mexican sanitary and storm sewer, and road culvert markets through sales on government-sponsored projects. With very loose or non-existent local standards in many states and municipalities, and encouragement from government agencies to use HDPE pipe, contractors are too pleased to use HDPE pipe, as they find it readily accepted and believe they are able to install it quickly. This is the current



**Delivery of 750 mm and 900 mm diameter reinforced concrete pipe for three kilometer sanitary sewer.**

challenge to the remaining concrete pipe producers, now that most of the small enterprises have gone out of business. Collectively, they realize that contractors and owners of projects need to be educated about the fundamental differences between rigid and flexible pipe systems, the differences in installation practices that will result in a system that will function as specified, and that high quality concrete pipe is expected on all projects.

Although HDPE pipe has been entering Mexico from the United States over the past ten years manufactured with high priced raw materials, government agencies have been able to justify the use of HDPE pipe on public projects. HDPE pipe manufacturers have been swift to capitalize on this overall acceptance, by building plants in Mexico employing local labor and using imported raw materials. With plants well established in Monterrey, the country's most industrialized city, the distribution of HDPE pipe into the largest markets of the country is assured. As recently as two years ago, another HDPE pipe plant was located in Mexico State nearby Mexico City, which has a population of 25 million (almost 25 percent of the country's 106 million people) located in a 2,000 square kilometer area requiring buried infrastructure. Even though the plant was built with used equipment from the United States, it will add to the volume of HDPE pipe entering the market.

An unexpected ally to the Mexican concrete pipe industry arrived in 2005 during the series of hurricanes that devastated United States Gulf Coast infrastructure and parts of the Mayan Riviera. An unprecedented series of category 3, 4 and 5 storms damaged oil platforms. Disruption to the U.S. crude oil supply from the Gulf raised the price of oil to the point where HDPE pipe manufactured with imported raw materials became more expensive than concrete pipe using local materials. This unexpected turn



**Construction of brick manhole.**

of events occurred around the same time that the Juventino Rosas project was being bid. In addition, some local government officials started to wonder about the claims made by HDPE pipe producers when reports of pipeline fail-



ures began to surface.

As prices of HDPE rose, officials of the Guanajuato State Water Commission began to question their own specification for HDPE pipe on a project requiring almost three kilometers of sanitary drainage pipe. The Commission was faced with changing to a more affordable material, or canceling the project. Concrete pipe was not their first choice because of lingering concerns about product quality.

Grupo Mondragon had established a trustworthy relationship with the contractor awarded the project, Buga Construcciones, S.A. De C.V. of San Luis Potosí, SLP. Buga has been installing HDPE pipe over the past three years, as its use is encouraged by government officials. When Grupo Mondragon staff explained the “whole enchilada” of how HDPE pipe should be installed and treated, the contractor realized the level of risk and liability that faced his company, if he continued to install flexible pipe without clear local standards, or in the same manner in which rigid pipe is installed.

Buga Construcciones immediately approached the Guanajuato State Water Commission and explained why reinforced concrete pipe would be the best option for constructing two sanitary sewer networks to the plant. The Commission agreed and the project was supplied with concrete pipe instead of HDPE pipe. This decision was considered by Grupo Mondragon as the turning point in the struggle to re-take its share of the Mexican pipe market. Following this decision, several major projects specified for HDPE pipe were changed to concrete, including a 200 mm diameter 12-kilometer sanitary sewer drainage system in the town of Villa de Arista, San Luis Potosi. Specifications for a 2400 mm centrifugally cast fiberglass reinforced polymer mortar pipe storm sewer for the City of Guadalajara were also changed to concrete pipe.

Grupo Mondragon supplied the concrete pipe from its facility, “Tubos Y Construcciones de Queretaro, S.A. De C.V.” in Queretaro, Qro, located 50 miles from the project. Production of concrete pipe with O-Ring gasketed joints was time consuming, since pipe produced from the Besser machine were eight feet in length.

The pipe shipped to the project, however, were high quality, and the schedule of pipe shipments kept pace with the installation speed of the contractor. The installation crew was able to lay approximately sixty meters daily.

