



Construction
Engineering
SOLUTIONS

ENTUITIVE

Contents

CONSTRUCTION ENGINEERING SOLUTIONS OVERVIEW

- 1 FIRM OVERVIEW
- 5 OUR SECTORS
- 7 OUR SERVICES
- 9 CONSTRUCTION ENGINEERING SERVICES
- 21 PROJECT HIGHLIGHTS
- 44 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.



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, climate resilience, and sustainable master planning, where they can have the most beneficial impact on the project.

1

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.

2

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.

3

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.

4

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.



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.



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.



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

Our services span the asset lifecycle, from planning and design through construction, renovation, and end of life renewal, with sustainability as the foundation throughout.

We offer integrated structural engineering, building envelope, sustainable building consulting and planning, special projects and renovations, energy and carbon performance, fire and pedestrian modelling, restoration, bridge design and rehabilitation, construction engineering, and transportation solutions for new and existing structures and communities.

The solutions we provide and continue to develop are designed to address climate change and to secure a future that is economically, socially, and environmentally sustainable.



SUSTAINABLE PERFORMANCE

We support our clients in building a better world through project engagement, planning, design, construction, renovation, and operation to achieve projects' sustainable design goals. We are well versed in the management of third party sustainable design certifications such as LEED, Zero Carbon Building Standard, Envision, Built Green, WELL, Fitwel, Living Building Challenge, and custom-fit solutions. Our analysis services allow us to quantify projects' operational energy, embodied carbon, and occupant comfort conditions to ensure a high-performance design is achieved.



NATIONAL VETERANS RESOURCE CENTER SYRACUSE, NY



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.



BUILDING ENVELOPE

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



CONSTRUCTION ENGINEERING

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



EXPERT ADVISORY SERVICES

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



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.



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.

Construction Engineering Solutions

Entuitive's Construction Engineering service provides engineering support to both contractors and owners during active construction and design. We also offer bid-phase support when construction methods have substantial influence on the finished structure and/or cost estimating.

By combining our collaborative approach, creativity, and disciplined imagination with our technical knowledge, our Construction Engineering team develops appropriate solutions for the unique challenges presented in the construction of new structures and the rehabilitation of existing structures.

Our goal is to provide solutions that have the best benefit to the project and our clients. We investigate various approaches from conventional methods to innovative solutions, delivering the right solution for the project.

Our service includes the design of temporary components to facilitate the construction of permanent structures, the development of engineered procedures and sequences for construction and deconstruction/demolition of structures, the provision of alternative designs to suit preferred construction methods, and assistance to contractors and owners in addressing unexpected field conditions.



FAIRWAY BRIDGE
KITCHENER, ON

WHAT MAKES CONSTRUCTION ENGINEERING DIFFERENT AT ENTUITIVE?

The combination of the committed collaborative approach, knowledge of construction methods, technical skill in structure design, and capability to integrate our work into the whole of the project is central to our view of what we bring to our work.

The construction process is often iterative and draws upon the combined knowledge of both Entuitive and our clients. The Construction Engineering project team leads are senior staff who actively participate in the technical delivery of the project. We remain dedicated and flexible throughout the implementation of the project so that we can address changes and emergency conditions. We are often on site and make ourselves available when situations arise.

A significant component to Entuitive's Construction Engineering service is emergency issue support. Emergency issue support typically involves addressing unforeseen field conditions, contract design issues, or construction errors that need immediate response to allow work to continue or establish safe conditions.

In any of these cases immediate engineering effort is required through analysis, site presence, or alternative solutions to enable continued operations or at least a restoration of safe conditions as rapidly as possible. Entuitive's strong technical background and experience with permanent structure design allows for a quick understanding of the problem and development of remedial or alternate schemes that provide the required performance at the least disruption to the project delivery.

TRANSPORTATION STRUCTURES & CONSTRUCTION ENGINEERING

Transportation structures, such as subway stations, airports, and light-rail transit, present complex planning and construction challenges.

Entuitive's unique service, combining Transportation and Construction Engineering, eliminates uncertainty in the design of the structure and method of construction.



INTEGRATION WITH BUILDING ENVELOPE

Entuitive's Building Envelope team provides services to assist General Contractors in their responsibilities during the pre-construction, construction, and post-construction phases of a project. Our team can respond to design challenges and site conditions, perform special inspection, and conduct field testing.

RESPONSE TO DESIGN OR SITE CONDITIONS

On occasion, a General Contractor could use support from a Building Envelope Specialist to act on their behalf and/or help resolve various challenges. Support may include:

- ✔ Situations where the contractor is not comfortable with the design intent and requires building envelope support to gain confidence in the design direction, or to work with the design team to develop a mutually beneficial solution.
- ✔ Developing shop drawings, submittals, substitutions, or alternates.
- ✔ Providing third-party support for unforeseen site conditions.
- ✔ Sub-trade installation variances where the development of options for remediation or recalibration of the design are required (on behalf of the General Contractor), including on-site, real time, investigation and development of design solutions, and computer-aided thermal and hygrothermal analysis to review effects on performance, alternate pathways to compliance, and/or the effect of the variance on thermal bridging.

SPECIAL INSPECTIONS

This type of inspection is typically required by the project specifications, for warranty or municipal compliance, or for client requirements. Typical systems can include:

- ✔ Below-grade vertical waterproofing (blindsides and back-fill)
- ✔ Under-slab waterproofing or vapour barrier
- ✔ Air barrier
- ✔ Vapour barrier
- ✔ Thermal barrier
- ✔ Glazing (manufacturing plant and/or site)
- ✔ Roofing
- ✔ Cladding and cladding attachment systems (calculations and/or details, material, alternates)
- ✔ Bosuns chair inspection/access

FIELD TESTING

This type of testing is typically required by the project specifications, for warranty or municipal compliance, or to verify the performance of unforeseen conditions or installations on site. Testing examples include:

- ✔ Infrared thermography
- ✔ Water testing
- ✔ Adhesion testing
- ✔ Moisture readings and monitoring
- ✔ Roofing/waterproofing flood testing
- ✔ Third party testing witness (on behalf of the contractor, for testing by others)



CONTRACT ADMINISTRATION & CONSTRUCTION ENGINEERING

Entuitive employs an experienced Contract Administration team that is well-versed in all types of Construction Materials and Delivery Methods.

Whether we're functioning as a standalone group or part of a team, our CA team brings value to construction outcomes through streamlining construction communication, honing in on root-cause design and coordination issues, and assisting with identifying and resolving scope gaps.

On projects where there is a hard delineation between Contract Administration support and Contractor Responsibilities, our Construction Engineering team is prime-positioned to supplement the construction team.

Through our Construction Engineering practice, we can support Contractors in the following ways:

- ✔ Performing construction equipment and material storage load checks.
- ✔ Providing tower/assist crane shoring and bracing design.
- ✔ Designing man and material hoist shoring bracing design.

These deliverables are further optimized for projects where Entuitive has already been engaged as the Base Building Engineer.

DELIVERING UNCOMPROMISING PERFORMANCE

In response to industry efforts to move from prescriptive to performance-based design, it is not uncommon to find Subcontractors struggling to deliver contractually delegated design scopes.

Entuitive has great depth of experience working with Fabricators and Installers based on preferred construction practices, and as a result we can offer:

- ✔ Shoring design for demolition and formwork
- ✔ Concrete surveying implementation plans
- ✔ Underpinning design and procedures
- ✔ Curing procedures
- ✔ Demolition procedures
- ✔ Thermal control plans for mass concreting
- ✔ Cold and hot weather concrete protection plans
- ✔ Additional reinforcement required in concrete walls for temporary loads from climbing formwork systems
- ✔ Quality Control plans

UNFORESEEN SITE CONDITIONS

We understand that construction does not always go according to plan.

Our team offers solutions that allow for constructibility and expedient repair, including:

- ✔ Remedial work design, such as temporary and permanent load-path review, architectural considerations, and installation feasibility
- ✔ Alternate construction methods and sequences
- ✔ Emergency site reviews

QUALITY VERIFICATION & CONSTRUCTION ENGINEERING

Entuitive's Construction Engineering team provides Quality Verification services during the construction phase of a project.

These services can start in the pre-bid phase of construction and continue through to project close-out and commissioning. Quality Verification services can apply to Owners, General Contractors, Fabricators and Installers, as well as Interested Third Parties, and can apply to all procurement types regardless of whether Entuitive is engaged in another role on the project.

Through Entuitive's broad expertise in all types of construction, sizes, and scopes, as well as our efficient internal resourcing methods, we bring our clients the highest level of service at a Competitive Fee Advantage.

QUALITY VERIFICATION SERVICES BY PHASE

PRE-BID & BID QUALITY VERIFICATION

Entuitive's experience with inspection- and testing-related work, combined with our design background, enables us to work with Contractors, Owners, and other Stakeholders to establish bid scope terms of reference, critical quality control milestones, and necessary reporting and testing documentation requirements for project budgets and schedules to properly reflect desired quality outcomes.

Upon award, Entuitive closely engages with and provides support to Subcontractors to identify key quality metrics and to tailor in-house Quality Control programs to meet specific project needs, facilitating Project Quality meetings with external inspectors and other trades to benchmark expectations and behaviours

THROUGH CONSTRUCTION

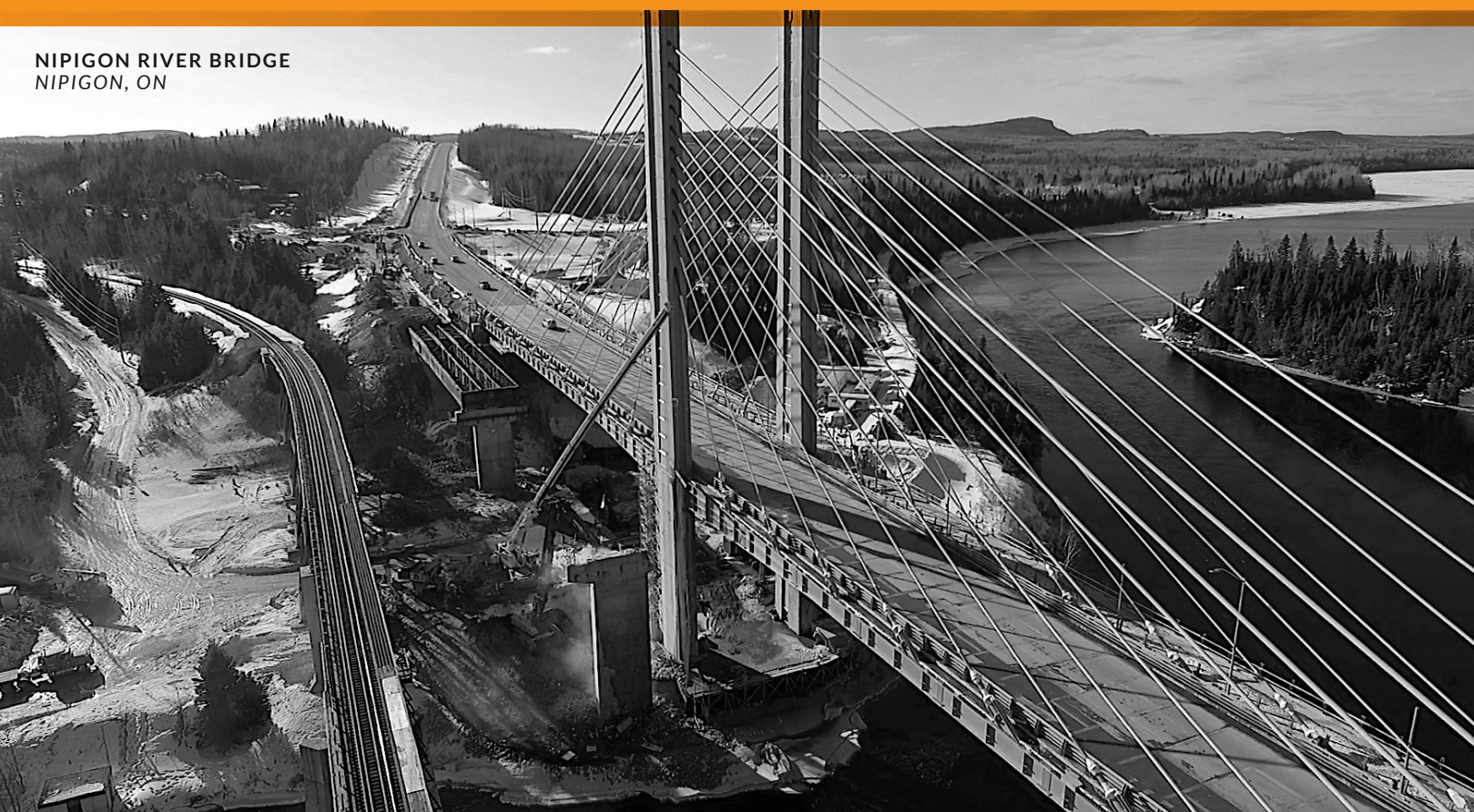
Whether working for Contractors or Owners or on behalf of legislative bodies to satisfy legal requirements, Entuitive can provide or augment inspection services for a variety of construction materials.

In addition to providing these inspection services to satisfy minimum quality requirements, Entuitive continually works to make process and detail improvements to result in cleaner and more efficient construction detailing and installation.

When engaged to provide supplemental inspection services, Entuitive's clients benefit from knowing that the work they are going to install and subsequently have installed will pass all required inspections, preventing costly schedule delays.

