



Bridge
Engineering
SOLUTIONS

ENTUITIVE

Contents

BRIDGE ENGINEERING SOLUTIONS

- 1 FIRM OVERVIEW
- 5 OUR SECTORS
- 7 OUR SERVICES
- 9 BRIDGE ENGINEERING SOLUTIONS
- 13 RELEVANT PROJECT HIGHLIGHTS
- 26 OUR LEADERS



Purpose-led. Passion-fueled.

ENTUITIVE BRINGS TOGETHER A HIGH CALIBRE, EXPERIENCED GROUP OF ENGINEERS WITH A NEW ATTITUDE.

It's a new way of thinking that's driving our success as we strive to build the first-choice engineering firm for exceptional clients in Canada and around the world.

We are a group of purpose-driven engineers, scientists, designers, technologists, and city-building experts who deliver uncompromising performance through a comprehensive range of services for the built environment. Our culture, commitment, and passion enable us to achieve progressive solutions to the most complex challenges.

Since our inception in 2011, we have been recognized as the firm that does things differently. Our organization is designed for agility and navigated using guiding principles that aid us in achieving uncompromising performance: always asking better questions, tackling every challenge as an opportunity, and a relentless pursuit in being better tomorrow than we were today. We are committed to a sustainable future.



We exist to realize our potential for the fulfillment of our people, our clients, and the communities where our work comes to life. We strive to build a better world by being creative, collaborative, and advanced.

Why Entuitive?

A NEW WAY OF THINKING

Cities are demanding more from the built environment as the way people live, work, and travel changes at an unprecedented pace. Sustainability, once considered an afterthought, is now central to designing buildings suited for future demands.

CREATIVE

We combine our insight, experience and creativity with our technical knowledge to solve the unique challenges presented by every new project. Whether it's a design challenge, a cost challenge or a scheduling challenge, we are committed to being problem solvers.

COLLABORATIVE

At Entuitive, we collaborate with developers, architects, building owners, building managers and construction clients to find the best constructible, cost-effective solutions. We also have an open approach in-house, where we share ideas, knowledge and resources across our multi-disciplinary team and between offices.

ADVANCED

Our in-house innovation process is designed to rapidly bring challenges to the masses, tap our high-caliber talent for solutions, and implement change for the advancement of our firm and the evolving needs of our clients. Ennovation is a discipline in process that removes barriers and empowers our people to discover opportunities that benefit the projects our clients have entrusted us to deliver.

PERSPECTIVE

Founded in 2011, Entuitive is rapidly expanding. We currently have one office in New York and five Canadian offices positioned strategically across the country in Vancouver, Calgary, Edmonton, Ottawa, and Toronto. Our One-Company philosophy and corporate structure allows us to involve the right people at the right time from across the firm to deliver complex and challenging projects. This has worked very effectively on larger complex projects where team members are located across multiple geographies.

RELATIONSHIPS

Entuitive has developed long standing relationships with many of Canada's most established developers, builders, and property managers. We work hard to establish enduring relationships with clients and have built a strong reputation across the country through hard work, innovation and, most importantly, collaboration.

EXPERTISE

Our team has a solid track record of delivering existing building projects across a wide range of sectors, including strata, multi-unit residential, commercial, hospitality, institutional, retail, sports and recreation, industrial, transportation, and healthcare. We invest in the latest information and conference technology to allow for a unified and flexible internal project workflow.



OUR LOCATIONS

CANADA

TORONTO
VANCOUVER
EDMONTON
CALGARY
OTTAWA



UNITED STATES

NEW YORK



290+

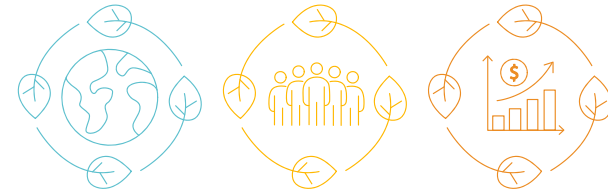
TOTAL
STAFF

2011

YEAR
ESTABLISHED

We Engineer For Sustainability

With a triple bottom line focus, we strive to create a built environment that is environmentally, socially, and economically sustainable.



We believe building performance is sustainable performance.

As both legislated and voluntary responses to the environmental crisis continue to become more ambitious, Sustainability Stewardship at Entuitive seeks to reduce our own carbon footprint, coordinate our services to provide a holistic approach to sustainable planning, design, and delivery, and equip our clients with the knowledge they need about how building performance can contribute to a sustainable future.

We have developed four guiding principles to steer our efforts and align with this approach.

1

SUSTAINABLE PROJECT DELIVERY & CARBON REDUCTION

Our diverse and expansive portfolio of projects across multiple sectors has positioned us to work with forward-thinking clients and teams seeking excellence in design. Leading the collaborative process, we integrate early sustainable design considerations, such as net zero, water conservation, waste reduction, circular design, and community health, where they can have the most beneficial impact on the project.

2

SUPPORT INNOVATION THROUGH RESEARCH & DEVELOPMENT

Staying up to date on climate trends and resilient design practices is paramount. Our team of engineers, scientists, designers, and technologists actively research new and improved methods of analyzing embodied carbon, optimizing structural design, modelling whole-building energy efficiency, and enhancing envelope durability.

3

COMMUNITY ENGAGEMENT & EDUCATION

We provide educational resources and outreach to all employees and clients to continuously improve our collective acumen at tackling the challenges of climate change, resource scarcity, urban densification, and social inequity. We commit to community-focused projects that provide more green spaces and help offset both our own carbon footprint and that of the buildings and infrastructure we design.

4

LOW-CARBON OPERATIONS

We have benchmarked our 2018 Operational Carbon Footprint according to the GHG Protocol, ISO 14064-1:2018 Part 1, and the Climate Registry General Reporting Protocol Version 3.0 guidelines and standards. We are also addressing our largest emitter activities to reduce our carbon footprint across our offices and are providing financial support to carbon emissions reductions projects for our excess corporate emissions.



Our Sectors

UNCOVER THE LIMITLESS POTENTIAL OF THE BUILT ENVIRONMENT



We unlock the potential within new and existing sites with solutions that surpass expectations. We collaborate with stakeholders, owners, developers, architects, and contractors to drive maximum return on investment for commercial buildings.



Every cultural venue is an original creation. Iconic civic, cultural, and performing arts centres in our community are designed to inspire awe and inclusivity inside and out. Our commitment to creativity, collaboration, and advanced technology supports bringing these venues to life.



Positive outcomes in healthcare facilities demand high-performing structures. We work with healthcare providers and stakeholders within acute care, long-term care, and rehabilitation services to design buildings that support healing, recovery, and resilience.



From hotels to ballrooms and convention centres, hospitality projects present unique challenges with a need to integrate repetitive framing at suite level with long-span, open areas for amenities, restaurants, and more. Our expertise seamlessly unites these needs to create welcoming, accessible, and inclusive spaces.



We are committed to creating a built environment that unites its residents and fosters community spirit. Publicly funded projects, such as schools, universities, seniors living, community centres, government offices, police stations, fire halls, courthouses, and more, fulfil the noble purpose of community, connectedness, and environmental and social stewardship.



