expresso

Spring 2014

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TRANSPORTATION

exp.

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spidermen (and women)

SWINGING FROM TALL STRUCTURES USED TO BE ONLY THE STUFF OF SUPERHEROES – NOT ANYMORE!

Building on over 70 years of experience in bridge and overpass design, **exp** provides specialized, comprehensive, and customized bridge infrastructure services. Our teams design and inspect several hundred bridge infrastructures each year, and the inspection techniques are numerous and varied.

They include regular inspections, also called "hands-on", and those conducted from bridge-trucks or hydraulic platforms, which offer increased flexibility to bypass obstacles. Inspections can also be conducted from safety nets, allowing for efficient and safe movement under the structure, or using rope access techniques. These "rope" inspections are increasingly popular with inspectors, and can prove to be very cost-effective and, at times, significantly more convenient for hands-on inspections!

Unlike what most of us may think, the techniques used for rope access inspections have nothing to do with those used for rock climbing. Although rock climbing techniques are sometimes used to access the higher sections of a structure, rope access techniques are in fact inspired by those used by cave explorers. The basic difference between both techniques is that, when rock climbing, you travel upwards on a surface, using only the rope as fall-protection, whereas when inspecting a bridge, you literally travel on the rope, downwards or upwards, using it as an elevator.

Those techniques have been adapted and are now part of the way we work because of the many benefits they bring – whether financial or organizational. Conducting inspections without having to block a traffic line keeps traffic flowing and also saves on signage costs. It also provides alternative solutions for inspection work on other types of structures, including dams, cliffs, tall chimneys and exterior building envelopes. Besides the Jacques-Cartier, Champlain and Mercier bridges in the Montreal area, our experts have inspected the walls of the Mullochville tunnel, the ventilation towers of the Louis-Hippolyte Lafontaine Bridge-Tunnel, the Horne refinery smokestack, and many other structures.

Of course, finding or training qualified inspectors who also master rope access techniques is somewhat of a challenge. In Quebec, **exp** employs some fifteen qualified rope access inspectors. These inspectors can work outside of Quebec, respecting applicable professional requirements. So, our "superheroes" can save the day for you, too!

NACE: engineering takes on corrosion

Whether it's on construction sites, bridges, shipyards, plants, pipelines or power plants, the coating that protects installations from corrosion is essential to public safety. Cracked coating can lead to expensive repair work, shorter facility lifecycle, or worse, environmental disaster.

Exp provides expert consultant services for inspections of protection coatings. Indeed, by achieving National Association of Corrosion Engineers – Coating Inspector Program certification (NACE – CIP), Benoit Gauvin, metallurgical and welding engineer at our Sherbrooke office, provides our earth and environment team an opportunity to branch out in a new direction and to offer additional expertise to clients.

NACE offers the world's most recognized and widely accepted coating inspector program.

As a NACE-certified inspector, Benoit can conduct coating inspection work on many types of coatings (paint, galvanizing, metallizing, etc.), and on different substrates (steel, concrete, copper, aluminium, galvanized elements and non-metallic materials). Understanding the environmental impact of corrosion on components that we frequently used on projects of all disciplines – MEP, civil, structural, bridges and industrial – constitutes a tremendous asset for **exp**.

In short, Benoit's new expertise, combined with his metallurgical engineering experience, will allow us to increase complementary services offered in many disciplines, cross-sell our services, and win more multidisciplinary contracts.

Don't hesitate to contact Benoit for projects requiring NACE-CIP staff.

NACE INTERNATIONAL
THE CORROSION SOCIETY

exp tunneling to keep Toronto on the move

YORK SPADINA SUBWAY EXTENSION, TORONTO

The length of the subway extension is approximately 8.6 km from Downsview Station to Vaughan Metropolitan Centre Station including 5 Launch Shafts, 5 Extract Shafts, 6 Emergency Exit Buildings and 7 Cross Passages. A total of six stations will be built along the extension:

1. Sheppard West Station
2. Finch West Station
3. York University Station
4. Steeles West Station
5. Hwy 407 Station
6. Vaughan Metropolitan Centre Station

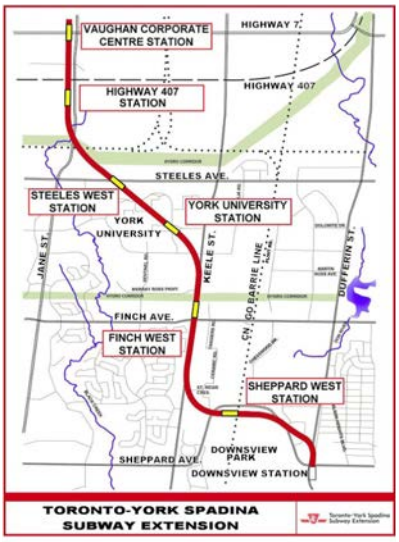
The tunneling was completed on November 8, 2013 and the monitoring work will continue for one more year. The excavation of the six stations was completed and monitoring work will continue until the official completion of the stations.