Entuitive's team also includes experienced Project Managers working in the Construction Engineering group, who in addition to providing Quality Inspection services can provide Quantity Inspection services, which can be used to substantiate progress billing and change management.

Working for Contractors or Subcontractors in the field allows Entuitive also to draw on our extensive building expertise to recognize issues before they come to fruition and swiftly address them with the design team, mitigating schedule impacts.



NIPIGON RIVER BRIDGE
NIPIGON, ON

CONSTRUCTION ENGINEERING SERVICES

Entuitive's Construction Engineering services include:



ADVISORY

- ✔ Bid Support
- ✔ Constructibility Reviews
- ✔ Construction Logistics Reviews
- ✔ Geometry Control
- ✔ Integration of Temporary Works & Permanent Works
- ✔ Quantity Take-Offs & 4D Modelling
- ✔ Value Engineering



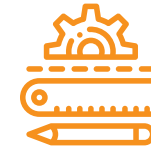
MEAN & METHODS

- ✔ Access & Debris Platforms
- ✔ Ancillary Component Design (Cranes, Debris Screens, Static Lines)
- ✔ Cable-Stay Construction
- ✔ Casting Curves for Cast-in-Place Concrete Cantilever Construction
- ✔ Concept Development (Means & Methods)
- ✔ Construction & Equipment Load Reviews
- ✔ Construction Staging
- ✔ Crane Platforms
- ✔ Cribbing & Dunnage
- ✔ Demolition Sequencing/ Deconstruction
- ✔ Emergency Engineering Support
- ✔ Erection Plans
- ✔ Façade Retention
- ✔ Falsework, Formwork, Reshoring
- ✔ Man Hoist Support Structure
- ✔ Moving Bridges (Vertical & Lateral Jacking, etc.)
- ✔ Moving Buildings (Vertical & Lateral Jacking, etc.)
- ✔ Overbuild (Underpinning, etc.)
- ✔ Shoring & Support of Excavation (SOE)
- ✔ Stability Analysis (Erection & Stabilization, etc.)
- ✔ Structural Openings & Penetrations (Temporary or Permanent)
- ✔ Structural Steel & Masonry Erection Support
- ✔ Temporary Access Supports (Swing Stages & Scaffolding, etc.)
- ✔ Temporary Structures
- ✔ Utility Support & Protection



PERMANENT WORKS FOR CONTRACTOR

- ✔ Alternative Designs (Field Conditions, Errors, etc.)
- ✔ Concrete Repair (Procedures & Field Review)
- ✔ Coring reviews
- ✔ Delegated Structural Design (Misc. Metals, Connections, Anchors, etc.)
- ✔ Emergency Engineering Support
- ✔ Forensic Engineering/ Investigations/Assessments
- ✔ Remedial Design
- ✔ Specialty Cladding/ Glazing Peer Reviews
- ✔ Strengthening & Reinforcing for Permanent Condition (Result of Construction Concerns)



QUALITY AND PERFORMANCE SUPPORT

- ✔ Building Envelope Analysis
- ✔ Building Envelope Commissioning
- ✔ Condensation and Thermal Analysis of Details
- ✔ Construction Monitoring
- ✔ Construction Support (CA PM Services)
- ✔ QVE Services
- ✔ Roof Anchor Review
- ✔ Special Inspection Services, Including
 - Building Envelope Material Assembly Inspection (For Warranty, Municipal Requirements, Meet Specification Requirements, etc.)
 - Concrete & Shotcrete Placement Inspection
 - Erection of Precast Concrete Members
 - Field Air Tightness Testing (Glazing Systems, Whole Building)
 - Field Water Penetration Testing (Glazing, Roofing, Waterproofing)
 - Formwork Inspection for Shape, Location & Dimensions of the Concrete Member Being Formed
 - Infrared Thermographic Survey
- Inspection for Maintenance of Specified Curing Temperature & Techniques
- Installation Failure Analysis, Investigation, or Opinion Support
- Monitoring of In-Place Temperatures Per Thermal Protection Plan When Required
- Post-Construction Condition Assessments
- Pre-Construction Condition Assessments
- Reinforcing Steel Inspection, Including Prestressing Tendons
- Third Party Temporary Works Inspection

SHORING & SUPPORT OF EXCAVATION (SOE)

Entuitive provides shoring and SOE services to our Contractor clients, ensuring safe and successful construction from start to finish.

TIME & COST SAVING

Complex structural projects require a tremendous amount of coordination between the temporary and permanent engineers of a construction team. Entuitive's knowledge of construction engineering helps clients avoid breaking down their work into different packages.

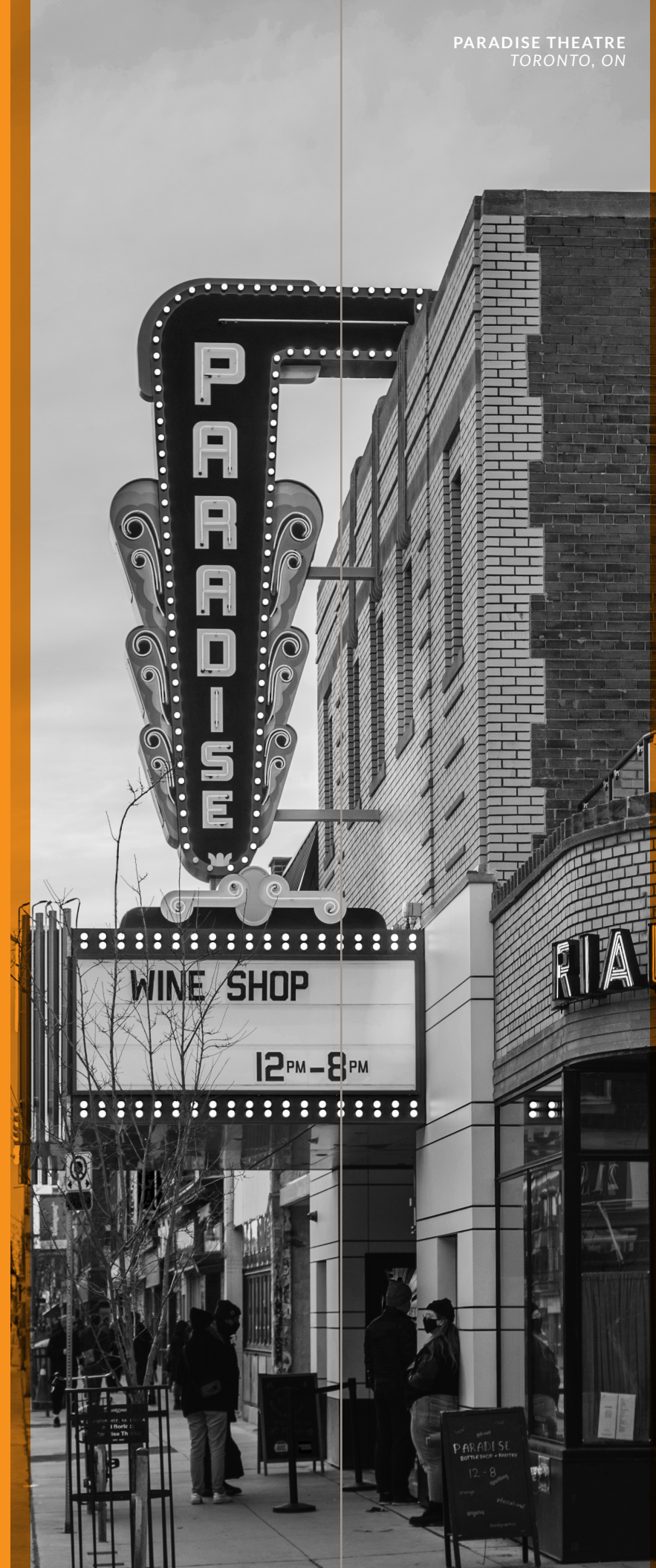
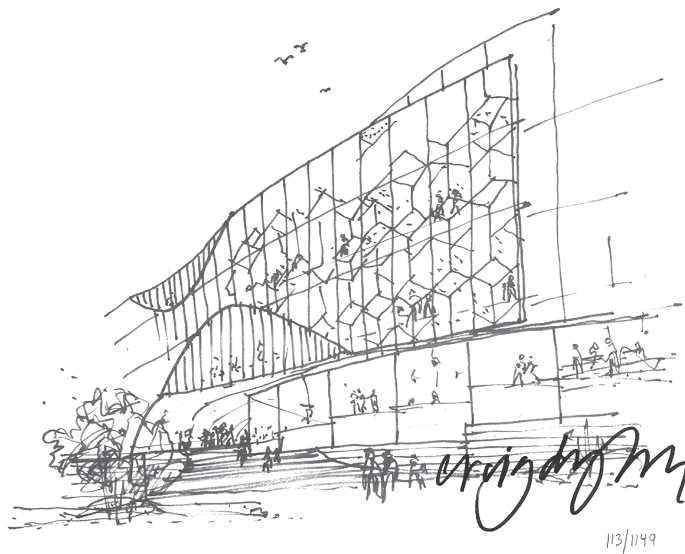
In addition, the integration of temporary shoring structures into permanent structure requires sharing the final liability between both permanent and temporary engineers. Offering both services saves our clients from any potential conflict while reducing the costs and time of two separate contracts.

STREAMLINED CONSTRUCTION

The coordination of both the temporary and permanent structural design by one fully integrated team eliminates the risk of any omission and extra effort. Entuitive can explore and implement the right solution to accommodate the most straight forward construction sequence when building around existing facilities.

MULTIDISCIPLINARY APPROACH

Having one of the most versatile structural teams in the industry, Entuitive can easily leverage the knowledge and experience of different sector and service subject matter experts to accommodate the most efficient and cost-effective solutions for any project.



TEMPORARY STRUCTURES - BUILDING

Whether or not Entuitive is engaged as Base Building Engineer, our team can provide design services for temporary structures as required to facilitate all types of construction.

Our One Company philosophy enables us to deliver projects at a Competitive Fee Advantage. Our work can be incorporated into the permanent structure or act as a standalone structure to be dismantled at the end of construction.

In all cases, Entuitive's extensive Base Building Design experience provides us with the necessary tools and skills to review the impact of the temporary structure on the base structure in addition to the design of the temporary structure if required.

STRUCTURE TYPES INCLUDE

GENERAL CONTRACTOR / CONSTRUCTION MANAGER

- Temporary Stairs & Egress Platforms
- Temporary Hoarding Design & Pedestrian Protection
- Perimeter Protection & Safety Netting
- Grillage Support Structures for Cranes & Hoists

SUBCONTRACTORS

- Concrete Formwork Design
- Design of Load Redistribution Structures to Limit Superimposed Load Pressure On Base Structure
- Design of Self-Climbing Structures (e.g. for Recladding, Formwork, Perimeter Protection)
- Design of Access Platforms to Facilitate Work
- Design of Specialty Rigging for Equipment & Material Repositioning

TEMPORARY MASONRY WALL BRACING

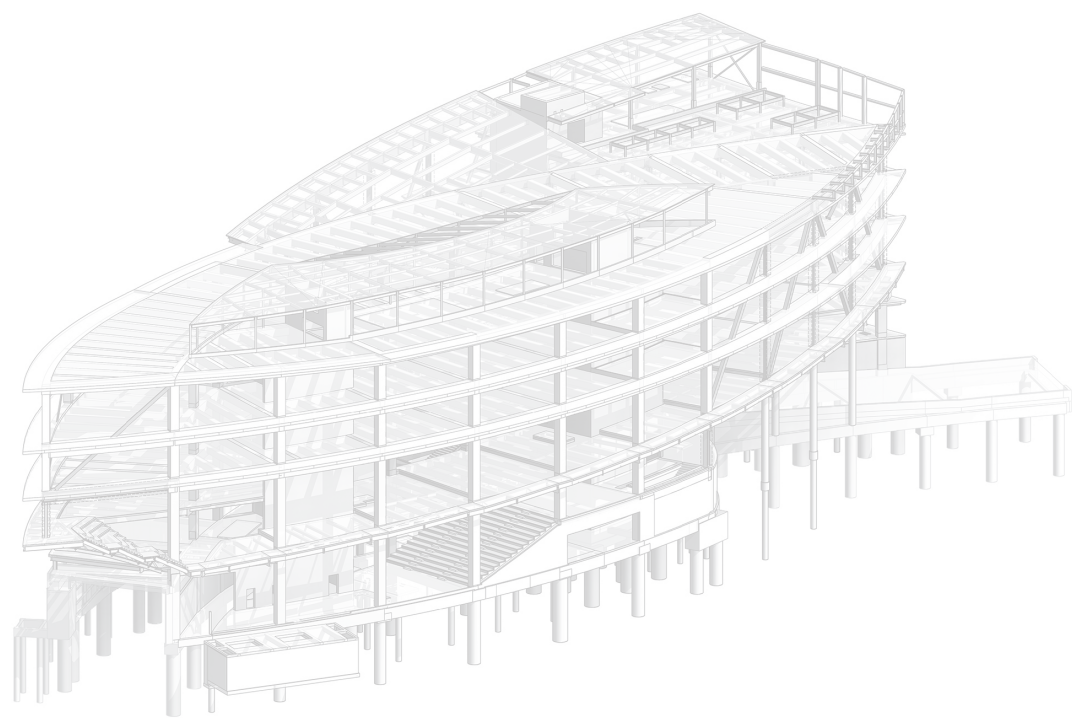
Whether or not Entuitive is engaged as the Base Building Engineer, our team can provide design services for temporary bracing to laterally support masonry walls during erection until the permanent lateral bracing is installed (commonly a steel roof deck diaphragm).

