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On the Cover:
New concrete box fish barrier during spring flow following winter construction.

Editorial

ACPA Supports NASSCO's Pipeline Assessment and Certification Program

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

The National Association of Sewer Service Companies[1] (NASSCO) sets industry standards for the rehabilitation of underground pipelines, and advocates continued acceptance and growth of trenchless technologies. NASSCO offers its Pipeline Assessment and Certification Program[2] (PACP) that provides standardization and consistency in the way sewer pipe condition is reported, and how TV inspection results are managed. ACPA supports PACP because certified technicians are able to undertake stringent post installation inspection of storm sewers that is credible. Because of this, ACPA is able to approach DOTs with inspection requests using PACP-certified inspectors, while encouraging DOTs to have their own inspectors certified by NASSCO.

Many municipalities require PACP-certified inspectors and condition assessment codes to be used for pipeline condition assessments. Even the software used for data collection and reporting must be PACP-certified in many municipalities. This is not surprising within the context of GASB 34[3] that requires that state and local governments determine the costs associated with initial construction, subsequent capital improvements, and the cost associated with using an asset. These assets include sewers and culverts.

In 2008, an ACPA/NASSCO task group was formed to explore issues of mutual interest. ACPA was quick to join NASSCO as a professional member and attended its annual meeting. ACPA is working with NASSCO to make PACP more relevant to DOTs and AASHTO, and ACPA and NASSCO are close to implementing revisions to PACP to improve inspections of storm sewers.

Updates to the PACP Advanced Inspection Module will include additional storm sewer piping products, additional condition codes and more pictures of storm drainage products. Codes will accommodate deformation and buckling. There are software updates to allow measurements of crack width and length, joint gap widths, and percent deflection.

So, what lies ahead in our relationship with NASSCO? ACPA is supplying NASSCO with DOT PII Specs; helping NASSCO identify DOT contacts to ensure that updates to PACP will meet needs of DOTs; encouraging PACP-certified technology for PII Specifications in DOT Specifications; and encouraging DOTs to obtain PACP training. NASSCO is actively pursuing opportunities to present papers at AASHTO Bridge and AASHTO Construction meetings, along with meetings of SASHTO.

PACP is a great tool for assessing performance of installed storm sewer pipelines. Whatever our industry can do to assist NASSCO will go far in demonstrating the long-term performance of concrete pipe[4] and add value to the inventory of infrastructure assets owned by states and municipalities.

LINKS

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2. http://www.nassco.org/training_edu/pdfs/editorial.pdf
3. http://www.gasb.org
4. http://www.concrete-pipe.org/why.htm

Bridging The Technology Gap

Precast Concrete Box Utility Chamber Showcases Best Practice for Utilities Maintenance

By Michael R. Miller, Quality Manager
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Engineers and architects have accepted the use of concrete vaults and utility chambers[1] to house services for easy access and reduced maintenance costs. The University of Arkansas, Fayetteville[2] needed to add a new buried service chamber alongside existing classroom buildings for the beginning of classes in the fall. The watertight, 50-year+ capital asset was changed to precast from poured-in-place to meet the summer construction schedule. Project team members consisted of University Utility Operations, McClelland Engineers[3], and the Construction Manager, CDI Contractors, LLC[4]. Scurlock Industries[5] supplied the precast concrete box sections with forms supplied by Mid-America Manufacturing[6]. Press-Seal Gasket Corporation[7] supplied gaskets and NEC Contractors installed the boxes.

Extending more than 600 feet, the chamber carries primary electrical distribution, district heating, and hot and chilled water. To channel any residual piping leaks safely to the side of the chamber, the core form for the (8-foot x 8-foot x 6-foot laying length) precast box was modified to form a slope to one side of each box.

The chamber was designed for low pressure sealing with precision rubber-compound gaskets for joints[8] and tolerances measured in thousandths of an inch. Before the box sections were shipped, they were fitted with gaskets. When installed[9], the joints were closed to within a half inch, creating good compression of the gasket. Each joint was covered with mastic-coated wrap material, and non-woven filter cloth wrapped the entire structure.