Performance in these facilities means the ability to help medical researchers, businesses, and governments undertake vital work and securely store their data. Our team provides a holistic, all-encompassing approach to building solid, resilient structures designed with post-disaster strategies in mind.



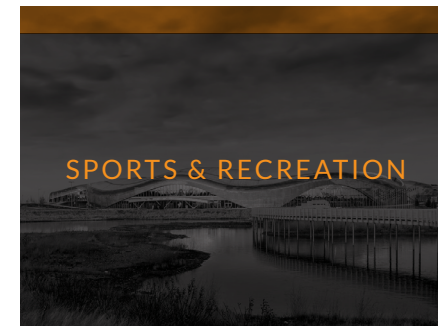
Mixed-use developments support walkable, accessible community hubs that enrich the lives of their residents and workers, creating urban spaces that meet the needs of our growing populations. Our multi-sector expertise allows us to bring these hubs to life.



Residential projects demand an approach that considers return on investment, design aspirations, and quality of life. We collaborate with all stakeholders to design efficient, sustainable, readily constructible homes for multi-unit projects and private residences.



Redefining the brick-and-mortar retail experience requires a combination of technical skills, imagination, and collaboration. We work with architects and developers to create unique customer encounters that maximize return on investment.



Sports and recreation facilities demand some of the fastest delivery schedules in the industry. We work closely with architects and designers to create venues that offer best-in-class facilities for athletes and deliver an enhanced experience for the viewing community.



Our cities, people, and economy all demand modern, efficient, sustainable, and reliable infrastructure to keep them connected as they evolve. Transportation projects are most successful when they are delivered on time and on budget, and, perhaps most importantly, without compromising day-to-day operations.

Our Services

UNCOVER THE LIMITLESS POTENTIAL OF THE BUILT ENVIRONMENT



ADVANCED PERFORMANCE ANALYSIS (APA)

APA allows us to consider all aspects of a project and how its environment will impact performance.



CONSTRUCTION ENGINEERING

The integration of our Construction Engineering services enables our team to tailor designs to the distinct needs of our contractor clients.



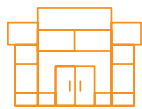
BRIDGE ENGINEERING

Our Bridge Engineering group has a keen focus on mitigating construction costs for new bridges, as well as extending the lifespan of existing ones.



EXPERT ADVISORY SERVICES

Corporate teams, such as Investment, Legal, Insurance, and Planning, rely on our experts for consultations on a variety of issues.



BUILDING ENVELOPE

Our Building Envelope team specializes in the complete enclosure of new and existing buildings.



FIRE ENGINEERING

We provide holistic, performance-based fire engineering solutions that meet all stakeholder goals and broaden the range of design possibilities while having the same or better performance than prescriptive building codes deliver.



NATIONAL VETERANS RESOURCE CENTER SYRACUSE, NY



PEDESTRIAN MODELLING

We are able to quantify how occupants move through a physical space under a range of scenarios to gain insight into the user experience and inform design and renovation decision making.



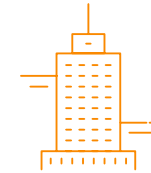
RESTORATION

Restoration is an alternative to demolition that favours the preservation of sustainability, heritage, and an original architectural vision, allowing us to accommodate the growing density of modern cities.



SPECIAL PROJECTS & RENOVATIONS

From repurposing existing structures to tenant fit outs, public art installations, and updates to private residences, we deliver unique and strategic solutions, often on expedited timelines.



STRUCTURAL ENGINEERING

Structural Engineering is a pillar on which a high-performing, creative vision stands, most successfully if it begins with a holistic view of an asset's impact on its users and community.



SUSTAINABLE BUILDINGS & SITES

We support our clients in building a better world through project engagement, planning, design, construction, renovation, and operation to achieve sustainable certifications and performance standards, including LEED, Envision, Built Green High Density, WELL, Fitwel, Living Building Challenge, BOMA Best, SITES, TRUE, and custom-fit solutions.



WHOLE LIFE CARBON CONSULTING

Our team offers a broad suite of carbon assessment, auditing, and retrofitting services spanning the full asset lifecycle, enabling our clients to achieve their net-zero or near net-zero carbon goals and building certifications.

Bridge Engineering Solutions

WHY ENTUITIVE?

Entuitive offers specialized expertise in bridge design and rehabilitation using a range of procurement methods, from conventional design-bid-build to design-build to public-private partnerships.

Bridges are a critical part of the infrastructure of our society, providing crucial links between communities and regions for all our modes of transportation.

They can also serve as a significant part of the landscape, providing a sense of place and symbolizing a community. Each bridge, whether utilitarian, context-sensitive, or iconic, requires good design to ensure the structure serves its purpose well. We are committed to providing that design efficiently, cost-effectively, and with a strong focus on our client's needs.

Entuitive offers specialized expertise in Bridge Design, Rehabilitation, and Integrated Construction Engineering using a range of procurement methods. Our Bridge Engineering services include the following:

- ✔ Accelerated Bridge Construction Support
- ✔ Bridge Design
- ✔ Bridge Evaluation & Load Posting
- ✔ Bridge Inspection
- ✔ Bridge Rehabilitation
- ✔ Moving Bridges
- ✔ Vertical & Lateral Bridge Jacking

“ We collaborate with our clients to deliver appropriate solutions on time and on budget, including preliminary designs, detailed designs, environmental assessments, inspections, evaluation, load posting, demolition design, moveable bridges, and more. Our experts bring decades of experience to each bridge project. ”



INTEGRATED BRIDGE & CONSTRUCTION ENGINEERING

Our history in construction engineering for both small and large projects informs all our work, whether for contractors or owners. Our designs are constructible, clearly defined, and appropriately specified.

Our integration of construction engineering and temporary works into final structure design can offer significant benefits in both cost and efficiency.

Our team is approved under Ministry of Transportation Ontario's RAQS registry for Bridge Engineering (Design & Evaluation – Simple Structures (single span), Complex Structures (multi-span), and Rehabilitation – General) and with British Columbia's Ministry of Transportation for Bridge Design and Bridge Rehabilitation Design (short-span, intermediate to long-span, culverts, retaining walls, and miscellaneous structures). We provide leadership in project management and a demonstrated capability of delivering complex structural assignments (structural design, staged demolition and construction, temporary and permanent retaining walls, and constructability). Our engineers are licensed in every province and territory in Canada and sit on two section committees of the Canadian Highway and Bridge Design Code (Section 8 – Concrete, and Section 9 – Wood).

A CREATIVE & COLLABORATIVE PROCESS

Entuitive understands that engineering is a collaborative and creative process, with our work integrated into the work of the whole team, including designers, constructors, and owners. For our Bridge Specialists that means looking beyond the strict scope of our work and ensuring we are helping deliver a project.

We listen to our clients, working to develop their ideas and bringing our own to them, developing a common course of action, and then delivering on that vision.

