

# Concrete Pipe News



WINTER 2015  
Volume 67 No. 1



American **Concrete Pipe** Association  
[www.concrete-pipe.org](http://www.concrete-pipe.org)



*Concrete Pipe News* is published four times each year by the American Concrete Pipe Association. It is available in hard copy and digital format posted on the ACPA website. *Concrete Pipe News* content is linked to archived technical information, research and product development, educational products and applications of precast concrete pipe and boxes. Content is linked to archived word and graphic files on the ACPA and other industry-wide websites. Readers include engineers, specifiers, contractors, suppliers, government officials, and members of the American Concrete Pipe Association.

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#### On the Cover:

Bridge collapse and temporary structure an example of rapid response strategies being developed throughout North America.

Photo: Courtesy of Tubocreto



American Concrete Pipe Association

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# Editorial

## To Communicate Effectively, Include the Language of Symbols...



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



Our industry is no different than any other steeped in technology and applied science. Some might think that writing and speaking English well in America is all that is required to communicate ideas and inspire the specification of concrete pipe and other precast products. Times have changed – and continue to change before our eyes. For most, “olde” English is used in a modern world that does not relate to words and phrases that once inspired emotions to take certain actions.

The language of symbols is now intertwined with written words to the point where symbols and colors, instead of words may be the edge needed to induce an emotional tie to a product, idea or service, or the mental imprint to instigate a negative response. Our industry is becoming more visual in messaging.

For example, the phrase “take out” once conjured pleasant images of food or a date, nowadays the same phrase has another less appealing emotion. Food logos are laced with red and yellow to trigger an emotional response to eat. Imagery and color in waiting rooms are designed to prepare visitors in a certain way for a meeting or interview.

Language changes and so does the lexicon of receivers of messages. Generations Y and X receive messages much differently than baby boomers. If we want to communicate well with the various generations, cultures, and ethnic groups working in the business of infrastructure building and rebuilding, it is important to keep abreast of the most effective ways to communicate and the places where core audiences may be found. And many are found on social media, modern websites and blogs. The logos and symbols of social media sites trigger emotional responses to many audiences and emit unwritten messages.

No longer can businesses ignore social media and the expectations of websites. The ACPA joined social media sites in early days and learned what works and what does not work well. It continues to adopt and adapt to communications platforms and methods to support its members and Technical Resource Engineers who sometimes need backup and relevant information immediately – not a week from when needed. Information may be quickly drawn from archives on websites and social media.

The ACPA is acutely aware of the changing demographics and communications expectations of its audiences, and those of its members, too. ACPA organized its social media communications and has reached out to industry sites that have members who are influencers of specifications and Standards. The sites are populated with short English language and some Spanish messages linked to videos, photos, and other languages.

No organization can wait nowadays for a website to build traffic organically. It takes a lot of work to push audiences to sites that archive relevant and useful information and knowledge, while at the same time encouraging interaction between the organization and its audiences. Sites have to be designed to pull people to them and build a loyal base of users, while social media does the pushing day and night. Much of the hard lifting is accomplished with e-pipe publications, brochures, and flyers with definitive imagery and sample calculations. And, the ACPA's educational video library continues to grow.

The language of the modern world is not solely text-based. It is laced with visuals that continue to evolve in detail and meaning.

#### LINKS

1. [www.widgit.com/symbols/guide\\_to\\_symbols/Guide\\_to\\_Symbols.pdf](http://www.widgit.com/symbols/guide_to_symbols/Guide_to_Symbols.pdf)

## Standard RCP “At-the Ready” for Situations Requiring Rapid Response

By Carlos A. Trueba Salinas

TUBOCRETO

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Hurricane “Ingrid” and tropical storm “Manuel” caused the collapse of a vehicular bridge in Coyuca de Benitez, Guerrero, Mexico in September 2013. Standard-sized 96-inch diameter reinforced concrete pipe (RCP) produced by [Tubocreto](#)<sup>1</sup> was used by the Ministry of Communications and Transportation (SCT) to temporarily replace the [collapsed bridge](#)<sup>2</sup>. The SCT’s decision to work with its local concrete pipe supplier to resolve a situation that threatened the health and safety of nearby communities, as well as the economy of a region (including the tourist industry in Acapulco, one of Mexico’s oldest and best-known beach locations), heralds a new era in which standard-size concrete pipes can be included in rapid response strategies to address natural and man-made calamities.