Two box sections per truckload were offloaded and placed with 6 to 12 feet of backfill within a narrow alignment. The first box section had exposed reinforcing to tie into a poured-in-place structure. Despite rainstorms which periodically halted construction, progress continued at an average of 3 to 4 sections per day.

Utility chambers are being used throughout North America for cost efficient long-term preventative and emergency maintenance of buried infrastructure, and public safety and security. In addition to gaining a secure and valuable asset, the University of Arkansas was able to keep its commitment to staff and students to have the improved facilities available on time.

Full Story: http://concrete-pipe.org/CP/PrecastConcreteBoxUtilityChamberShowcasesBestPracticeforUtilitiesMaintenance.pdf

Removing box section from mold.

Joining first box section with pipe puller.

Boxes installed within a narrow alignment.

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- **Keyword Search on American Concrete Pipe Association Website**
  (Precast boxes, culverts, chambers, gallery, utility)
  www.concrete-pipe.org
- **Concrete Pipe Design Manual**
  http://www.concrete-pipe.org/designmanual.htm
- **Concrete Pipe News**
  http://www.concrete-pipe.org/cpnews.htm

Photos: CDI Contractors, LLC.

New concrete box fish barrier at winter low flow with concrete apron visible.

Precast concrete barrier stops migration of non-native fish species.

Wooden fish barrier that was replaced.

Precast Boxes Ideal for Fish Barriers

By Brian C. Anderson, Product Development Engineer
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Our natural resources become more important to us, as awareness increases about how fragile they are, and how some can easily disappear never to return. Such is the case with aquatic ecosystems. Our industry produces environmental products that contribute to the health and safety of urban and rural communities – large and small. Concrete pipe and boxes[1] are used for innovative applications that often mitigate the effects of human activities on streams, rivers, and lakes. Innovation has now come to stream rehabilitation work and the need along the reaches of some waterways to bar non-native species of fish and other aquatic organisms from invading high priority watersheds occupied by existing native, or repatriated species.

Cretex Concrete Products West[2] is working with Montana Fish, Wildlife & Parks[3] to improve the quality of its streams with the construction of fish barriers using precast concrete boxes. The producer completed its first project on White's Gulch in Lewis and Clark County, Montana near Helena, where boxes were used to separate the endangered Western Slope Cutthroat Trout from non-native trout species, and maintain a genetically pure population that could be relocated to other streams. Precast boxes were selected because of the short construction window during low flow, and longer service life[4] than a wooden barrier installed about 10 years ago.

Cretex was approached by Allied Engineering[5] of Bozeman, MT during the design phase of the project for technical input and opinion. The design was a collaborative exercise between Cretex engineers, the consulting engineer, and Mainstream Restoration[6], also of Bozeman.

Two sizes of precast boxes were used for the structure. Three 6-foot x 3-foot by 6-foot (lay-length) box sections were installed in the stream perpendicular to the flow and bolted together top and bottom with one-inch bolts. Four 8-foot x 3-foot by 6-foot box sections were stacked two sections high on either side of the 6-foot x 3-foot boxes to prevent the stream from eroding the banks adjacent to the structure. The box sections were designed as vertical box manholes in a fully saturated condition. Precast cover slabs were installed over the 6-foot x 3-foot sections and a precast concrete splash pad with footings installed at the toe of the structure.

Installation of the structure by Helena Sand and Gravel was completed in about five days of a three-week schedule. Allied Engineering did not require any special quality control assurance other than the American Concrete Pipe Association Q-Cast[7] certification held by the Cretex facility. Because the precast boxes proved to be a very desirable solution that closes a technology gap between legislated environmental challenges and construction methodology, the design will be used for another barrier in 2010.

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Photos: Brian Anderson, Cretex.

