

## New

Ministry

Transportation and Economic Corridors

### Describe: Basic Job Details

#### Position

Position ID

Position Name (30 characters)

Bridge Design Engineer

Requested Class

Engineering & Related Level 2

Job Focus

Operations/Program

Supervisory Level

Agency (ministry) code

Cost Centre

Program Code: (enter if required)

#### Employee

Employee Name (or Vacant)

#### Organizational Structure

Division, Branch/Unit

Current organizational chart attached?

Supervisor's Position ID

Supervisor's Position Name (30 characters)

Supervisor's Current Class

### Design: Identify Job Duties and Value

#### Job Purpose and Organizational Context

Why the job exists:

Reporting to the Structural Engineering Specialist, this position establishes, maintains, and implements structural engineering design standards, procedures, guidelines, and standard drawings for bridges and appurtenances on the provincial highway network. This position captures and transfers technical knowledge relating to structural engineering to a range of internal and external stakeholders. This position also provides technical advice on complex structural engineering and detailed design issues that arise in assessment of existing structures and delivery of capital construction projects. This position provides structural engineering and detailed design components of engineering reviews of ongoing projects and in-house design projects. This position may involve contributions to the development of the Canadian Highway Bridge Design Code.

#### Responsibilities

Job outcomes (4-6 core results), and for each outcome, 4-6 corresponding activities:

1. Development and maintenance of technical information related to structural engineering of highway structures in Alberta.  
 - Participate in the development and maintenance of standards and guidelines, including the Bridge Structures Design Criteria, Bridge Load Evaluation Manual, and Bridge Culvert Design Guidelines.  
 - Participate in the development and maintenance of standard and typical detail drawings used in detailed design of bridges.

- Participate in updating the Canadian Highway Bridge Design Code (CHBDC) through involvement in a range of CHBDC Technical Sub-committees and TAC committees.

2. Assist with capture and transfer of technical knowledge in bridge structural engineering to clients.  
- Capture new technical information through reading, conferences, research, courses, and committee participation.

- Participate in the transfer of technical knowledge to asset management and delivery staff and consultants through various means including project meetings, training sessions, workshops, and conferences.

3. Provide technical advice on complex projects; deliver engineering reviews and in-house designs.

- Provide technical advice to a range of internal and external clients on complex structural engineering issues, including interpretation of code requirements and AT standards.

- Provide technical advice and support on bridge construction and rehabilitation projects including review of structures alternatives reports, project design briefs and detailed design submissions.

- Provide structural engineering component of project engineering reviews targeted at obtaining standards related feedback and improvement of project delivery.

- Provide structural engineering and detailed design services for in-house design projects.

- Provide technical support to load permitting staff on truck routing issues relating to oversize loads including analysis techniques and impacts to the highway network.

4. Assist with updates to Standard Drawings and CAD standard development.

- Using CAD software to assist with the preparation of new and updates to existing standard drawings.

- Assist with the maintenance of Department CAD standards.

- Assist with assigning drawing inventory numbers for bridge capital projects.

## Problem Solving

Typical problems solved:

- Update standards and standard drawings based on the latest developments in the CHBDC, requiring strong detailed computer modelling skills and practical application of engineering principles.

- Assess the load carrying capacity of bridges in deteriorated condition and recommending course of action based on potential failure mechanisms and application of judgement and experience.

- Evaluate new bridge configurations, elements, and materials for alignment to standards and codes, and apply first principles to support decisions when codes are not sufficient.

- Interpret and communicate understanding of guidelines and codes in the application to complex projects to ensure safety and value.

Types of guidance available for problem solving:

- National bridge code (CHBDC)

- Department standards such as Bridge Structures Design Criteria and Load Evaluation Manual

- Engineering principles and detailed computer modelling

- Published studies and research projects (e.g. girder load analysis)

- Engineering judgement and experience, peer network, Academia

Direct or indirect impacts of decisions:

- Safety of bridges in operation, confidence of travelling public in infrastructure.

- Value delivered on construction projects.

- Minimizing impact to traffic with resilient solutions.