As per the Alberta Occupational Health and Safety Code, an employer must ensure that any masonry wall that is more than 2 metres high during its erection is adequately braced. Masonry walls can be load-bearing or non-load bearing. Typically, load-bearing masonry walls include reinforced cells, which are advantageous in both the permanent and temporary condition.

Bracing solutions include:

- ✔ Pull-pull type bracing, such as cables on both sides of the walls, connected down to soil anchors.
- ✔ Push-pull type bracing, including proprietary steel systems specifically designed to support masonry walls during erection.
- ✔ Push-push type bracing, such as temporary timber bracing on both sides of the walls, connected to concrete blocks on the ground.
- ✔ Unique systems that utilize the base-building structure to temporarily laterally support the wall.

Entuitive understands the base structure and what we can use as lateral support. As the Base Building Engineer, engaged by the General Contractor, Construction Manager, or the Mason, we can perform advanced analysis on the structure to consider elements that are not typically used for lateral support, such as columns.



MANHATTAN WEST PLATFORM
NEW YORK CITY, NY

Project Highlights

SELECTED RELEVANT
PROJECT EXPERIENCE



Challenge

It was essential in the design of the platform to minimize, or completely avoid, disruption of rail service to New York's Penn Station.

Solution

Entuitive developed a design that incorporated deep post-tensioned segmental precast box girders to span 16 tracks, allowing crews to avoid intrusive construction at track level.

The Manhattan West Platform was the first stage in a commercial development project to reclaim 2.6 acres of land over the busiest commuter rail corridor in North America. Completed in 2015, the platform serves as the foundation for a plaza and public space over previously uncovered railway tracks and serves part of a new 5.4 million ft² office development in west Manhattan.

The project required constant coordination with Amtrak and the Long Island Railway, and with the design and construction of Amtrak's new High-Speed Rail terminal at Moynihan Station, directly east of the site.

The project involved the construction of an innovative 240-foot span platform structure using post-tensioned precast technology, a rarity among commercial construction projects. Brookfield Properties retained Entuitive to design the foundations and platform support beams, and to develop the structural design of the long-span platform.

Architect

Skidmore Owings and Merrill (SOM)
Architects

Client

Brookfield Properties

Size

10,500 m² (115,000 ft²)

Role

Structural Engineering Consultant

Budget

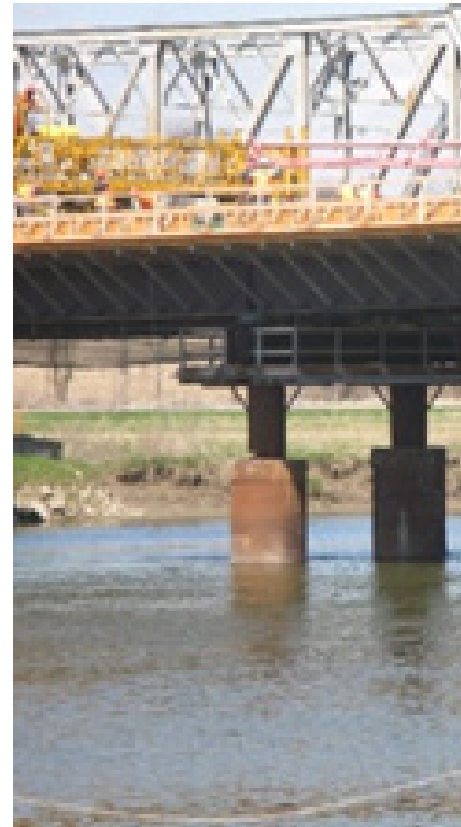
\$200 M

HIGHWAY 3 OVER THE GRAND RIVER CAYUGA, ON



Highway 3 over the Grand River is a bridge replacement project. The existing five-span, 200-metre-long truss bridge was severely deteriorated and full replacement of the superstructure and partial replacement of the foundations was required. The owner elected to use the construction management process to develop the design, with full integration of the construction method. Critical issues on the site were the cost of providing a temporary bridge, limited space due to adjacent archeology-rich lands, and species at risk in the river.

Entuitive worked with Dufferin Construction and the owner to develop the sliding option to permit the use of the permanent bridge superstructure as the detour structure. We then designed the temporary piers and short spans at each end to complete the detour structure. The sliding approach eliminated the need for a temporary superstructure and brought the detour structure as close as possible to the existing structure, significantly reducing the archeological impacts. Entuitive also provided the engineering design for the slide on behalf of the selected structure moving contractor (Western Mechanical).



Owner
Ministry of Transportation Ontario

Prime Consultant
McCormick Rankin Corporation

Client
Western Mechanical
Dufferin Construction

Size
200 m

Role
Bridge Engineering
Construction Engineering

Budget
\$15 M

HIGHWAY 140 CP RAIL REHABILITATION WELLAND, ON



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.

Client
Dufferin Construction

Owner
Ministry of Transportation Ontario

Total Span
200 m

Role
Prime Consultant (Project Manager,
Bridge Engineering & Construction
Engineering Consultant)

Budget
\$7 M

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



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.

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

HIGHWAY 400 & LINE 11 (COULSON ROAD) UNDERPASS TORONTO, ON



This project involved the design, from 30% to final, and construction for replacement of the Highway 400 & Line 11 bridge structure and approaches. The existing structure at Line 11 was a rigid frame bridge with an insufficient span to permit future widening of Highway 400. The project area is at the Highway 400 and Line 11 (Coulson Road) underpass, located south of the Highway 400 and Highway interchange.

Our team's primary function was to provide the structural design of a new bridge that would accommodate the future widening of Highway 400. The new design is a two-span continuous (36.5 m – 36.5 m) two-lane integral abutment bridge. The bridge's superstructure is comprised of 1,600-mm-deep precast concrete NU girders and precast concrete deck panels with a cast-in-place concrete overlay. The substructure was comprised of cast-in-place concrete abutments founded on driven steel H piles and a cast-in-place concrete pier founded on a spread footing in the highway's median. Specific requirements of the design included the provision of heritage elements to replicate features of the original bridge structure. Open metal railings were used on the parapet walls, curved fascia curtain walls were introduced at the pier and both abutments and large precast concrete wall panels imprinted with the Ontario coat-of-arms were inset into each of the wingwalls to achieve the heritage considerations.

Our team also provided full construction support to Dufferin Construction, including the design of the demolition plan for the existing structure, formwork and access platform design, and field presence.

Owner
Ministry of Transportation Ontario

Primary Consultant (Client)
Ainley Group

Contractor
Dufferin Construction

Total Span
36.5 m

Role
Bridge & Construction
Engineering Consultant

Budget
\$4 M

FINCH LRT - KEELE AND HUMBER STATIONS AND CP RAIL TUNNEL

TORONTO, ON



The Finch LRT stations at Keele and Humber College are below grade facilities. At Keele the station is entirely below grade with Finch Avenue on a roof structure, and the TTC Subway station immediately below the track level. The concourse level of the Keele station is below the track and level with the underside of the TTC box. Limited unwatering is possible at the Keele station, requiring a watertight excavation. The temporary structure will be incorporated into the permanent structure at both stations.

The CP Tunnel is a crossing under the CP mainline double track. The work will be completed using shoring and trestle spans installed during short term closures, followed by excavation below the trestle to facilitate tunnel box construction. This is very similar to one of the possible construction methods at the East Don.

Services Provided

Brown & Co provided support of excavation and temporary structure design services for three components. The work on these projects is ongoing at this time.

Challenge

The principal challenge for the support of excavation design in all three cases is to provide a shoring system that is both cost effective and meets the stringent deflection criteria for this type of work. The work also must be carefully co-ordinated with the permanent structure design to facilitate its integration.

Solution

Brown|CO has achieved both goals through the application of sophisticated analysis, careful development of staging and careful review of constructibility requirements. Developing the staging for the CP Tunnel was particularly complex because of the very limited closures available and the concerns with track movement.

Owner
Metrolinx

Client
Mosaic Transit Group

Role
Structural Engineering
Construction Engineering

NIPIGON RIVER BRIDGE

NIPIGON, ON



Highway 17 at Nipigon is a major bridge on the Trans Canada Highway. The existing bridge was a four-span steel girder bridge with a total length of 260 metres and a maximum span of 82 metres.

The bridge was demolished to accommodate the new span at the site. Western Mechanical were retained by Priestly Demolition to remove the existing structure with a reverse launch procedure.

Entuitive was retained by Western Mechanical to complete the analysis to confirm the structure at all stages of the reverse launch. Our team developed all of the strengthening details required for the existing structure due to the changing support condition, determined the required cable staging forces to support the cantilever through all phases of the reverse launch, determined the sequencing of concrete removals to maintain adequate ballast, and reviewed the interface between the reverse launch hardware and existing structure. Western Mechanical designed the reverse launch equipment in house.

Owner
Ministry of Transportation Ontario

Prime Consultant
Western Mechanical

Client
Western Mechanical

Size
260 m

Role
Bridge Engineering
Construction Engineering

MOUNT DENNIS STATION TORONTO, ON



Construction of the Eglinton Crosstown LRT at the Mount Dennis station required installation of two new precast LRT tunnels beneath four active rail lines. To facilitate this construction Entuitive was retained to design select support of excavation systems (SOE) and a temporary rail bridge to cross the excavation at the site.

Due to the defined staging and the large size of the precast units, installation of a conventional shoring wall did not permit for connection of the tunnels across the interface between the construction stages. An approximately 9m high precast concrete, modular retaining wall system was designed which allowed for full access to the ends of the new tunnels after the first phase of work was completed. The retaining wall was installed with backfilling operations in the first phase of work and utilized post-installed vertical reinforcement with grouting. The wall was stabilized with multi-level tie backs to deadman anchors to support the surcharge from three active rails in the second phase of work.

A temporary bridge was designed to carry an active rail line over the precast tunnels during the second phase of work. The temporary bridge was an approximately 24m long, two-span steel plate girder structure. The temporary bridge was founded on piles and utilized an adjacent permanent bridge for support of traction and braking loads.

Owner
Metrolinx

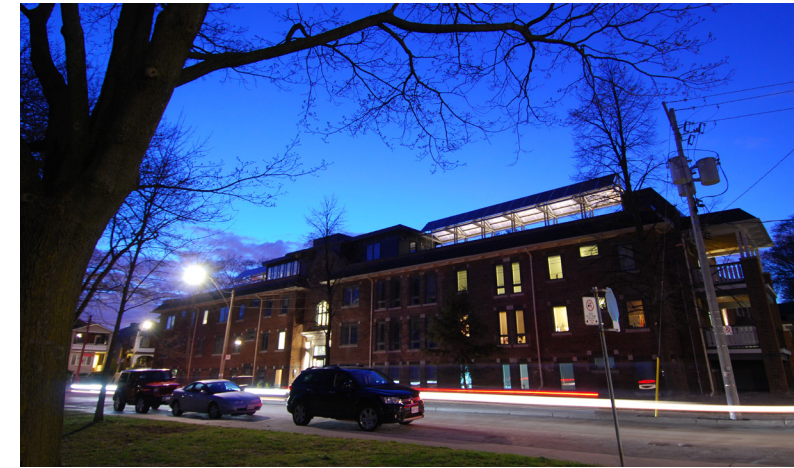
Prime Consultant
Crosslinx Transit Solutions
Construction

Contractor
Western Mechanical

Total Span
24 m

Role
Structural Engineering Consultant

42 HUBBARD BLVD TORONTO, ON



The Toronto Housing apartment complex at 42 Hubbard Blvd was originally constructed in the 1920s with masonry walls and timber floor framing. The building developed mold problems and required complete reconstruction of the interior framing. The concept developed for the proposal and successfully developed in the completed structure included complete removal of the interior framing, lowering the basement, underpinning the walls, reconstructing the floors with Hambro joists and adding a partial 4th floor.

The structural challenges included stabilization of the existing masonry walls to facilitate the full framing removal, evaluation and reinforcement of existing masonry wall shear walls, and micropile support of existing walls. The support system for the existing walls could only be anchored in the interior of the building because of extremely limited setbacks from the property line on the north side. The system also had to be designed to allow for simple installation of the Hambro joists and removal of the framing with limited crane assistance.

Architect
Van Elslander Carter Architects

Client
Toronto Community Housing

Role
Structural Engineering Consultant

FOUNTAIN STREET BRIDGE CAMBRIDGE, ON



Challenge

The project included the conceptual and detailed schematic design of the demolition procedure for the existing concrete box structure over the Grand River. The bridge had to be carefully dismantled to avoid adversely affecting the river's ecosystem.

Solution

Our team developed a demolition strategy that did not rely on access from the river to meet environmental restrictions on in-water work. The developed solution included a sequence of structure removal and stabilization.

Client

Region of Waterloo

Total Span

150 m

Role

Structural Engineering Consultant

Budget

\$14 M

Awards

2019 Award of Excellence - Consulting Engineers of Ontario

The Fountain Street Bridge in Cambridge, Ontario, was a replacement project for the original bridge built in 1957. The existing bridge was a four-span continuous haunched concrete four-cell voided slab bridge on wall piers. The project included the evaluation of the existing structure and assessment of various rehabilitation and replacement options, as well as preliminary and detailed design.