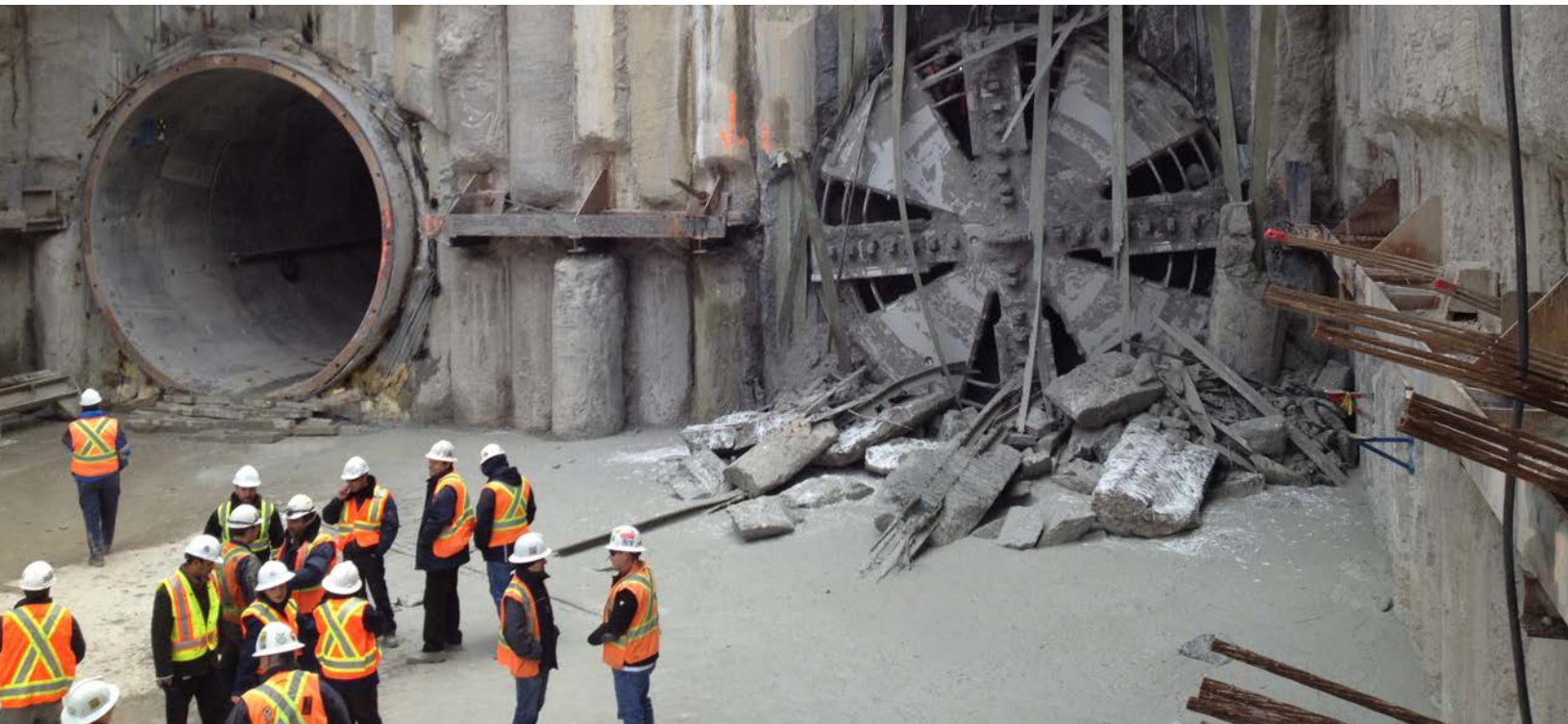
Our major responsibilities, as the monitoring consultant for the Toronto Transit Commission are:

- Instrumentation Monitoring Auditing
- Instrument Installation Auditing
- Pre and Post Construction Condition Survey
- Monitoring Data Verification System Development (TYSSE Information Management System – TIMS)

Based on our outstanding performance, Toronto-York Spadina Subway Extension (TYSSE) assigned a new project to **exp** recently for installing and monitoring the instruments for the Finch West Station backfilling areas. This project will start in mid-2014.