- Alignment with relevant legislation (e.g. Engineering and GeoSciences Professions Act).

- Support for economic development with consideration of innovative materials and processes.

## Key Relationships

Major stakeholders and purpose of interactions:

- Director (bi-weekly) - seek clarity and context, alignment with department goals

- Structural Engineering Specialist and structural engineers team (daily) - technical guidance, assignment of work, monitoring progress and performance, ensure engineering responsibility requirements met

- Bridge Project Managers - (weekly) - technical support and advice on complex projects, receive feedback

on standards, monitor implementation of standards, interpret and communicate standards and process requirements.

- Other bridge engineers and specialists (weekly) - support bridge planning, fabrication and construction as well as assessment of safety of deteriorated bridges.

**Required Education, Experience and Technical Competencies**

Education Level	Focus/Major	2nd Major/Minor if applicable	Designation
Bachelor's Degree (4 year)	Engineering		

If other, specify:

Degree specializing in structural engineering

Job-specific experience, technical competencies, certification and/or training:

- Minimum 5 years of experience in bridge design and structural engineering.
- Master's in structural engineering or related is an asset.
- Experience with Alberta standards and infrastructure is an asset.
- Familiarity with other areas of bridge engineering (e.g. planning, fabrication, construction, and preservation) is an asset.
- Experience using CADD software is an asset

**Behavioral Competencies**

Pick 4-5 representative behavioral competencies and their level.

Competency	Level					Level Definition	Examples of how this level best represents the job
	A	B	C	D	E		
Creative Problem Solving	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Engages the community and resources at hand to address issues: <ul style="list-style-type: none"> <li>• Engages perspective to seek root causes</li> <li>• Finds ways to improve complex systems</li> <li>• Employs resources from other areas to solve problems</li> <li>• Engages others and encourages debate and idea generation to solve problems while addressing risks</li> </ul>	Our group develops standards to be used for the design of bridges in Alberta. However, the standards may not encompass or be appropriate for certain complex projects. Our group may be involved on complex projects throughout conceptual, preliminary, and detailed design of these projects. It will be important to be able to seek solutions to issues we have not encountered before.
Develop Networks	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Leverages relationships to build input and perspective: <ul style="list-style-type: none"> <li>• Looks broadly to engage stakeholders</li> <li>• Open to perspectives towards long-term goals</li> <li>• Actively seeks input into change initiatives</li> <li>• Maintains stakeholder relationships</li> </ul>	Working with internal stakeholders (regions) and external stakeholders (consultants) during project reviews. It's necessary to gain understanding of challenges and other viewpoints which will assist with future project reviews and development of bridge design standards.
Build Collaborative Environments	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Collaborates across functional areas and	The Bridge Engineering Section (BES) works very

		<p>proactively addresses conflict:</p> <ul style="list-style-type: none"> <li>• Encourages broad thinking on projects, and works to eliminate barriers to progress</li> <li>• Facilitates communication and collaboration</li> <li>• Anticipates and reduces conflict at the outset</li> <li>• Credits others and gets talent recognized</li> <li>• Promotes collaboration and commitment</li> </ul>	<p>closely with the Regions. It's important that these relationships are nurtured and that we truly work with these internal stakeholders. Understanding that the delivery of projects requires meeting schedule and budget expectations is important. The structural group within the BES can also expect to work closely with the other bridge disciplines (Planning, Construction, Fabrication and Preservation) on project reviews and long-term goals.</p>
Develop Self and Others	<input type="radio"/> <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>	<p>Plans according to career goals and regular development:</p> <ul style="list-style-type: none"> <li>• Aligns personal goals with career goals</li> <li>• Leverages strengths; attempts stretch goals</li> <li>• Provides feedback and openly discusses team performance</li> <li>• Values team diversity, and supports personal development</li> </ul>	<p>Individuals within the Bridge Engineering Section of the Technical Standards Branch are expected to be subject matter experts. This requires continued learning throughout their career. Technical topics will be explored in-depth to a level that is not easily attained in consulting.</p>

**Benchmarks**

List 1-2 potential comparable Government of Alberta: [Benchmark](#)