Due to the condition of the structure and the difficulty in rehabilitating this type of structural system, the best option was found to be the replacement of the superstructure. A new haunched steel girder sympathetic to the shape of the existing structure was used. The existing piers were rehabilitated and maintained for the new bridge, with rock protection added to protect from scour. New semi-integral abutments were constructed and set back further from the riverbanks to improve the hydraulic opening.

To address the high water levels at the bridge, the new bridge and road profile were raised by 600 mm. Cultural heritage assessment and protection of the natural environment were also important aspects of this project. Contract administration and engineering services during construction were also part of this assignment.

FAIRWAY ROAD BRIDGE OVER THE GRAND RIVER KITCHENER, ON



Challenge

The bridge superstructure was to be constructed over the Grand River valley without any major shoring system over the water portion.

Solution

The main span of the bridge was constructed by the method of segmental bridge construction. Our team was responsible for the detail design of the segmental construction sequencing and the accounting of all relevant staged construction variables, including bridge launching machine loads, setting screed elevations to account for segmental cantilever deck deflections, PT jacking loads, and PT sequencing.

The two end span segments of the bridge were constructed over conventional shoring and formworks. Our team was responsible for the design of the high-load shoring system and related formworks.

Owner

City of Kitchener
Region of Waterloo

Prime Consultant

McCormick Rankin

Contractor

Aecon Group Inc
Torbridge Construction

Total Span

247 m over land and water

Role

Bridge Engineering
Construction Engineering

Budget

\$51 M (bridge and access road)

Awards

2013 Ontario Concrete Award - Cast-in Place Category

This project involved the construction of the Fairway Road multi-span bridge segments that link Fairway Road in east Kitchener to Kossuth Road in north Cambridge, spanning 247m meters over land and the Grand River. Our team provided full construction engineering support services to Aecon Torbridge for the erection of this prestressed post-tensional cast-in-place segmented concrete bridge.

FREDERICKHOUSE RIVER BRIDGE

TORONTO, ON



Brown & Co. Engineering Ltd. designed the special equipment and the work sequence required to remove the Frederickhouse River truss bridge from its piers to permit its demolition on shore.

The work required the development of a detailed work plan to identify all temporary support conditions, evaluation of the truss for each of the conditions and strengthening of the truss as required. A critical component of the work was the detailed evaluation of the weight of the existing structure to ensure that sufficient flotation was available and the capacity of all temporary support components were sufficient for the loads. The construction stage design components included a custom lifting frame to lift the truss approximately 4 m, a barge mounted support frame and a rollway mounted on the existing approach spans. This work was presented along with two other sequential deconstruction projects at a CSCE conference in 2006.

Client
AECON Construction

Owner
Ministry of Transportation Ontario

Role
Construction Engineering Consultant

SCARBOROUGH GO STATION EXPANSION

SCARBOROUGH, ON



Accessibility improvements at the Scarborough GO Station included the installation of new pedestrian tunnels beneath existing rail tracks and new stairways and elevators to access existing platforms. Entuitive (formerly Brown & Co) was retained to complete the structural design of these subgrade components and to design the temporary support of excavation (SOE) system to facilitate their construction.

The SOE system was designed using soldier pile and lagging framing. Supported excavation depths at the site varied from approximately 2.0m to 8.0m. A variety of systems were used to support the excavation; cantilever, strutted, single layer tie-back, and multi-layer tie-back. Depending on the position within the site, the SOE system considered the surcharge loading from multiple rail lines or vehicular traffic directly adjacent to the shoring walls.

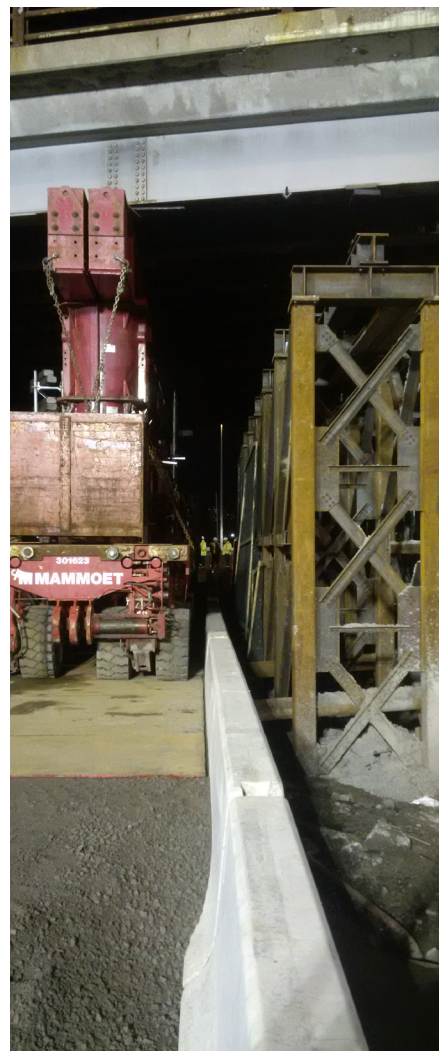
Owner
GO Transit

Prime Consultant
Chisholm, Fleming & Associates

Contractor
Dineen Construction

Role
Structural Engineering Consultant

LEES AND RIVERSIDE REPLACEMENT OTTAWA, ON



Challenge

To remove and replace underpass bridge superstructures while minimizing Hwy 417 closure time.

Solution

Remove and install bridge superstructures via Self Propelled Modular Transporter (SPMT's) rapid replacement technology. Each instance of bridge rapid removal and replacement was completed within the very short time frame of two overnight highway closures.

The installation of the new Lees Ave Underpass on Hwy 417 was completed by the rapid lift of a prefabricated twospan continuous steel bridge superstructure from the staging area to the permanent location. This stage of construction had the distinction of involving the heaviest superelevated bridge units (2100 tonnes) in North America at the time using Rapid Lift Technology.

The removal and replacement of the Riverside Dr Underpass on Hwy 417 required the rapid lift of a new two-span continuous concrete bridge superstructure between staging area and the permanent location.

As part of Ottawa's Light Rail Transit project, the existing underpass bridges at Lees Avenue and Riverside Drive required rapid removal and replacement with new structures to allow for the widening of Hwy 417.

Owner
City of Ottawa

Prime Consultant
McCormick Rankin

Client
Tomlinson Group & Mammoet

Size
Lees Ave Underpass: 87 m structure on SPMT's
Riverside Dr Underpass: 57 m structure on SPMT's

Role
Bridge Engineering
Construction Engineering

QEW OVER CREDIT RIVER MISSISSAUGA, ON



The existing concrete arch deck spans and floor beams of the QEW Bridge over the Credit River were deteriorated and required significant rehabilitation. Completing the necessary rehabilitation works would typically occupy traffic lanes using conventional construction methods.

Maintaining full traffic lanes across the structure during the rehabilitation works was critical for not increasing congestion on the QEW and was a mandated requirement for the project. Additionally, environmentally sensitive areas beneath the existing structure limited potential construction access.

Entuitive was retained to develop a method of under deck support and an access plan that allowed full access to remediate the existing structure while maintaining full traffic on the bridge with limited disturbance to the wetlands beneath.

We developed a new "construction access deck" below the existing structure, supported on the tie beam between the arches. The "construction access deck" was a steel girder bridge with four 45-metre spans that allowed for the heavy construction equipment required for the bridge rehabilitation to access the work zones. The new structure was launched into place by incrementally building it from the existing structure's west abutment. Once landing on the eastern pier of the existing arch bridge, the completed deck was jacked 5 metres vertically into its final position.

Owner
Ministry Transportation Ontario

Prime Consultant
SNC Lavalin

Client
SNC Lavalin

Size
188 m

Role
Construction Engineering
& Schematic Design

Budget
\$1.8 M

YONGE- EGLINTON STATION UNDERPINNING TORONTO, ON



As part of construction works for Eglinton Station on the ECLRT Project, the existing structures located below the Yonge and Eglinton intersection must be verified for the construction equipment loads working in its vicinity. The tunnel lies within the excavation footprint of the new ECLRT station and must be verified to assure the public safety prior to the commencement of vertical drilling operations for Support of Excavation (SOE). Vertical elements of the SOE consist of a combination of secant pile wall, soldier pile and lagging, and jet grouting, and as such, heavy construction equipment will operate on existing grade at street level and above the structures.

As part of the Eglinton Crosstown LRT (ECLRT), the existing TTC subway unit Y3376 at the Yonge-Eglinton intersection will be supported during excavation and construction for the new ECLRT line. There are in total six (6) girders which will jack the unit at seven locations in order to compensate for the loss of soil support and transfer these forces to the main girders and caisson piles. Construction of the underpinning structure will be done in stages. At each stage the subway structure and excavated soil should be sufficiently supported to satisfy the existing capacities and TTC requirements. This task includes propping the excavated trenches for needle beams, define the jacking sequence at each stage as well as series of shotcrete and micro piles walls to support the excavation.

THE WELL - CONCRETE COLUMN REMEDIATION TORONTO, ON



The Well is a mixed-use development currently under construction in downtown Toronto. During construction, compressive strength testing of the concrete performed by a third party identified several columns that tested below specified compressive strengths. Further in-situ core sample testing returned similar results. Entuitive has been retained to perform structural analysis to assess the adequacy of the columns with the reduced concrete strength and design remedial repairs as required.

Challenge

The concrete used in a number of columns did not achieve the designed compressive strength of 70 Mpa.

Solution

A number of columns had already been replaced, though some could not be replaced due to scheduling and because other structures above them had already been constructed. As such, our team proceeded with structurally strengthening those columns either via FRB wrapping or enlargement.

Architect

Adamson & Associates Architects

Client

Deltera Inc.

Size

3 million ft²

Role

Remedial Construction Engineering

LEED® Certification

Targeting LEED® Platinum/Gold



550 WASHINGTON REDEVELOPMENT NEW YORK, NY



550 Washington was constructed in the 1930s as St. John's Terminus, the depot for the rail tracks that are today's High Line. The building's redevelopment will create a new high-performance, health and wellness commercial office building, described as a "workplace of the future."

The 1.1 million ft² building will include commercial, retail, and ground floor event space. A new nine-storey addition will be constructed on top of a renovated existing three-storey podium structure (12-storey plus penthouse in total). The building's green rooftops and recessed terraces will offer views of the Hudson and New York City skyline. The site/building is located in the AE Flood Zone.

Challenge

550 Washington's initial programming has little connection to its use as an office building. However, retaining the authenticity of this unique building is paramount to creating an honest structure that will attract prestigious tenants.

Solution

Reviewing archived drawings and testing existing materials was a critical first step toward understanding the existing building's capacities. Through close collaboration with the architect, MEP engineer, owner, and contractor, Entuitive proposed solutions that maintain and expose a significant amount of the structure. While this is most evidenced by the exposed north portal entry, it was equally as important to maintain the existing deep foundations that were constructed below the watertable.

Architect

Adamson Associates Architects (Executive Architect);
COOKFOX (Design Architect)

Client

Oxford Properties

Size

102,193 m² (1,100,000 ft²)

Role

Structural Engineering Consultant

LEED® Certification

Targeting LEED® Platinum and WELL Certification for Core/Shell

AMERICAN DREAM - WATER PARK EAST RUTHERFORD, NJ



The American Dream project is a \$5 billion retail and entertainment complex totaling 5 million ft² in East Rutherford, New Jersey. The mega-mall and complex includes the largest indoor water park in North America.

Developer

Triple 5 Group

Client

UCC Group

Size

24,100 m² (260,000 ft²)

Role

Construction Support

Budget

\$250 M

Challenge

The project presented many challenges, including the poor soil supporting the building and construction activity, the finely interwoven scheduling between construction trades, and the high level of planning and coordination required due to lack of repetition in the building design.

Solution

Entuitive was originally engaged to provide on-site technical coordination and change management support to the concrete subcontractor performing the work for the water park.

Over time, the role evolved to include the following construction support activities:

- All technical document management, coordination, and distribution (RFIs, submittals, etc.).
- Determining planning, sequencing, and logistics requirements in order to inform and meet the project schedule.
- Developing value engineering alternatives for the client and liaising with the design team for approval of the same.
- Labor and manpower tracking and forecasting.
- Development and deployment of QC program, and coordination with building inspectors.
- Project invoicing and third-tier subcontract management.
- Documentation and substantiation of change order requests. Daily engineering assistance to field labor to minimize lost time and coordinate disparate activities and priorities

PARADISE THEATRE RESTORATION & CONSTRUCTION ENGINEERING TORONTO, ON



Originally built in 1937, the Paradise Theatre served the community around Bloor Street West and Westmoreland Avenue for decades. The heritage building and the adjacent single-storey retail annex are undergoing renovations to restore and convert the existing theatre into an event space, add a second storey and exterior terrace to the retail annex, and renovate the retail area to accommodate a restaurant.

The façade of the structure was protected by heritage designation, and the retention of the façade presented challenges to the contractor with respect to staging of the work. The developer retained Entuitive to assist the contractor in engineering a façade retention structure that was coordinated with the demolition sequence for the interior structure. Entuitive also investigated and specified repairs to deteriorated structural elements as necessary to reinstate the safe load-carrying capacity of the existing structure, and to accommodate the new structure and new interior finishes.

In addition, our team worked with the contractor to develop an excavation shoring scheme to allow adjacent roadways to remain open while waterproofing existing rubble foundation walls.