The bridge at Coyuca de Benitez was 110 meters long. A temporary structure to ford the shallow crossing required 112 units of 96-inch diameter RCP with lay-lengths of 2.40 meters. The design required 28 “culverts” with four units of pipe comprising each structure. The 28 structures were drawn together and stabilized using three-quarter-inch steel cable. Once the decision was taken to build the temporary bridge, 300 workers using excavators, compactors, loaders and dump trucks completed the structure in ten days. The road bed measured seven meters, with shoulders one meter wide on each side. An asphalt surface and metal guardrails completed the structure and the crossing was opened to the public and commerce.

Not only is the structure a very good example of rapid response strategies being developed throughout North America for failed infrastructure due to major storms, but it has shown to be an environmental success, because the impact on the aquatic environment was minimized through rapid construction, and the concrete pipes can be removed and reused for other purposes at any time. Different pipe materials, such as thermoplastic or corrugated metal, for example, could not be used to temporarily replace structures such as the bridge in Coyuca de Benitez.

Concrete pipe producers throughout North America have rapidly upgraded their production facilities over the past 20 years, taking advantage of automation and the introduction of robotic plants to raise the quality of their products. Tubocreto committed to this technology shift, and has significantly raised the quality of its standard pipe and box products in all three of its production plants. The company tests the strength of its precast boxes used for culverts according to harmonised European Standard: BS EN 14844:2006 + A2:2011, Category I: Precast Products - Box Culverts. In addition, Tubocreto hydrostatic pressure tests its pipes, both in plant and after installation, according to Mexican Standard: NOM-001-CONAGUA. Specialized jacking pipes, installed under ocean waters up to 20 meters below sea level used to extract seawater, have grinded double-gasket joints and are pressure tested, both internally and externally, to ensure water tightness at 29 psi (2 Bar).

American policy-makers, industries and academics are working rapidly to introduce ways to increase disaster resilience in the [United States](#)<sup>3</sup>. Calamities following super storms like Andrew, Katrina and Sandy, tornadoes in the U.S. heartland, and “9/11” have ushered an era of preparedness and vigilance. Precast concrete pipes and boxes are important elements of America’s infrastructure. North American producers stand ready to participate in local and national disaster planning.

### LINKS

1. [www.tubocreto.com](http://www.tubocreto.com)
2. [http://youtu.be/mWDo\\_669s4U](http://youtu.be/mWDo_669s4U)
3. [www.nap.edu/catalog.php?record\\_id=13457](http://www.nap.edu/catalog.php?record_id=13457)

### Learn More About Buried Infrastructure

- **Keyword Search on American Concrete Pipe Association Website** (disaster, storm, infrastructure, bridge, culvert, quality, test) [www.concrete-pipe.org](http://www.concrete-pipe.org)
- **Concrete Pipe Design Manual** [www.concrete-pipe.org/pages/design-manual.html](http://www.concrete-pipe.org/pages/design-manual.html)
- **Concrete Pipe News** [www.concrete-pipe.org/pages/cpnews.html](http://www.concrete-pipe.org/pages/cpnews.html)

Precast boxes used for culverts strength tested according to harmonised European Standard: BS EN 14844:2006 + A2:2011.  
Photo: Carlos A. Trueba Salinas



Structure to temporarily replace collapsed bridge required 112 units of RCP.  
Photo: Courtesy of SCT



Specialized underwater jacking pipes have grinded double-gasket joints and are pressure tested to 29 psi (2 Bar).  
Photo: Carlos A. Trueba Salinas



Night time installation of precast concrete culvert.



