

## Kellie Cockle, P.Eng.

Structural Engineer

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### PROFESSIONAL PROFILE

Kellie is a forensic structural engineer with 10 years of experience in the consulting and construction industries on projects located across Western Canada. Her specialty is in commercial, institutional, and residential buildings and foundations, but she also has experience on process plants and wastewater treatment facilities. She has been involved in all stages of a building's lifecycle including new design, renovations and retrofitting, construction, and demolition. Her current role focuses on structural investigations to determine the root cause of structural failures, construction defects or incidents, and building performance issues. She is a driven individual who works hard to meet the needs of her clients across the insurance, legal, and construction industries. Kellie has a strong understanding of engineering first principles required to solve unique problems, and she has extensive skills in structural analysis software, as well as experience preparing engineering drawings, letters, reports, and specifications.

Kellie's recent project and investigative experience includes:

- Concrete construction defects in high-rise towers
- Masonry wall collapse during construction
- Wood framed structure collapse during construction
- Assessment of structural stability after fire, flood and impact
- Retrofit and upgrades to existing foundations and superstructure
- Design of high-rise towers
- Building code compliance review
- Independent structural review
- Experience designing in concrete, steel, wood and masonry

### EDUCATION

B.Sc. Civil Engineering Cooperative Program, University of Alberta, Edmonton, AB 2016

- Specialized in structural and geotechnical design
- Graduated with distinction

### PROFESSIONAL AFFILIATIONS

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Engineers and Geoscientists British Columbia (EGBC)

### WORK HISTORY

**2023 – Present: Structural Engineer, Oak Forensic Engineering Ltd., Edmonton, AB**

Forensic analysis of structures, incidents, property losses, and course of construction disputes. The work generally falls into three categories:

1. Structural investigations to assist with insurance claims, course of construction disputes and mediation, and legal proceedings.

2. Structural assessment to determine the immediate structural stability and safety of a building after fire, flood or impact. I can also provide repair recommendations and details if necessary.
3. Preventative structural review and oversight. Assistance with identifying structural risks in new construction, independent structural reviews, and building code compliance.

I leverage my past experience, structural analysis skills, and network of associated labs and consultants to manage the technical investigation for our clients. I also stay current with industry leading technologies to complete detailed inspections, and conduct non-destructive and destructive testing to determine the facts of our investigation. For certain unique, complex projects, I will also consult with external subject matter experts to ensure our clients get the best possible results and deliverables.

**2016 – 2023: Structural Design Engineer, RJC Engineering, Edmonton, AB**

Served as a structural design engineer and acted as the technical lead on projects such as high-rise towers, wastewater treatment plants tanks, and intricate lateral force resisting systems.

Utilized 3D finite element analysis models to analyse structures for capacity and serviceability requirements (deflection, crack control, vibration). Example elements include concrete transfer slabs and beams, feature stair steel trusses, water retaining concrete pools and tanks, and heavy loading slabs on grade.

Designed elements for soil-structure interaction and loading including foundations, slabs on grade, retaining walls, foundation walls, and raft slabs.

Created engineering documentation including schedules, specifications, letters/reports, drawings, response to RFI, site instructions, change orders and design notes.

Implemented new digital markup workflow using Bluebeam Revu Studio that optimized communication between designers and drafters on a \$300+ million recreation centre project.

Conducted independent reviews of designs by other engineers to ensure their accuracy and completeness.

Conducted field review during the construction of structures to ensure compliance with the contract documents and to address site-specific issues and details.

**2014-2015: Project Coordinator & Field Engineer, Graham Group Ltd., Edmonton, AB (Co-op)**

**Project Coordinator (on-site):**

Monitored and recorded subtrade activity and produced daily reports on the production rates of subcontractors. While monitoring progress Kellie also conducted routine quality control checks around the 64,000m<sup>2</sup> building. Utilized this data to manage Graham's liability, conduct billing reviews and do schedule forecasting. In this role, Kellie was also responsible for document control for a variety of superstructure subtrades which included reconciling billing and invoicing documentation for contracts exceeding \$5,000,000.

**Field Engineer (on-site):**

Managed onsite concrete operations which included ordering concrete, concrete schedule creation and distribution, preparing quantity take-offs and quality control management. This experience had a lot of exposure to overall project scheduling, resource management, construction methods, and subcontractor coordination.

**2013: Geotechnical Technician, Shelby Engineering Ltd., Edmonton, AB (Co-op)**

Conducted various tests on soils, concrete and asphalt in a lab environment and generated reports from the results. Performed standardized concrete testing methods in the field, such as air entrainment, slump, and casting cylinders for compression tests.

**SAMPLE OF PROJECT EXPERIENCE**

**Structural Investigation: Wood-Framed Building Collapse During Construction**

- Completed a site inspection including evidence retention to document and assess the total collapse of all walls and roof trusses.
- Conducted a design check on the truss manufacturers drawings and a review of the construction procedure and site conditions at the time of loss.
- Determined the causal and contributing factors to the loss and issued a full Cause of Loss report to our client.

**Structural Investigation: Leaking Wastewater Treatment Plant (WWTP) Digester Tank**

- Conducted a site visit and lidar scan to create 3D point cloud of the existing structure as a basis for our drawings and investigation.
- Extensive review of existing drawings, historical codes, and historical material availability.
- Prescribed testing to obtain material properties for the in-situ concrete, steel, and soil.
- Created a 3D SAP2000 model to analyze the structure for loads including dead, live, fluid, wind, seismic, backfill/surcharge, thermal, shrinkage, and creep.

**Structural Design: New Above-Grade Digester Tanks in High-Seismic Zone**

- Analyzed and designed the new tank structure for critical loading combinations including thermal loads and thermal gradients, impact loads from tidal wave zone, hydrostatic fluid loads, hydrodynamic fluid loads during a seismic event, gas pressures within tank, buoyancy loads resulting from potential water levels, and loads imparted on the structure by process equipment.
- Designed the raft slab foundation under the digester tanks. Subgrade conditions were challenging even after years of preloading the site and installing a tight grid of stone columns. Close collaboration with geotechnical engineering out of California was required to design the structure for post-disaster seismic loading.

**Structural Design: Above-Grade, Open-Air, Cast-In-Place Concrete Parkade**

- Used SAP2000 to analyze the structure for complex loading conditions that arise from a cast-in-place structure being exposed to the elements.
- Loads that drove the design and detailing included thermal fluctuations and concrete shrinkage.

**Structural Design: Analysis of High-Rise Tower Staged Construction Methods to Optimize Formwork**

- Worked with concrete strength gain curves and long-term concrete deflection calculations to recommend a safe and efficient workflow for contractor to remove shoring and formwork as the tower was constructed.

**CONTINUING EDUCATION / ADDITIONAL TRAINING**

American Concrete Institute, *Fall Convention*, October 2023

Bluebeam, *Revu XCON Conference*, August 2022

Bluebeam, *Revu XCON Conference*, September 2021

RJC Engineers, *Python for Structural Engineers* (RJC Internal Course), July 2020

American Concrete Institute, *Mass Concrete Pours Seminar*, January 2020

Construction Specifications Canada, *Principles of Construction Documentation*, 2019

**PRESENTATIONS**

Oak Forensic Engineering Ltd., *Structural Steel Investigations – For OHS Investigators*, at the first annual Alberta Occupational Health and Safety Investigations Unit Symposium, September 2023.

**VOLUNTEERING**

Women In Science Engineering and Research (WISER), Experienced Mentor in the Trio Mentorship Program, October 2023 – April 2024