The project commenced at the beginning of December. Pipe started to arrive on site on December 10, but due to Christmas holidays, the project stopped for the last ten days of the month. By February 2, 2006, Mondragon had delivered 60 percent of the order. The project is expected to be completed by April.

The struggle by Mexican concrete pipe producers to take back their market from HDPE pipe producers will be challenging, due in part to the location of Mexican HDPE pipe production plants in close proximity to major markets. It is clear, however, that Mexican concrete pipe producers can regain market share by following the lead of Grupo Mondragon who is winning back its market, project-by-project, with high quality concrete pipe, open-minded contractors, and the resources of the American Concrete Pipe Association. ☺

<b>Project:</b>	Sanitary Trunk Sewer Juventino Rosas, Guanajuato, Bajío Zone, Mexico
<b>Owner:</b>	Comision Estatal de Agues de Guanajuato
<b>Contractor:</b>	Buga Construcciones, S.A. De C.V. San Luis Potosí, SLP Eng. Fernando Piña, Site Representative
<b>Producer:</b>	Tubos Y Construcciones de Queretaro, S.A. De C.V. Queretaro, Qro, Mexico
<b>Quantities:</b>	1,925 meters of 750 mm Reinforced Concrete Pipe (with rubber compound gaskets) 822 meters 900 mm Reinforced Concrete Pipe (with rubber compound gaskets)

Grupo Mondragon is one of the oldest and most respected concrete pipe producers in Mexico with more than 60 years of experience. With nine facilities in Mexico, Mondragon produces concrete pipe with the greatest number of Besser and Pedershaab machines in Mexico.

# QUÉBEC TRANSPORTATION MINISTRY SETS Policy for Pipe Under Highways

By Domenico Miceli, ing., Miceli et Frères Ltée  
450-474-6189

A new policy for installing pipe under highways was realized when construction began on the Highway 40 Phase III project in the province of Québec, Canada. The policy was a result of a lengthy review of the culvert and storm sewer construction specifications of the Québec Transportation Ministry (MTQ). These documents entitled, *Tome III – Ouvrages d'art* and *Tome II – Construction routière* are part

of the seven books of standards published by the MTQ. In essence, the policy states that reinforced concrete pipe will be the only circular pipe allowed for culverts and storm sewers under highways. Reasons such as durability and reliability seem to have justified this choice. Culverts under highways must last a minimum of 75 years and storm sewers must last at least 50 years.

The MTQ standards recommend that concrete pipe should be considered for all other types of roadways when it is ascertained that an element of risk may be encountered in the



Photos: Marie-Josée Huot



**250 mm diameter reinforced concrete pipe being installed over 3.5 kilometer alignment.**



following situations:

- When the road is the only link to a region, and that there is no detour available;
- If there is a lot of heavy traffic transporting dangerous or flammable material, or that the road leads to an industrial area;
- If there are underground public utilities nearby, and that work on the utilities could damage the culvert or storm sewer;
- If a ruptured culvert or storm sewer could have important repercussions on the environment; and,
- When costs associated with repairs on culverts or storm sewers are prohibitive because of high fill, cost of detouring traffic, etc.

Summer, 2005 was an exciting time for the Québec Transportation Ministry. In this short construction period, the MTQ had to manage the construction or repairs of many highways and provincial roads. Québec's highway and roads system totals 28,965 kilometers and 19 percent are highways. There are 60,000 culvert structures. If they were to be joined end to end, these structures would extend approximately 1,300 kilometers.

The MTQ also owns storm sewer systems, but their numbers are not compiled.

The Highway 40 Phase III project was one of the major reconstruction projects undertaken by the MTQ in the summer of 2005. The project was located on Highway 40 between Des Sources Boulevard in Dorval and Saint-Charles Boulevard in Kirkland, west of Montréal on the north shore of the Saint Lawrence River. It consisted of 6.1 kilometers of pavement, with an adjacent underground storm sewer system. Continuous reinforced concrete pavement (CRCP)

