



HEADWALL
ENGINEERING

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Summary of Skills

- Wide breadth of experience in structural engineering of light-frame wood, mass timber, steel, concrete, and masonry structures in the residential, commercial, and institutional sectors.
- Advanced travel skills in remote and backcountry situations. Able to effectively manage complex avalanche terrain, access remote sites, and work independently in challenging environments.
- Strong background in applied sciences, leading to data-driven decision making and meticulous record keeping of observations and field reviews.
- Skilled in the design of custom equipment such as lifting devices (spreader beams, link plates, man-baskets) and transport equipment (load spreaders, saddles, bands, strong-arms, chaining arrangements).
- Excellent written and verbal communication skills, developed through the preparation of technical reports and progressively advanced workplace roles, which include liaising directly with clients, regulators, inspectors, and contractors.
- Aptitude working with CAD software (2D & 3D) such as AutoCAD, BricsCAD & SolidWorks, including solid modelling, running simulations and preparing complete engineered drawings.
- Experienced in group and team environments, developed through collaborative work environments in the engineering and avalanche industries.

Education & Training

SEABC Certificate Program

Structural Engineers Association of British Columbia
Ongoing Coursework in the Program

2019-Present

Canadian Avalanche Association Industry Training Program

Avalanche Operations Level 2
Avalanche Search and Rescue Advanced Skills
Introduction to Weather
Avalanche Control Blasting
Avalanche Operations Level 1

2022
2020
2020
2018
2016

B.Sc. in Mechanical Engineering

University of Alberta, Edmonton, AB
Cumulative GPA: 3.7

2009-2013



Engineering Employment History

Principal Engineer

July 2018 – Present

Headwall Engineering Ltd, Jasper, AB

- I help building owners, business operators, and public agencies with their structural engineering needs and challenges.

Work Portfolio:

- Concrete Foundations
 - Design of numerous cast-in-place concrete basement, raft, and isolated foundations for new construction, as well as evaluations of existing foundations for building retrofit applications.
 - Associated familiarity with the local soil properties and building practices.
- Retaining Walls
 - Designed several cast-in-place concrete retaining walls for commercial and residential properties in the region.
 - Performed evaluations on existing walls with performance issues, and designed necessary improvements to ensure ongoing safety.
 - Value-engineered alternatives to CIP concrete where appropriate.
- Structural Design of Buildings & Bridges
 - Design multiple new buildings & significant renovations in the commercial and residential sectors.
 - Perform evaluations on existing buildings to determine suitability for addition or change of use plans. Design of modifications to suit such building modifications.
 - Design pedestrian & forestry bridge components.
- Construction Inspections & Field Reviews
 - Perform necessary field reviews and coordinated construction administration for all engineering completed in-house.
 - Perform field reviews for third-parties operating in this region, namely the new HI Hostel on Sleepy Hollow Road.
- Construction Management
 - Manage the construction of commercial properties for owners/landlords who lack knowledge of construction practices.
- Forensic Engineering
 - Perform investigations, assessments, and associated reporting on foundation issues for properties at the request of insurance adjusters.
- Specialized Equipment Design
 - Design custom equipment, such as stiff-leg derricks and custom jacking devices for contractors in the heavy lifting and heavy haul industries.
 - Perform independent reviews of custom lifting equipment designed by others.

Engineer

January 2017 – June 2018

NCSG Engineering, Acheson, AB

- Designed a variety of custom lifting, transportation, and rigging devices.
- Conducted training for field supervision, management, and foreign peers.
- Completed expert reviews of structural equipment designed by others, and also certified non-destructive tests of equipment.



Work Portfolio:

- Dimensional (Heavy Haul) Transport
 - Assessed on-site transport routes for clients in the oil, gas, and oilsands industries.
 - Designed temporary support structures (grillage) for modules, vessels, and customer equipment.
 - Designed matting and assessed pavements for heavy-haul loading scenarios.
 - Assisted specialized consultants with the assessment of public and private bridge structures for exceptional load permitting.
- Heavy Lifting & Industrial Construction
 - Prepared engineered operational plans for high-risk activities, such as tandem crane lifts, the use of superlift ballast, and the high percentage-of-capacity operations.
 - Designed matting and assessed ground loading to ensure safe operations.
 - Designed custom rigging arrangements to suit the structure of lifted loads.
 - Prepared jacking & shoring plans for complex civil construction requirements, often assessing both the equipment and the supporting structure for adequacy under temporary loading conditions.
 - Designed custom steel equipment to suit project needs.

Jr. Engineer & Engineer

May 2013 – January 2017

Mammoet Canada Western Ltd, Edmonton, AB

My role consisted of planning complex operations into simple and safe tasks through engineered execution plans.

- Designed custom structural equipment for moving equipment weighing up to 1,250 tonnes.
- Trusted point of contact for many clients and third parties in the industrial construction industry.

Project Portfolio:

- Aurora Mine Relocation
 - Engineered custom rigging arrangements, jacking and shoring plans, and assessed heavy haul transport operations to facilitate the relocation of an oilsands mine relocation from an existing open pit to a new location.
 - Designed matting and assessed loading on concrete pavements for equipment during such operations.
 - Assessed transported/lifted/shored equipment for structural adequacy under temporary conditions.
 - Designed custom support equipment & arrangements for large buildings and mine equipment.
- Northwest Redwater Refinery Construction
 - Performed pre-construction feasibility studies on construction sequencing, scheduling and equipment installations for all refinery units.
 - Designed temporary slender steel structures up to 70 m tall, with associated foundations, for the erection of exceptional equipment such as a 1,250 tonne reactor vessel.
 - Assessed on-site transport routes for the movement of exceptional cargo. Coordinated with consultants on the assessment of deep underground utilities.