Challenge

At the roof level on the east façade of the structure there is a curving brick band that has been designated by the City of Toronto to have high heritage value. Preserving the brick band presented major structural challenges, since much of the foundation wall and ground floor structure below had to be removed and reconstructed.

Solution

Entuitive worked closely with the heritage preservation consultant to design a façade retention shoring system to preserve this masonry. The design of this shoring also had to be carefully coordinated with the steel erector, foundation underpinning contractor, and concrete contractor, to establish a design that would not impact construction sequence for the restoration and addition work.

Architect

Ware Malcomb

Client

Craft Development Corporation

Size

260,000 ft²

Role

Structural Restoration Consultant

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 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 offramp, 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 that facilitated both the analysis and the drawing production. Sixtysix removal and erection plans were detailed, using cranes with capacity between 145 and 200 tonnes to replace 1.15 km of the Gardiner Expressway.

Owner

City of Toronto

Client

AECON

Size

1.15 km, 66 spans

Role

Structural Engineering Consultant



FREDERICKHOUSE RIVER BRIDGE
TORONTO, ON

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



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
Central Avenue Bridge Temporary Pier Design and Lateral Slide	Fort Erie, Canada	Hwy 17 over Nipigon River Bridge De-Launching
Daviselm Bridge	Brampton, Canada	Hwy 410 Bridge Jacking
Eglinton Crosstown LRT Chaplin Station Temporary Traffic Deck and Formwork Design	Toronto, Canada	Hwy 7 at Brock Road Falsework Design
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
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
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
Highway 12 over Coldwater River Falsework Design, Roadway Protection, Bridge Jacking, and Temporary Access Deck		Mountain Ash Road South Bridge
Highway 12 over Wye River Falsework Design, Roadway Protection, and Bridge Jacking		Ninth Line over Little Rouge Creek
Highway 140 - CNR/CPR	Ontario, Canada	Norwich Avenue over Highway 401 Falsework Design, Formwork Design, Access Platforms, and Girder Stabilization
Highway 400 and 10th Line (McKay Road) Underpass Bridge Replacement	Barrie, Canada	QEW over Bronte Creek Sequential Demolition Analysis, Falsework Design, and Access Platforms
Highway 400 and Line 11 (Coulson Road) Underpass Bridge Replacement	Toronto, Canada	QEW over Credit River Bridge
Highway 400 NB over Highway 407 Jacking and Bearing Replacement		Reesors Road Bridge
Highway 400 SB over Highway 407 Jacking and Bearing Replacement		Removal of Nipigon River Bridge
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
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.



MIKE HILLCOAT, P.ENG., CCCA
PRINCIPAL

*Project led by Mike Hillcoat while employed at a previous firm.

Our cities are growing faster than the infrastructure required to support them. We need commitment from all levels of the planning and design community to present forward thinking solutions to prepare our cities for this growth. Reclaiming valuable urban land through rail overbuild, structures, and rehabilitating and rejuvenating existing deteriorating buildings, are areas where a structural engineer with a strong appreciation of constructability can make a valuable contribution to sustainable urban growth.

Passionate about improving public infrastructure, and engaging on projects that make positive contributions to renewing and rehabilitating our cities, Mike acts as project manager for Entuitive's transportation sector and building restoration service in Toronto.

Mike has extensive experience in the rehabilitation of existing structures, and leads Entuitive's Building Restoration group in Toronto. This experience includes the renovation and restoration of schools and institutional buildings, parking structures, residential buildings, office buildings, and transportation structures. He understands the importance of developing designs that can be constructed with minimum impact on existing operations.

Mike also brings over 23 years of experience in construction contract administration and has acted as resident engineer on a number of projects in Canada and the US. He is a Certified Construction Contract Administrator and has a true appreciation of the needs of all parties involved in the design and construction process.

Before his current focuses on transportation and restoration, Mike's worked on a broad range of projects in the commercial, retail, hospitality, cultural, healthcare, sports and education sectors.

EDUCATION

Bachelor of Engineering Science, University of Western Ontario

MEMBERSHIPS

Professional Engineers Ontario (PEO)
 International Concrete Repair Institute (ICRI) – Toronto Chapter
 CSA S413 – Parking Structures Code Committee
 Construction Specifications Canada
 American Institute of Steel Construction
 CSA S413 “Parking Structures” Code Committee

AWARDS

ACI NJ Chapter – Grand Award Winner – American Dream - Water Park
 ACEC Engineering Excellence: Diamond Award for Structural Systems Manhattan West Platform, 2015
 Award of Excellence, Canadian Architect, Union Station - GO Roof, 2012
 Ontario Concrete Award for Structural Design Innovation, Niagara Fallsview Casino Resort Hotel, 2004

PROJECT EXPERIENCE

COMMERCIAL

First Canadian Place – Window Washing Track and Roof Replacement	Toronto, ON
131 Queen Street*	Ottawa, ON
Battery Park City Commercial Tower*	New York, NY
Bay Adelaide Centre West Tower*	Toronto, ON
College Park – Renovations*	Toronto, ON
MaRS – Phase II*	Toronto, ON
MGCS Data Centre*	Guelph, Canada
Toronto Life Square*	Toronto, ON
TransCanada Tower*	Calgary, AB

HEALTHCARE

Belleville Hospital Renovation*	Belleville, Canada
Campbellford Health Centre*	Campbellford, Canada
Joseph Brant Memorial Hospital*	Burlington, Canada
Runnymede Health Care Centre*	Toronto, ON
Trenton Memorial Hospital*	Trenton, Canada
Trillium Health Centre – Colonel Sanders Family Care Centre*	Mississauga, Canada
Trillium Health Centre – Queensway Site Addition*	Toronto, ON
West Park Long Term Care Centre*	Toronto, ON

HERITAGE RESTORATION

Colonel Sam Smith Powerhouse Restoration,	Toronto, ON
Massey Hall – Masonry Restoration	Toronto, ON
Ed Mirvish Theatre – Bridge Stabilization	Toronto, ON
Hamilton GO Centre Building Rehabilitation	Hamilton, Canada
Metrolinx Restoration of Heritage Signal Towers	Toronto, ON
Paradise Theatre Restoration	Toronto, ON
St. Leo's Catholic Elementary School – Roof Structure Stabilization	Toronto, ON
Union Station Enhancement Project	Toronto, ON
Bay Adelaide Centre West Tower*	Toronto, ON
Rotman School of Management*	Toronto, ON
TELUS Centre Royal Conservatory of Music*	Toronto, ON
Union Station – Atrium and Train Shed Rehabilitation*	Toronto, ON

HOSPITALITY

Casino Niagara Renovations*	Niagara Falls, Canada
Fallsview Blvd. Pedestrian Bridge*	Niagara Falls, Canada
Niagara Fallsview Casino Resort*	Niagara Falls, Canada

INSTITUTIONAL

Correctional Worker's Monument at Queen's Park	Toronto, ON
Crescent Town School Additions*	Toronto, ON
École Secondaire Gabriel Dumont*	London, Canada
École Secondaire de Windsor*	Windsor, Canada
Father Michael McGivney School*	Brampton, Canada
Gabriel Dumont High School*	London, Canada
Harvie Road School*	Barrie, Canada
Holy Family School*	Brampton, Canada
Holy Spirit School*	Bolton, Canada
J. Clarke Richardson and Notre Dame Catholic S.S.*	Ajax, Canada
Japanese Canadian Cultural Centre*	Toronto, ON
King City Public School*	King City, Canada
Queen Elizabeth Public School*	Oshawa, Canada
Rotman School of Management*	Toronto, ON
Royal Botanical Gardens*	Burlington, Canada
Springdale Elementary School*	Brampton, Canada
St. Joseph's Catholic Elementary School*	Guelph, Canada
TEL Centre at York University*	Toronto, ON
Thornhill Woods School*	Thornhill, Canada
Trinity College – Le Van Hall*	Port Hope, Canada
University of Toronto, Graduate Residence*	Toronto, ON
University of Toronto – Mississauga Campus – Film School*	Mississauga, Canada
UOIT / Durham College – South Wing*	Oshawa, Canada
Victoria University Student Centre*	Toronto, ON

OVERCLADDING & ENERGY UPGRADES

500 MacNab Street North	Hamilton, Canada
TCHC ReSet – 3847 Lawrence Ave. East	Toronto, ON
TCHC ReSet – 4301 Kingston Road	Toronto, ON
TCHC ReSet – Lawrence Orton Park	Toronto, ON

RESIDENTIAL

Papillon Place Waterproofing Repairs	Mississauga, Canada
Alexandra Gate Condominium*	Toronto, ON
Concord CityPlace - Panorama Condominium*	Toronto, ON

SPORTS & RECREATION

Air Canada Centre Expansion*	Toronto, ON
BMO Field – North Grandstand*	Toronto, ON
Niagara Falls Community Centre*	Niagara Falls, Canada

PROJECT EXPERIENCE CONT'D

STRUCTURAL RESTORATION

33 Bloor St. E., Parking Restoration	Toronto, ON
80 Port St. Structural Restoration	Mississauga, Canada
243-255 Consumers Road Restoration	Toronto, ON
Algonquin Ridge Elementary School Restoration	Barrie, Canada
Delta Hotel Montreal – Podium Restoration	Montreal, Canada
Dufferin Peel Catholic District School Board - Restoration of 14 Schools	Ontario, Canada
First Canadian Place – Window Washing Track and Roof Replacement	Toronto, ON
Noor Cultural Centre Restoration	Toronto, ON
Ontario Place – Cinesphere Ramp Restoration	Toronto, ON
Ontario Place – PODS Interior Renovations	Toronto, ON
Parkway Place – Concrete Restoration	Toronto, ON
St. Hilda's Towers	Toronto, ON
TCHC Reset	Toronto, ON
3847 Lawrence Avenue East – Energy Improvements and Envelope Repairs	
3947 Lawrence Avenue East – Balcony Restoration and Envelope Repairs	
4301 Kingston Road – Structural Restoration and Envelope Repairs	
Lawrence-Orton Daycare	
Lawrence/Orton Restoration	
TPA Carparks 36 and 52 – Restoration	Toronto, ON
University of Toronto – 89 Chestnut Parking Garage Restoration	Toronto, ON
Yorkville Village - Parking Garage Condition Assessment and Restoration	Toronto, ON
Union Station – Platform Reconstruction and Stair Enclosures*	Toronto, ON
Various GO Stations – Pedestrian Tunnel Rehabilitation*	Toronto, ON

TRANSPORTATION

Hamilton GO Centre – Facility Audit	Hamilton, Canada
Long Beach GO Station Renovation*	Toronto, ON
Manhattan West Platform	New York, NY
TPA 36 and 52 Condition Assessment and Repairs	Toronto, ON
Union Station Pedestrian Tunnel	Toronto, ON
VIVA Bus Operations, Maintenance, and Storage Facility	Richmond Hill, Canada
Union Station – Atrium and Train Shed Rehabilitation*	Toronto, ON
Norfolk Naval Ship Yard*	Norfolk, USA
TTC Leslie Subway Station*	Toronto, ON
Union Station – Vertical Access Improvements*	Toronto, ON



UNION STATION ATRIUM & TRAINSHED REHABILITATION
TORONTO, ON



RANDY THESEN, M.ENG., P.ENG.
PRINCIPAL

*Project led by Randy Theseen while employed at a previous firm.

“ In my area of the firm, each project is about making an existing structure better. It’s rewarding work - you’re always making a positive difference, and it’s satisfying to have a client who appreciates their improved or restored building. ”

Randy is the leader of Entuitive’s structural restoration services, and also leads the special projects and renovations group in the Calgary office.

He has been involved in thousands of building improvement projects with over 15 years of experience in a wide variety of building types, including institutional, academic, healthcare, retail, commercial and residential structures.

Virtually all of Randy’s projects involve facilities that are operating, a challenge Randy gladly accepts. He applies his project management skills to schedule creatively, using his skills as project leader to develop innovative engineering solutions with his team. Equally important, it’s an opportunity for Randy to practice what he particularly enjoys – collaborating with building owners and managers, architects, tenants, developers, consultants and contractors.

