

Kellie Cockle, P.Eng.

Structural Engineer

Office: 780-902-3993

Cell: 780-203-1628

Email: kellie.cockle@oakforensic.com

PROFESSIONAL PROFILE

Kellie is a structural engineer with over six years of consulting experience on projects located in Alberta and British Columbia. Her specialty is in analysis and design on new construction, renovation, and structural investigation projects with a focus on the primary structural elements of buildings. She has acted as a technical lead for complex projects requiring creative solutions by leveraging advanced modelling techniques and finite element calculations. 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. She has exposure to a variety of work settings including commercial, industrial, institutional and residential construction, process plants, and wastewater treatment facilities.

Kellie's expertise includes:

- High-rise towers
- Wastewater infrastructure
- Structural shoring details
- Retrofit and upgrades to existing foundations and superstructure
- Structural capacity checks
- 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

- Graduated with distinction
- Specialized in structural and geotechnical design

PROFESSIONAL AFFILIATIONS

Association of Professional Engineers and Geoscientists of Alberta (APEGA)

WORK HISTORY

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

Forensic failure analysis of incidents, property losses, and course of construction disputes. Shoring and remediation after fires, vehicle strikes, and wind or water damage.

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 64,000m² 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 of a leaking wastewater treatment plant (WWTP) digester

- 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.
- Worked with American codes, particularly ACI 350, since Canada did not have an equivalent at the time.
- Prescribed testing to obtain material properties for 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 of 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 in concrete, 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 static and dynamic 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.

Above-grade open-air parkade constructed with cast-in-place concrete

- Used SAP2000 to analyze the structure for potential loading situations 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.

Analysis of high-rise tower staged construction methods to optimize formwork workflow

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

Structural investigation of a column removal in existing WWTP diversion structure

- Used SAP2000 and SAFE to assess the capacity of an alternate load path after removal of an existing concrete column.

CONTINUING EDUCATION / ADDITIONAL TRAINING

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.