We have substantial technical abilities proven by our work on complex projects. Similarly, we offer simple rapid design where that is appropriate. In all cases we are committed to the best overall outcome for the team rather than the use of any particular approach. This commitment to collaborate, to bring our skills to the enhancement of the whole team, and to properly scale our work to the project is what sets us apart.

Our demonstrated skill set includes:

- ✔ Analysis of Structures on Temporary Supports, Including SPMTs
- ✔ Conventional, Integral & Tied-Back Abutment Design
- ✔ Parametric Modelling of Large Bridge Structures
- ✔ Pretensioned & Post-Tensioned Concrete Design
- ✔ Staged Construction, Including Full Consideration of Shrinkage & Creep
- ✔ Steel Box Girder & Plate Girder Design
- ✔ Temporary Bridges
- ✔ Temporary Foundations for Permanent Bridges
- ✔ Vibration Analysis, Including Application of Tuned Mass Dampers

THE FULL ASSET LIFECYCLE

BUILD

Our services include bridge planning, design, and lifecycle costing for new bridge projects. Working with all stakeholders, we assess client and project needs to inform our bridge design work, considering all levels of impact, from environmental to traffic and the surrounding community.

OPERATE & ASSESS

Entuitive can support the maintenance of bridge projects through inspections and maintenance recommendations, working with specialists to provide the most effective approaches to minimize the lifecycle cost of the structures.

RENEW

Bridge rehabilitation calls on the full range of our skills, including analysis, knowledge of construction methods, capability with temporary works, evaluation of deteriorated structures, demolition, and a focus on the particular problems at a specific site.

REHABILITATION SERVICES

- ✔ Barrier Replacement
- ✔ Bearing Replacement
- ✔ Bridge Jacking
- ✔ Concrete Patching
- ✔ Deck Replacement
- ✔ Excavation Support
- ✔ External Post-Tensioning
- ✔ FRP Reinforcement
- ✔ Semi-Integral Deck Conversion
- ✔ Structural Evaluation
- ✔ Structural Steel Recoating

Entuitive offers particular expertise in preliminary demolition design and detailed demolition design, with a view to the effect of demolition and construction sequencing on construction and traffic staging.



Project Highlights

SELECTED EXPERIENCE IN BRIDGE ENGINEERING

PORT LANDS FLOOD PROTECTION & ENABLING INFRASTRUCTURE PROJECT TORONTO, ON



The Port Lands is a 400-hectare district currently undergoing massive development that will see it revitalized for Toronto's growing population.

The Port Lands Flood Protection and Enabling Infrastructure Project (PLFPEIP) has two primary goals: comprehensive flood protection for the Port Lands; as well as the creation of crucial infrastructure that will support creative and economic growth in the area. The work involves a southward extension of the Don River through the Port Lands area; widening of the mouth of the Don River at Keating Channel; new bridges, roads, and utilities; and lake filling to create new parkland. Recreational, cultural, and tourist amenities will springboard the Port Lands into the future.

Entuitive was retained by Waterfront Toronto as the Prime Consultant for the PLFPEIP Bridges and Engineering Contract. Managing ten subconsultants, Entuitive is providing design and contract administration services for four new signature road and LRT bridges, the expansion of three existing bridges over the Don River for Lake Shore Boulevard and the Port of Toronto (TPLC) railway bridge, as well as the demolition of the existing Cherry Street Bridge.

As Prime Consultant, Entuitive is assisting Waterfront Toronto in obtaining all required permits and approvals from numerous federal, provincial, and municipal agencies, coordinating work with local utility providers, and integrating work with upcoming City of Toronto road and bridge projects. Working with Grimshaw, Entuitive is designing all three bridges to serve as elegant, modern landmarks significant to the city. The bridges will accommodate vehicular traffic, an interim BRT, future LRT, utility services, dedicated bike lane, and generous sidewalk that will double as a leisure space.

Architect
Grimshaw

Client
Waterfront Toronto

Size
Cherry Street North Bridge – 56 m
Cherry Street South Bridge – 110 m
Commissioners Street Bridge – 150 m
Lake Shore Road Bridges – 120 m
Port of Toronto Railway Bridge – 120 m

Role
Prime Consultant; Structural
Engineering; Construction
Administration Lead

Budget
\$140 M

Awards
Special Jury Award For Catalytic
Infrastructure, Toronto Urban Design
Awards

GARDINER EXPRESSWAY TORONTO, CA



Constructed between 1956 and 1965, the Gardiner Expressway is travelled by over 50,000 trucks and cars on average each day, making it one of the most heavily travelled structures in the City of Toronto. The Gardiner Expressway Rehabilitation Project extends 1.15 km from Jarvis street to Cherry street, including the York/Bay/Yonge Westbound off-ramp, Sherbourne Westbound off-ramp, and the Jarvis Eastbound on-ramp.

The project involves the replacement of all the bearings, steel girders, and concrete deck that make up the bridge superstructure. Entuitive is providing construction engineering support for the fabrication and installation of 412 unique prefabricated superstructure components, which includes the production of shop drawings for the precast deck panels, the design of formwork and access platforms, and the specification of removal and installation procedures.

Challenge

Engineering a construction method to allow rapid removal of existing superstructure components, and erection and installation of new prefabricated components. The contractor's preference was to use mobile cranes to complete all removal and erection work, in order to avoid the higher costs of more specialized equipment and to maximize flexibility on the job site. It is rare for mobile cranes to be set up and operated on a bridge structure, as the weight of a crane plus the load it is lifting will far exceed the design live loads for bridges. To add to the challenge, the schedule requires cranes to be set up both on the existing structure and on newly installed superstructure components.

Solution

Entuitive enabled the use of cranes for all removals and erections by individually analyzing both the existing and new structure under more than 3,000 crane load cases. This work was made possible through the development of a parametric model of the structure which facilitated both the analysis and the drawing production. Sixty-six removal and erection plans were detailed, using cranes with capacity between 145 and 200 tonnes to replace 1.15 km of the Gardiner Expressway.

Client
AECON

Size
1.15 km, 66 spans

Role
Structural Engineering Consultant

DALEWOOD ROAD BRIDGE REPLACEMENT ST. THOMAS, CA

The City of St. Thomas commissioned a replacement for the Dalewood Road Bridge, which carries Dalewood Road across the Dalewood Reservoir and Kettle Creek. The new bridge will provide vehicular crossing and an active transportation link for the walkway around the reservoir and creek.

The new bridge structure will be a two-span continuous extradosed bridge with integral abutments, carrying two lanes of traffic as well as a multi-use path. Special attention was given to structural aesthetics, including the provision of a decorative pedestrian railing, the design of a light slender structure, and the painting of the superstructure.



The bridge's superstructure comprises two very slender 500 mm-deep steel box girders, a series of transverse steel floor beams, and a composite cast-in-place concrete deck. The box girders are supported by steel pipe stays and pylons, the provision of which enabled the slender box girder design, allowing the structure to meet flood requirements without a significant grade raise to the existing road.

Each box girder was designed with a full-width top flange to improve its torsional stiffness, which allows for erection in the absence of temporary supports. The pier floor beam was made integral with the box girders to further ease erection procedures.

