Update

Ministry

Transportation and Economic Corridors

Describe: Basic Job Details

Position

Position ID

Position Name (30 characters)

Bridge Planning Specialist

Current Class

Engineering & Related Level 4

Job Focus

Operations/Program

Supervisory Level

01 - Yes Supervisory

Agency (ministry) code

Cost Centre

Program Code: (enter if required)

Employee

Employee Name (or Vacant)

Organizational Structure

Division, Branch/Unit

CPGES, Technical Standards, Bridge Engineering

☐ Current organizational chart attached?

Supervisor's Position ID

Supervisor's Position Name (30 characters)

Supervisor's Current Class

Design: Identify Job Duties and Value

Changes Since Last Reviewed

Date yyyy-mm-dd

Responsibilities Added:

Responsibilities Removed:

Job Purpose and Organizational Context

Why the job exists:

Reporting to the Director of Bridge Engineering, the Bridge Planning Specialist leads development of standards, guidelines, and development of tools relating to bridge conceptual design. Bridge conceptual design involves the determination of the optimal location, size, and geometry of new bridges, and typically involves the most opportunity for ensuring cost effectiveness and life cycle serviceability of a bridge. This

requires combining expertise in hydrotechnical and river engineering and highway geometrics, with working knowledge of several other engineering disciplines (structural, geotechnical, environmental, construction, etc.). This position also leads provision of technical advice in the bridge conceptual design phase of bridge construction projects, assessment of existing bridges to determine optimal life-cycle strategies, and hydrotechnical and river engineering associated with highway construction projects. It also plays a significant role in integrating bridge requirements into highway functional plans and roadway design standards. It also leads provision of level 2 bridge inspection programs for pier scour and river protection works. Significant interaction with regulatory agencies is often involved. This position requires a very specific skill set, with little formal training available outside the department.

Responsibilities

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

1. Lead development, maintenance, support and communication of bridge conceptual design standards, tools, and guidelines to ensure optimal bridge plans are developed in an efficient manner.
• Develop and update the “Bridge Conceptual Design Guidelines” documentation and associated best practice and technical reference documentation. Participate in development of highway design and planning standards to ensure integration of bridge requirements.
• Develop, update, and support bridge planning tools, including the “Hydrotechnical Information System”, “Bridge Planning Geometry” and “FlowProfile” tools.
• Participate in inter-departmental and inter-governmental initiatives to develop effective working practices with regulatory authorities, including navigation, fisheries, and water quality.
• Arrange for training through workshops, presentations, and sessions on use of computer systems and tools to identify hydrotechnical parameters and develop bridge conceptual design options.
• Guide participation of staff in engineering reviews and in-house design projects, as necessary.

2. Provide expert technical advice on bridge conceptual design and planning issues.
• Provide advice on hydrotechnical design parameter selection and optimal bridge plan development on bridge assessment, replacement, and new construction projects.
• Provide advice on integration of bridge requirements into highway functional plan development.
• Provide advice on river engineering issues and flood related impacts for highway and bridge infrastructure in the stream environment, including consideration of the impacts of climate change.
• Provide advice on resolution of regulatory issues related to stream crossings.
• Provide advice on potential impacts of detailed design and construction decision impacts on the overall bridge plan for safety, functionality, and cost-effectiveness.
• Provide advice and input into department work on improving infrastructure resiliency.

3. Lead delivery of Pier Scour and River Protection Works Level 2 Bridge Inspection and Maintenance programs.
• Prioritize program and manage contract for delivery of pier scour surveys, and guide development of pier scour evaluation reports with recommendations for related work activities.
• Deliver the annual river protection works inspection program by assessing lateral stream migration and flow alignment changes using updated imagery and GIS analysis.

4. Supervise staff within the bridge planning group
• Assignment of tasks to staff to meet goals.
• Provide mentoring to staff through technical advice and guidance.
• Conduct performance reviews with reporting staff.
• Coordinate group input to the development of annual section goals.

Problem Solving

Typical problems solved:

1. Conceptual design standards and guidelines have a significant impact on the value, safety, and serviceability of highway structures throughout the province.
2. Hydrotechnical engineering involves assessment of complex and diverse natural constraints and application of principles. River engineering solutions require creative thinking and judgement, with site specific customized solutions for each site.

3. Development of the optimal bridge concept requires consideration of competing objectives from multiple engineering disciplines.
4. Communication with regulators, promoting practical solutions is often required.
5. Interaction with highway planning and design staff, regional asset management and bridge project delivery staff are required to promote optimization of the overall project and explain the principles involved and judgements applied in development of the solution.
6. Changing climate conditions can affect how new bridges are designed and how existing bridges are maintained. This topic needs to be well understood and strategies will need to be developed to address it.