Replacement of CMP culverts that have reached the end of their service life before the design life of the Interstate highway system in Vermont.



Boxes can be installed deeper than the streambed to capture sediment and extend the natural channel.

## Vermont Specifies Precast Concrete Box Culverts for Resilient Infrastructure

By Trygve W. Hoff, P.E., Northeast Regional Engineer  
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Vermont's Agency of Transportation (VTrans) has approached critical infrastructure with tenacity and resolve. Since 2011, after Hurricane Irene, VTrans has been dealt a difficult hand regarding extreme weather. And yet the country's sixth smallest state has responded admirably to the challenges of severe weather patterns and may very well be leading the nation toward resilient infrastructure by [sharing their knowledge](#)<sup>1</sup>.

In 2011, Hurricane Irene damaged more than 2000 culverts in [Vermont](#)<sup>2</sup>. One of those corrugated metal pipe (CMP) culverts was replaced with a precast arch box on the Town of Townshend's Townshend Dam Road. To rebuild a resilient infrastructure, the washed out CMP culvert was replaced with a precast structure prior to acceptance by the Federal Emergency Management Agency (FEMA). After an initial FEMA ruling that the box was an "upgrade," VTrans defended the municipality's decision through two appeals, leading to the announcement by [Governor Peter Shumlin](#)<sup>3</sup> and Vermont's Congressional Delegation on March 22, 2013 that FEMA would agree to fund the replacement. This ruling set a precedent that could allow dozens of Vermont culvert replacements to qualify for funds from FEMA.

Perhaps the most dramatic example of VTrans' progression towards a resilient infrastructure occurred on April 20, 2013 when a 60-inch diameter HDPE pipe culvert, which a few months earlier had replaced a deteriorated CMP culvert, washed out in the darkness of the early morning due to a flash flood. A family, returning from the local airport in two cars encountered the washout. Both vehicles initially fell 5 feet, before sinking another 20 as the chasm expanded to 30-feet wide by 25-feet deep. Injuries were not life-threatening. The failed flexible pipe culverts on [Mines Road](#)<sup>4</sup> near Lowell were eventually replaced with reinforced concrete box culverts.

Since Irene, [VTrans](#)<sup>5</sup> and many municipal public works agencies have been given the ways and means for specifying concrete for the replacement or construction of culverts. Concrete culverts add long-term value to asset management plans and can be specified under MAP-21 (Moving Ahead for Progress in the 21st Century Act), allowing states to specify the appropriate pipe material without appearing biased. Precast boxes have the added benefit of meeting the state's standards on fluvial geomorphology, often considered as important as hydraulic or structural considerations. Boxes can be installed deeper in the streambed with or without baffles to capture sediment and extend the natural channel through the box.

One of the primary drivers in culvert replacement in Vermont, and throughout the country, is the Interstate System from the 1950s to 80s which primarily utilized metal culverts. In Vermont, these Interstate metal culverts corrode due to abrasion by high velocities in the mountains and chemistry of the water. If failure is imminent, then a precast concrete box replacement is strongly considered.

Perhaps even before the FHWA rolled out Accelerated Bridge Construction (ABC), VTrans was focused on accelerated construction. Their primary goal is the quick replacement of critical culverts and short bridges. Constructing culverts with RCBs is an important option for the department. By rerouting traffic for a short period, it can save the expenses of temporary lanes or bridges. Fitting perfectly into the ACPA's Accelerated Precast Construction (APC) concept, VTrans' focus on resilient infrastructure and quick turnaround exemplifies sound planning and engineering design using concrete boxes.