A Pragmatic Look at Sustainability

By Glenn Clayton, P.E., LEED AP
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Although sustainability[1] continues to be one of the hottest topics of this century, it is still widely misunderstood. The basic notion of sustainability is that human population is increasing at such a rate that humans will soon exhaust all of the Earth's natural resources and/or pollute the environment beyond repair. This concept was illustrated in *Limits To Growth: The 30-Year Update, 2002*[2]. According to the authors, humanity began to overshoot the carrying capacity of the Earth around 1978, which will inevitably lead to a "crash" or "die-off". There is plenty of evidence to the contrary.

Intuitively, since world population is rapidly growing (and industrial production along with it), and raw material supply is decreasing (being limited to that which is extractable from the Earth's crust), prices must be continually increasing. Surprisingly, according to *The Ultimate Resource 2 (1996)*[3], this is not the case. Prices of all natural resources have continued to fall over the last 200 years.

As population began to grow, temporary shortages began to occur, and prices began to rise. In a free marketplace, rising prices provide opportunities for investment and innovation that result in discovery of new reserves of resources, more efficient extraction methods, new manufacturing processes, and new consumer products that replace the old. The result is even lower prices than before the shortage occurred and lower prices are indicative of an abundant supply.

Regardless of the immediacy of any potential raw material supply problems, public policy is rapidly changing in response to sustainability concerns. Studies comparing competing sewer pipe materials have shown concrete pipe has a much lower detrimental impact on the natural environment than plastic. For those in the business of making drainage pipe, however, there are several public policy and industry initiatives that are likely to reduce the demand for piping systems. For instance, the U.S. EPA's National Pollutant Discharge Elimination System Phase II regulations require municipalities to use Best Management Practices (BMPs) to treat, store, and infiltrate runoff onsite, reducing the need for storm sewer piping.

The LEED Green Building Rating System for New Construction[4] also recommends BMPs as a strategy to earn LEED credit requirements. Although LEED certification carries no inherent regulatory enforcement capability, Federal government agencies, some states, and many cities are requiring some type of LEED certification or specifications containing LEED strategies.

In the rush to appear environmentally aware and responsive, engineers have been embracing unproven technologies, resulting in exorbitant maintenance costs, and failures. Responsible citizens should demand that public policy be formulated on credible science and not the unsubstantiated fears of radical environmentalist lobbyists that seems to be promoting an interpretation of sustainability that may be very light on science and history.

Full Story: http://concrete-pipe.org/CP/APragmaticLookatSustainability.pdf

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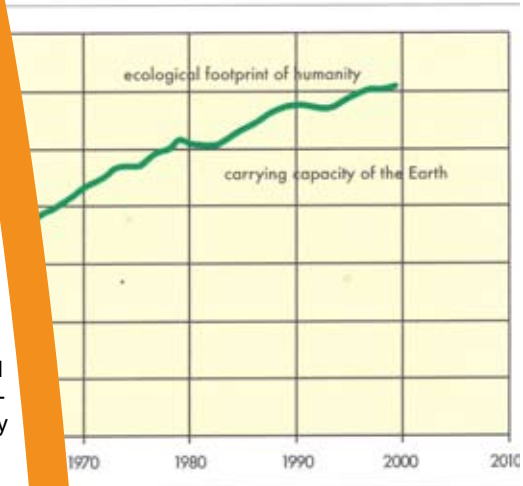