**Summer, 2005 was an exciting time for the Québec Transportation Ministry. In this short construction period, the MTQ has to manage the construction or repairs of many highways and provincial roads. Québec's highway and roads system totals 28,965 kilometers and 19 percent are highways. There are 60,000 culvert structures. If they were to be joined end to end, these structures would extend approximately 1,300 kilometers. The MTQ also owns storm sewer systems, but their numbers are not compiled.**

was chosen as the surface pavement, since the previous two phases were comprised of CRCP. The storm sewer system consisted of 3.5 kilometers of 250 mm diameter reinforced concrete pipe (RCP) and 800 meters of 450 mm diameter RCP. The 450 mm diameter RCP was used for the main line and the 250 mm diameter pipe was used for interconnecting catch basins. To simplify the installation, a uniform diameter of 250 mm was chosen as the smallest diameter for that job. In addition, 96 special fittings had to be manufactured to connect the main storm sewer line to the catch basins.

Miceli et Frères, a member of the American Concrete Pipe Association, supplied all of the 1,600 pipe sections and fittings that were needed for the Phase III project. Pipe and fittings were delivered onsite within a 40-day schedule.

All pipe and catch basins were manufactured according to Québec Bureau of Normalization (BNQ) standards and all products were certified by the BNQ according to the publicly accessible certification protocol NQ2622-951. That certification system is third party managed by the BNQ, which is also accredited by the Canadian Standardization Council to certify infrastructure products.

A special aspect of the project was that the catch basins had to be installed at precise locations to accommodate the drainage layout for the concrete pavement. That meant that a lot of pipe cutting was required to adjust RCP connections to every catch basin. Also, the 96 special fittings had to be custom made to fit properly at all connections.

According to Jean-François Gauthier, engineer and coordinator of the civil engineering component, the precision connections to all the catch basins did make the installation more complex than usual. The overall job using RCP

did go well and on schedule. Pipe inspectors found the concrete pipe installations easy to check.

Bidding for Phase IV of the Highway 40 project ended in early February 2006, with specifications complying with Québec's new policy. Complete concrete solutions for highways should mean long-term durability and return on investments for Québec taxpayers.

Miceli et Frères, founded in 1971, is one of the major concrete pipe producers in Québec. Located in Mascouche, north of Montréal, Miceli et Frères specializes in circular concrete pipe (250 mm to 3600 mm diameter), boxes and CON/SPAN arched structures. In 2004, Miceli et Frères opened a second production facility in Saint-Jérôme on the north shore of the St. Lawrence River near Montréal. Miceli et Frères employs approximately 50 people. The company is a member of the American Concrete Pipe Association, the Canadian Concrete Pipe Association and Tubécon (Québec Concrete Pipe Association). See [www.miceli.biz](http://www.miceli.biz) for information.

<b>Project:</b>	Highway 40 Phase III Québec, Canada
<b>Owner:</b>	Ministère des Transports du Québec
<b>Consultant:</b>	Consortium Groupe Génivar / Tecslut Jean-François Gauthier, ing., coordinator of civil engineering Groupe Génivar
<b>General Contractor:</b>	Demix Construction Longueuil, Québec
<b>Excavation Sub Contractor:</b>	Les excavations Panthère Blainville, Québec
<b>Producer:</b>	Miceli et Frères Ltée Mascouche, Québec
<b>Quantities:</b>	3.5 kilometers of 250 mm diameter Class III RCP 800 meters of 450 mm diameter Class III RCP



Photo: Tubécon

◀ *Excavation on connecting pipes of elliptical metal structure caused a loss of soil structure and collapse of elliptical metal culvert under Highway 40.*

▼ *3000 mm diameter concrete pipe replaced failed metal elliptical pipe.*



Photo: Tubécon

## METAL PIPE FAILURE UNDER HIGHWAY 40

On September 14 2005, a 7.6 meter span x 5 meter rise elliptical metal structure collapsed and caused the closing of Highway 40 near Trois-Rivières. Highway 40 is a major highway on the north shore of the Saint Lawrence River, running from Ontario to east of Québec City. Excavation on connecting pipes caused a loss of soil structure and the collapse of the elliptical pipe. Two lines of circular concrete pipe,

3000 mm in diameter, installed in parallel lines replaced the failed metal elliptical pipe structure. Miceli et Frères responded quickly and supplied the large diameter concrete pipe to get that section of the highway reopened to the public. ☺