### LINKS

1. [www.nytimes.com/2012/07/26/us/rise-in-weather-extremes-threatens-infrastructure.html?module=Search&mabReward=relbias%3Aw](http://www.nytimes.com/2012/07/26/us/rise-in-weather-extremes-threatens-infrastructure.html?module=Search&mabReward=relbias%3Aw)
2. <http://digital.vpr.net/post/minter-shares-irene-experience-colorado>
3. [www.leahy.senate.gov/press/fema-agrees-to-funding-for-flood-resistant-culverts](http://www.leahy.senate.gov/press/fema-agrees-to-funding-for-flood-resistant-culverts)
4. [www.youtube.com/watch?v=pezLDIz4unc](http://www.youtube.com/watch?v=pezLDIz4unc)
5. <http://vtrans.vermont.gov/>

### Learn More About Buried Infrastructure

- **Keyword Search on American Concrete Pipe Association Website** (box, culvert, fail, CMP, HDPE, buoyancy, Map 21, ABC) [www.concrete-pipe.org](http://www.concrete-pipe.org)
- **Concrete Pipe Design Manual** [www.concrete-pipe.org/pages/design-manual.html](http://www.concrete-pipe.org/pages/design-manual.html)
- **Concrete Pipe News** [www.concrete-pipe.org/pages/cpnews.html](http://www.concrete-pipe.org/pages/cpnews.html)

Photos: Courtesy of Wayne Symonds, P.E. VTrans

# Concrete Pipe Industry Scores Big at Baylor University's McLane Stadium

By Matt Childs, P.E.

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Concrete pipe and manholes were winning products that were specified for the sanitary and storm water management systems of Baylor University's McLane Stadium that opened for its inaugural Bears game August 31, 2014. [Hanson Pipe & Precast](#)<sup>1</sup> and [Johnson County Pipe Inc.](#)<sup>2</sup> (a subsidiary of Thompson Pipe Group) supplied precast concrete products. The \$260 million stadium is located on 93 acres in Waco, TX on the east bank of the Brazos River. Its horseshoe configuration, measures 1,254 feet with a capacity of 45,140 spectators, expandable to 55,000. There were approximately five miles of underground pipelines constructed to service [the stadium](#)<sup>3</sup>.

Included in the design of the facility was the need to relocate sewer and electric transmission lines, along with water, sewer and drainage services. Hanson supplied two [special 5-sided wastewater manholes](#)<sup>4</sup> as well as several additional manholes for 48-inch diameter sewer mains. To accommodate the size and angles of connecting sewer pipes, and address the requirement of a small construction footprint, the engineer designed 5-sided manhole structures. This design allowed the contractor to connect the large diameter sewer mains using only one structure at each point of intersection. In addition to the manholes, Hanson supplied various lengths of 24-inch, 27-inch, 30-inch, 36-inch and 42-inch diameter reinforced concrete pipe (RCP). All gravity storm sewer pipe, 15-inch diameter and larger was RCP. The civil engineering firm for the project, Walker Partners specified reinforced concrete pipe exclusively, because of concerns about flotation if thermoplastic pipe had been used.

Johnson County Pipe Inc. supplied large quantities of Class III RCP including 18-inch, 24-inch, 27-inch, 30-inch, 36-inch and 42-inch diameter sizes. The pipe was supplied to construct storm sewers along the stadium perimeter and under parking lots. The pipe was produced according to the requirements of ASTM C76, *Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe*. Class III RCP is a typical pipe strength for storm sewer pipelines requiring product ranging from 18 to 42-inch diameter.

[Buoyancy forces](#)<sup>5</sup> that affect a buried pipeline should always be a design consideration, especially on site conditions like those found along the Brazos River in Waco in the vicinity of McLane Stadium. The average density of concrete pipe is 150 lbs./cu. ft. which is 2.4 times that of water. For example, a 24-inch diameter RCP with two feet of earth cover and groundwater table near the surface (for calculation purpose and safety factor the pipe is considered empty), the downward force of concrete is about 1.6 times greater than the upward force meaning the pipe will not float. On the other hand, corrugated polyethylene conduit with an interior liner (often used for storm sewers and culverts) has a density as much as 6 percent less than that of water. Under the same situation, the downward force is approximately 0.8 of the upward force meaning the thermoplastic conduit will float.