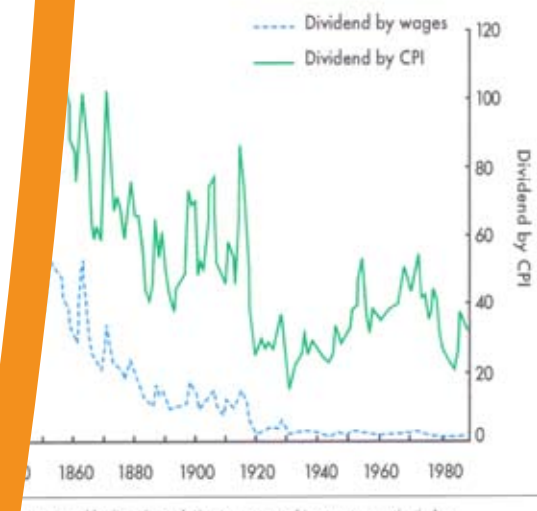

Specially Designed Concrete Pipe Sanitary Sewer Snakes Along Lakeshore

By Rylan MacDow, Sales Manager
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Design and construction of the North Dartmouth Sanitary Trunk Sewer (Phase Two)[1], in Dartmouth, Nova Scotia, Canada was a complex project requiring special design of the reinforced concrete pipe[2]. The 1500mm diameter trunk sewer closes a gap in the sewer that had existed since the 60s. The original design report recommended high density polyethylene pipe[3], but further investigations raised concern about buoyancy[4], and installation[5] in cold weather.

Concrete pipe supplied by Shaw Precast Solutions[6] was determined to be the best alternative to the original recommendation. Because the pipeline was to carry sanitary sewage, the system had to be watertight and corrosion resistant using pipe with joints[7] and walls that would not leak. The pipe had to be produced with sufficient weight to eliminate any concern of buoyancy. Dexter Construction[8] had to lower the level of the lake and associated high water table by two meters for construction.

Shaw produced each pipe with a waterproof membrane on the outside, an admixture to the concrete during batching, and a cement coating on the inside. The pipe wall was increased from 140mm to 230mm to achieve the required 6,260kg weight. Because the concrete pipe is an engineered product produced in a controlled environment, the design tolerances of the units were easily met.

The project called for 208 radius pipe to accommodate the curvilinear nature of the alignment. Custom pallets and headers created a 125mm variance at the header that resulted in a 40-degree deflection at the spigot. The design of the radius pipe allowed the pipeline to be constructed along a curve while maintaining the integrity of the O-Ring gasket.

Shaw supplied four modified three-sided boxes for a pedestrian bridge and a stream crossing. Each of the 4300mm x 3600mm sections was finished with railing, curb, and an architectural veneer finish.

The trunk sewer, constructed ahead of schedule along the shoreline of Banook Lake, was designed to last 100 years. The entire pipeline is constructed as a watertight structure with special treatment of the concrete, barrel of the pipe, and joints. Few residents will remember that a sanitary sewer lays metres below their feet.

Full Story: http://concrete-pipe.org/CP/SpeciallyDesignedConcretePipeSanitarySewer.pdf

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Photos: Darlene Battcock

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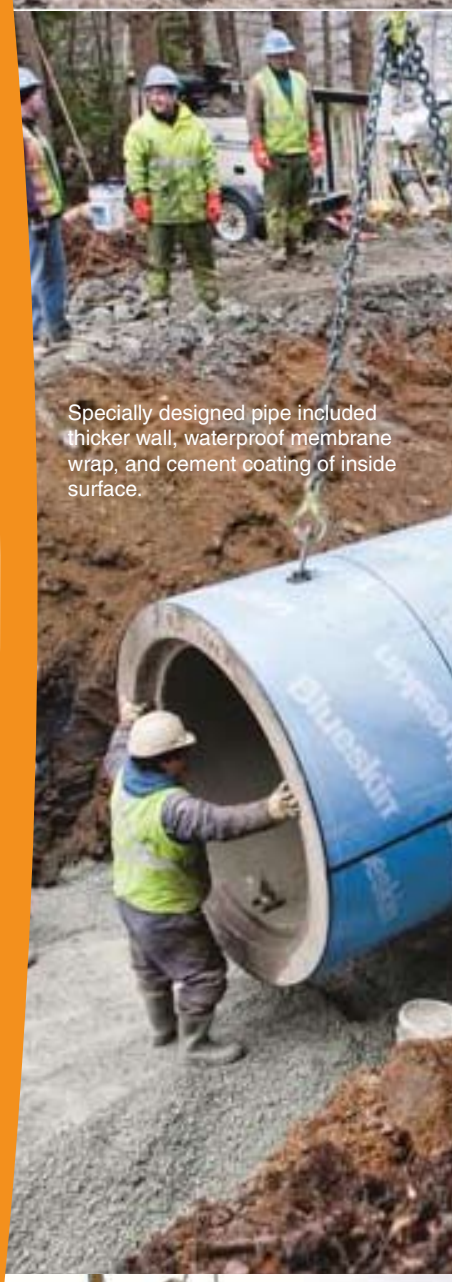
  www.concrete-pipe.org/designmanual.htm
- **Concrete Pipe News**
  http://www.concrete-pipe.org/news/2007_Summer_CP_News.pdf