- Led a team of five engineers on-site during construction of the refinery, supporting the modular assembly program for all units.
- Attended coordination meetings for the entire modular construction program, providing expert input on the coordination of equipment between prime contractors.
- Secondment in The Netherlands
 - Gained expert mentorship from the specialized structural engineering group based in Schiedam, The Netherlands.
 - Performed analysis of existing and proposed structures under temporary construction loading in Europe, South America, the United States, and the Middle East.
 - Assisted the marine division with the structural analysis of ships, barges, and the staged analysis of skid-on-skid-off or roll-on-roll-off operations.
 - Worked in sectors ranging from nuclear to infrastructure, as well as oil & gas extraction and refining.
- CF Industries Reactor Replacement
 - Designed custom transport equipment, post-tensioned connections, and handling operations for a custom fertilizer reactor vessel.
 - Operations planning spanned from the fabricator's site in Austria, to barge transport to the Netherlands, geared ship transport to Duluth, MN, rail transport to Medicine Hat, and on-site transport and lifting installation.
 - Significantly reduced costs through innovative connections that avoided welding to the heat treated vessel, even under rail transport loads (which include design loads of 3 x gravity)
- Other Projects
 - Performed feasibility studies for proposed projects & to support tender efforts.
 - Assisted specialized consultants with the assessment of public and private bridge structures for exceptional load permitting.
 - Developed in-house calculation tools, specifically for specialized jacking equipment & the stability analysis of hydraulic gantries.

Avalanche & Guiding Employment History

Tail Guide

Crescent Spur Heli-Skiing

2019 – Present

Crescent Spur, BC

- Participated in morning and afternoon avalanche forecasting meetings.
- Provided guest briefings and trained guests on companion rescue and emergency protocols to be used while in the field.
- Gathered field weather, snowpack, and avalanche observations while in the field.
- Provided support, encouragement, coaching, and guidance to skiing guests throughout the skiing day.
- Managed guests and controlled their behaviour around hazardous aspects of the skiing program, such as the helicopter, cornices, gullies, crevasses and glaciers, cliffs, stumps, tree wells, and difficult snow conditions.
- Provided the lead guide with valuable feedback on guest performance, specifically regarding those guests struggling or skiing at the back of the group.
- Occasionally led guests through specific terrain features under the direction of the guide leading my group.



Cariboo Snowcat Skiing

2018 – 2022

Tete Jaune Cache, BC

- Independently produced weather forecasts and summaries of avalanche information from other operations (InfoEx) for inclusion in the morning avalanche safety meeting.
- Participated in morning and afternoon avalanche forecasting meetings, leading such meetings on occasion.
- Provided guest briefings and trained guests on companion rescue and emergency protocols to be used while in the field.
- Gathered field weather, snowpack, and avalanche observations while in the field.
- Provided support, encouragement, coaching, and guidance to skiing guests throughout the skiing day.
- Managed guests and controlled their behaviour around hazardous aspects of the skiing program, such as the snow cat and associated roads, cornices, gullies, cliffs, stumps, tree wells, and difficult snow conditions.
- Provided the lead guide with valuable feedback on guest performance, specifically regarding those guests struggling or skiing at the back of the group.
- Led runs familiar to me, under local supervision of the lead guide.

Dynamic Avalanche Consulting

2021/22 Season

Trans Mountain Expansion Pipeline, Valemount, BC

- Participated in morning and afternoon avalanche forecasting meetings.
- Provided worker training on avalanches, avalanche terrain identification, working best practices when in avalanche terrain, companion rescue, and emergency protocols to be used while working in avalanche terrain.
- Independently collected field information such as weather, avalanche, and snowpack observations. Regularly completed observations and “piloted” afternoon InfoEx submissions.
- Independently travelled through complex avalanche terrain with other avalanche technicians, often in a leadership role.
- Utilized unmanned aerial vehicles (drones) to review avalanche terrain and facilitate field observations around active work sites.
- Collaborated with other avalanche technicians on the development of the pipeline’s avalanche terrain atlas.
- Led a terrain mapping project involving a review of existing desktop avalanche terrain mapping, verifying field conditions, evaluating typical snowpack and weather patterns, and providing recommendations for changes to the avalanche terrain boundaries and return periods in accordance with the TASARM.

Computer Skills

- Advanced proficiency with Microsoft Office including Word, Excel and PowerPoint as well as Visio and Project.
- Proficient at drafting, solid modelling, simulation and drawing preparation with AutoCAD, BricsCAD & SolidWorks.
- Skilled in use of WoodWorks software suite, SAFI GSE & SCIA Engineer (Structural Finite Element Packages), Mathcad, LICCON Lift Planner (Liebherr), SALSA (Scheuerle), LabVIEW, MATLAB, Visual Basic (VBA), MathCAD and familiar with C++.



Volunteer Experience

Jasper Employment & Education Centre

Director (Member at Large)

2018 - Present

- Provided strategic direction with the board to the executive director.
- Participated in the 3-year strategic planning process with a professional facilitator.
- Reviewed annual budgets, assisted in the annual financial audit process.

Aspen Gardens Condominium Corporation

President

2020 – 2022

- Developed and led new board for a complex condominium situation.
- Established financial best practices and set the long-term direction of the condominium corporation.
- Completed a financial audit of the developer's book-keeping, obtained a reserve fund study for the common property, and hired a property manager.

Alpine Club of Canada (ACC) – Edmonton Section

Vice-Chair

2013 - 2016

Chair

2016 - 2018

- Managed the Board of Directors for the Edmonton Section, instituted major modernization of the organization, refreshing of policies and processes, and inspired a systemic change in the organization's direction and energy.
- Instructed introductory courses to members in the fields of summer mountaineering and backcountry skiing. Also led regular trips with participants in the mountains.
- Mentored other leaders within the club.