# City Has Long History of Using Reinforced Concrete Pipe

By J.P. Nolan, Vice-President  
American Concrete Pipe Company  
920-494-3436

The City of Fond du Lac, Wisconsin located at the southern end of Lake Winnebago, is the hub of residential, commercial, industrial, and institutional activity for the region. The City serves as the center for wastewater treatment. The service area of its wastewater treatment facility is approximately 94 square miles, servicing a population of approximately 55,000 people. The sanitary sewer system surrounds the southern one-third of Lake Winnebago, encompassing portions of three counties, ten individual municipalities and twelve individual sanitary districts. Lake Winnebago is the second largest fresh water lake in USA (137,000 acres).

The Fond du Lac regional treatment facility was designed for a maximum average daily flow of 11 million gallons per day (11 mgd.) over a design period that extends beyond the year 2020. Recent growth in the area required that the plant be modified to include facilities that

would handle peak hourly flows of 16 mgd. Many of the city's sanitary sewer interceptors are comprised of 48-inch, 42-inch, and 36-inch diameter reinforced concrete pipe (RCP). The project included the resizing of the plant's influent and outfall sewer and modification to the plant's onsite concrete pipe storm sewer. The expansion of the plant and modification of associated sewerage systems is expected to be complete by October 2008.

Concrete pipe for the project was supplied by American Concrete Pipe Co., Inc. The RCP sanitary sewer was constructed to convey mixed liquor, final effluent, excess flow and raw wastewater. Both the sanitary and storm sewer pipe were produced to ASTM C76 for circular pipe.

The sanitary sewer pipe was produced with a

"The City of Fond du Lac, Wisconsin, has a long and successful history of using reinforced concrete pipe for both storm water and sanitary sewer collection systems. Many of the sewers have been in service for over sixty years. The performance reliability, economics and ease of installation have made concrete pipe a natural selection of choice for our Engineering Division and Operations staff. As we developed design criteria and construction specifications for our \$61,000,000 Wastewater Treatment Plant upgrade construction project, pipe selection for the 72-inch influent and effluent discharge lines was an easy choice. No other product would provide the service life, meet the quality standards, and match the economy of reinforced concrete pipe."

Mark O. Lentz, P.E.  
Director of Public Works  
Fond du Lac, Wisconsin

Photos: American Concrete Pipe Company



C wall design and smooth exterior wall (no bell). Joints of the smooth wall installations were provided with an external bitumastic wrap that was secured on the pipe with a stainless steel band seal connector on each side of the joint. Joints had to meet ASTM C443 and all pipe was produced to accommodate O-ring gaskets satisfying ASTM C361. Specifications for the storm sewers required end walls at all discharges. Specifications also called for one lift hole per length of pipe for the storm sewer sections and no lift holes in the sanitary pipe.

All RCP and fittings for the sanitary sewer were vacuum tested to 15 psi. The test result, test date, pipe class, date of production, and individual pipe identification were marked on each section of pipe. Inspection engineers were provided the opportunity to observe vacuum testing.

In the field, the staff of J.F. Ahern Co. carried out the infiltration and exfiltration testing of the RCP lines. Established in 1880, J.F. Ahern is one of the largest mechanical contractors in the nation specializing in, among others, municipal water and wastewater treatment plants. J.F. Ahern was responsible for constructing the new final effluent sewer and outfall structure to Lake Winnebago, as well as construction of the plant sewer to allow for drainage of the new primary clarifiers and new 72-inch diameter effluent sewer.

Construction of the effluent sewer had to take place without disruption to the treatment efficiency of the plant that was established prior to construction. No bypassing of wastewater was permitted during construction. Connections of the new storm and sanitary sewer lines to existing sanitary and storm sewers were phased into the completion of the expanded facilities of the wastewater treatment plant. At a time of low flow, the City shut down the influent pumping station to allow the contractor to make the connection between the existing 60-inch diameter sewer and the new 72-inch diameter RCP outfall.

