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Genoa Bridge Collapse

On August 14, 2018 in Genoa, Italy, a 200m portion of the A10 motorway bridge collapsed, resulting in the evacuation of 600 people with 15 sent to hospital in critical condition and 43 deaths. The Italian government has declared a 12-month state of emergency in the region, with €28.5 million allocated to support those affected by the disaster.

Investigations into the collapse will look at different possible causes, including wear and tear, heavy traffic, structural flaws and other issues. The 51-year-old structure, known as "Italy's Brooklyn Bridge", was designed by Italian engineer Riccardo Morandi. It was completed in 1967 with restructuring work done in 2016. Some major repairs were also done to the bridge in the 1990s.

It has been criticized by experts who have, at different times, called for serious maintenance and risk assessments to be performed.

This is a tragic reminder of the importance of proper inspection and maintenance of bridges. It has prompted the Canadian Concrete Pipe and Precast Association to re-publish the following Concrete Pipe Journal article from 2016.

Provincial Auditors Raise Concerns with Bridges and Culverts

Auditor Generals in some provinces have released reports in recent years that are focused on the inspection and maintenance of bridges and culverts in their provincial highway systems. The Auditor General in Manitoba presented a report in July 2016 to the Manitoba Legislative Assembly entitled Management of Provincial Bridges. The Auditor General stated that "a well-maintained bridge inventory is essential for public safety and economic development. Inadequate management of this critical infrastructure can have significant adverse consequences as recent high-profile bridge collapses in Canada and the United States have shown. About 40% of the Province's bridge-inventory is more than 50 years old."

New Brunswick: In 2013 the Auditor General in New Brunswick released a report entitled *"Department of Transportation and Infrastructure Provincial Bridges."*

https://www.gnb.ca/oag-bvg/2013v2/chap3e.pdf

The report investigated the province's more than 2,600 bridges and culverts.

The report graded each structure on a Bridge Condition Index (BCI) up to 100. Any bridge that received 60 BCI or less was deemed in "poor" condition, requiring significant maintenance to keep them in service. The Auditor General's report identified 293 New Brunswick bridges that fell into this category.

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Raising Concerns with Bridges & Culverts

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Bridge and culvert failure lead to detours and traffic chaos

The department currently does not publicly report the conditions of bridges it maintains. The information is only available internally. The internal rating system the department is using (i.e. the Bridge Condition Index or BCI) is the same as that used by the Ministry of Transportation of Ontario.

By contrast, the Ministry of Transportation of Ontario and Transport Quebec publish sufficient information to allow the public to assess the overall condition of individual bridges in their respective jurisdictions.

Ontario: In 2009 the Office of the Auditor General of Ontario released a report entitled *"Bridge Inspection and Maintenance".*

http://www.auditor.on.ca/en/content/annualreports/arreports/en09/302en09.pdf

Ontario has about 14,800 bridges. Approximately 2,800 of these are located within the provincial highway system and are the responsibility of the Ministry of Transportation (Ministry). The remaining 12,000 are located in municipalities and are their responsibility.

In 2009 the Office of the Auditor General of Ontario reported that according to the Ministry's assessment, more than 180 or 7 per cent of provincial bridges were in poor condition, defined as requiring repair or rehabilitation work within one year of the bridge inspection. The Auditor found that despite being in most need of repair or rehabilitation, over one-third of these bridges were not included in the Ministry's capital work plan for the upcoming year.

Additionally there are 60,000 culverts under provincial highways in Ontario that are not classified as bridges.

Manitoba: In July 2016, the Manitoba Auditor General released a report entitled *"Management of Provincial Bridges".*

http://www.oag.mb.ca/wp-content/uploads/2016/07/BRIDGESWEBVERSIONJuly2016.pdf

Manitoba's Auditor General says hundreds of bridges and culverts across the province are not being inspected as frequently as required — if at all.

More ominous, 616 structures that were considered the department's responsibility were not being inspected at all, and another 288 were not being inspected because they were considered the responsibility of other departments or quasi-government authorities.

