

Self-Screening Registration Criteria

P03: General Arrangement Design of Forest Road Bridges

Mandatory Knowledge Requirements

The Ministry of Forests and Range will only contract with qualified professional engineers (PEngs) to provide professional services for general arrangement design of Forest Service road bridges. Professional engineers providing this service must:

1. be members in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC);
2. have appropriate education, training and experience within the discipline of engineering that are congruent with the bridge design services required by the ministry;
3. be familiar with forest road and bridge planning, layout, conceptual and detailed bridge design, construction considerations and techniques, design vehicle configurations and assessment, fluvial geomorphology, river engineering, scour and scour protection, design flood hydrology determination, open channel hydraulics, flood routing, methods for stream flow training, and debris potential assessment and estimation, bridge component fabrication, and shop and field welding principles and techniques;
4. have considerable recognized specialization in the layout and conceptual design of forest road bridges;
5. be thoroughly familiar with the typical details and arrangements described in the Ministry of Forests and Range publication entitled, *Forest Service Bridge Design and Construction Manual* available at the following web site:
<http://www.for.gov.bc.ca/hth/engineering/FRBDC.htm>
6. be thoroughly familiar with the *Canadian Highway Bridge Design Code* (CAN/CSA-S6) and other associated bridge standards for engineering materials and bridge component fabrication, or other standards as appropriate;
7. be thoroughly familiar with the “Guidelines for Professional Services in the Forest Sector – Crossings” (Crossing Guidelines) prepared by the Association of Professional Engineers and Geoscientists of British Columbia and the Association of BC Forest Professionals available at http://www.apeg.bc.ca/library/library/guidelines/guides_psfcs_crossings.pdf, and sign and seal drawings as the Coordinating Registered Professional, Engineer of Record or both;
8. be thoroughly familiar with stream crossing requirements and procedures of the Department of Fisheries and Oceans Canada and the British Columbia Ministry of Environment, and knowledgeable about Federal legislation such as the *Fisheries Act* and the *Navigable Waters Protection Act*, and about Provincial legislation such as the *Forest Practices Code of British Columbia Act*, *Forest and Range Practices Act*, and *Water Act*, and associated regulations under those acts, including the Water Regulation, Forest Road Regulation, and the Forest Planning and Practices Regulation, among other legislation relevant to specific forest road bridge projects;
9. have a working knowledge of related riparian and aquatic environmental issues (such as stream classification and fish passage requirements) and associated construction mitigation techniques;

10. have a comprehensive working knowledge and understanding of the principles and best management practices provided in the following government publications:
 - Forest Practices Code of BC Forest Road Engineering Guidebook (June 2002)
 - Forest Practices Code of BC Fish-stream Crossing Guidebook (March 2002)
 - Forest Practices Code of BC Riparian Management Area Guidebook
 - Forest Practices Code of BC Fish-stream Identification Guidebook
11. in the case of projects that come under the control and administration of BC Timber Sales (BCTS), obtain BCTS Environmental Management System (EMS) Level 3 training prior to commencing work on any BCTS Worksite.

Mandatory Experience Requirements

All professional engineers providing services for general arrangement design of Forest Service road bridges require a minimum of 5 years of demonstrated relevant professional bridge engineering experience. This experience must include bridge design work in forestry or related resource industries in British Columbia and acting as the “Engineer of Record” for this work.

Registered professional engineers must have specific work experience in the following bridge design and construction activities:

1. Development of general bridge arrangement drawings with consideration for:
 - design flood estimation
 - design flood and debris passage
 - bridge configuration alignment in relation to the road and stream
 - road approach and alignment considerations
 - crossing alignment to the stream
 - scour and scour protection
 - substructure and connection component alternatives including consideration for geotechnical conditions and construction parameters
 - cost effectiveness of bridge options
 - related riparian and aquatic environmental issues (such as stream classification and fish passage requirements) and mitigation strategies and options
 - construction equipment and practices in the forest sector
2. Preparation of conceptual and/or structural detailed design of forest road bridges, including design and/or analysis for log, timber, concrete, steel and composite bridge structures or components.
3. Preparation of detailed engineering reports, drawings, specifications and cost estimates.
4. Field reviews during construction of bridges to provide quality assurance and confirmation of conformance to design, including:
 - field monitoring of construction activities during critical phases
 - reviewing and interpreting design and shop drawings
 - assessing actual field conditions for consistency with design assumptions and recognized “changed conditions”
 - assessing alternatives, and providing revisions to designs for “changed conditions”
 - preparing as-built drawings, and providing statements of construction conformance.