The Fond du Lac Water Pollution Control Plant gives testimony to the reliability and performance of reinforced concrete pipe under the most demanding design considerations. The

City has been using concrete pipe for its sanitary and storm sewers for decades. Fond du Lac serves as a model community where its infrastructure is built to last. ☺

<b>Project:</b>	Water Pollution Control Plant Modifications Fond du Lac, Wisconsin
<b>Owner:</b>	City of Fond du Lac, Wisconsin
<b>Consulting Engineer:</b>	Strand Associates, Inc. Madison, Wisconsin
<b>General Contractor:</b>	C.D. Smith Construction Fond du Lac, Wisconsin
<b>Sub Contractor:</b>	J.F. Ahern Co., Fond du Lac, Wisconsin Dave Le May
<b>Producer:</b>	American Concrete Pipe Co., Inc. Green Bay, Wisconsin J.P. Nolan-Vice President Tim Whitehouse- Production Manager
<b>Quantities:</b>	<b>Sanitary Sewer</b> 1,240 feet of 72-inch diameter Class III RCP 520 feet of 60-inch diameter Class III RCP 888 feet of 54-inch diameter Class IV RCP 8 feet of 42-inch diameter Class IV RCP 275 feet of 72-inch diameter Class IV RCP 10 feet of 48-inch diameter Class IV RCP <b>Storm Sewer</b> 864 feet of 30-inch diameter Class III RCP 600 feet of 24-inch diameter Class III RCP 672 feet of 18-inch diameter class III RCP 240 feet of 15-inch diameter Class III RCP 1,840 feet of 12-inch diameter Class III RCP

Established in 1946, American Concrete Pipe (ACP) is a producer of reinforced concrete pipe and other infrastructure products. The company has facilities in Green Bay and Milwaukee, Wisconsin. ACP's products include reinforced concrete storm and sanitary sewer pipe, PVC-lined reinforced concrete pipe, reinforced concrete culvert pipe and reinforced concrete end walls, manholes, catch basins, boxes for culverts, box manholes and custom structures. ACP became the first automated concrete pipe producer in the United States when they upgraded the Milwaukee facility in 1987. In 2000 ACP completely automated their facility in Green Bay. ACP is a subsidiary of The Spancrete Group, Inc. See [www.spancrete.com](http://www.spancrete.com) for more information.



## editorial

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funding to repair and replace sections of infrastructure that have experienced premature degradation.

Portland's "Least Cost" statute does not require the city to buy the cheapest available product. The Portland case confirms a municipality's right to ask their engineers to include life cycle cost analysis in their design process for pipe material selection. The Portland decision also confirms the municipality's right to choose based on sound engineering. GASB 34 demands it. This decision may also provide more opportunities for contractors, as they can work with a municipality's design or specification engineers to deliver projects that do not necessarily include the lowest bid price using the cheapest first cost pipe material. When long-term performance of buried infrastructure is in a municipality's best interest, concrete pipe is often the first choice.

Brochures prepared to assist in the marketing and sales of products sometimes present convincing arguments on their own, if the recipients of the publications are not familiar with the science and performance of the product. Civil engineers have the knowledge to make choices and appreciate published materials from suppliers to assist in the decision making process. They do not need unnecessary or misinformed pressure from elected representatives, outside forces such as lobbyists, and legal interpretation of municipal policy to make that decision for them. The Portland case has removed some of this pressure from the engineer, so that informed independent choices can be recommended to enhance the value and performance of a municipality's infrastructure.

In the event that recommendations from design engineers are ignored or changed without the engineer's consent, the municipality's engineer or consulting engineer can reference the Portland decision and ask the contractor or product supplier to sign a contract accepting all responsibility for the performance of the installation, thereby removing all risk and liability from the engineer.

The Portland vs. ADS case is important for municipal and consulting engineers to understand. It does have implications for the city and may have far-reaching effects on the way public agencies control the value of their buried infrastructure asset. The choice of products and materials has been confirmed as resting with the design or specifying civil engineer, and not with the marketing and sales ambitions of a manufacturer or retailer. ☺

## Jeff Hite Wins His Second Longfellow Award



Every year, a *Concrete Pipe News* author is honored with the Richard C. Longfellow Award. The tribute is presented to the author of an article that most effectively demonstrates innovative and effective use of concrete pipe. The award is presented in memory of Rich-

ard Longfellow who had an outstanding career with Cretex Companies, Inc. based in Elk River, Minnesota. He significantly influenced the philosophy and goals of the ACPA, and played a leading role on technical matters. He was responsible for drafting a new concrete pipe design manual and initiated *Concrete Pipe News*. As a director of the Association, he was the force behind the establishment of the \$1 million concrete pipe test program at Northwestern University to establish industry-wide standards for product quality.