The province is responsible for 1,782 bridges and 1,317 large culverts. Their total replacement value is estimated at $9.2 billion. Close to 40 per cent of the bridges are more than 50 years old.

There are 1,317 "large" culverts in Manitoba.

- 546 large culverts are > 50 years old (includes 226 culverts of unknown age that are considered greater than 50 years old)
- 202 large culverts – 40 to 50 years old
- 251 large culverts – 30 to 40 years old

Two types of bridge inspections are conducted in Manitoba. Level 1 inspections or 'general inspections' are to occur every spring once water levels recede to normal. Level 2 inspections involve a more detailed visual look that might require the use of specialized equipment. The latter are required every two to six years, depending on the structure's size and type.

The audit found half the bridges did not receive general inspections (Level 1) yearly as required. It also found "some" bridges didn't receive the required more detailed inspections (Level 2) on time.

Asset Management: The Canadian Concrete Pipe and Precast Association agrees that a well-maintained bridge inventory is essential for public safety and economic development. The CCPPA supports all levels of government as they develop their Asset Management Plans. Regular inspections by qualified inspectors are a key element for the development and maintenance of any Asset Management Plan.

The key questions and elements of Asset Management are:

- What do we own and where is it located?
- What is it worth today?
- What condition is it in and what is its remaining service life?
- What needs to be done?
- How much will it cost?
- When do I need to do something about it?

Reinforced concrete pipe has a proven track record and is BUILT TO LAST.

Sinkhole caused by corrugated steel culvert failure on a major highway

WSP's Innovative Sewer Solutions are Helping Raise Ottawa's Skyline

Julian Bratina
Contract Administrator, WSP

Ottawa City Council recently approved the development of a mixed-use complex along the Albert Street Corridor. Two kilometres west of Parliament Hill, where OC Transpo's Confederation Line and Trillium Line intersect, the location is prime for intensification. A development proposing a mixed-use complex consisting of three towers, the tallest of which – at 65 stories – would be the city's highest, was approved by city council in July 2018.

WSP was engaged by Trinity Development Group to provide peer review and 3D models, hydraulic study and review, detailed design, tender and contract documents, contract administration, and site inspection for this project. The company developed innovative sewer solutions to successfully address the issues of this challenging site.

Technical scope for the project involved the following concrete pipes:

- Installation of 266m of 1950mm Class 140-D (Class V) to replace 211m of 1650mm pipe.
- Installation of 6m of 1050mm Class 140-D (Class V) to replace 65m of existing 1050mm pipe.
- Installation of 70m of 1800mm Jack and Bore Pipe, MT 140-D (Class V) in accordance with CAN/CSA A257.2.
- Installation of 156m of 2400mm 100-D (Class IV) to replace 168m of existing 1800mm Storm Pipe.

The Hydraulic Report was completed in 2016 and the design later completed in 2017. Construction began in October of 2017 and WSP's work on the site was completed in May of 2018.

Once WSP obtained the necessary approvals in a very tight timeframe, advanced engineering methods, such as hydraulic modeling, microtunnelling, innovative shaft construction techniques, and the selection of reinforced concrete pipe, made this project possible.

1950mm Sanitary Sewer Relocation South of Albert Street

Reinforced Concrete Pipes

The soil of an abandoned rail yard, which previously featured a roundhouse and other ancillary buildings, had been contaminated by rail operations. This challenge would affect the selection of material for the new sewer pipes.

The preferred material for critical municipal infrastructure, reinforced concrete pipe (RCP) – with a service life of 70 to 100 years and inherent structural strength with reduced dependence on bedding – was the natural choice for the sanitary and storm sewers. Future developments nearby will subject the ground to blasting, heavy truck traffic, and an increase in cover by several meters in some places due to backfill. The pipe selected needed to be reliable, sturdy, and able to withstand disturbances. RCP fit the bill in all instances.