The specification of precast drainage concrete products for McLane Stadium was a winning choice for both the project engineers and members of the American Concrete Pipe Association. "Sic 'Em Bears"!

## LINKS

1. [www.hansonpipeandprecast.com/english/index.php](http://www.hansonpipeandprecast.com/english/index.php)
2. [www.thompsonpipegroup.com/](http://www.thompsonpipegroup.com/)
3. <http://ftw.usatoday.com/2014/08/ftw-exclusive-time-lapse-video-baylor-mclane-stadium-construction>
4. [www.concrete-pipe.org/magazine/2013wintercpnews.html](http://www.concrete-pipe.org/magazine/2013wintercpnews.html)
5. [www.concrete-pipe.org/brochures/flotation-brochure.pdf](http://www.concrete-pipe.org/brochures/flotation-brochure.pdf)

## Learn More About Buried Infrastructure

- **Keyword Search on American Concrete Pipe Association Website** (stadium, field, storm, sanitary, manhole, flotation) [www.concrete-pipe.org](http://www.concrete-pipe.org)
- **Concrete Pipe Design Manual** [www.concrete-pipe.org/pages/design-manual.html](http://www.concrete-pipe.org/pages/design-manual.html)
- **Concrete Pipe News** [www.concrete-pipe.org/pages/cpnews.html](http://www.concrete-pipe.org/pages/cpnews.html)

Concrete pipe in various sizes supplied by Hanson Pipe & Precast and Johnson County Pipe Inc. Photo: Twitter



Everybody wins with concrete pipe!  
Photo: Courtesy Matt Childs



To accommodate design requirements and a small construction footprint, the engineer designed 5-sided manhole structures.  
Photo: H&B Contractors



## RCP Culverts Increase Capacity and Replace CMP in Florida

By David L. McClintock, P.E., Technical Resource Engineer  
Hanson Pipe and Precast  
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After years of service a number of waterways on U.S. 41 (Tamiami Trail) in Port Charlotte, Florida required upgrades and improvements. Continuing development of the Charlotte Harbor area resulted in additional stormwater runoff and the need to replace or add capacity to many of the waterway culverts. The Charlotte County Community Development Engineering Division began work in 2014 with waterway improvements and weir replacements at four separate locations.

The waterway improvements include adding capacity with reinforced concrete pipe (RCP) culverts under mainline U.S. 41 and replacing existing corrugated metal pipe (CMP) culverts with RCP culverts on the North and South Access Roads and another local road. Since Tamiami Trail is a highly traveled six-lane urban highway in a dense commercial area, road closures and detours were not an option. The owner, Charlotte County decided to install the mainline U.S. 41 RCP culverts by microtunneling construction. The RCP culverts on the access and local roads, with far less traffic, could be installed by open cut construction. The stand-alone weirs were cast-in-place. The project demonstrates the ease of use of concrete pipe for microtunneling and the ever-increasing specification of precast concrete pipe and boxes for the replacement of corrugated metal pipe culverts when they have failed or are failing, or before the end of their projected service life.

### Construction Sites

#### U.S. 41 / Elkcam Waterway Culvert Improvements and Weir Replacement

Install three – 190-foot, 84-inch diameter RCP culverts under Tamiami Trail by microtunneling; Waterway improvements incorporating the existing twin 7-foot x 10-foot concrete box culverts; and, replace the existing weir north of the North Access Road with a 205-foot CIP concrete weir structure.

#### Elmira Boulevard / Pompano Waterway Crossing Improvements

Replace twin 35-inch x 58-inch diameter CMP culverts with a 94-foot 84-inch diameter RCP culvert under Elmira Blvd. by open cut installation; and various roadway, drainage and waterway improvements.