Types of guidance available for problem solving:

- Department standards such as the Bridge Conceptual Design Guidelines and the Design Guidelines for Bridge Size Culverts
- Department hydrotechnical reference documents and Bridge Planning Tools
- Department bridge planning workshop documents
- Published studies and research
- Engineering judgement and experience

Direct or indirect impacts of decisions:

1. Conceptual planning considers hydotechnical and river engineering, roadway, geotechnical and structural parameters in such a way as to optimize costs, safety and resiliency of new bridges. The conceptual planning standards and the related technical recommendations from this position will have immediate impact on department budgets as well as lasting impacts on the safety and resiliency of the department bridge network.

2. Monitoring pier scour and river protection works ensures that the department can respond to changing riverbed/bank conditions in a timely manner to improve the resiliency of existing bridges.

Key Relationships

Major stakeholders and purpose of interactions:

- Director (weekly) - seek clarity and context, alignment with department goals, report on progress, seek support on procedural and staffing matters
- Bridge planning team (daily) - supporting this team as required with technical guidance, assignment of work, and ensure engineering tasks are met. Provide training and mentoring of staff.
- Other bridge specialists (weekly) - participate on section leadership issues including collaboration, resourcing, and priorities.
- Consultants (weekly) - review report submissions. Provide training/support of bridge planning principles and tools.
- Bridge regional staff (monthly) - work collaboratively to develop optimal bridge solutions for projects. Provide advice on complex projects, such as development of options for major bridge replacement and response to flood events. Provide training to regional staff as required.
- Highway planning and design staff (monthly) - ensure integration of bridge requirements in the highway planning studies.
- Technical leaders in other jurisdictions (monthly) - share experiences, identify research and standards development needs.

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:

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

Requirements include a civil engineering degree with a minimum of 10 years of experience in the hydrotechnical engineering and bridge geometrics. A Master's degree specializing in hydrotechnical engineering and bridge geometrics would be an asset. Membership in APEGA is also required.

Strong hydrotechnical and highway geometrics skills are required, including familiarity with the use of GIS tools and practical hydraulic models. Experience with combining hydrotechnical principles and bridge

related highway geometrics in an optimization framework is required. Familiarity with other engineering disciplines related to bridge conceptual design, such as geotechnical, structural, construction, and environmental components, is necessary.

Analytical, creative problem solving, use of computing tools, training and mentoring skills are required. Skills in communication and personal interaction are particularly important in dealing with stakeholders, particularly due to the low level of understanding of bridge conceptual design in the industry, and the need to influence regulators.

Behavioral Competencies

Pick 4-5 representative behavioral competencies and their level.

Competency	Level A B C D E	Level Definition	Examples of how this level best represents the job
Systems Thinking	○ ○ ◉ ○ ○	Takes a long-term view towards organization's objectives and how to achieve them: • Takes holistic long-term view of challenges and opportunities • Anticipates outcomes and potential impacts, seeks stakeholder perspectives • Works towards actions and plans aligned with APS values • Works with others to identify areas for collaboration	For new bridge projects, this position requires the consideration of many engineering disciplines (hydrotechnical, structural, roadway, geotechnical, etc.) in order to ensure the right balance between safety, resiliency and economics is attained. For existing bridges, this position must consider the impact to users if bridges are damaged during flood events, while at the same time striving for efficient use of constrained operational and capital budgets.
Creative Problem Solving	○ ○ ◉ ○ ○	Engages the community and resources at hand to address issues: • Engages perspective to seek root causes • Finds ways to improve complex systems • Employs resources from other areas to solve problems • Engages others and encourages debate and idea generation to solve problems while addressing risks	This position must work closely with consultants, regional staff, and many as well as other technical specialists within department to find optimum solutions for complex bridge projects. This position must also work closely with federal and provincial regulators to develop mutually agreeable solutions for fish passage at bridge sites.
Build Collaborative Environments	○ ○ ◉ ○ ○	Collaborates across functional areas and proactively addresses conflict:	The Bridge Engineering Section (BES) works very closely with the Regions. It's important that these

		• Encourages broad thinking on projects, and works to eliminate barriers to progress • Facilitates communication and collaboration • Anticipates and reduces conflict at the outset • Credits others and gets talent recognized • Promotes collaboration and commitment	relationships are nurtured and that we truly work with together these internal stakeholders. In addition, this position works closely with federal and provincial regulators. It is important that these relationships remain positive so that we can work through challenging issues towards common objectives.
Develop Self and Others	○ ○ ◉ ○ ○	Plans according to career goals and regular development: • Aligns personal goals with career goals • Leverages strengths; attempts stretch goals • Provides feedback and openly discusses team performance • Values team diversity, and supports personal development	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.
	○ ○ ○ ○ ○		

Benchmarks

List 1-2 potential comparable Government of Alberta: Benchmark