The substructure comprises cast-in-place concrete integral abutments founded on driven steel H piles and two concrete-filled steel columns, each founded on a piled footing. The steel columns were designed for the effects of stream flow and ice forces.



Client
BT Engineering

Size
50 m long

Role
Structural Engineering Consultant

Budget
\$4 M

MILNE CREEK BRIDGE

MARKHAM, CA



The Milne Creek Bridge is located within the Milne Dam Conservation Park, a 123-hectare (305-acre) park in the Markham area of Ontario. Located on the Milne Reservoir, the park features a 2.3-kilometre hiking and cycling trail.

The 58-metre-long bridge has a superstructure comprising two rolled I-section steel girders, steel floor beams, and a wood plank deck. Steel bridge strand cables support the girders. The cables are deviated at steel towers positioned on the abutments, and the back stays are anchored to cast-in-place concrete deadman anchors. The substructure comprises cast-in-place concrete abutments founded on helical piles. The concrete deadman anchors are held down by helical piles battered to match the inclination of the back stays.

A distinct feature of the bridge is the absence of back spans, which resulted in the need for crossing cables to equilibrate the system. The use of cables afforded the ability to span across the full width of the creek without the need for temporary supports. Intentional modular design allowed for cantilever construction of the superstructure from the abutments outwards.

Architect
Schollen & Company

Client
City of Markham

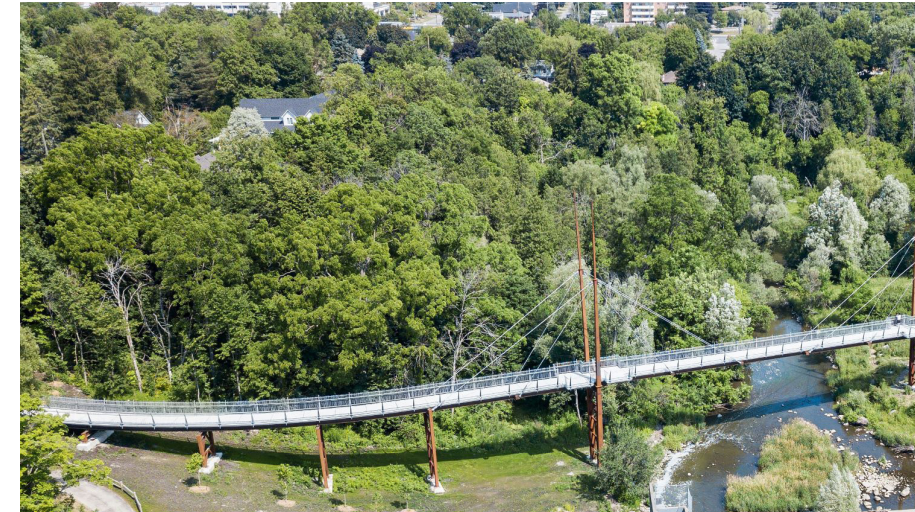
Size
58 m

Role
Structural Engineering Consultant

Budget
\$600,000

MILNE DAM BRIDGE

MARKHAM, CA



The Milne Dam Pedestrian Bridge is a multi-span, cable-stayed structure spanning the environmentally sensitive Rouge River in Markham, Ontario. The 45-metre main span crosses above the Milne Dam and features a fanned cable design with architecturally tapered steel pylons founded over 20 metres below the cable anchor points.

To lessen the difficulties of erection on a site with limited access, the twin-girder steel superstructure was detailed for modularity and prefabricated into segments. To speed up the erection process the structure also features precast concrete deck panels that are precisely detailed to match the geometry of the curvilinear west approach spans.

As a signature structure, the Milne Dam Pedestrian Bridge is completed with unique stainless steel metal rod railings anchored to the deck panels with custom-engineered cast-in anchors and railing posts.



Architect
Schollen & Company

Client
City of Markham

Size
143 m

Role
Construction Engineering Consultant

Budget
\$1.6 M

HATMON PEDESTRIAN BRIDGE - MGM CITY CENTRE LAS VEGAS, US



The Harmon pedestrian bridge spans Harmon Avenue, connecting a three-storey retail center to the Crystals building, which is part of the new MGM City Center complex. The bridge allows pedestrians to cross Harmon Avenue on the east side of Las Vegas Boulevard without worrying about vehicle traffic at one of the main access points to the Strip.

The bridge includes stairs, elevators, and escalators on both sides of Harmon Avenue. The bridge is an assembled steel structure supported on concrete piers. Vibration was an issue due to the long span of the bridge and required the incorporation of tuned mass dampers.

Architect
Foster + Partners

Role
Structural Engineering Consultant



HIGHWAY 400 NORTHBOUND BRIDGE VAUGHAN, CA



The Highway 400 Northbound bridge is a third level, post tensioned concrete bridge carrying traffic over the mainline Highway 407 ETR and associated ramps. The disc bearings at the piers of the existing structure were failing and required replacement.

Our team was retained to develop a jacking procedure that would allow the replacement of these bearings. The existing pier columns were approximately 13 metres tall with footings founded at an elevation significantly below grade.

Jacking the structure conventionally from the top of the footings was not a practical solution because of the large quantities of excavation required and the proximity to adjacent roadways. Bent plate steel collars designed to be clamped onto the existing concrete pier columns using post-tensioning were used to develop the friction required to support the loads from the superstructure above. Thirty-six to 250 tonne jacks placed on heavy steel jacking frames supported from the collars lifted the existing structure 25 millimetres at each pier. New bearings were successfully installed.

Client
407 ETR Concession Company Ltd.

Size
210 m

Role
Structural Engineering Consultant

Budget
\$1.2 M

HIGHWAY 400 SOUTHBOUND BRIDGE VAUGHAN, CA



Client
407 ETR Concession Company Ltd.

Size
210 m

Role
Structural Engineering Consultant

Budget
\$1.5 M



The Highway 400 Southbound bridge is a third level, post tensioned concrete bridge carrying traffic over the mainline Highway 407 ETR and associated ramps. The disc bearings at the piers of the existing structure were failing and required replacement.

Our team was retained to develop a jacking procedure that would allow the replacement of these bearings without disrupting any of the traffic on the surrounding highways. The challenge presented with this site

was at the northern pier. The existing pier columns ran between the EB and WB Highway 407 mainline structure and had approximately 200 millimetres of clearance on their north and south sides. The limited access prohibited jacking the structure from grade or clamping onto the existing pier columns, similar to what was done on the Northbound Bridge.

After reviewing the site, it was discovered that the existing pier columns had been constructed with a

slightly larger diameter than intended by the original design. With some minor widening of the larger than anticipated pier columns, enough jacks could be placed directly on top of the columns. The widening of the existing columns was created with concrete collars anchored with post-tensioned hoop strands. Thirty-six to 250 tonne jacks were used to successfully lift the structure and replace the existing bearings.

BRITANNIA AVENUE BRIDGE OSHAWA, CA



Project led by Stephen Brown while employed at a previous firm.

The substructure is comprised of cast-in-place concrete abutments founded on driven steel H piles and two cast-in-place concrete piers founded on spread footings. The abutments will feature long wingwalls downs into the abutment footing via torsion because the semi-integral deck ends limited the connection strength between the wingwalls and abutment stems.