Specially designed 1500mm diameter RCP for curvilinear sanitary sewer.



Specially designed pipe included thicker wall, waterproof membrane wrap, and cement coating of inside surface.

Three-sided box used for pedestrian bridge and support for stream crossing of sanitary sewer.

13,500 feet of 84-inch diameter reinforced concrete jacking pipe supplied by American Concrete Pipe.

Photos: The Spancrete Group, Inc.

Joints produced to exacting tolerances and inspected frequently.

Jacking pipe shipped through two winters.

Zero Product Defects on Deep Tunnel Sewer

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Collector sewers and the Deep Tunnel[1] are part of a comprehensive, multi-year, $2.3 billion sewer improvement program that the Milwaukee Metropolitan Sewerage District[2] began in 1986 to comply with federal water quality standards by reducing the amount of untreated sewage discharged into local waterways. The Deep Tunnel sewer system helps eliminate sewage releases into Lake Michigan, Milwaukee's source of drinking water. Wastewater flows into the District's system of collector sewers before it is treated, or temporarily stored in 19.4 miles of tunnels at depths of up to 325 feet. The system is known as the Deep Tunnel.

Michel's Tunneling[3] of New Berlin, Wisconsin was contracted to carry out the tunneling and pipe jacking on a portion of the project, which included 13,500 feet of 84-inch diameter reinforced concrete jacking pipe[4] supplied by American Concrete Pipe (ACP)[5]. Working through two winters, ACP delivered 1,692 units of custom concrete pipe that were shipped two pipes per load because of size and weight. Every piece that ACP manufactured was a flawless, quality product, resulting in zero waste.

Each unit of pipe went through multiple inspections. ACP inspected every piece following production, and after a unit had been loaded onto the truck for shipment to the job site. At the job site, Michel's Tunneling staff inspected the product immediately after offloading. The joints[6] were all in good condition according to design tolerances, resulting in a watertight sewer. When the contractor does not have to return pipe to the producer, it is never short on any individual day, and the job keeps moving along on, or ahead of schedule.

The portion of the Deep Tunnel project supplied by ACP was a collector sewer designed to upgrade and improve an existing sewage system along Canal Street from 27th Street to 5th Street. Even with the pipe being jacked to a depth of 80 feet, the project was completed three months ahead of schedule. A collector sewer is a conduit that receives sewage and/or stormwater from two or more lateral sewers or other branch conduits.

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ACPA has a Facebook Site

Facebook has come to dominate social networking in the U.S. Well-known companies like Microsoft, IBM, Wells Fargo, State Farm, Ernst & Young, Victoria's Secret, and Prudential all have well-attended and active Facebook Fan Pages. Facebook engages with people who like our brand, want to interact with it, and stay abreast of latest developments. ACPA is increasing awareness of its Facebook site with photos, links to videos and the ACPA Website, events, and a growing fan base. Discussion threads will soon be initiated. Set up a Facebook account, check out our site, and help build our fan base to promote the Association, its members and the products we make that last a lifetime.

Save this link www.concrete-pipe.org/cpnews.htm 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.