The opening of the extension is anticipated for the fall of 2016.





designing a traffic solution

SAINT JOHN, NEW BRUNSWICK

This assignment for **exp** began as a traffic study and grew into a multi-discipline design effort which included several teams of **exp** specialists. The initial transportation study was led by Don Good and included transportation planners, traffic engineers and civil engineering specialists from our Fredericton and Saint John, NB Offices.

Upon completion of the traffic study, the New Brunswick Department of Transportation and Infrastructure (NBDTI) engaged **exp** to move forward with the design of the interchange as well as offsite upgrades to intersections within the City of Saint John. The design activities included; topographic surveying, right-of-way identification, geotechnical investigations, above and below ground utility relocation, superstructure design, geometric design of all roadway components of the interchange, intersection upgrade design and relocation. It also included upgrading of existing water, sanitary and storm sewer piping at the upgraded intersection locations. In addition to design, we offered construction support to the NBDTI Resident Construction Team for the project. This support included; shop drawing reviews, periodic site visits during construction and response to contractor requests for clarifications.

The completed project is named the One Mile House interchange. Residents, the business community, and visitors to the Saint John region are realizing the benefits of reduced traffic congestion and safety for both vehicular and pedestrian within the project corridor as well as other areas of Saint John that were envisioned in the 1999 study.

stunning architecture brightens transit

WASHINGTON-WABASH STATION, CHICAGO

The concept of movement is at the heart of the transit system, and the "L" is the thread that weaves through Chicago to connect the City of Neighborhoods with the Loop, its iconic landmarks, and the Lakefront parks.

The new Washington-Wabash Station will transform the perception of public transportation facilities, and become a new gateway for Millennium Park and many of Chicago's downtown attractions.

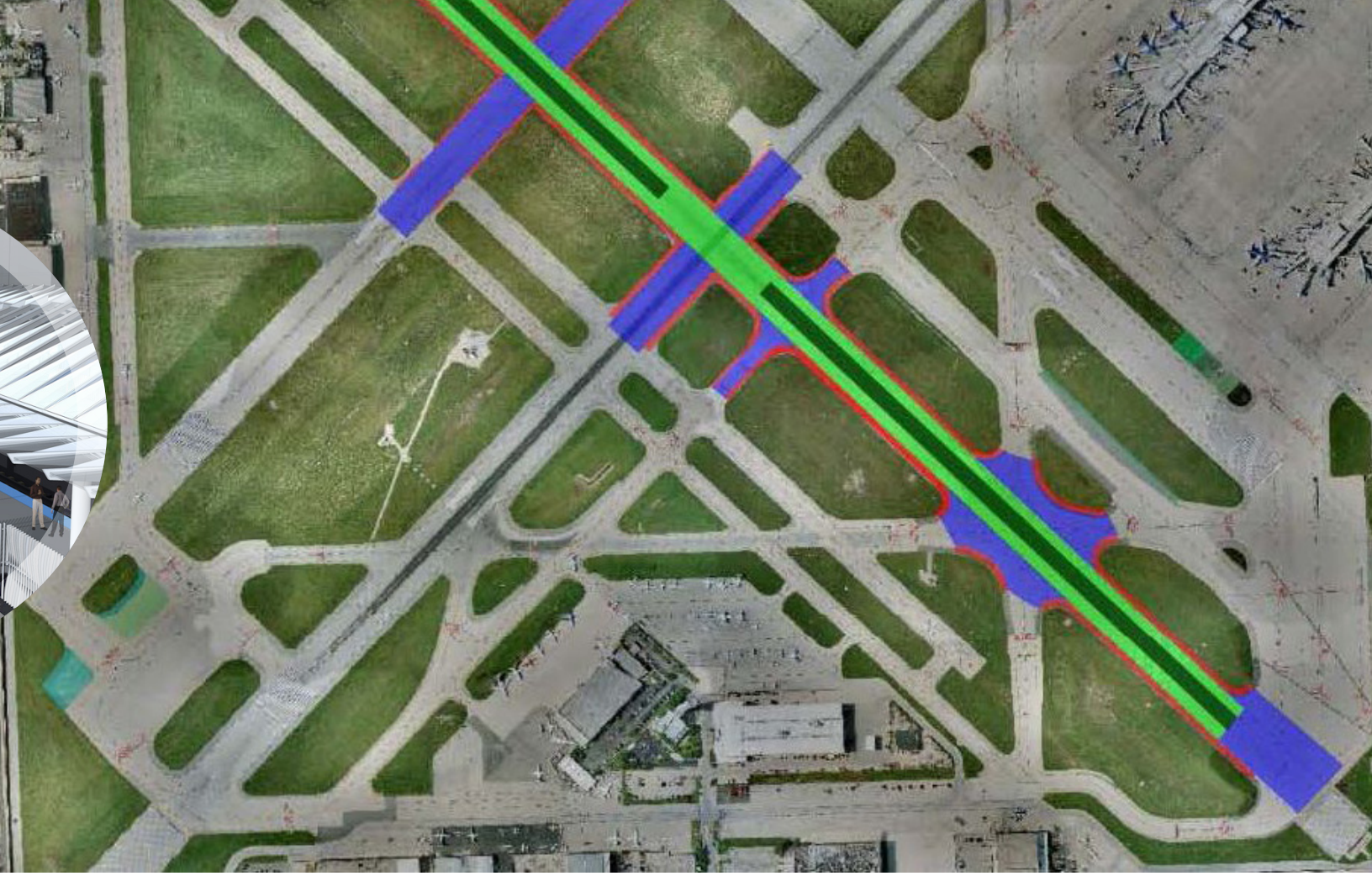
In his press conference, Mayor Rahm Emanuel noted that the station's