PROJECT EXPERIENCE

HOSPITALITY

Banff Gondola Upper Terminal Investigation	Banff, Canada
Blackfoot Inn Wall Opening Framing	Calgary, Canada
Blue Devil Golf Course Light Foundations	Calgary, Canada
Clearwater Hotel Porte Cochere Review	Fort McMurray, Canada
Coast Plaza Hotel Tieback Anchor Review	Calgary, Canada
Delta Bow Valley Hotel parkade restoration	Calgary, Canada
Delta Edmonton South parkade restoration	Edmonton, Canada
Edmonton City Centre East parkade peer review	Edmonton, Canada
Elbow River Casino Envelope Repairs	Calgary, Canada
Lake Louise Pool Deck Structural Investigation	Lake Louise, Canada
Rimrock Hotel – Condition Assessment	Banff, Canada
Sheraton Skylight Replacement	Calgary, Canada

PROJECT EXPERIENCE

COMMERCIAL

4th & 4th – Tieback Anchor Review	Calgary, Canada
310 – 8th Avenue SW Structural Assessment	Calgary, Canada
510 – 5th Street SW Exterior Condition Assessment	Calgary, Canada
820 – 28th Street NE Structural Modification	Calgary, Canada
840 – 7th Avenue SW Flood Assessment	Calgary, Canada
840 – 7th Avenue SW Parkade Structural Assessment	Calgary, Canada
840 – 7th Avenue SW Post-Tension System Update	Calgary, Canada
840 – 7th Avenue SW Tenant Renovation	Calgary, Canada
7070 Farrell Road SE Structural Assessment	Calgary, Canada
9705 Horton Road SW Roof Load Review	Calgary, Canada
Airport Corporate Centre Sign Review	Calgary, Canada
Airport Corporate Centre Tieback Anchor Review	Calgary, Canada
Atrium I & II Post-Tension Update	Calgary, Canada
Atrium I Plaza Restoration	Calgary, Canada
Blackfoot Inn Wall Opening Framing	Calgary, Canada
The Bow Base Building Modifications and Tenant Improvements	Calgary, Canada
Braithwaite Boyle Centre Post-Tension System Update	Calgary, Canada
Brookfield Place Cenovus Tenant Improvement	Calgary, Canada
Brookfield Place Scotia Bank Improvement	Calgary, Canada
Calgary Courts Centre Tieback Anchor Review	Calgary, Canada
Calgary International Airport Control Tower Fall Protection	Calgary, Canada
Centron Place Exterior Sign Review	Calgary, Canada
Country Hills Revitalization	Calgary, Canada
Fifth Avenue Place Site Safety Plan	Calgary, Canada
Foothills Professional Centre Vibration Review	Calgary, Canada
McFarlane Tower Exterior Building Condition Assessment	Calgary, Canada
McFarlane Tower Exterior Cladding Assessment	Calgary, Canada
McFarlane Tower Exterior Condition Assessment	Calgary, Canada
Northwest Centre I Load Review	Calgary, Canada
Rocky Mountain Plaza Exterior Condition Assessment	Calgary, Canada
Rocky Mountain Plaza Exterior Plaza Restoration	Calgary, Canada
Rocky Mountain Plaza Roof Opening Infill	Calgary, Canada
Rocky Mountain Plaza Tieback Anchor Installation	Calgary, Canada
Rockyview Professional Centre Slab Removal Review	Calgary, Canada
Rogers Data Centre	Airdrie, Canada
Roslyn Building Tieback Anchor Installation	Calgary, Canada
Scotia Centre Entrance Sign Frame	Calgary, Canada
Scotia Centre Parkade Condition Assessment	Calgary, Canada
Scotia Centre Tenant Improvement	Calgary, Canada

Shaw Global Renovation	Calgary, Canada
Shenandoah Parkade Review	Washington, USA
SMART Technologies Equipment Load Review	Calgary, Canada
Stock Exchange Tower Parkade Maintenance	Calgary, Canada
Sunlife Plaza – Podium Renovation	Calgary, Canada
TELUS House Renovation	Calgary, Canada
TransCanada Pipelines Tower Generator Replacement	Calgary, Canada
XL Foods Structural Review	Brooks, Canada

CULTURAL

17 Avenue Extension/ Stampede Trail	Calgary, Canada
96th Avenue Light Ring	Calgary, Canada
City of Calgary Oarsman Sculpture Restoration	Calgary, Canada
Eamon’s Sign	Calgary, Canada
Kinsmen Park Dome Sculpture	Saskatoon, Saskatchewan
Manitoba Plaza Cones Sculpture	Vancouver, Canada
Mill Street Art	Toronto, Canada
National Music Centre Exhibit Design	Calgary, Canada
St. Stephens Church Renovation	Calgary, Canada
Strathmore Church Investigation	Strathmore, Canada
TELUS Spark play structure peer review	Calgary, Canada
Waskasoo Park Signage	Red Deer, Canada

HEALTHCARE

8th & 8th Medical Centre Parkade Evaluation	Calgary, Canada
Cardston Taber, and Crowsnest Pass Hospitals Operating Room Lights	Blairmore, Canada
Foothills Medical Centre Ground Floor Renovation	Calgary, Canada
Foothills Medical Centre MRI Load Review	Calgary, Canada
Highriver Hospital Elevator Review	Highriver, Canada
Highriver Hospital Flood Review	Highriver, Canada
Lacombe Hospital Load Review	Lacombe, Canada
Mayfair Place MRI Installation	Calgary, Canada
Mira Health Centre Roof Assessment	Edmonton, Canada
Mira Health Centre Slab Settlement Investigation	Edmonton, Canada
Misercordia Hospital Structural Modifications	Edmonton, Canada
Peter Lougheed Hospital A/C Unit Support Frame	Calgary, Canada
Peter Lougheed Hospital Green Roof Tieback Review	Calgary, Canada
Peter Lougheed Hospital MRI Replacement	Calgary, Canada
Peter Lougheed Hospital Tieback Anchor Installation	Calgary, Canada
Ponoka Hospital Load Review	Ponoka, Canada
Riley Park Cladding Restoration	Calgary, Canada
Riley Park CT Framing	Calgary, Canada
Riley Park Slab Removal Review	Calgary, Canada
South Health Campus Guardrail	Calgary, Canada
Strathmore Hospital Filing Load Review	Strathmore, Canada

PROJECT EXPERIENCE CONT'D

INSTITUTIONAL

Altadore School Slab Movement Review	Calgary, Canada
Centre 4800 Beam Restoration	Calgary, Canada
Calgary Drop in Centre Structural Assessment	Calgary, Canada
City of Calgary Gantry Crane Review	Calgary, Canada
City of Calgary Municipal Building Condition Assessment	Calgary, Canada
City of Calgary Old City Hall Condition Assessment	Calgary, Canada
City of Calgary Old City Hall Lighting	Calgary, Canada
City of Calgary Tieback Anchor Reviews	Calgary, Canada
Edmonton Zoo Exhibit Design	Edmonton, Canada
Greenview School Structural Upgrades	Calgary, Canada
Mount Royal University Conservatory Acoustic Panel Design	Calgary, Canada
Mount Royal University Monitory Support	Calgary, Canada
Mount Royal University Natatorium Assessment	Calgary, Canada
Mount Royal University Pre-Cast Assessment	Calgary, Canada
Mount Royal University Stair Replacement Study	Calgary, Canada
SAIT Canopy Frame	Calgary, Canada
SAIT Structural Engineering VOR	Calgary, Canada
SAIT Student Art Plinth	Calgary, Canada
Three Hills School Slab Settlement Review	Three Hills, Canada
University of Calgary Cogeneration Screen	Calgary, Canada
University of Calgary Hotel Alma Fence	Calgary, Canada
University of Calgary MacKimmie Library Tieback Anchor Review	Calgary, Canada
University of Calgary Mechanical Engineering Building Chiller Installation	Calgary, Canada
University of Calgary Wayfinding Signage	Calgary, Canada
University of Lethbridge Tunnel Restoration	Lethbridge, Canada
William Aberhart High School Cladding Review	Calgary, Canada
Willow Park School Cladding Investigation	Calgary, Canada
Willow Park School Mechanical Unit Platforms	Calgary, Canada

RESIDENTIAL

8th Street & 47th Avenue SW House Design	Calgary, Canada
17th Avenue NW – Envelope Restoration	Calgary, Canada
27th Avenue SW Structural Condition Review	Calgary, Canada
29th Avenue SW Exterior Cladding	Calgary, Canada
Arriva Balcony Restoration	Calgary, Canada
Arriva Parkade Assessment	Calgary, Canada
Ashton Apartments Balcony Restoration	Edmonton, Canada
Bridgeland Mews Flood Review	Calgary, Canada
Cayuga Crescent House Renovation Design	Calgary, Canada
Crestmont House Deck	Calgary, Canada
Centro 733 Tieback Anchors	Calgary, Canada
City View Manor Post-tension Assessment	Calgary, Canada
Coachway Gardens Structural Assessment	Calgary, Canada
Dalcastle Drive NW, Wall Removal Review	Calgary, Canada
East Village Place Cladding	Calgary, Canada

RETAIL

17th Avenue SW Brewhouse Feasibility	Calgary, Canada
Atrium II Yoga Studio Renovation	Calgary, Canada
Auburn Bay Station Renovation	Calgary, Canada
Chinook Centre Polar Bear Exhibit	Calgary, Canada
Craft Southcentre Mall	Calgary, Canada
Browns Social House	Calgary, Canada
Joey Jasper Restaurant Renovation	Edmonton, Canada
Local 8th Avenue Restaurant Renovation	Calgary, Canada
Saltlik Restaurant Renovation Study	Calgary, Canada
Sunridge Mall Load Review	Calgary, Canada
Sunridge Mall Wall Opening Assessment	Calgary, Canada
Trolley 5 Construction Support	Calgary, Canada
Undercard	Calgary, Canada
University of Calgary Administration Building Pre-Cast Stairs	Calgary, Canada
University Centre Parkade maintenance	Calgary, Canada
Willowbrook Vehicle Impact Review	Airdrie, Canada

SOLAR PANELS

2930 Centre Avenue NE - Telus Parking Lot Solar	Calgary, Canada
ALSA Road Construction Solar Panel Load Review	Calgary, Canada
Cochrane High School Solar Panel Load Review	Cochrane, Canada
Deer Park United Church Solar Panel Load Review	Calgary, Canada
Jack Setters Arena - Solar Panel Review	Calgary, Canada
Mount Royal University Solar Panel Load Review	Calgary, Canada
Rotary Challenger Park Solar Panel Load Review	Calgary, Canada

SPORTS & RECREATION

Beltline Aquatic Centre Renovation	Calgary, Canada
Foothills Aquatic Centre Renovation	Calgary, Canada
Kingsland Community Association	Calgary, Canada
Montgomery Community Association Assessment	Calgary, Canada
Parkhill Stanley Park Feasibility Study	Calgary, Canada
Radium Hotsprings Pool Renovation	Radium, Canada
Saddledome Catwalk Restoration	Calgary, Canada
Saddledome Ice Slab Investigation	Calgary, Canada
Saddledome Plaza Restoration	Calgary, Canada
Thornclyffe Greenview Stair Replacement	Calgary, Canada
West Hillhurst Arena Renovation	Calgary, Canada





PAUL TOMASIK, B.ENG.
ASSOCIATE

*Project led by Paul Tomasik while employed at a previous firm.

“ Our CA group has a passion for seeing Entuitive designs come to life and for bringing value to our clients in the construction phase of a project. We have fun working with other stakeholders through construction to successfully deliver a challenging project on time and on budget. ”

Paul is an Associate at Entuitive. He has experience in a variety of project types, including commercial and residential towers, and institutional facilities.

As a contract administrator, Paul works proactively with architects and contractors to anticipate and overcome challenges during construction in a timely, cost-effective manner.

Paul has experience on a variety of high-profile projects, including the role of resident inspector for the St. Regis Toronto and the RBC Centre, both in downtown Toronto.

EDUCATION

Bachelor of Engineering, McMaster University

PROJECT EXPERIENCE

COMMERCIAL

550 Washington St	New York, NY
Bay Adelaide North Tower	Toronto, ON
True North Square – 242 Hargrave Street	Winnipeg, MB
RBC Centre*	Toronto, ON
Southcore Financial Centre - Bremner Office Tower*	Toronto, ON

CULTURAL

Massey Hall Revitalization	Toronto, ON
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HEALTHCARE

Lakeridge Health Long Term Care	Ajax, ON
Kingsway Arms Aurora Retirement Residence	Aurora, ON
Mackenzie Vaughan Hospital	Vaughan, ON
Peel Memorial Centre for Integrated Health and Wellness	Brampton, ON

HOSPITALITY

Southcore Financial Centre – Delta Hotel*	Toronto, ON
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RESIDENTIAL

TANU – 21 Park St	Port Credit, ON
True North Square – 225 Carlton Street	Winnipeg, MB
The St. Regis Toronto*	Toronto, ON

RETAIL

Rideau Centre Expansion	Ottawa, Canada
Wayne Gretzky Estates Winery & Distillery	Niagara-on-the-Lake, ON
Yonge-Sheppard Centre	North York, ON

SPORTS & RECREATION

BMO Field Renovations	Toronto, Canada
Rochester Institute of Technology – Gene Polisseni Arena	Rochester, NY
York Community Centre*	Toronto, ON

INSTITUTIONAL

Boston University Center for Computing and Data Sciences	Boston, MA
University of Toronto, FitzGerald Building Revitalization	Toronto, ON
York Regional Police #1 District	Newmarket, ON
The Brearley School	New York, NY
Calgary Police Association Building – Westwinds Drive	Calgary, AB
Humber College Learning Resource Commons	Toronto, ON
New Westmount Public School	Kitchener, ON
Seneca College – King Campus Expansion	King City, ON
University of Toronto Mississauga Innovation Complex	Mississauga, ON
MaRS Phase 2*	Toronto, ON





DAVE DOUGLAS, P.ENG.
ASSOCIATE

*Project led by Dave Douglas while employed at a previous firm.

Dave is an Associate with over 15 years of experience in Engineering and Construction.

He has experience across all disciplines of the building industry, including large commercial buildings, residential, high-rise concrete, institutional, healthcare, retail and entertainment, sports and recreation, and transportation and infrastructure. His experience includes new construction projects as well as renovation, restoration, and upgrades to existing buildings.

Dave has experience working on multiple types of project delivery methods, including traditional Design-Bid-Build via General Contract or Construction Management, Design-Build, Construction Management at Risk, and the Public-Private-Partnership (P3) model. In addition, Dave's more recent experience has provided him with several years of exposure in working directly with a subtrade on a major project, giving him unique and valuable insight into "the other side."