We are providing full construction support to the City of Oshawa for this project. Construction support includes the provision of tender analysis, the review of all shop drawings, responding to all requests for information, the performance of site inspections, and the completion of as-built drawings.

Construction of the bridge is ongoing and is anticipated to be completed in Fall 2019.

Architect
Greck and Associates Limited

Location
Cambridge, Canada

Client
City of Oshawa

Size
40.0m

Role
Structural Engineering Consultant

Budget
\$6 M

Brown Co was retained by Greck and Associates Limited to serve as the structural consultants for this City of Oshawa design-bid-build contract. This project involves the design, from 30% to final, and the construction support for the new Britannia Avenue Bridge. Oshawa Creek currently separates the Windfields and Kredon residential neighborhoods. The new Bridge will make Britannia Avenue continuous across the creek, connecting both neighborhoods. The project area is located along Britannia Avenue, approximately 0.9km east of Simcoe Street North and approximately 0.6km north of Colin Road East. The project lies within the City of Oshawa and the Region Municipality of Durham.

Our Primary Function was to provide the structural design of a new bridge to carry Britannia Avenue across Oshawa Creek. The new structure design will be a three-span continuous (40.0m-40.0m-40.0m) two-lane semi-integral abutment bridge. The bridge's superstructure is comprised of six 2300mm deep precast concrete CPCI girders and a cast-in-place concrete deck.

HIGHWAY 140 CP RAIL
WELLAND, CA



Brown|CO was retained by Dufferin Construction to provide detailed design services for the rehabilitation of the Highway 140 bridge over the CP Rail Line south of Welland as part of a design-build contract. The structure is a 5 span, 200 m long steel girder bridge with concrete deck. The work included full confirmation of the existing structure, review of deterioration of the existing piers, bearing replacement, deck replacement, abutment widening and construction phase services. The reconstruction of the deck was staged with one lane remaining open while the other section of the deck was demolished and replaced.

Brown|CO developed an initial plan for the design-build project followed by full detailed design of the work based on the Owner's "30 %" design drawing. Remedial work design for the piers included determination of the areas of the pier requiring concrete removal and replacement, assessing the piers in the deteriorated condition and developing a sequence of work for the safe completion of the pier reconstruction. Redesign work for the abutments included review of foundations at one end for a conversion to semi-integral construction and altering the wingwalls at both ends to accommodate a widened deck. The steel structure was full analyzed for the widened deck and current loading using a grillage method to accurately distribute the load from the widened deck. The deck construction included assessment of the differential deflection of the interior and exterior girders during the staged deck replacement. Other work on the project included design for the jacking of the structure, demolition procedures, formwork and roadway protection.

- Architect**
Dufferin Construction
- Client**
Ministry of Transportation Ontario
- Role**
Structural Engineering Consultant
- Budget**
\$4 M

HIGHWAY 407ETR OVER WEST DUFFINS CREEK
PICKERING, CA



The eastbound and westbound Highway 407ETR bridges over West Duffins Creek are concrete slab-on-girder bridges with a total length of 136m. The abutments of both structures have semi-integral configurations with their expansion joints placed at the ends of the approach slabs. The existing expansion joints had deteriorated and Brown & Company Engineering Ltd. was retained to devise a rehabilitation strategy which allowed for the joints to be replaced while maintaining full capacity lanes for weekday traffic. New precast concrete expansion joints and a carefully sequenced plan were used to replace the existing expansion joints staged over the course of two weekends. High performance, rapid setting concrete was utilized to stitch the two stages of joint together and reconnect to the existing approach slab to the expansion joint. For each stage, one lane for each structure was closed on a Friday evening and was subsequently reopened to traffic the following Monday morning at 6:00 am with a new expansion joint in place.

- Architect**
407ETR Concession Company Limited
- Client**
407ETR Concession Company Limited
- Role**
Structural Engineering Consultant
- Budget**
\$1.2 M

HIGHWAY 58 OVER FORK'S ROAD AND CN RAIL WELLAND, CA



Owner
Ministry of Transportation Ontario

Prime Consultant
Entuitive

Contractor (Client)
Dufferin Construction

Total Span
30 m (9.3-11.7-9.3 m)

Role
Project Management, Bridge
Engineers, Construction Engineers

Budget
\$3 M

Entuitive was retained by Dufferin Construction to provide detailed design services for the rehabilitation of the Highway 58 bridges over Fork's Road and CN Rail. The two structures are each three-span steel bridges with concrete decks, with an overall length of approximately 30 m. The overall project included full confirmation of the existing sub-structure, review of deterioration of the existing piers, bearing replacement, deck replacement, abutment widening, and vertical realignment of the roadway between the structures, requiring a substantial increase in fill height and construction phase services.

Entuitive developed an initial plan for the design-build project followed by full detailed design of the work based on the owner's 30% design drawing. Remedial work design for the piers included assessing the piers for the widened deck, with strengthening required. The rehabilitation work included detailed mark out of concrete replacement at the abutments and piers.

The design of new components included design of new wing walls with anchorage to the existing abutments and new semi-integral deck and steel beam design. Entuitive were the lead consultants on this work. Our subconsultants were BTE, who provided the design for the realigned and widened roadway, and Patriot Engineering, who provided geotechnical design for the confirmation of the existing foundations and embankment stability and settlement analysis.

E N

Our Leaders

**DELIVERING SUCCESSFUL PROJECTS
ACROSS OUR MARKETS**

We operate as One Company, driven by a shared purpose. We are defined by our collective intelligence and united by a common mindset. We are the sum of our people and acknowledge that we are better together.



STEPHEN BROWN, P. ENG., P.E.
PRINCIPAL

*Project led by Stephen Brown while employed at a previous firm.

Backed by over 42 years of experience in structural engineering, Stephen is known for his unique expertise in the design, construction, and restoration of buildings, pedestrian bridges, and vehicular bridges.

He is particularly valued in the construction industry, providing innovative and efficient construction engineering solutions to complex erection challenges. His experience covers design, planning, feasibility studies, investigations, and contract preparation for projects across a wide range of sectors including transportation, commercial, retail, healthcare, and institutional.

Notable projects include the Humber River Pedestrian Bridge in Toronto, which received the Governor General Award for Architecture, and an Award of Excellence from the Canadian Institute for Steel Construction. Other award-winning projects include the 650m long Perley Bridge over the Ottawa River from Hawkesbury, Ontario to Grenville, Quebec; and the Mount Pleasant Visitation Centre. Stephen has also recently completed work on the UP Express air-rail link in Toronto, and the design of Burlington GO Station.