"... modern design with undulating waves that serve as a welcome contrast to the city grid and will replace two century-old stations that were not designed for the needs of modern public transit.

"You cannot have a 21st century economy sitting on 20th century economic infrastructure."

From the platform, the canopy serves as a deliberate contrasting frame that captures views to the historic Wabash facades while confidently expressing our forward progress – telling the story of where we have been, and where we are going – an appropriate expression for a great City that can never be finished, but is always moving forward.

The full city press release can be found at: http://www.cityofchicago.org/city/en/depts/mayor/press_room/press_releases/2013/september_2013/mayor_emanuel_announcesreleaseoffinalrenderingsofwashington-waba.html



going all the way for Midway

MIDWAY INTERNATIONAL AIRPORT, CHICAGO

Runway 13C-31C is considered the main artery of Midway International Airport in Chicago and has the highest utilization of all five active runways.

We provided design consulting services for the rehabilitation of this runway and were responsible for the design of pavement overlay for the existing runway. The new pavement overlay will raise the runway about six to nine inches. **Exp** was also responsible for full construction document preparation, construction phasing and cost estimates. The project challenges included limited runway closures and multiple, smaller cross runways that must remain operational at all times. All construction must be completed at night and must allow for the re-opening of the runway each morning.

The scope also included adjustment or replacement of edge lighting and new in-pavement centerline lights to provide increased visual awareness. **Exp** also coordinated with an FAA-approved manufacturer for the replacement of the Engineered Materials Arrestor System (EMAS) and provided civil design services for the EMAS bed.

keeping Calgary connected

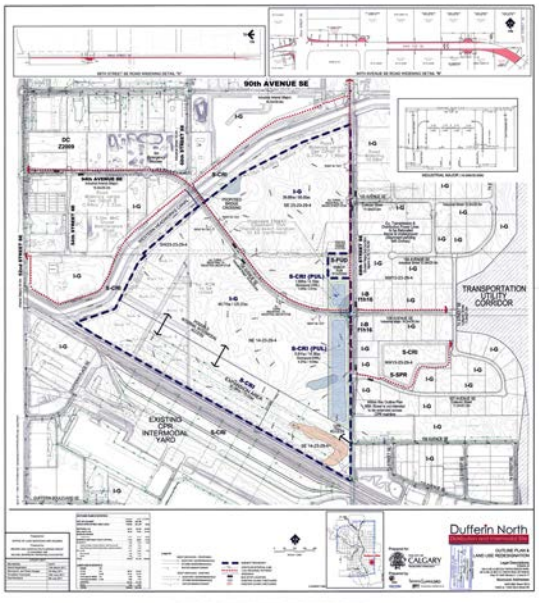
The 106th Avenue Bridge Connector is a critical component of the East Shepard land development project within Calgary's southeast. Its success by **exp** represents a team effort by several offices, with expertise leveraged across Canada and the United States, through majority involvement by Fredericton and Calgary, and support by Edmonton and Chicago. Although not a large structure by some standards, the challenging schedule for design, approval, public tendering, and construction, as set by the Client is met with excitement by **exp**. From preliminary approval of a bridge concept through to construction completion of this 63m long / 23m wide concrete structure, a timeline of only eleven months will pass!