Dave is leading the Construction Engineering and Special Inspections group in New York, specializing in working with Contractors and Building Owners to realize their potential.

EDUCATION

Bachelor of Engineering, McMaster University

MEMBERSHIPS

ACI Committee 311 – Inspections of Concrete – Associate Member
American Concrete Institute
American Concrete Institute – NJ Chapter
International Concrete Repair Institute – Metro-NY Chapter

CERTIFICATIONS

ACI Concrete Construction Special Inspector
ACI Concrete Field Testing Technician – Grade 1
Post-Tensioning Institute – Level 1 PT Inspector
Certified Construction Contract Administrator
CISC Accredited Steel Inspector – Buildings
OSHA 30

AWARDS

ACI NJ Chapter – Grand Award Winner – American Dream - Waterpark

PROJECT EXPERIENCE

COMMERCIAL

66 Hudson (Elevator Rigging)	New York, NY
550 Washington Street	New York, NY
2200 Norcross Parkway	Atlanta, GA
Bay Adelaide Centre East Tower	Toronto, ON
Deloitte Tower	Montreal, ON
Hudson Yards – Western Rail Yards Podium Interface	New York, NY
Bay Adelaide Centre West Tower*	Toronto, ON
RBC Centre*	Toronto, ON

PROJECT EXPERIENCE

HEALTHCARE

Juravinski Hospital*	Hamilton, ON
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HOSPITALITY

The Adelaide Hotel*	Toronto, ON
The Residences at the Ritz-Carlton and the Ritz-Carlton Hotel*	Toronto, ON
St. Regis Hotel and Tower*	Toronto, ON

INSTITUTIONAL

University of Toronto – Daniels Faculty of Architecture, Landscape and Design	Toronto, ON
McMaster New Engineering Building*	Hamilton, Canada
Mohawk College 'H' Wing Addition*	Hamilton, Canada
University of Waterloo Health Science Building 'B'*	Kitchener, Canada
Ecole secondaire de Windsor*	Windsor, Canada

RESIDENTIAL

The Residences at College Park (Aura Tower)*	Toronto, ON
X-Condominium Tower*	Toronto, ON

RETAIL

American Dream Meadowlands Headon Forest Shopping Centre*	East Rutherford, NJ Burlington, Canada
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SPORTS & RECREATION

American Dream Water Park	East Rutherford, NJ
Miami Dolphins Football Training Center	Miami, FL
BMO Field	Toronto, ON
American Dream Meadowlands Wayne Gretzky Sports Complex*	East Rutherford, NJ Brantford, Canada
Gravenhurst Centennial Centre Expansion and Aquatic Facility*	Gravenhurst, Canada

TRANSPORTATION

33 Bloor – Construction Monitoring and Subway Adjacency Review	Toronto, ON
Northwell Health – Southside Hospital Parking	Bayshore, USA
Union Station Enhancement Project	Toronto, ON
Union Station Train Shed and Vertical Access Improvements*	Toronto, ON





*Project led by Mohammad Mirmoezi while employed at a previous firm.

MOHAMMAD MIRMOEZI, P.ENG., M.ENG.
ASSOCIATE

Mohammad is an Associate at Entuitive with more than 17 years of industry experience.

Mohammad has worked on a wide range of industrial and transportation projects including new construction rehabilitation, independent reviews, and construction engineering. Mohammad's expertise includes the analysis, assessment, preliminary design, detailing, and review of industrial structures; construction engineering tasks such as structures underpinning, shoring and support of excavation, erection staging, analysis of structures under temporary construction loads, design of falsework and formwork; and forensic analysis of structures displaying unexpected behavior. Mohammad leads projects from conceptual design to contract administration.

Mohammad is proficient with various structural engineering software packages including ETABS, SAFE, SAP, and RAM Structural System and is highly skilled in the use of AutoCAD as a 2D drafting tool.

EDUCATION

M.Eng. Civil Engineering, Concordia University
B.A.Sc. Civil Engineering, Azad University of Tehran

MEMBERSHIPS

Association of Professional Engineers of Ontario (PEO)

PROJECT EXPERIENCE

INDUSTRIAL

- | | |
|-----------------------------------|-------------------|
| DSO Iron Ore Mine Development* | Schefferville, QC |
| Romaine 4 Powerhouse* | Quebec |
| Beauharnois Powerhouse* | Beauharnois, QC |
| SNIM Iron Ore* | Mauritnia |
| Clean Soil Water Treatment Plant* | Toronto, ON |
| Labatt Brewery* | Montreal, QC |
| Ghaenat Steel Making Plant* | Iran |
| Hormozgan Steel Making Plant* | Iran |
| Songon Copper Mine* | Iran |
| Amak Gas Gathering* | Iran |

HEALTHCARE

- | | |
|---------------------------------|-----------------|
| Laval Hospital Research Centre* | Quebec City, QC |
|---------------------------------|-----------------|

CONSTRUCTION ENGINEERING

- | | |
|--|-----------------|
| CRH Cement Plant Conveyor Rehabilitation | Mississauga, ON |
| Viva Next Bridge Expansion | Vaughan, ON |
| Rouge River Overpass | Markham, ON |
| QEW and Bowen Rd | Fort Erie, ON |
| Hwy 407 Bridge Widening (East)* | Ontario |
| Hwy 407 ETR Bridge Widening | Ontario |
| Hwy 401 and Norwich Bridge Widening | Ontario |

TRANSPORTATION

- | | |
|---------------------------------|-----------------|
| Eglinton Crosstown LRT | Toronto, ON |
| Finch LRT Support of Excavation | Toronto, ON |
| Kef-Eddir Dam Access Bridge | Tipaza, ALGERIA |





MOHAMMAD MOAYYED, M.A.SC., P.ENG., MCSCE
ASSOCIATE

*Project led by Mohammad Moayyed while employed at a previous firm.



I believe that honest, open and proactive communication between project teams is the key to project ultimate success. We appreciate the challenges faced by the project stakeholders and collaborate for delivering outstanding and innovative solutions.



Backed by over 25 years of industry experience, Mohammad is as an Associate at Entuitive with a practical approach to problem solving and a drive to see things through to completion.

He has a great eye for details and genuine interest in leading a team to achieve a common goal. His greatest pleasure comes from working on complicated challenges and mentoring junior staff.

Mohammad began his career in consulting in 1993 for design of building, infrastructure, and industrial developments. During 14 years of engineering practice in Iran, he worked in various positions culminating to leadership position in multi-disciplined firms.

In 2007, Mohammad and his family came to Canada and began his career in consulting engineering. He has also completed his Master's degree in Structural Engineering with a focus on composite materials in construction from Dalhousie University in 2010.

During his time in Canada, Mohammad has participated in engineering and management of several multi-disciplined and construction managed projects span the public and private sectors. According to his background, he has experience in various project delivery systems and has a full understanding of, and appreciation for, the required intensive co-ordination and inherent implications of fast-tracked projects.

EDUCATION

Master of Applied Science in Structural Engineering, Dalhousie University, Halifax, Nova Scotia, Canada
Bachelor of Applied Science in Civil Engineering, Sharif University of Technology, Tehran, Iran

MEMBERSHIPS

Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)
Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG)
Canadian Society of Civil Engineers
Structural Engineers Association of British Columbia

AWARDS

Consulting Engineers of Alberta 2020 Showcase Gala for AUPE Headquarters, Edmonton

PROJECT EXPERIENCE

COMMERCIAL

AUPE Headquarters	Edmonton, AB
Central Drug Production Facility	Edmonton, AB
Crystallina Commercial Development	Edmonton, AB
Gibbard Block Rehabilitation	Edmonton, AB
Edmonton IBEW – Addition and Renovation	Edmonton, AB
Reflex Medical Office	Toronto, ON
Elite Northwest Crossing	Edmonton, AB
Block 156 Development	Edmonton, AB
Starbucks at 13010 97 Street	Edmonton, AB
Sun Life Place - Life Safety and Electrical System Upgrade	Edmonton, AB
Palm Gardens Cannabis Facility	Edmonton, AB
Taiga Nova Lube Warehouse and Operational Complex*	Fort McMurray, AB
Timberlea Landing Shopping Centre – Plaza Renewal*	Fort McMurray, AB
Bell Aliant Central Harbour Office Upgrade*	Dartmouth, NS
New Brunswick Union Building Addition*	Fredericton, NB
Paragon Business Park*	Sherwood Park, AB
Marine House Plaza Rehabilitation*	Dartmouth, NS

CULTURAL

City of Edmonton CO*Lab/ Quarters Arts Society Building Quarters Arts Society	Edmonton, AB
City of Edmonton Ociciwan Contemporary Arts Centre	Edmonton, AB
William Hawrelak Park Rehabilitation	Edmonton, AB
Whitefish Lake First Nation New Gathering Hall	Whitefish, Canada
Boyle Street Community Services - Expansion Feasibility Study	Edmonton, AB
Royal Alberta Museum Glenora – Mechanical Upgrades	Edmonton, AB
Eleanor Pickup Arts Centre Renovation and Addition*	Drayton Valley, Canada
Tulita Community and Town Centre*	Hamlet of Tulita, Canada
Edmonton Garneau Theater – Structural Assessment*	Edmonton, AB
Beacon Height Community Hall – Structural Assessment*	Edmonton, AB
The World's Largest Dinosaur – Structural Inspection and Assessment*	Drumheller, Canada

HEALTHCARE

Central Drug Production Facility	Edmonton, AB
MacTaggart Continuing Care Facility	Edmonton, AB
Hythe Pioneer Assisted Living Residence	Hythe, Canada
Good Samaritan Society Edmonton Village – Senior Housing Complex	Edmonton, AB
AHS Youville Home Mechanical Room Upgrades	Edmonton, AB
Edmonton CapitalCare Norwood – Foundation Remediation	Edmonton, AB
Alexis First Nations Health Care Building - Head Start Addition	Alexis First Nations, AB

INFRASTRUCTURE

Centennial Plaza Redevelopment	Edmonton, AB
Government Centre Power Distribution System Upgrades	Edmonton, AB
City of Edmonton William Hawrelak Park Capital Investment Plan	Edmonton, AB
Coliseum LRT Station Refurbishment – Assessment and Schematic Design Phase	Edmonton, AB
Edmonton LRT Capital and Metro Lines Stations – Platform Assessment and Renewals	Edmonton, AB
City of Edmonton Transit Garage Rehabilitations (7 Facilities)	Edmonton, AB
Edmonton Fire Station No. 1 - Skylight Replacement	Edmonton, AB
Edmonton Legislature Annex Feasibility Study	Edmonton, AB
Ballasted PV System for Electric Vehicle Charging Stations - Alberta Infrastructure Building	Edmonton, AB
Alberta Innovates Millwoods – Facility Upgrades	Edmonton, AB
Edmonton Law Court – Switchgear Replacement	Edmonton, AB
Alberta Infrastructure Building – Data Centre Data Centre Electrical Upgrades	Edmonton, AB
RCMP Detachment Building*	Inuvik, Canada
Foster Creek Emergency Services Buildings*	Cold Lake, AB
Alberta Legislature Building North Stair Structural Review	Edmonton, AB
Canadian Coast Guard Standard Helicopter Landing Pads*	various, Canada
CFB Central Heating Plant Upgrades*	Shearwater, NS
Marine Atlantic Ferry Terminal Facility Renovation*	Port Aux Basques, NL
CFB Fleet Maintenance Facility Additions*	Halifax, NS
Nova Scotia Provincial Data Centre Upgrades*	Halifax, NS

INSTITUTIONAL

Keswick Catholic K-9 School	Edmonton, AB
Keswick Public K-9 School	Edmonton, AB
Garth Worthington (Chappelle East) K-9 School	Edmonton, AB
Eagle Butte High School Modernization and Addition	Dunmore, AB
Fultonvale K-9 Elementary Junior High School Modernization*	Sherwood Park, AB
Marshall Springs (Evergreen) School*	Calgary, AB
Robert W. Zahara Replacement Wheatland Crossing School*	Calgary, AB
St. Albert Catholic School Modernization*	St. Albert, AB
St. Mary Catholic Replacement School*	Beaverlodge, AB
Two Hills Mennonite Replacement School*	Two Hills, AB
Montana First Nation Head Start	Montana First Nation, AB
Swan River First Nation Head Start	Swan River, MB
South Shore High School Energy Efficiency Upgrade*	Bridgewater & Liverpool, NS
NorQuest College Heritage Tower Upgrades and Renovations	Edmonton, AB
Uof A Oil Sands Tailings Research Facility – Building Additions and Upgrades*	Devon, AB

INSTITUTIONAL CONT'D

Edmonton Land Title Building – Canopy Replacement	Edmonton, AB
Coady International Institute, St. Francis Xavier University*	Antigonish, Canada

MUNICIPALITY

City of Fort Saskatchewan Facility Assessments and upgrades (including 4 facilities)	Fort Saskatchewan, AB
City of Calgary Flood Management*	Calgary, AB
City of Saint John Harbour Cleanup, Lift Stations*	Saint John, NB
Colchester Wastewater Treatment Plant Upgrade*	Truro, NS
Eastern Saint John Wastewater Treatment Facility*	Saint John, NB
Greater Sydney Area Wastewater Collection*	Sydney, NS
Jensen Lakes Storm Water Lift Station*	St. Albert, AB
Lunenburg Water Treatment Plant*	Lunenburg, NS
Parker Street Retaining Wall and Trail*	Dartmouth, NS