#### U.S. 41 / Fordham Waterway Culvert Improvements and Weir Replacement

Install two – 150-foot, 84-inch diameter RCP culverts under Tamiami Trail by microtunneling; waterway improvements incorporating the existing triple 8-foot x 10-foot concrete box culverts; and replace the existing weir north of the North Access Road with a 137-foot CIP concrete weir structure.

#### U.S. 41 / Pompano Waterway Culvert Improvements and Weir Replacement

Install two – 160-foot, 60-inch diameter RCP culverts under Tamiami Trail by microtunneling; waterway improvements incorporating the existing 4-foot x 6-foot concrete box culvert; replace twin 38-inch x 60-inch diameter CMP culverts with triple 60-inch diameter RCP culvert under South Access Road by open cut installation; replace twin 19-inch x 30-inch diameter CMP culverts with triple 60-inch RCP culvert under North Access Road by open cut installation; and replace the existing weir north of the North Access Road with an 80-foot CIP concrete weir structure.

Hanson Pipe and Precast's<sup>1</sup> Winter Haven, Florida facility produced 870 feet of 84-inch diameter Class III RCP jacking pipe for microtunneling; 94 feet of 84-inch diameter Class III RCP for open cut; 320 feet of 60-inch diameter Class III RCP jacking pipe for microtunneling; and 400 feet of 60-inch Class III RCP for open cut. Due to the relatively shallow cover Hanson was able to design and produce the 60-inch and 84-inch diameter jacking RCP with a C-wall and ASTM C76 Class III reinforcing steel. The jacking design included 6,000 psi concrete compressive strength and ¼-inch steel bell bands.

Since the specification of reinforced concrete pipe for microtunneling and open cut was met with success, Charlotte County anticipates similar projects with concrete pipe at other waterway locations.


### LINKS

1. [www.hansonpipeandprecast.com/english/index.php](http://www.hansonpipeandprecast.com/english/index.php)


### Learn More About Buried Infrastructure

- **Keyword Search on American Concrete Pipe Association Website** (microtunnel, tunnel, jacking, culvert, CMP, metal, trench) [www.concrete-pipe.org](http://www.concrete-pipe.org)
- **Concrete Pipe Design Manual** [www.concrete-pipe.org/pages/design-manual.html](http://www.concrete-pipe.org/pages/design-manual.html)
- **Concrete Pipe News** [www.concrete-pipe.org/pages/cpnews.html](http://www.concrete-pipe.org/pages/cpnews.html)


Photos: David L. McClintock, P.E.



Culverts installed by microtunneling under U.S. 41.



Two – 160-foot, 60-inch diameter RCP culverts under Tamiami Trail installed by microtunneling and incorporating existing 4-foot x 6-foot concrete box culvert.



Successful use of concrete pipe may lead to specification on similar projects at other waterway locations.



330 meters of HDPE-lined 2400mm x 1800mm concrete box sections for primary influent box conduits.



Project design required straight, radius and bend sections to follow the congested and intricate layout of the effluent conduits.



HDPE-lined precast concrete boxes.

## Lined Precast Concrete Boxes Used In Calgary WWTP System

By Shawn Rogers  
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When specifiers think of culverts in need of a long service life, precast concrete boxes and reinforced concrete pipe are often top of mind. Waste water treatment plant designers in Calgary, Alberta, however, saw an opportunity for building primary influent box conduit with lined precast concrete boxes. [Inland Pipe](#)<sup>1</sup> was contracted by [Standard General Inc.](#)<sup>2</sup> in 2011 to supply 330 meters of HDPE-lined 2400mm x 1800mm concrete box sections that would form a serpentine layout for the new processing upgrades at Bonnybrook Waste Water Treatment Plant.

The Bonnybrook plant services the northern half of the city. The facility is one of three waste water treatment plants servicing Calgary. The other two, Pine Creek Waste Water Treatment Plant and the Fish Creek Waste Water Treatment Plant serve the southern reaches. Bonnybrook is being upgraded and expanded ahead of the other two, because it can accept waste from those facilities but not the other way around.