Originally, part of a competitor's engineering scope, the 106th Avenue Bridge Connector became available to **exp** in late 2012 as part of an overall 320 acre Industrial and Intermodal project. In order for **exp** to work on this project, we needed to pre-qualify for bridge infrastructure projects within the City of Calgary. This undertaking was made possible through the use of company-wide resources and expertise. This has since resulted in further growth potential for **exp** since RFPs that were once unavailable to us are now unrestricted.

This project is a perfect example of how company-wide resources can be employed to ensure success. Endorsement for proceeding by Calgary Planning Commission was required with only a few weeks' notice for preparation of a report and presentation, complete with renderings. Efforts by the Landscape Architect group out of Chicago, Mauro Crestani, RLA, ASLA and his team, met the challenge by coordinating work with both Fredericton and Calgary in time for the CPC Hearing.

With construction now underway, we're looking to further challenges ahead!

Whether a large project or small, the 106th Avenue Bridge Connector is an example of **exp**'s success when leveraging company-wide expertise.



an eye on design

O'HARE INTERNATIONAL AIRPORT, CHICAGO

xp is providing full architectural and engineering services from concept design through post-construction phase services for the new South Airport Traffic Control Tower (SATCT) at O'Hare International Airport. The new SATCT will serve the planned 7,500-foot runway, the southern-most runway of the six east/west runways planned as part of the $15B O'Hare modernization project.

The most striking aspect of the design is the simple extruded shaft – a break from the traditional shaft and bulb-top. The design evolved as the result of a very successful continuous design process with the Federal Aviation Administration (FAA).

The design provides a simple, economical and durable solution to meet the operational needs of the FAA, while at the same time addresses the City of Chicago's desire to create an elegant, iconic image that meets sustainable design objectives.

Services we're providing for this project include; architecture, landscape architecture, MEP, structural and civil engineering.

The Tower is a key component in the reconfiguration of the airfield from an outdated intersecting runway configuration to a modern parallel configuration that will substantially reduce delays and increase air traffic capacity.

new connection to bridge over the Mississippi River

EAST ST. LOUIS, ILLINOIS

Exp recently completed phase II design engineering services for the new Interstate 70 Mississippi River Bridge (MRB) Crossing - I-70 connection in East St. Louis, Illinois. **Exp** was responsible for bridge and roadway design to connect the existing I-55, I-64 and I-70 interchange to the new bridge. The Stan Musial Veterans Memorial Bridge was officially opened to traffic on Sunday, February 9th.

The MRB project creates a new gateway between Illinois and Missouri that provides better connections to and through St. Louis. The project included a landmark bridge structure, and the reconstruction of the I-70 and numerous local roads on both sides of the state line

Exp is proud to have contributed to this project which provides needed traffic capacity, improves system linkages and community access, reduces traffic accidents, improves travel times, and enhances economic growth.

tunneling through bedrock to take to the skies

BILLY BISHOP AIRPORT PEDESTRIAN TUNNEL, TORONTO

The Billy Bishop City Airport is a small but busy airport located on a Toronto island in Lake Ontario, near the downtown financial, medical and tourism core. Home to thousands of workers and businesses (air ambulance, couriers, flight schools, aircraft sales, sightseeing tours, etc.) the island airport relies on a ferry to connect its people to the mainland.

Starting in the fall of 2014, the airport underwater pedestrian tunnel will allow passengers and workers to walk to and from the airport in 6 minutes. The tunnel, dug through the bedrock, will also carry the city water; improving sanitary conditions.

Exp designed the underwater excavation plan (rock-structure interaction, in-situ stresses and deformation in the Bay shale). Our experts also managed the control of dewatering activities and contaminated overburden of this unique project; working under and adjacent to the lake during the construction.

With its four moving sidewalks travelling at 2.3 kilometers per hour, the tunnel will improve access to the airport, reducing congestion. Ferry service will continue to deliver transport vehicles, fuel, and other supplies.

With a mission to understand, innovate, partner and deliver, **exp** provide professional, technical and strategic services to the world's built and natural environments in six key practice areas: Buildings, Earth & Environment, Energy, Industrial, Infrastructure, and Sustainability. Our heritage dates back to 1906, when the earliest of **exp**'s predecessor companies started its engineering infrastructure practice in northern Ontario.

Today, close to 3,000 creative **exp** professionals across North America and around the globe provide the expertise and experience needed to deliver successful projects for clients.

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