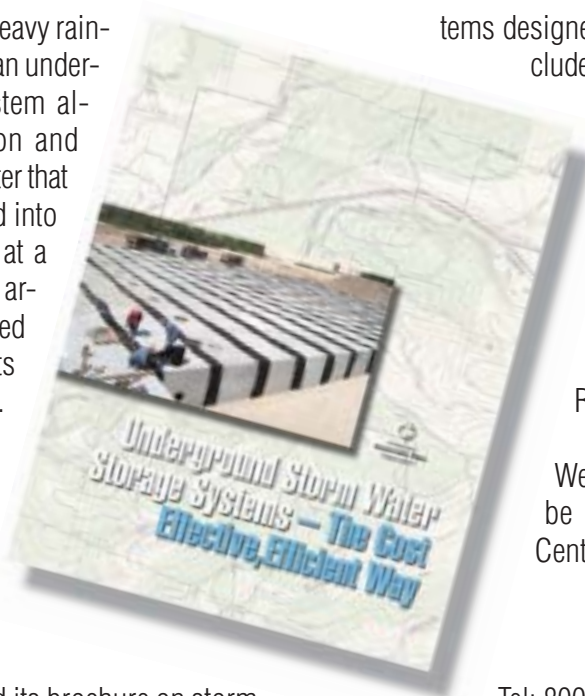
The 2005 winner of the Richard C. Longfellow Award was Jeff Hite of Rinker Materials – Concrete Pipe Division in Miami, Florida. He was also the 2004 winner. Jeff was honored at the 2006 American Concrete Pipe Association Annual General Meeting in Scottsdale, Arizona. His article, "Precast Box Storm Water Vault Meets Environmental and Structural Design Challenges" was published in the summer, 2005 issue of *Concrete Pipe News*. The article addressed the treatment of storm water before it is released into water bodies. The use of storm water ponds for treatment is not always desirable, or feasible. He used the Westshore Yacht Club, located in South Tampa, Florida to describe how a precast concrete system solved problems related to final grade limitations, water table concerns, and construction costs. His article was edited and re-published in *Engineering News Record* in 2005.

Mr. Hite's 2004 article focused on lessons learned about making the right choice for culvert pipe. Residents of the River's Edge Street Subdivision in Jupiter, Florida banded together to replace a failing high density polyethylene (HDPE) pipe installation with a reinforced concrete box culvert. Residents had taken a contractor's advice to install HDPE pipe instead of concrete because of a lower initial cost of the culvert material. ☺

# Underground Storm Water Storage Systems Brochure Released

In areas prone to heavy rainfalls or flash flooding, an underground detention system allows for the collection and storage of the storm water that can later be discharged into the municipal system at a controlled rate. In dry areas, water can be stored for use during droughts or other times of need. The benefits of underground storage tanks are as numerous as the configurations made possible with concrete pipe and boxes.

ACPA has released its brochure on storm water storage systems that focuses on the many benefits of managing storm water with underground storage sys-



tems designed with precast concrete pipe and boxes. Included in the brochure is reference to ACPA's DASH (Detention And Sewer Hydraulics) software. DASH is an easy-to-use interactive design software for underground storm water detention systems, storm sewers and sanitary sewers. The software is used to determine the storage volume required for a site by a variety of methods including HEC-1, TR-55, TR-20, and Modified Rational Method.

This brochure is available on the ACPA's Web site as a viewable document only, and may be purchased through the ACPA's Resource Center. ☺

## ACPA Resource Center

675 Grigsby Way  
Cedar Hill, TX 75104-2537

Tel: 800.290.2272 or 972.293.2171 (for questions or  
to place an order)

Fax: 972.291.0622



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