



Jim Gilliland, Ph.D., P.Eng., LEED® AP, FEC
Regional Director, Alberta and Arctic
Senior Structural Engineer



EDUCATION

ICD.D Governance Essentials for Not-For-Profit Organizations

PSMJ Principles Bootcamp

LEED® Accredited Professional

Ph.D., Structural Engineering, 2000
University of Calgary, Calgary, Alberta

M.Sc., Structural Engineering, 1994
Queen's University, Kingston, Ontario

B.Sc. Civil Engineering, 1992
Queen's University, Kingston, Ontario

AFFILIATIONS

APEGA, APEGM, NAPEG, PEGNL

MEMBERSHIPS

APEGA, Elected to APEGA Council
2007 – 2010

APEGA President 2014

Canadian Society for Civil Engineering,
President 2016

Member, Canada Green Building Council
(CaGBC)

Jim is our Calgary Buildings Practice Leader and Regional Director, Alberta and Arctic. Jim has a broad range of experience that includes commercial, educational, institutional, health care, and environmental applications. Jim delivers his projects using a variety of methods including construction management, fast-tracking, and design-building. The main focus of Jim's work is to produce efficient structural designs that can be built quickly, easily, on time, and within the allocated budget. This focus results in projects that minimize construction costs and achieve both corporate and client objectives.

Jim's experience and training allow him to provide overall direction on projects from both a structural perspective and the review and development of designs at all stages of a project. Jim is also a LEED® Accredited Professional, committed to creating sustainable designs and being aware of environmental issues on both new and renovated facilities. Jim's extensive experience enhances the depth of structural expertise at the Williams Engineering Canada Inc. He has been involved in a wide range of projects, including the following:

PROJECT EXPERIENCE

LEGAL/LITIGATION

Numerous Structural Condition Assessments

- Residential - single-family and multi-family
- Industrial – warehouse, manufacturing facilities
- Oil Storage Tanks
- Floor slab movement
- Building deflection
- Evaluation of repair options

Forensic Investigations – accident and failure investigations

Legal Opinions on Liability Exposure – construction document reviews



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INDUSTRIAL FACILITIES

Photovoltaic Panel Support Structures; Alberta

Wind Power Generation Facilities; Across Canada – Nova Scotia to British Columbia

Concrete foundations and steel tower supports

Sunnyrose Cheese Plant Expansion; Lethbridge, Alberta

Addition to a production facility and new loading docks

Safeway Canada Milk Plant Expansion; Edmonton, Alberta

Expansion to production facility as well as new exterior storage silo tanks

Safeway Canada: Calgary and Edmonton Freezer Warehouses; Calgary and Edmonton, Alberta

New freezer warehouse in Calgary and renovations to an existing facility, including loading docks; new freezer warehouse expansion at existing facility in Edmonton

Safeway Canada – Calgary, Edmonton and Winnipeg Warehouse Renovations; Western Canada

Renovations, modifications and upgrades to existing warehouses including loading docks, equipment relocations, “cold chain” networks, rooftop refrigeration systems and interior partitioning

Fall Protection Systems; Various locations throughout North America

Horizontal lifelines, rigid rail and trolley systems, single point anchors, at approximately 200 industrial facilities

City of Calgary, Maintenance Facilities, Manchester Yards; Calgary, Alberta

Restoration and renovation of existing buildings, including new service bays for heavy equipment

City of Calgary, Maintenance Buildings, East Calgary and Spy Hill Landfill Sites; Calgary, Alberta

Building relocation and expansion; existing buildings at Spy Hill were dismantled and re-located on new foundations at East Calgary

University of Calgary, Grounds Maintenance Building; Calgary, Alberta

New pre-engineered building



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Numerous Light Industrial Buildings Combining Pre-Engineered Warehouse/Shop Buildings with Custom Office Space; Various locations throughout Canada

Petro Canada Gas Stations and Bulk Fuel Facilities; Various locations throughout Western Canada

ATCO Structures, Modular, Wood-Framed, Single and Multi-Storey Camp Facilities; Various locations throughout Western Canada
Included 1500-man camp in Fort McMurray, Alberta

BHP Ekati; Northwest Territories
Existing mine renovations and repairs

BHP Diavik; Northwest Territories
New mine residence and office facilities

Lafarge Pipe Plant Expansion; Winnipeg, Manitoba
New expansion to an existing manufacturing facility. Incorporated a new overhead crane and a new McCracken machine, a new Hawkeye machine, and an extension to overhead travelling concrete placement bucket.