The project presented several challenges from a production and design standpoint. The most obvious was providing a square reinforced concrete product with a cast in HDPE liner. Although the use of concrete boxes for conduit has a long history, the production process incorporating a liner does not.

The project design required straight, radius and bend sections to follow the congested and intricate layout of the effluent conduits that would transfer partially treated sewage to the settling ponds and then back to the treatment plant for further processing. The HDPE liner was specified to resist corrosion of the concrete by sulfuric acid generated by anaerobic bacteria that form in raw sewage and produce hydrogen sulfide gas (H<sub>2</sub>S). Hydrogen sulfide gas is converted into sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) by the aerobic Thiobacillus bacteria that grow on the concrete surfaces above the wastewater flow. Site conditions and the facility layout dictated a shallow installation using custom reinforcement design to accommodate loading requirements.

Engineering and design staff at Inland Pipe worked on the layout and reinforcing designs through 2012 to meet the production start date at its [Spyhill facility](#)<sup>3</sup> in 2013. The final layout consisted of 72 HDPE-lined straight box sections; 26 HDPE-lined box bends; 24 HDPE-lined radius box sections; and, 17 HDPE-lined custom length box sections. The initial product shipments delivered in the summer of 2013 were installed, and the conduits commissioned to allow work to proceed in other areas of the facility. Delivery of the balance of the order for completion of the conduits is planned for 2014.

With its ultraviolet-light disinfection facility that adds no harmful chemicals to the plant's final effluent, the [Bonnybrook waste water treatment plant](#)<sup>4</sup> is one of the premier plants in Canada. The conduit system for transporting sewage to the clarifiers is critical infrastructure that must perform as designed. The boxes were specified because of the need for a product material that has a proven history. The Bonnybrook plant plays a vital role in the health of the City and it must perform according to long-term plans and maintenance schedules.

### LINKS

1. [www.lehighhansoncanada.com/products/pipe.aspx](http://www.lehighhansoncanada.com/products/pipe.aspx)
2. [www.standardgeneratedmonton.ca/?s=home](http://www.standardgeneratedmonton.ca/?s=home)
3. [www.youtube.com/watch?v=HWmjQ9gXO0g](http://www.youtube.com/watch?v=HWmjQ9gXO0g)
4. [www.youtube.com/watch?v=ZCWG6U6J41Q](http://www.youtube.com/watch?v=ZCWG6U6J41Q)

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- **Keyword Search on American Concrete Pipe Association Website** (box, application, sanitary, water, retention, detention, sewer) [www.concrete-pipe.org](http://www.concrete-pipe.org)
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## Pipe School 2015

The Precast Concrete Pipe Industry has a long history of providing durable and reliable products that serve as the foundation of our highways. It is time to start thinking about participating in the 2015 Pipe School, March 3 to 6, at the Wyndham Orlando Resort on International Drive in Orlando, Florida. There, the concrete pipe industry will hear about lessons from the past and to build an even better product in the future. It's also a great opportunity to attend the Precast Show at Orange County Convention Center, Orlando, Florida starting on March 5.

Attendees will be able to access educational presentations in the areas of production, quality, safety, sales and marketing, and engineering design. By sending employees to the school, employers will benefit with improved production, engineering design and sales. Despite today's fierce competition, better-trained staff leads the way by making quality products in a safe and efficient manner. Don't miss the opportunity to learn from the most experienced and knowledgeable instructors in North America. Pipe School details and registration are posted on the [ACPA website](http://www.concrete-pipe.org).



Save this link [www.concrete-pipe.org/pages/cpnews.html](http://www.concrete-pipe.org/pages/cpnews.html) to your favorites list to increase your knowledge about drainage applications and innovative ways to use precast reinforced concrete pipe and boxes to build structures that will last.