Hydraulic Modelling

A smaller-than-standard pipe diameter was essential to the creation of an alignment that missed existing infrastructure, while maintaining the fixed and very shallow slope of the pipe. Refining of the hydraulic modelling with more advanced 3D techniques assured the City that a smaller pipe was hydraulically sufficient. The downstream connection point of the storm sewer was extended to the north side of Albert Street in order to mitigate the negative impacts on the sewer hydraulics. Two bends of 50 degrees, rather than two of 90 degrees, were used for the extension, resulting in considerable gains in hydraulic efficiency.

The resulting solution to reduce the pipe from 2400mm to 1800mm not only made the project technically feasible, but also made microtunnelling a much less expensive option.

Computer modelling was also used to validate the new sanitary sewer design, which was considerably longer than the existing arched brick sewer. Rerouting the storm sewer around the proposed building footprint required additional deflections and maintenance holes.

WSP's development of the 3D hydraulic models for the proposed sewer alignments not only provided the required assurances to the City, but allowed for the refining of previously developed friction loss calculations, and the numerical modelling of the concrete benching in the large maintenance holes to optimize the hydraulic efficiency in the sewers.

Microtunnelling

The site's location on the busy Albert St thoroughfare, a major transit route and arterial road, presented an additional set of challenges due to the City's firm directive that there could be no impact on traffic flow. WSP's team also had to address issues such as the extension of the reconnection point, and the addition of a new connection point which, at 13m below grade, could potentially impact the LeBreton Flats development. Their solution involved the use of microtunnelling technology, which involved minimal disruption to the surface and minimized the impact that the high groundwater table had on construction.

Microtunnelling, the installation of a pipe using a small tunnel boring machine (TBM), was the most practical solution, resulting in an 1800mm storm sewer placed 13m below the street and ground water table. The construction of the two shafts and the set up of equipment took more than a month, however boring 70m of pipe took only 11 days to complete.

This type of tunneling is also referred to as the Jack-and-Bore method, where a three-piece TBM is set up in front of a large jack, which is laid horizontally inside the launch shaft.

A bentonite slurry is pumped to the cutter head at the front of the TBM and used to lubricate the cutting edges, the exterior of the new pipe, and facilitate the capture of cutting spoils. The slurry is pumped to the surface where the water is separated for reuse, and the earth and rock excavated by the process are stored for removal from the site. The jack pushes the TBM

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Exit Shaft once tunneling (right) was completed

Designers Need to do More Than Reference a Standard

On a regular basis, the professional engineers at the Canadian Concrete Pipe and Precast Association (CCPPA) are presented with specifications for drainage systems that do little more than reference a national or provincial manufacturing standard for a particular type of pipe. Typically in Ontario, the referenced standards are developed by the Canadian Standards Association or Ontario Provincial Standards. Design engineers charged with designing our province's infrastructure need to do more than just reference a standard. Specifically for drainage systems and sanitary sewers, designers need to recognize that successful projects demand three key elements:

- Quality pipe
- Sound engineering and design
- Proper installation and post installation inspection

In order to achieve this, comprehensive specifications are required that address all three elements regardless of the pipe material or pipe system that is being used. For the purpose of this article the designer is urged to consider the following information and disclaimer from Canadian Standards Association (CSA).

The Canadian Standards Association is a not-for-profit, membership-based association serving business, industry, government and consumers in Canada and the global marketplace.

CSA standards are developed through a consensus development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve agreement and develop a standard. Although CSA administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.[1]

The following Disclaimer and exclusion of liability is included in the standards developed by CSA:

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The user of such a standard, namely the design engineer, should be under no illusion: The Canadian Standards Association or any similar body is NOT accepting any responsibility for his/her design.

The engineers at CCPPA have over 100 years combined experience in the gravity pipe and precast industries. We make this experience available to designers and project managers through our Lunch and Learn program. We address the three essential elements listed above for successful drainage and sanitary sewer projects and provide recommendations to the designers to protect himself or herself from litigation.

References:

[1] www.csagroup.org

[2] Canadian Standards Association – Legal Notice for Standards

Note: This article was previously published in the Fall 2011 Concrete Pipe Journal.