Permolex Ethanol Plant Upgrades; Red Deer, Alberta
Work included new foundations required for new storage tanks, new pipe racks, and new catwalks

Oilsands Pipelines; Fort McMurray, Alberta
Structural design for new pipelines located across an oil sands site. Foundations and supports for feedstock pipelines as well as tailings pipelines were completed. Designs incorporated innovative pipe collars that eliminated the need for field welding during construction as well as reduced construction costs by 30%.

CONCRETE RESTORATION

City of Calgary Spring Gardens Bus Barn; Calgary, Alberta
Provided structural services for repairs to the existing facility

Banff Upper Hot Springs Addition and Concrete Restoration; Banff, Alberta
Work completed in multiple phases and multiple years; included pool deck expansion and repairs due to freeze-thaw deterioration.



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Calgary Greyhound Station; Calgary, Alberta
Parking deck restoration

City Service Parkade; Calgary, Alberta
Condition survey and restoration

Pre-Stressed Wall Panel Repair on an Existing Building

Numerous Post-Tensioning Cable Condition Assessment Surveys on Existing Buildings

County of Paintearth; Alberta
Maintenance building concrete service bay restoration

Banff Upper Hot Springs Addition and Restoration; Banff, Alberta
Work completed in multiple phases and multiple years

Cascade Plaza; Banff, Alberta
Parkade restoration; included precast deck repairs, topping and membrane replacement.

BRIDGES

Langevin Bridge Crack Investigation; Calgary, Alberta
Completed web-cracking investigation, including site monitoring and bridge design review analysis. Bridge consists of a continuous, two-cell box-girder with multiple spans that are curved and super-elevated.

Red Deer Pedestrian Bridges; Red Deer, Alberta
Design of two (2) wood deck 30 meter pedestrian bridges and one precast concrete 20 meter pedestrian bridge; design-build with Volker Stevin. Bridges erected by helicopter to avoid environmental damage.

MacDonald Bridge Restoration; Calgary, Alberta
Completed concrete abutment and bearing restoration, as well as added a pedestrian walkway and restored external post-tensioning bridge strengthening system

New NU Girder Development; Calgary, Alberta
Involved with the evaluation of a new concrete pre-stressed and post-tensioned girder designed to increase permissible span-to-depth ratios



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Historic Bridge Evaluation; Canmore, Alberta

Completed a preliminary structural evaluation

Waskahegan River Bridge; Alberta

Involved in abutment design

Macleod Trail/Shawnessy Blvd. Interchange; Calgary, Alberta

Involved in abutment design

O'Chiese First Nation Steel Bridge Assessment; Alberta

Condition assessment, rating and repair work

Calgary Convention Centre Plus-15; Calgary, Alberta

Conducted a preliminary design of the pedestrian walkway over the 8th Avenue Mall

Mechanically Stabilized Earth Retaining Walls; Alberta

Walls were designed for a bridge abutment as well as sloped roadways

Ph.D. Research – Crack Prediction in High Performance Concrete Structures During Construction

3-D, finite-element computer models were developed to predict temperature, shrinkage, and cracking in user-defined construction structures. Work included concrete temperature and crack monitoring during construction the Confederation Bridge in Atlantic Canada, as well as at the Tsable River Bridge, part of the Vancouver Island Highway Project

COMMERCIAL

Atlantic Avenue Art Block; Calgary, Alberta

Provided structural services during the design and construction phases of the project. The project consists of a four-storey building with office, retail, and museum-grade gallery facility. The building also provides two levels of underground parking, and was built on a contaminated site with a very high water table. Interior structural design included stainless steel artwork in the four-storey atrium that also functioned as a stair, and structural features in the art gallery including a “floating bird’s nest” and “walk-in light box”.

