



Improvements in Bridge Design and Construction

A simple crossing, spanning 18.29 metres (60 feet), over a class S3 stream on a forest service road in the Selkirk Natural Resource District.

Photo credit: Forest Practices Board.

In April, the Forest Practices Board published our second special investigation of bridge planning, design, and construction. The first bridge investigation found significant concerns with professional practice, environmental protection, and safety. This special investigation is a follow-up to the Forest Practices Board March 2014 report.

Following publication of the 2014 report, the Association of BC Forest Professionals took significant and positive actions. The ABCFP, in partnership with Engineers and Geoscientists BC (EGBC), updated the *Guidelines for Professional Services in the Forest Sector – Crossings* (the “Crossing Guidelines”) to Version 2, released in June 2014 (Version 3 is currently in development). In the fall of 2014, this magazine¹ reminded registrants of their obligations, which are worth reviewing. The *Crossing Guidelines* were elevated to a standard of professional practice when the membership voted for its inclusion in ABCFP Bylaws in 2015.

Despite this guidance, safety and environmental concerns continued to show up in some board audits, so we decided to look at a broader sample of structures to see if practices have improved. We looked at 269 bridges and 59 wood box culverts, all built since 2017 in five geographically distributed natural resource districts.

The good news is we found significant improvements in all areas. Safety improved; there were significant safety concerns on five per cent of crossings, down from 15 per cent in 2014. However, we can still do better. The goal is for all new crossings to be safe while protecting environmental resources. A valuable reference for clarity is the new practice advisory, *Professional Roles and Responsibilities for the Life Cycle of Forest Road Crossings* (2019) (developed jointly with EGBC).

Are you involved with bridge planning, design, and construction? Here are some important things to remember:

Safety

- If portable structures are reused, they need to be inspected and assured as safe by a qualified registered professional (QRP).
- The Professional of Record (POR) must be satisfied the crossing is

constructed in a manner consistent with the design, and needs to sign-off on the construction assurance statement before industrial use commences.

Environment:

- Sediment control is crucial to minimize impacts to water quality and fish habitat, especially in areas with highly erodible soils.

Professional Documentation

- Bridge plans need to be complete and assured by an appropriately qualified registered POR, as described in Section 6 of the *Crossing Guidelines*.
 - This includes fabrication drawings of bridge components and the general arrangement of the crossing and its approaches.
 - Generic general arrangement drawing templates that do not adequately consider site-specific peak flows, approach alignment, or local site conditions and geometry are not acceptable.
- Record drawings (i.e. the post-construction design, also called “as-built”) need to be accurate, signed, sealed, and dated by the POR.

Professional Assurance

- Two crossing assurance statements are needed for every crossing: one signed by the Coordinating Registered Professional (CRP) and one signed by the POR.
- Professionals must recognize when a crossing is complex and ensure the POR has the required expertise.
 - Review Section 4.1 of the *Crossing Guidelines* for criteria of a simple crossing. Any crossing that does not meet these criteria is complex and requires specialized expertise for the design and supplementary documentation.

One final note on due diligence. Some record drawings were signed and sealed by forest professionals, but a professional engineer designed the crossing. If you, as a forest professional, take professional responsibility for the post-construction design, you become the POR, and you must possess the required qualifications and expertise.

Results of the follow-up investigation indicate professional practices for bridge planning, design, and construction have improved. With a little more effort, you can make things even better.

Go to our website at www.bcfpb.ca to see the full report, where you can also find a summary presentation and photos of good and inadequate crossings. ✖

REFERENCES

1. BC Forest Professional, September-October 2014 “Forest Road Crossings and Public Safety – A Collective Responsibility” by Sharon Glover, MBA

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