WSP's Innovative Sewer Solutions

continued from page 3

in as it cuts through the soil until the jack is fully extended. When the jack is withdrawn, a piece of RCP is lowered and installed behind the TBM, with a steel-collar-reinforced bell and spigot.

The Jack-and-Bore process is controlled with a laser manipulated by an operator, and continues piece-by-piece until it breaks into the exit shaft. While the Jack-and-Bore process may incur additional expenses and risks, the process excels in instances like this where typical cut-and-cover installation would be cost prohibitive and disruptive.

Innovative Shaft Construction Techniques

Five types of shoring techniques were utilized for the Albert St site:

- Piles and Lagging: Hammering steel piles into the ground and using wooden lagging between them to retain the earth.
- Sheet Piles: Driving interlocking steel sheet piles into the ground to create the shaft and retain the earth.
- Secant Piles: Drilling piles into the ground and backfilling the piles with concrete in a concentric design, so that the piles will exert force on each other and hold back the earth outside the shaft.
- Sunken Caisson: Framing and pouring a concrete ring and then excavating inside and under the ring, allowing it to slide into the ground. Repeating the forming, pouring, and excavating occurs until reaching a desired depth where workers pour a watertight concrete slab.
- Trench box: A rigid box is moved along the trench to support excavation slopes and protect workers as pipe is installed.

The sunken caisson and secant pile techniques are not generally used for sewer construction and installation, however the project team decided to use these approaches in this instance, and successfully achieved their objectives despite site limitations.

WSP's detailed understanding of both the challenges inherent in this complex site, and the sensitivities of aspects, like mitigating impacts on Albert St, led to the development of innovative solutions that worked towards helping the client and other stakeholders realize their objectives for this exciting new development in Ottawa.

Project Team

Client, Trinity Development Group
Consultant, WSP
Developer, TIP Albert GP Inc.
General Contractor, Doran Contractors Ltd
Civil Contractor, Taggart Construction
Microtunneling Contractor, Ward & Burke

Addendum Addresses Standard of Care for Plastic Pipe

A sanitary sewer project was released for tender by the City of London in early 2013. The sanitary sewer was designed using reinforced concrete pipe. However, the contract also included a trial section of 65 metres of 900mm polypropylene plastic pipe. The plastic pipe in question was offered free of charge by the Ohio based producer of this pipe.

There are major differences between reinforced concrete pipe and plastic pipe. Drainage systems and sewer systems constructed from concrete pipe and plastic pipe have to be designed differently and installed differently. The consulting engineer for the City of London project recognized those differences and issued a comprehensive addendum to address the design and installation of a relatively large plastic pipe.

The key points of the Addendum included:

- **Certification Letter from contractor – includes shop drawings, calculations, and installation procedures.**
- **Design calculations stamped by a professional engineer registered in the Province of Ontario**
- **Trench box detail stamped by a professional engineer registered in the Province of Ontario addressing the potential conflict between ASTM D2321 and Occupational Health and Safety Act**
- **Shop drawings for connection to manholes**
- **Deflection testing at completion of construction and again at one year before the expiration of the warranty period.**
- **Manufacturer's representative on-site during construction**

Design engineers and municipal engineers involved with drainage systems and sewer systems across Ontario should take note of the wording of the Addendum as follows:

"For the Pipe Trial Section pipe materials, the Contractor shall submit shop drawings. The shop drawing submission shall include a Certification Letter from the pipe manufacturer that the pipe material and installation procedures will meet or exceed City of London Standard Specifications, these Special Provisions and the installation conditions shown on the drawings and as otherwise identified in the Contract Documents. The Contractor (or pipe supplier) shall provide the structural design calculations for this pipe installation, stamped by a professional Engineer licensed in Province of Ontario.

The Contractor shall submit drawings for the trench box use stamped by a Professional Engineer licensed in the Province of Ontario which meets the requirements of both ASTM D2321 -Standard Practise for Underground Installation of Thermoplastic for Sewers and Other Gravity- Flow Applications and Occupational Health and Safety Act and Regulations for Construction Projects.