Northstar Ford and Lincoln Dealership; Fort McMurray, Alberta

Provided structural services during the design and construction phases of the project



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Hyatt Regency; Calgary, Alberta

21-storey building with conference facilities, as well as the Convention Centre in downtown Calgary, included integrating new concrete and steel structures with existing heritage buildings. Project Value: \$80 Million.

Long Term Care Centre; Red Deer, Alberta

Building consisted of four-storey wood-framed residential units linked to a central facility that provides food services and meeting rooms

Rooftop Cellular Antenna Stations; Calgary, Alberta

Added new cellular stations on the roofs of existing buildings across Calgary

Haworth; Calgary, Alberta

Review of modular floor and wall systems

Calgary Airport Authority; Calgary, Alberta

Existing food court floor expansion

Numerous Condition Assessments, Building Inspections; Western Canada

Investigations, reports and cost-estimates for proposed renovations and repairs to existing buildings

Interior Climbing Wall Designs

Exterior, stand-alone climbing towers, as well as numerous, new climbing walls inside existing buildings.

RESIDENTIAL FACILITIES

Pre and Post-Construction Home Assessments

New Lieutenant Governor's Residence; Edmonton, Alberta

Concrete, light steel and wood framing; design only.

Affordable Housing Complex; Drumheller, Alberta

A new four-storey, wood-framed building with a walk-out basement

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Mustard Seed Affordable Housing Development; Calgary, Alberta

Design only of a variety of building options:

- 30-storey high-rise, concrete framing, underground parking, four-storey retail and office podium.
- 18-storey high-rise, concrete framing, underground parking, two-storey retail and office podium.

Mustard Seed Affordable Housing Development; Calgary, Alberta

Design and construction of 12-storey mid-rise, concrete framing, underground parking, two-storey retail and office podium optimized to provide same number of apartments and parking stalls as 18-storey design option for 20% less cost to the Owner.

Northern Lights Special Care Home; Fort Smith, Northwest Territories

In order to minimize structural costs and optimize the building envelope, a preserved wood foundation system was used to complement the wood-framed building design.

INSTITUTIONAL FACILITIES

Whitehorse Hospital Staff Residence, Whitehorse, Yukon

New, four-storey office and residential building completed as a design-building. Structural costs were optimized for the contractor as well as the user by using the most appropriate structural solution for each structural component. Modular, off-site construction of structural components was maximized in order to minimize site construction costs and accelerate the schedule:

- Cast-in-place concrete for the foundations
- Cast-in-place concrete for the stair shafts and elevator shaft
- Light-gauge steel, load-bearing wall system
- Steel and concrete composite Hambro floor system, and
- Wood roof trusses combined with OSB SIP roof diaphragm.

University of Calgary – ICT Building; Calgary, Alberta

Provided structural services for the project and acted as architectural project lead during construction; included design of load-bearing masonry, steel and concrete. A seven-storey office building acts as a central hub for a lecture auditorium and two lecture halls. The facility is also linked to adjacent buildings with a two-storey plus-15/30 bridge at one end, and an at-grade walkway at the other end.



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Calgary Court Centre; Calgary, Alberta

Provided structural services during the design and construction phases of the project. Included two high-rise buildings linked with full-height and glazed atrium. Building designed in compliance with United States GSA design standards to prevent progressive collapse. Facility included prisoner holding cells and processing areas, and explosion-proof holding areas.

University of Calgary – CCIT Building; Calgary, Alberta

Provided structural services for the project; work included a high-bay testing laboratory and laboratory space for vibration-sensitive equipment combined with office and administration facilities.