EDUCATION

Bachelor of Engineering Science in Civil Engineering, University of Western Ontario
Master of Engineering in Civil Engineering, University of Toronto

MEMBERSHIPS

Association of Professional Engineers of Ontario (PEO)
Board of Professional Engineers of the State of Michigan

AWARDS

Ontario Steel Design Awards (Honourable Mention) for Town and Country BMW, 2002
Canadian Portland Cement Institute (Ontario) for Perley Bridge, 2002

PROJECT EXPERIENCE

BRIDGE CONSTRUCTION, REHABILITATION, & CONSTRUCTION ENGINEERING

Altona Road Bridge (over rail)	Pickering, Canada
Bearing Replacement for Queenston Bridge	Ontario - New York
Dalhousie Bridge	Ontario, Canada
Fairway Bridge over the Grand River	Waterloo, Canada
Father Tobin Bridge	Brampton, Canada
Garden City Skyway	Saint Catherine's, ON
Grand River Bridge	Cayuga, Canada
Hwy 58 and Hwy 140 (over CP Rail)	Port Colborne, Canada
Highland Creek Pedestrian Bridge	Toronto, ON
Highway 400/Line 11 Bridge Replacement	Ontario, Canada
Highway 407/ETR Design-Build Project	Toronto, ON
Highway 407 - Ninth Line	Markham, Canada
Highway 407e - ramp to Woodbine Avenue	Markham, Canada
Highway 407w - hwy 403w, Freeman Interchange	Burlington, Canada
Humber River Pedestrian Bridge	Toronto, ON
Hwy 427 over Hwy 407	Toronto, ON
James Snow Parkway at 16 Mile Creek	Milton, Canada
Markham Road Bridge Widening (over rail)	Scarborough, Canada
Matheson Boulevard Bridge	Mississauga, Canada
Middle Road Bridge	Etobicoke, Canada
Milne Creek Basketweave Pedestrian Bridge	Markham, Canada
Milne Dam Cable Stay Pedestrian Bridge	Markham, Canada
Mountainash Bridges (north and south)	Brampton, Canada
Mt. Pleasant Road Bridge	Toronto, ON
Ninth Line and Major MacKenzie Bridge over Little Rouge Creek	Markham, Canada
Perley Bridge	Ottawa & Grenville, ON
QEW over Credit River Bridge	Mississauga, Canada
Pier Cofferdam Design for Island Airport Bridge	Toronto, ON
Pier replacement Highway 401 over Leslie St	Toronto, ON
Reesor's Road Bridge	Markham, Canada
Region of Waterloo LRT under Hwy 7/8	Waterloo, Canada
Removal of Fredrick House River Bridge	Timmins, Canada
Removal of Pickerel River Bridge, Hwy 69	Sudbury, Canada
Richmond Hill Pedestrian Bridges	Richmond Hill, Canada
UP Express	Toronto, ON
Sheflin Bridge	Ottawa, Canada
Simson Bridge	St. Maarten
Sioux Lookout structure removal	Sioux Lookout, Canada
Sutherland Bridge	Ontario, Canada
PEI Fixed Link (Confederation Bridge)	PEI & New Brunswick
Terry Fox Drive over Highway 417	Ottawa, Canada
Vernon Bridge	PEI, Canada
Willey Road Overpass	London, Canada

TRANSIT STATIONS

Eglinton Crosstown Yonge Station (Construction Engineering)	Toronto, ON
Finch West LRT	Toronto, ON
Yonge North Subway Extension	Toronto, ON
Scarborough Subway Extension	Toronto, ON
Bramalea GO Station	Bramalea, Canada
Burlington GO Station	Burlington, Canada
Scarborough GO Station	Scarborough, Canada

OTHER

10 Market Street	Toronto, ON
46 Old Bridle Path	Toronto, ON
600 Lonsdale	Toronto, ON
Britannia Hills Golf Club House	Mississauga, Canada
Cabot Place	St. John's, Canada
CBC Radio Building, Jarvis Street,	Toronto, ON
CNE Bandshell Extension	Toronto, ON
Etobicoke Long Term Care	Etobicoke, Canada
H&R Developments Office Building	Thornhill, Canada
Haefely Trench Oven Pit	Ajax, Canada
Harbord Collegiate WWII Monument	Toronto, ON
Hogan Chevrolet Olds	Scarborough, Canada
Kitchener Waterloo BMW Dealership	Waterloo, Canada
Legislative Assembly Roof Refurbishment	Toronto, ON
Markham Chinese Baptist Church	Markham, Canada
Mount Pleasant Cemetery Visitation Centre	Toronto, ON
Old City Hall Life Safety Improvements	Toronto, ON
Pickering College	Newmarket, Canada
Scarborough Grace Hospital	Scarborough, Canada
St. Elizabeth High School	Vaughan, Canada
St. Mary's Ukrainian Catholic Church	Sault Ste. Marie, Canada
Toronto Honda	Toronto, ON
Town and Country BMW	Markham, Canada
Trinity Presbyterian	Toronto, ON
University of Toronto Law and Music Library	Toronto, ON
Victory Building, 80 Richmond Street	Toronto, ON
Volvo on Dundas	Toronto, ON
Woodpecker Sculpture	Toronto, ON
Convention Centre	Toronto, ON



JONATHAN WERNER, M.A.S.C., PMC, P.ENG.
SENIOR ASSOCIATE

*Project led by Jonathan Werner while employed at a previous firm.

“ It’s how we work as a team that determines the success of the project. ”

Jonathan Werner is a Senior Associate at Entuitive with over 25 years of experience in structural analysis and design of bridges, subway stations and other structures.

Jonathan has an extensive background in contract administration, project management, foundation investigations, bridge inspections, and structural evaluations, as well as experience on Design Build, P3 and Program Management assignments.

Jonathan’s portfolio includes roles varying from inspection, deck rehabilitation, fatigue investigation, Owner’s Engineer and preliminary design on several long span/viaduct bridge projects. Some of his most notable projects include Gordie Howe International Bridge, Port Mann/Highway 1 Bridge over the Fraser River in Vancouver (Gateway Program), the Blue Water Bridges in Sarnia, the Sault Sainte Marie International Bridge, and the Thousand Islands Bridges.

Before joining Entuitive, Jonathan held leadership positions including Project Engineering Coordinator for the \$100 million York University Subway Station on the TTC Spadina Line, Lead Bridge Engineer on the \$3 billion Gateway Program in Vancouver, British Columbia, and Project Manager or Structural Lead on many other projects.