RESIDENTIAL & HOSPITALITY

Glenora Park Retirement Residence	Edmonton, AB
Artists Quarters – Validation and Conceptualization Phases*	Edmonton, AB
CRHC - Petrolia, Duggan and Brander Gardens Residential Complex – Structural Investigation and Remediation	Edmonton, AB
Royal Alex Place – Conversion of Commercial Floor to Residential	Edmonton, AB
Jasper Oneleven – Exterior and Interior Renovations	Edmonton, AB
Jasper Oneleven – Feasibility Study for Addition of Roof Amenities	Edmonton, AB
Stonebridge Complex – Unit Conversion	Sherwood Park, AB
Oliver Village Apartments – Balcony Condition Assessment and Restoration	Edmonton, AB
Moose Haven Lodge*	Conklin, AB
Keyera Energy Dormitory Camps*	Valleyview, AB
Meg Energy Poplar Ridge East Camp*	Northern Alberta

RETAIL

Kingsway Mall – Sears Redevelopment	Edmonton, AB
Kingsway Mall – Phase 3 addition and Target Redemise	Edmonton, AB
Campio (Bearhill) Brewing and Restaurant	Edmonton, AB
Polar Park Brewing – Conversion of Existing Building to Brewery and Restaurant	Edmonton, AB
GWL warehouse at 51st street*	Edmonton, AB
General Motors Warehouse and Office Facility – Floor Slab Settlement Repairs*	Edmonton, AB
City Honda Expansion*	St. John's, NL

SPORTS & RECREATION

Royal Glenora Club Redevelopment	Edmonton, AB
Bonnie Doon Leisure Centre Rehabilitation	Edmonton, AB
Confederation Leisure Centre and Arena Rehabilitation	Edmonton, AB
Michael Cameron Arena Renovation	Edmonton, AB
Callingwood Twin Arenas Rehabilitation	Edmonton, AB
Archie Simpson Arena – Ice Rink Slab Addition*	Edmonton, AB
Centennial Summing Pool Renovation and Additions*	Halifax, NS
Dalhousie University Sport Complex (Dalplex) Roof Replacement Feasibility Study *	Halifax, NS
Eastglen Summing Pool Upgrades*	Edmonton, AB
Royal Glenora Club – Ice Rink Facility Upgrades and Additions*	Edmonton, AB
Strathcona Olympiette Centre - Facility Upgrades and Additions*	Strathcona, AB
Canadian Athletic Club Arena – Structural Assessment and Facility Roof Strengthening*	Edmonton, AB

INDUSTRIAL

Atlas Copco Facility	Acheson, AB
Weyerhaeuser Sawmill Facility Expansion	Grande Prairie, AB
Weatherford Multiple Product Line Facility*	Lloydminster, AB
Air Separation Plant, Vale Inco Ni-Co Processing Plant*	Long Harbour, NL
Cleveland Cliffs Iron Ore Mine, New self-cleaning magnet support structure, infill floor framing, and new monorail support structure*	Wabush Lake, NL
Design of Pre-fabricated/Modular Units for Alta Fab Structures*	Alberta and Northwest Territories, Canada
Irving's Lincoln Compressed Natural Gas (CNG) Stations*	New Brunswick and Maine, Canada
Michelin Bridgewater Plant, Roof modification and new steel frame in one of production building*	Bridgewater, NS
New Maintenance Platforms for Canada Post Mail Processing Plant*	Edmonton, AB
Newalta Facility Expansion*	Foxtrap, NL
NewPage Mill Plant Railing and Guard Systems Upgrade*	Port Hawkesbury, NS
NuStar Energy-Oil Tank Internal Floating Roof*	Point Tupper, NS





MICHAEL LEMBKE, B.ARCH.SC., ENG.L., LEED®AP, RRO
PRINCIPAL, BUILDING ENVELOPE SPECIALIST

*Project led by Michael Lembke while employed at a previous firm.

On each of our projects, we apply sound proven building envelope science theory, practical experience, and new technology in order to deliver sustainable constructible and efficient solutions for our clients. Well-designed building enclosure systems have greater longevity with less maintenance, and higher-energy efficiency brings greater economy.

Michael is co-leader of Entuitive's overall building envelope services team, while providing leadership in our Vancouver office.

His expertise includes the design and construction of building envelope systems for new buildings, and restoration of existing buildings and heritage buildings. Michael has over 20 years' experience in building envelope consulting on projects throughout Canada, the United States and the United Kingdom, including the commercial, residential, mixed-use, healthcare, institutional, sports, cultural and retail sectors.

Michael is recognized by his clients as a dynamic leader who provides sound, progressive insight to help develop and achieve durable, constructible, and energy conscious building envelope solutions. He thrives in a team atmosphere, where close collaboration with clients and the design team results in solutions that equally benefit the project, client and end user.

EDUCATION

Bachelor of Architectural Science (Building Science), Ryerson University

MEMBERSHIPS

Engineers and Geoscientist of British Columbia (EGBC) - Engineering Licensee
 Association of Professional Engineers and Geoscientists of Alberta (APEGA) - Professional Licensee
 Association of Professional Engineers & Geoscientists of Saskatchewan (APEGS) - Engineering Licensee
 British Columbia Building Envelope Council (BCBEC) - Member
 International Institute for Building Enclosure Consultants (IIBEC) - Member and Registered Roof Observer (RRO)

ADDITIONAL TRAINING

Passive House - Design and Construction (120A)
 Certified Infrared Thermographer - Level 1

PROJECT EXPERIENCE

NEW CONSTRUCTION & RECLADDING

24 Jefferson Colliers Center	Phoenix, AR
34 Avenue Condominium	Calgary, AB
100 Mill Avenue	Tempe, AZ
500 Block Residential	Calgary, AB
1111 Travis Street Commercial Tower	Houston, TX
1520 4th Street Development	Calgary, AB
2270 Broadway	Oakland, CA
1601 Wewatta Street	Denver, CO
1940 Main Street	Vancouver, BC
2350 North Orchard	Chicago, IL
2880 Arbutus Street	Vancouver, BC
2900 Lonsdale	North Vancouver, BC
5740 Cambie Street	Vancouver, BC
6103 West Boulevard Mixed-use	Vancouver, BC

PROJECT EXPERIENCE

NEW CONSTRUCTION & RECLADDING

6615 Telford Lowrise and Highrise Development	Burnaby, BC
Airport Street BC Housing	Oliver, BC
Ambrosia Affordable Housing	Vancouver, BC
ATCO Business Centre	Calgary, AB
Bowen Road BC Housing	Nanaimo, BC
Brighthouse United Church Mixed-Use	Richmond, BC
Brookfield Place Calgary	Calgary, AB
Canadian Cancer Society	Vancouver, BC
Claridge Place	Vancouver, BC
Cineplex Expansion	Saskatoon, SK
Copperfield K-4 School	Calgary, AB
Deep Ellum Office Building	Dallas, TX
East Village Hilton	Calgary, AB
Eaton Corporation World Headquarters	Cleveland, OH
Edge on Hudson, Sleepy Hollow	New York, NY
Eighth Avenue Place West	Calgary, AB
Great Plains Recreation Facility	Calgary, AB
Haida Gwaii BC Housing	Haida Gwaii, BC
Hillhurst Multi-family Residential	Calgary, AB
Hinton Training Centre	Hinton, AB
Lakesview United Church Residential Redevelopment	Vancouver, BC
Lethbridge College Trades and Technologies Renewal and Innovation Project (TTRIP)	Lethbridge, AB
Lincoln Common	Chicago, IL
Linwood Residential	Victoria, BC
Little Mountain Building BA	Vancouver, BC
Lloydminster Mall Entrance	Lloydminster, AB
Martin Expo Town Center	Los Angeles, CA
Menno Hall	Vancouver, BC
Mount Royal University Riddell Library	Calgary, AB
New Brighton K-4 School	Calgary, AB
New Westminster Supportive Housing	New Westminster, BC
Oakridge Baptist Mixed-use	Vancouver, BC
The Odeon Mixed-use Building	Calgary, AB
Powell River BC Housing	Powell River, BC
Quarry Park Recreation Facility	Calgary, AB
Rocky Ridge Recreation Facility	Calgary, AB
Royal Inland Hospital Patient Care Tower	Kamloops, BC
Royal Columbian Phase 1 Mental Health and Energy Centre	New Westminster, BC
Royal Columbian Phase 2 Acute Care Tower	New Westminster, BC
Sarcee Operations Workplace Centre	Calgary, AB
Saskatchewan Public and Catholic Schools (9)	Saskatchewan, SK
South Station Tower	Boston, MA
Stadium Redevelopment	Calgary, AB
Truman North Residential	Calgary, AB
UBC Brock Commons Phase 2	Vancouver, BC
The Underwood/Union Square Place II	Calgary, AB
Village Church Worship Centre	Surrey, BC
Walter Residence	Calgary, AB
20 Fenchurch Street*	London, UK
Calgary Animal By-law Services Addition*	Calgary, AB
CCIS Building University of Alberta*	Edmonton, AB

CORE Glass Roof*	Calgary, AB
Devonian Gardens Recladding and Skylights*	Calgary, AB
Eighth Avenue Place East Tower and Podium*	Calgary, AB
Harmon Lifestyle Tower*	Las Vegas, NV
Quantum Residential Towers*	Toronto, ON

EXISTING BUILDING CONSULTING

441 5th Avenue - Curtain Wall Consulting	Calgary, AB
Canada Games Aquatic Centre Infrastructure Upgrade	Kamloops, BC
Centre 4800 - Building Envelope and Roofing Condition Assessments (16 buildings)	Calgary, AB
City View Manor - Window and Door Replacement	Calgary, AB
Columbia Ice Fields Visitors Centre - Cladding and Podium Restoration	Jasper, AB
CP Rail Air Brakes Building - Recladding	Calgary, AB
Elbow River Casino - Flood Remediation	Calgary, AB
GP Vanier School (CBE) - Building Envelope Improvements	Calgary, AB
Holy Spirit Academy - Recladding	High River, AB
Huntcliffe Gardens - Window Consulting	Calgary, AB
Lynnmour Village North Podia, Parking Garage Restoration	Vancouver, BC
Martens Residence Recladding & Reroofing	Calgary, AB
Mount Royal University Natatorium - Building Envelope Condition Assessment	Calgary, AB
Municipal Building, Administration Building and Trade Centre - Infrared Thermographic Review	Calgary, AB
Notre Dame Collegiate - Recladding	High River, AB
Rocky Mountain Plaza - Glass Consulting	Calgary, AB
SaskPower Headquarters - Building Envelope Consulting	Regina, SK
Sierra Place and Britannia Place - Infrared Thermographic Review	Calgary, AB
Strathmore Travel Lodge - Expert Witness	Strathmore, AB
Three Hills School - Cladding Assessment	Three Hills, AB
Trolley Square - Flood Remediation and Recladding	Calgary, AB
Vista View Commercial Building - Building Envelope Restoration	Calgary, AB
Village at West Springs - Building Envelope Consulting	Calgary, AB
Water Centre - Infrared Thermographic Review	Calgary, AB
Watermark Tower - Building Envelope Analysis	Calgary, AB
West 17 Lofts - Building Envelope Consulting	Calgary, AB
Wexford Place - Window Replacement	Calgary, AB
Yellow Pages Building - Building Envelope Remediation	Calgary, AB

PROJECT EXPERIENCE CONT'D

HISTORICAL BUILDING RESTORATION

Calgary City Hall - Condition Assessment	Calgary, AB
Canada Life Building - Historical Stone and Railing Restoration*	Toronto, ON
Corvette School - Brick Restoration*	Toronto, ON
Elmbank School Brick and Window Restoration*	Toronto, ON
Fairglen Junior School - Brick Restoration*	Toronto, ON
Fern Public School - Brick, Stone, Window, and Roofing Restoration*	Toronto, ON
Hearn Building - Masonry Investigation*	Toronto, ON
Henderson Hospital - Masonry Condition Assessment*	Hamilton, ON
Jean Tweed Historical Residence - Condition Assessment*	Toronto, ON
Kelowna Train Station Redevelopment*	Kelowna, BC
Lawrence Park High School - Brick and Stone Restoration*	Toronto, ON
McMurrich Junior Public School - Brick, Stone, and Window Restoration*	Toronto, ON
Royal Victoria Hospital - Historical Masonry and Window Assessment*	Montreal, QC
St. Mary's General Hospital - Condition Assessment and Repairs*	Kitchener, ON

ROOFING

4502 10th Avenue NE - Roof Replacement	Calgary, AB
7060-7070 Farrell Road - Roof Consulting	Calgary, AB
Andrew Davidson Building - Main Roof Replacement	Calgary, AB
Manchester Building E - Roof Consulting	Calgary, AB
Mayland Heights Building - Metal Roof Over-cladding	Calgary, AB
Mechanical Roof Replacement	Calgary, AB
NE Sportsplex - Roof Consulting	Calgary, AB
Northland Building - Main and Rocky	Calgary, AB
Mountain Plaza - Roof Replacement	Calgary, AB
Caramoor Condominium - Roof Replacement*	Calgary, AB
City of Calgary Firehalls - Roof Replacement*	Calgary, AB
Peter Lougheed Centre - Roof Replacement*	Calgary, AB
Rockyview General Hospital - Capital Roof Replacement	Calgary, AB
Scotiabank Saddledome - Roof Replacement	Calgary, AB
Wheatland Elementary - Roof Replacement*	Strathmore, AB



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