The Certification Letter shall be supported by detailed pipe class selection calculations and shall be sealed by an Ontario Professional Engineer, specifically for this project.

The Contractor shall provide a shop drawing identifying the two manhole connections. A cored hole shall be drilled to accommodate the manufacturers' connection boot.

Sanitary sewers are to be installed as per manufacturer's specification. The Contractor shall have on-site at the commencement of construction, a manufacturer representative to advise on the recommended construction procedure for the installation of sanitary sewer. The Contractor shall maintain liaison with the manufacturer throughout the installation of the sanitary sewer trial section for advice and guidance as required. In addition, the Contractor shall ensure that a representative of the manufacturer makes daily site visits during construction and after completion, if required. The representative of the manufacturer should alert the Contractor in writing of any variance to their recommended material and construction procedures. Copies of all correspondence shall be given to the Contract Administrator.

Where the trial pipe section is used, the Contractor shall perform a mandrel test, upon completion of construction, to ensure that pipe deflection does not exceed a 5% deflection. Prior to the end of the one year warranty period, the Contractor shall perform another mandrel test, to the satisfaction of the Contract Administrator."

Update in 2018:

In a more recent contract, the consulting engineer for a project in the Municipality of Chatham-Kent with a 1200mm storm sewer recognized the importance of a rigorous specification for large diameter plastic pipe by issuing an addendum requiring trench box details similar to the London case above and the following requirement for structural design:

"The Contractor shall submit shop drawings for SRPE pipe materials, including structural design calculations for the installation conditions as shown on the Contract Drawings or as otherwise contained in the Contract Documents. These shop drawings and structural design calculations shall be stamped by a Professional Engineer licensed in the Province of Ontario." For more information contact paul.imm@ccppa.ca.

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Staff Changes at CCPPA

We regret to announce that Andrea Kozak, E.I.T. – Technical Resources Engineer, has accepted a position with the Town of High River, Alberta and is resigning from the Canadian Concrete Pipe & Precast Association. We thank Andrea for her efforts at CCPPA over the last 3.5 years and wish her well at the Town of High River.

Andrea Kozak

Mafe Pinzon

We are pleased to announce that Mafe Pinzon, P.Eng., has accepted the position of Alberta-BC Region Engineer with the Canadian Concrete Pipe & Precast Association.

Mafe joined CCPPA in 2014 in Winnipeg and has been a solid performer for our industry in Saskatchewan and Manitoba over the last four years.

Mafe will relocate from Winnipeg to Calgary this fall. Her replacement will be announced in the near future.

Concrete Pipe Used in Flood Mitigation Project in the City of Edmonton

Throughout the world, weather patterns are changing and the drainage systems across various municipalities are affected. Edmonton is no exception to this, and older communities are feeling the impacts after severe storms. This was especially true for Edmontonians in 2004 and 2012, after large rainfall events caused flooding in the city. As a result, a city-wide flood assessment was initiated and launched many mitigation projects, one of which is the Tawa Park Drainage Improvement project. The Tawa Park Drainage Improvement project required a dry pond to be constructed and sewer pipes to be upgraded. The dry pond and new piping upgrades would mitigate flood impacts for up to 1 in 100 year rainfall event, decreasing the flood risks for aging neighborhoods.

Lafarge Concrete Pipe Ready for Installation

Lafarge was chosen for the project and supplied the following solutions:

- 363m of 2400mm Class IV Concrete Pipe
- 84m of 1800mm Class IV Concrete Pipe
- 4 Concrete Vaults
  - o 1 - 3.5m x 5.5m
  - o 1 - 3.5m x 4.0m
  - o 2 - 3.5m x 3.5m

With such a large scale project, Lafarge had to pull all of their local resources together and work as a team to complete the project. The concrete pipes were manufactured at the Edmonton Pipe plant, the largest vault was manufactured at the Edmonton Precast plant, and the other three vaults were manufactured at the Saskatoon Pipe plant. Together, Lafarge was able to provide a feasible solution to help build a better city and stronger communities.