University of Lethbridge – Landscaping Repair and Restoration; Lethbridge, Alberta

All exterior landscaping overlooking the river valley including stairs, amphitheatre, promenade, and patios including space over existing underground structures

Yellowknife Court Centre – New Construction; Calgary, Alberta

Provided structural services during the schematic design phase of the project

Territorial Adult Supported Living Day Program Centre; Hay River, Northwest Territories

A modular, light steel wall and roof framing system was used in order to facilitate off-site construction efficiencies while reducing costly on-site construction work and accelerating the construction schedule

Fish Creek LRT Station; Calgary, Alberta

New train station linked to adjacent parkade and bus drop-off facilities by pedestrian bridges crossing a main roadway and railway right-of-ways

Kainai Indian Reserve Care Centre; West of Lethbridge, Alberta

Long-term care combined with community gathering spaces

Tom Baker Cancer Centre; Calgary, Alberta

Building expansion

Strathcona Tweedsmuir School; Calgary, Alberta

Building expansion

University of Calgary Vibration Studies; Calgary, Alberta

Vibration studies of existing buildings for the purposes of locating vibration sensitive equipment



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Prince's Island Park; Calgary, Alberta

Public facilities upgrade and expansion feasibility study

Grandfather Ayha High School Foundation Remediation; Deline, Northwest Territories

Remediation of existing timber pile foundation

Deninu High School; Deninu, Nunavut

Foundation and structure repairs

Yellowknife Fieldhouse; Yellowknife, Northwest Territories

Conceptual design and design development phases for a new indoor soccer and recreation centre were completed. Design included a suspended running track, viewing stands, change rooms, as well as front-of-house services.

City of Calgary, Talisman Centre; Calgary, Alberta

Roof replacement and infrastructure renewal. Structural work included evaluation of the existing structural cable and steel arch system. A new mechanical system was supported around the roof perimeter and new mechanical components were added to the arch structure. Restoration of the existing concrete diving tower was included as well as modifications to the renovated changing room facilities.

Inuksuk High School; Iqaluit, Nunavut

Renovation and upgrade; re-configuring the existing school including a new atrium and theatre inside the existing building

Grandfather Ayha High School; Deline, Northwest Territories

Remediation of existing timber pile foundation

Deninu High School; Deninu, Nunavut

Foundation and structure repairs

Yellowknife Courthouse; Yellowknife, Northwest Territories

Conceptual and design development phases for a new courthouse facility. Design included courtrooms, prisoner cells, administration offices, and judicial offices.

Tom Baker Cancer Centre Expansion; Calgary, Alberta

Western Arctic Visitors Centre, Hay River, Northwest Territories

New building consisting of heavy timber framing, tall-walls, and custom, insulated roof panel system that utilizes the z-girt framing of the insulated panels for structural support of the slender roof overhang architectural features.

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PARKS AND RECREATION

Prince's Island Park – Public Facilities Upgrade and Expansion; Calgary, Alberta

Feasibility study for expansion of public facilities as well as existing restaurant

Shouldice Park Redevelopment; Calgary, Alberta

Re-development of park including two new practice football fields and one main competition field with viewing stands and kiosks.

City of Calgary, South Glenmore Park Boat Launch; Calgary, Alberta

Provided structural engineering services to repair erosion caused by flooding and storm damage

University of Lethbridge; Lethbridge, Alberta

Landscaping repair and restoration. All exterior landscaping overlooking the river valley including stairs, amphitheatre, promenade, and patios including space over existing underground structures.

Banff Upper Hot Springs Addition and Concrete Restoration; Banff, Alberta

Work completed in multiple phases and multiple years. Work included pool deck expansion and repairs due to freeze-thaw deterioration.

Kootenay Hot Springs; Radium, British Columbia

Report on the existing condition of various structures on the property, both heritage and non-heritage. Investigation and repairs involved two pedestrian bridges, some interior elements and retaining walls on site.

Kicking Horse Campground Shelter; Field, British Columbia

Temporary structural support for an existing camp shelter located within the Kicking Horse Campground. This particular structure is a heritage building and as such, care had to be taken to ensure that no damage occurred from the placement of temporary support.

Roger's Pass Visitor Centre Restoration; Roger's Pass, British Columbia

Work included accommodating new drainage requirements for the existing green roof, repair and replacement of deteriorated heavy-timber structural components, and upgrading the lateral stability system for the building. Modifications were completed in compliance with Federal Historic Building Standards.