PROJECT EXPERIENCE

BRIDGE INSPECTION, EVALUATION AND REHABILITATION

Blue Water Bridges Annual Inspections*	Point Edward, Canada
Dundas / Bronte Creek*	Halton, Canada
Dundas / Cawthra Bridge*	Mississauga, Canada
Dundas / CNR*	Halton, Canada
Hastings Swing Bridge Rehabilitation*	Hastings, Canada
Highway 7 Rehabilitation*	St. Mary’s, Canada
Highway 11 / Concession 8 and 14th Line in Orillia Township*	Orillia, Canada
Highway 17 & White River, West White River and Wabikoba Creek Bridges*	Northwestern Ontario, Canada
Highway 400 / Dunlop Street Underpass*	Barrie, Canada
International Bridge Annual Inspection, Joint International Bridge Authority*	Sault Ste. Marie, Canada

EDUCATION

Master of Applied Science in Civil Engineering, University of Waterloo
Bachelor of Applied Science in Civil Engineering, University of Waterloo
PSMJ/ACEC – PM Bootcamp
Project Management Certified (PMC)

MEMBERSHIPS

Professional Engineers Ontario (PEO)
Association of Professional Engineers & Geoscientists of BC (APEGBC)
Qualified Designer (Building Structural) – Ontario Ministry of Municipal Affairs and Housing
Tunneling Association of Canada
Association Professional Engineers and Geoscientists of Alberta (APEGA)

AWARDS

Sanford Fleming Medal of Academic Excellence

PROJECT EXPERIENCE

International Bridge, Deck Rehabilitation Design & Construction Liaison - Joint International Bridge Authority*	Sault Ste. Marie, Canada & Michigan, USA	Hwy 23 Structure Replacement and Rehabilitation*	Mitchell, Canada
International Bridge, Deck Replacement/ Rehabilitation Study - Joint International Bridge Authority*	Sault Ste. Marie, Canada & Michigan, USA	Port Severn Swing Bridge*	Port Severn, Canada
Jane and Steeles over Black Creek*	Toronto, Canada	Portage Road – CN Grade Separation*	Niagara, Canada
Lawrence Avenue East over Highland Creek*	Toronto, Canada	QEW/Red Hill Creek Expressway Bridges*	Hamilton, Canada
Lorne Bridge over the Grand River*	Brantford, Canada	Ravenshoe Road (YR 32) Bridge over Zephyr Creek*	York Region, Canada
Overlea Blvd. Bridge over Don River*	Toronto, Canada	Red Hill Creek Expressway (RHCE) at the QEW*	Hamilton, Canada
Rehabilitation of Big Creek Bridge*	Delhi, Canada	Trimble Road Bridge*	Glanbrook, Canada
Rehabilitation of Boston Creek Bridge*	Willow Grove, Canada		
Rehabilitation of Concession Street and Victoria Street Bridges over the Grand River*	Region of Waterloo, Canada		
Rehabilitation of Cooksville Creek Culvert and Retaining Walls at Dundas Street East*	Mississauga, Canada		
Sault Ste. Marie Emergency Swing Dam*	Sault Ste. Marie, Canada		
St. David’s Overpass at Highway 406*	St. Catharines, Canada		
Thousand Islands Suspension Bridge, Viaduct and Arch Inspection/Rehabilitation*	Ivy Lea, Canada		
Truss Repairs on Grand River Bridge*	Cayuga, Canada		
York Mills Road Bridge*	Toronto, Canada		
Walker Bridge over the Mallet River*	Wellington, Canada		
Whiteman Creek Bridge Repairs*	Brantford, Canada		

NEW BRIDGE DESIGN

Port Lands Flood Protection & Enabling Infrastructure Project – Bridge Design	Waterfront Toronto, Canada		
Lakeshore Bridge over the Don River	Toronto, Canada		
Bridge 2-S01, Fredericton-Moncton Highway Project*	Fredericton, Canada		
Bridge 3-S03, Fredericton-Moncton Highway Project*	Fredericton, Canada		
Bridge 3-S04, Fredericton-Moncton Highway Project*	Fredericton, Canada		
East Morrison Creek Pedestrian Bridges* Gateway Program*	Oakville, Canada		
Highway 6 and Twenty Mile Creek*	Vancouver, BC		
	Niagara Peninsula, Canada		
Highway 7/8 Bridges East of New Hamburg*	Wilmot, Canada		
Highway 17 (new) - Lower Echo River Bridge*	Sault Ste. Marie, Canada		
Highway 17 (new) - Noonday Road Bridge*	Sault Ste. Marie, Canada		
Highway 21 / Adam’s Drain Culvert*	Dunlop, Canada		
Highway 69 – Blackstone/Crane Lake Road*	Parry Sound, Canada		
Highway 69 – CNR Grade Separation (SBL and NBL)*	Burlington, Canada		
Highway 72/Frog Rapids*	Sioux Lookout, Canada		
Highway 401 Bridges, Leslie to Warden*	Toronto, Canada		
Highway 401 / Burnham Street Underpass*	Cobourg, Canada		
Highway 401 and Highway 10*	Caledon, Canada		
Highway 401 and Homer Watson Interchange*	Waterloo, Canada		
Highway 401/RR 58*	Stoney Creek, Canada		
Highway 403 and 16 Mile Creek (EBL)*	Oakville, Canada		
Hurst Drive Extension over Lover’s Creek*	Barrie, Canada		
Dufferin Jog Elimination at Queen Street*	Toronto, Canada		
Silvercreek Rail Grade Separation (Subway)*	Guelph, Canada		
TTC Toronto-York Spadina Subway Extension*	Toronto, Canada		
TTC Bayview Subway Station Construction Phase (Phase 4)*	Toronto, Canada		
TTC Bayview Subway Station Detailed Design Phase*	Toronto, Canada		
TTC Brimley RT Station Design Feasibility Study*	Toronto, Canada		
TTC Finch West LRT*	Toronto, Canada		
TTC Structural Engineering Services Contract*	Toronto, Canada		
TTC Triennial Contract*	Toronto, Canada		
Union Station Rail Corridor – Infrastructure Improvement Program*	Toronto, Canada		
West Toronto Diamond Project*Weston Tunnel, Georgetown South Rail Corridor Expansion*	Toronto, Canada		

PROGRAM MANAGEMENT AND OWNER’S ENGINEER

Gateway Program*	Vancouver, Canada
Gordie Howe International Bridge*	Windsor, Canada
Hwy 407 East Owner’s Engineer Phase 1*	Toronto, Canada
Hwy 407 ETR Independent Auditor*	Toronto, Canada
Jacques Cartier Bridge*	Montreal, Canada

RAIL AND TRANSIT STRUCTURES DESIGN AND REHABILITATION

Dufferin Jog Elimination at Queen Street*	Toronto, Canada
Silvercreek Rail Grade Separation (Subway)*	Guelph, Canada
TTC Toronto-York Spadina Subway Extension*	Toronto, Canada
TTC Bayview Subway Station Construction Phase (Phase 4)*	Toronto, Canada
TTC Bayview Subway Station Detailed Design Phase*	Toronto, Canada
TTC Brimley RT Station Design Feasibility Study*	Toronto, Canada
TTC Finch West LRT*	Toronto, Canada
TTC Structural Engineering Services Contract*	Toronto, Canada
TTC Triennial Contract*	Toronto, Canada
Union Station Rail Corridor – Infrastructure Improvement Program*	Toronto, Canada
West Toronto Diamond Project*Weston Tunnel, Georgetown South Rail Corridor Expansion*	Toronto, Canada

OTHER PROJECTS

Lawrence Avenue East over Highland Creek Duct Support Structure*	Toronto, Canada
Milton Quarry Primary Crusher*	Milton, Canada
Niagara Falls Decommissioned Hydro Tunnels*	Niagara Falls, Canada
Pickering’s Millennium Square Waterfront Development*	Pickering, Canada
Port Loring Water treatment Plant*	North Bay, Canada
Shoreham Drive over Black Creek Duct Support Structure*	Toronto, Canada



JASON JELINEK, P.ENG.
PRINCIPAL

*Project led by Jason Jelinek while employed at a previous firm.