Owner: City of Edmonton Integrated Infrastructure Services
Engineer: Sameng Inc.
Contractor: Whissell Contracting Ltd.
Manufacturer: Lafarge Pipe

Forterra Introduces Best Seal Pipe

Over the past several years, Forterra has supplied numerous projects across the province of Ontario where both the local municipalities and design engineering firms had concerns with the high-water table, significant depth of bury, and/or poor native soil conditions.

Although standard concrete pipe has, and continues, to demonstrate its ability to provide great performance characteristics for the majority of buried infrastructure requirements, there is a need for a higher performing joint in certain extreme applications.

Standard concrete pipe is tested and performs up to a joint pressure of 15 psi. Forterra has developed a reinforced concrete pipe that has a certified (under AWWA C302) 55 psi joint. The Best Seal Pipe utilizes a steel bell with an 'O' ring type wedge gasket to provide the performance needed to meet the C302 testing criteria.

Hydrostatic Test Demonstration

The pipe is to be used in traditional open cut applications and can be manufactured with a liner if required.

The pipe can also be tapped into or cored in the same manner as standard reinforced concrete pipe. No special saddle or connection equipment are required.

Forterra held a plant tour which featured a demonstration of the pipe pressure test along with a guided, first-hand look at the various facets of its manufacturing facility representatives from the City of Ottawa along with individuals from local consulting engineering firms were present for the tour and demonstration.

Forterra is confident that the new Best Seal Pipe will provide municipalities and design engineering firms with a reinforced concrete pipe solution that incorporates a high capacity joint system to ensure performance in challenging environments.

Paul Imm Receives 2018 WEAO Golden MH Award

Paul Imm with John Presta, WEAO President and Director of Environmental Services at Durham Region

Paul Imm, P.Eng., Director of Technical Services at OCPA and CCPPA, was awarded the 2018 WEAO Golden Manhole Society Award at their Annual Awards Banquet on April 16, 2018 in London, Ontario. This award was established to acknowledge an individual for contributions to promote wastewater and stormwater collection system understanding, operation and maintenance, training and continuing education.

WEAO (Water Environment Association of Ontario) is a 1,300 member chapter of the Water Environment Federation (WEF) representing water quality professionals around the world.

Cambridge Member of Parliament Tours Forterra Pipe and Precast

Leo Steffler - Forterra, Bryan May MP, Edwin Kling - Forterra, Mike Dubeau - Forterra

Bryan May, MP for Cambridge, visited the Forterra Pipe and Precast plant in North Dumfries, Ontario in April 2018. There are three concrete pipe companies located in the Cambridge and Guelph area of Ontario. Collectively they hire hundreds of people directly and stimulate employment in other local industries such as sand and gravel quarries. Workers are well compensated and these companies make a significant contribution in local taxes in their respective municipalities, as well as to the provincial and federal governments.

The Canadian Concrete Pipe and Precast Association sincerely thanks Mr. May for taking the time in his busy schedule to meet with our industry.

York Region Staff Tours DECAST Ltd.

York Region Staff Observe Production Process

York Region works at keeping their staff up-to-date with various aspects of the industry. The Canadian Concrete Pipe and Precast Association coordinated a tour for York Region's Infrastructure Management and Capital Delivery Groups at DECAST Ltd. in Utopia, Ontario. It started with presentations from CCPPA and then DECAST gave background knowledge of the industry, the facility's many functions and product lines. This was followed by a tour of the plant's main areas of interest to Region staff. The day ended with a lunch where any last-minute questions were answered.

Frank Badinski, Construction Administrator for the Environmental Services with York Region, thanked the CCPPA and their many members for making these types of information sessions available to groups interested in their product lines.