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WATER AND SEWAGE TREATMENT/RESERVOIR/PUMPHOUSES

Wastewater Treatment Plant; Jasper, Alberta

Work included concrete crack width control and watertight structure requirements

Storm Water Outfall Structures in Calgary and Several Pump Stations; Red Deer, Alberta

Community Wastewater Treatment Plant; Gull Lake, Alberta

Work included concrete bioreactors, partially buried, with removable covers

Residential Development Wastewater Treatment Plant; Wolf Creek, Alberta

Work included concrete bioreactors and clarifiers for a proprietary ozone process developed by Seair; bioreactors are partially buried with removable covers in order to optimize excavation but to minimize buoyancy issues

Water Reservoirs; Central Alberta

New concrete water reservoirs for the Counties of Coronation and Paintearth, Alberta. Depending on the watertable level, the reservoirs are partially buried to minimize structural costs and minimize impact on surrounding countryside.

PUBLICATIONS

Gilliland, J., Schroeder, B., Carinelli, F., Pedersen, R. (2006a), "Solutions for Construction of Two Linked Highrise Towers in a Dense Urban Setting", CD ROM Proceedings of the CSCE 1st International Construction Specialty Conference, Calgary, May, CT-077.

Schroeder, B., Gilliland, J., Birkle, G. (2006b), "Design of Two Highrise Buildings Linked with Full Height Glazed Atrium", CD ROM Proceedings of the CSCE 1st International Structural Specialty Conference, Calgary, May, ST-073.

Birkle, G., Schroeder, B., Gilliland, J. (2006c), "Lessons Learned from Application of Progressive Collapse Guidelines to Highrise Building Design", CD ROM Proceedings of the CSCE 1st International Specialty Conference on Disaster Mitigation, Calgary, May, DM-012

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Lissel, S.L., Gilliland, J.A., Shrive, N.G., (2002), "Design of Demonstration CFRP Post-Tensioned Masonry Diaphragm Retaining Walls", 6th International Masonry Conference, Church House, Westminster, London, England, November

Gilliland, J.A., Dilger, W.H. (2001), "Stresses Induced During Construction of Segmental, Cast-in-Place High Performance Concrete Box-Girder Bridges", Proceedings of the 6th International Conference on Creep, Shrinkage & Durability Mechanics of Concrete and Other Quasi-Brittle Materials, M.I.T., Cambridge, USA, August

Gilliland, J.A., Dilger, W.H. (1998a), "Modeling Thermal Stresses Induced During Construction of Segmental, Cast-in-Place Concrete Box Girder Bridges", CD-ROM Proceedings of the CSCE 5th International Conference on Short and Medium Span Bridges, Calgary, AB., July

Gilliland, J.A., Dilger, W.H. (1998b), "Modeling Thermal Stresses in Concrete Structures Induced During Construction", Proceedings of the CSCE Annual Conference, Halifax, N.S., June

Gilliland, J.A., Dilger, W.H. (1997a), "Monitoring Concrete Temperature During Construction of the Confederation Bridge", Canadian Journal for Civil Engineering, Vol.24, No.6, pp.941-950

Gilliland, J.A., Dilger, W.H. (1997b), "Modeling concrete temperature during construction of the Confederation Bridge", Proceedings of the CSCE Annual Conference, Sherbrooke, PQ, May, Vol.1, pp.187-196

Gilliland, J.A., Dilger, W.H. (1996a), "Thermal Effects in Concrete Structures", Proceedings of the Taiwan/Canada Workshop on Medium and Long-Span Bridges, D.T. Lau, M.S. Cheung, J.C. Chern, C.S. Yeh, Editors, Ottawa-Carleton Bridge Research Institute, Ottawa, Canada, October, pp.93-120

Gilliland, J.A., Dilger, W.H. (1996b), "Method to Determine the Thermal Conductivity of Concrete", Paper presented at the Concrete Canada Annual Meeting, Moncton, N.B., August

SPECIALITY SOFTWARE KNOWLEDGE

SAP2000, S-Frame - Finite Element Structural Analysis
ETABS Lateral Stability Analysis of Multi-storey Building Structures
SAFE Finite Element Analysis of Concrete Floor Systems