Jason is a Principal at Entuitive with over 19 years of experience in structural engineering.

He obtained his Bachelor of Engineering Science from the University of Western Ontario in 1999 and his Master of Engineering Science from the University of Western Ontario in 2002.

Jason's projects have included sequential demolition and reconstruction design for a multi-span arch bridge, removal of a 60m truss bridge by reverse launching, development of a new line of highway sign structures for design-build work in Alberta, bridge lifting and bearing replacement for large post-tensioned bridge structures for 407ETR, commercial buildings and recreational building expansion, and a complex utility bridge over the Don River in Toronto.

He has published papers on material properties of historical bridges, condition of uninspectable members in steel truss bridges and bridge lifting.

EDUCATION

Bachelor of Engineering Science, Civil Engineering, University of Western Ontario
 Master of Engineering Science, Civil Engineering, University of Western Ontario

MEMBERSHIPS

Professional Engineers Ontario (PEO)
 Engineers and Geoscientists British Columbia

AWARDS

University of Western Ontario, Winner of the 1999 City of London Design Competition at the University of Western Ontario
 University of Western Ontario, 2nd Place finish in the 1999 Peter S. Higgins Structural Analysis Competition
 Canadian Society for Civil Engineering Graduate Student Paper Competition, 3rd Place finish in the 29th Annual Conference

PROJECT EXPERIENCE

BRIDGE CONSTRUCTION, REHABILITATION, & CONSTRUCTION ENGINEERING

Altona Road Bridge over CN	Pickering, Canada	Highway 427 over Highway 407 Bridge Widening	Toronto, Canada
Central Avenue Bridge Temporary Pier Design and Lateral Slide	Fort Erie, Canada	Hwy 17 over Nipigon River Bridge De-Launching	Thunder Bay, Canada
Daviselm Bridge	Brampton, Canada	Hwy 410 Bridge Jacking	Brampton, Canada
Eglinton Crosstown LRT Chaplin Station Temporary Traffic Deck and Formwork Design	Toronto, Canada	Hwy 7 at Brock Road Falsework Design	Pickering, Canada
Eglinton Crosstown LRT Forest Hill Station Temporary Utility Support, Crane Mats, Jib Crane Design, Caisson Cage Erection Plans, and Formwork Design	Toronto, Canada	Jockvale Bridge (Ottawa) Bridge Jacking, Access Deck Design, and Falsework Design	Ottawa, Canada
Eglinton Crosstown LRT Mount Dennis Station Temporary Rail Bridge, SOE Design, and Relocation of the Kodak Building	Toronto, Canada	Line 11 over Highway 400 Falsework Design, Formwork Design, Access Platforms, and Girder Erection and Stabilization	Bradford, Canada
Highway 11 Bridge Rehabilitation	Ontario, Canada	Link 427 (Multiple Sites) Bridge Jacking and Bearing Replacement	
Highway 11/12 Bridge Rehabilitation	Ontario, Canada	Major MacKenzie Bridge over Little Rouge Creek	Toronto, Canada
Highway 12 over Coldwater River Falsework Design, Roadway Protection, Bridge Jacking, and Temporary Access Deck		Mountain Ash Road South Bridge	Brampton, Canada
Highway 12 over Wye River Falsework Design, Roadway Protection, and Bridge Jacking		Ninth Line over Little Rouge Creek	Markham, Canada
Highway 140 – CNR/CPR	Ontario, Canada	Norwich Avenue over Highway 401 Falsework Design, Formwork Design, Access Platforms, and Girder Stabilization	Woodstock, Canada
Highway 400 and 10th Line (McKay Road) Underpass Bridge Replacement	Barrie, Canada	QEW over Bronte Creek Sequential Demolition Analysis, Falsework Design, and Access Platforms	Oakville, Canada
Highway 400 and Line 11 (Coulson Road) Underpass Bridge Replacement	Toronto, Canada	QEW over Credit River Bridge	Mississauga, Canada
Highway 400 NB over Highway 407 Jacking and Bearing Replacement		Reesors Road Bridge	Markham, Canada
Highway 400 SB over Highway 407 Jacking and Bearing Replacement		Removal of Nipigon River Bridge	Thunder Bay, Canada
Highway 402 (Multiple Sites) Bridge Jacking, Falsework Design, Roadway Protection, and Access Platforms	Ontario, Canada	St. Joseph's Bridge (Ottawa) Bridge Jacking and Falsework Design	Ottawa, Canada
Highway 403 (Multiple Sites) Bridge Jacking, Falsework Design, Roadway Protection, and Temporary Traffic Plates	Ontario, Canada		
Highway 407 over Gorewood Drive Rapid Expansion Joint Replacement			
Highway 407 over Highway 401 Jacking and Lateral Restraint			
Highway 407 over Little Rouge River Jacking and Lateral Restraint			
Highway 407 over Rouge River Jacking and Lateral Restraint			
Highway 407 over West Duffins Creek Rapid Expansion Joint Replacement			
Highway 407E-Highway 403W Jacking and Bearing Replacement			
Highway 407E-Highway 410S Jacking and Bearing Replacement			
Highway 410 (Multiple Sites) Bridge Jacking and Bearing Replacement			
Highway 427 (Multiple Sites) Bridge Jacking and Bearing Replacement			

PUBLICATIONS

Brown, S., and Jelinek J. (2014): "Bridge Lifting at Columns". Proceedings of the 9th International Conference on Short and Medium Span Bridges. Calgary, Alberta, Canada.

Bartlett, F.M., Dexter, R.J., Graser, M.D., Jelinek, J.J., Schmidt, B.J., and Galambos, T.V. (2003): "Updating Standard Shape Material Properties Database for Design and Reliability". American Institute of Steel Construction Engineering Journal. First Quarter 2003.

Jelinek, J., and Bartlett, F.M. (2002): "Material Properties of Historical Bridge Steel". Proceedings of the 30th Annual Conference of the Canadian Society for Civil Engineering. Montreal, PQ, Canada, ST-115.
 Jelinek, J. (2002): "Material Properties of New and Historical Bridge Steels". Masters Thesis. University of Western Ontario, London, Ontario, Canada.

Jelinek, J., and Bartlett, F.M. (2001): "Condition of Uninspectable Members in a Steel Truss Bridge Constructed in 1922". Proceedings of the 29th Annual Conference of the Canadian Society for Civil Engineering. Victoria, BC, Canada, A-30.

ENTUITIVE

New York

28 West 44th Street,
Suite 1118
New York, NY 10036
T. +1 718 280 5935

Toronto

200 University Avenue,
7th Floor
Toronto, ON M5H 3C6
T. +1 416 477 5832

Calgary

150 9th Avenue SW,
Suite 1610
Calgary, AB T2P 3H9
T. +1 403 879 1270

Edmonton

10055 106 Street NW,
Suite 1250
Edmonton, AB T5J 2Y2
T. +1 587 401 4371

Vancouver

1075 West Georgia St.,
Suite 1020
Vancouver, BC V6E 3C9
+1 604 900 6224

entuitive.com