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Website: www.coldstreamconcrete.com
Contact: Robert Brown

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Location: Guelph, ON
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Fax: 519-763-1982
Email: sales@concastpipe.com
Website: www.concastpipe.com
Contact: Brian Wood or Jason Spencer

DECAST Ltd.
Location: Barrie, ON
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Fax: 705-734-2920
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Website: www.decastltd.com
Contact: Jim Tully

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Website: www.mconproducts.com
Contact: Doug Galloway

Rainbow Concrete Industries Ltd.
Locations: Sudbury, ON
Tel: 1-800-461-6281
Fax: 705-566-4813
Email: sales@rcil.ca
Website: www.rcil.com
Contact: Boris Naneff

Souris Valley Industries
Locations: Weyburn, SK
Tel: 306-842-5854
Fax: 306-842-1011
Email: dustin@sviprecast.com
Website: www.sviprecast.com
Contact: Dustin Bell

Gaskets and Connectors

Hamilton Kent
Location: Etobicoke, ON
Tel: 1-800-268-8479
Fax: 416-674-6960
Email: bernard.gregoire@hamiltonkent.com
Website: www.hamiltonkent.com
Contact: Bernard Gregoire

Press-Seal Gasket Corporation
Location: Fort Wayne, IN
Toll-free: 800-348-7325
Cell: 617-803-1750
Email: mtomkinson@press-seal.com
Website: www.press-seal.com
Contact: Matt Tomkinson

Trelleborg Pipe Seals
Location: Milford, NH
Tel: 800-262-2180
Email: Terry.macdonald@trelleborg.com
Website: www.trelleborg.com
Contact: Terry Macdonald

Reinforcing Steel

Laurel Steel
A Division of Harris Steel ULC
Location: Burlington, Ontario
Tel: 800-265-6811
Fax: 905-634-7888
Email: grant.fraser@laurelsteel.com
Website: www.laurelsteel.com
Contact: Grant Fraser

Numesh Inc.
Location: Laval, PQ
Tel: 1-800-363-0847
Fax: 450-663-9049
Email: michel.mongeau@numesh.com
Website: www.numesh.com
Contact: Michel Mongeau

StelCrete Industries Limited
Location: Niagara Falls, ON
Tel: 1-866-924-0837
Fax: 905-735-3955
Email: bhansen@stelcrete.com
Website: www.stelcrete.com
Contact: Bob Hansen

Safety Climbing Equipment

MSU Mississauga Ltd.
Location: Mississauga, ON
Tel: 1-888-220-2213
Fax: 905-823-4947
Email: sales@msumississauga.com
Website: www.msumississauga.com
Contact: Virginia Junkin

Stepcon Industries Inc.
Location: Mississauga, ON
Tel: 1-888-783-7266
Fax: 905-897-6001
Email: stepcon@on.aibn.com
Website: www.stepconindustriesinc.com
Contact: Michael Greer

Precast Manufacturing Equipment and Accessories

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Location: Mediapolis, IA
Tel: 800-626-1453
Email: rbeelman@hawkeyepedershaab.com
Website: www.hawkeyepedershaab.com
Contact: Randy Beelman

Mel C. Marshall Industrial Consultants Inc.
Location: Delta, BC
Tel: 604-943-8512
Fax: 604-943-2738
Email: melmarshall@telus.net
Website: www.precastconcretebc.com
Contact: Mel Marshall or Braden Marshall

J D Industrial Sales
Location: Cambridge, ON
Tel: 519-267-4340
Cell: 519-841-2554
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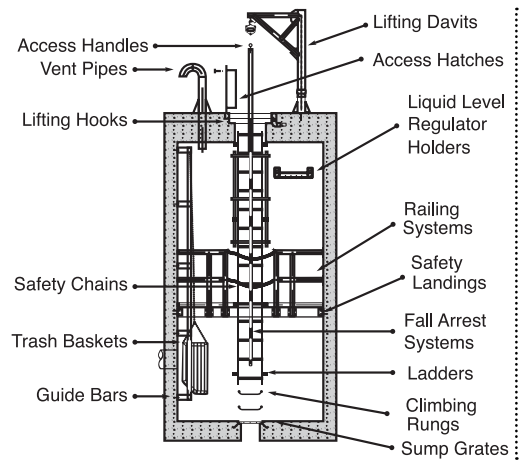

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