



Roads & Crossing Structures

IMPORTANT POINTS FOR PROFESSIONALS TO CONSIDER



Forest
Practices
Board

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Overview

Setting the Scene

- How does the FPB view compliance and attribute findings?
- What are the defences?
- How does this relate to professional practice?

Industrial Use: Construction & Maintenance

- Bridges
 - Requirements for the tenure holder
 - Obligations of qualified professionals
 - “Apples to huckleberries” comparison
- Roads – high cutbanks

Industrial Use: Bridge Maintenance - guardrails

- Section 72 vs section 75 of FPPR

Non-industrial Use: Wilderness Roads

- Section 79 (6) a & b of the FPPR
- Section 75 & 77 of the FPPR

FPB mission & mandate

Forest Practices Board encourages:

- Sound forest and range practices that warrant public confidence
- Fair and equitable application of FRPA
- Continuing improvements in forest and range practices

In exercising its powers, FPB must act:

- Within its jurisdiction
- In a procedurally fair manner



Example of continuous improvement

The FPB is like a newspaper

PLAN: Forest Policy and Professional Guidance

- *Crossing Guidelines practice standards*

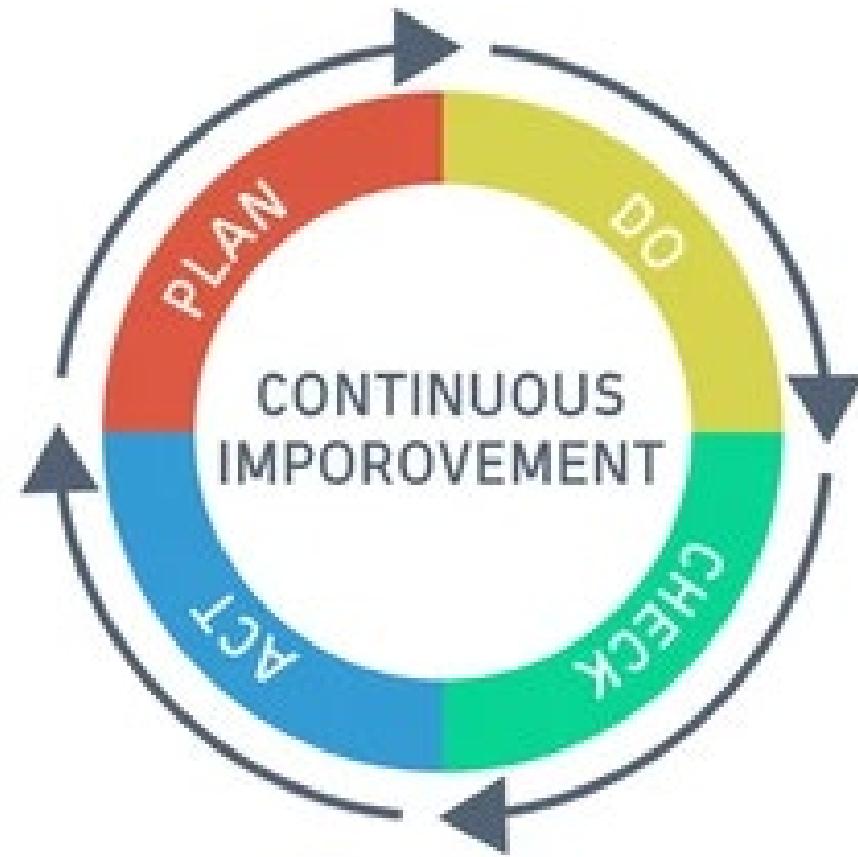
DO: Forest Practices

- *Crossing structure installation*

CHECK: Audits, Investigations

- *Findings*

ACT: Recommendations lead to revisions & fine-tuning



Attribution of FPB findings

- **Audits & Complaint Investigations:** attributed to tenure holders
 - “Agreement holder”
 - “Authorized in respect of a road”
 - “Authorized person”
- **Special Investigations:** often, there is no attribution
- Registrants of FPBC or EGBC? **No**
- **Assumption:** good faith relationship between the tenure holder and professionals



FRPA defences [see Sections 101 & 122 (2) (b)]

1. **Due Diligence:** took all reasonable care to avoid the non-compliance.
 - Level of care is proportional to
 - Likelihood of non-compliance occurring
 - Potential damage
2. **Mistake of Fact:** reasonably and honestly believed the facts.
 - Must have come from a reliable source that took steps to ascertain facts (i.e., not blind faith)
3. **Officially Induced Error:** followed the advice of an official.
 - Consulted an appropriate official
 - Obtained reasonable advice and relied on it

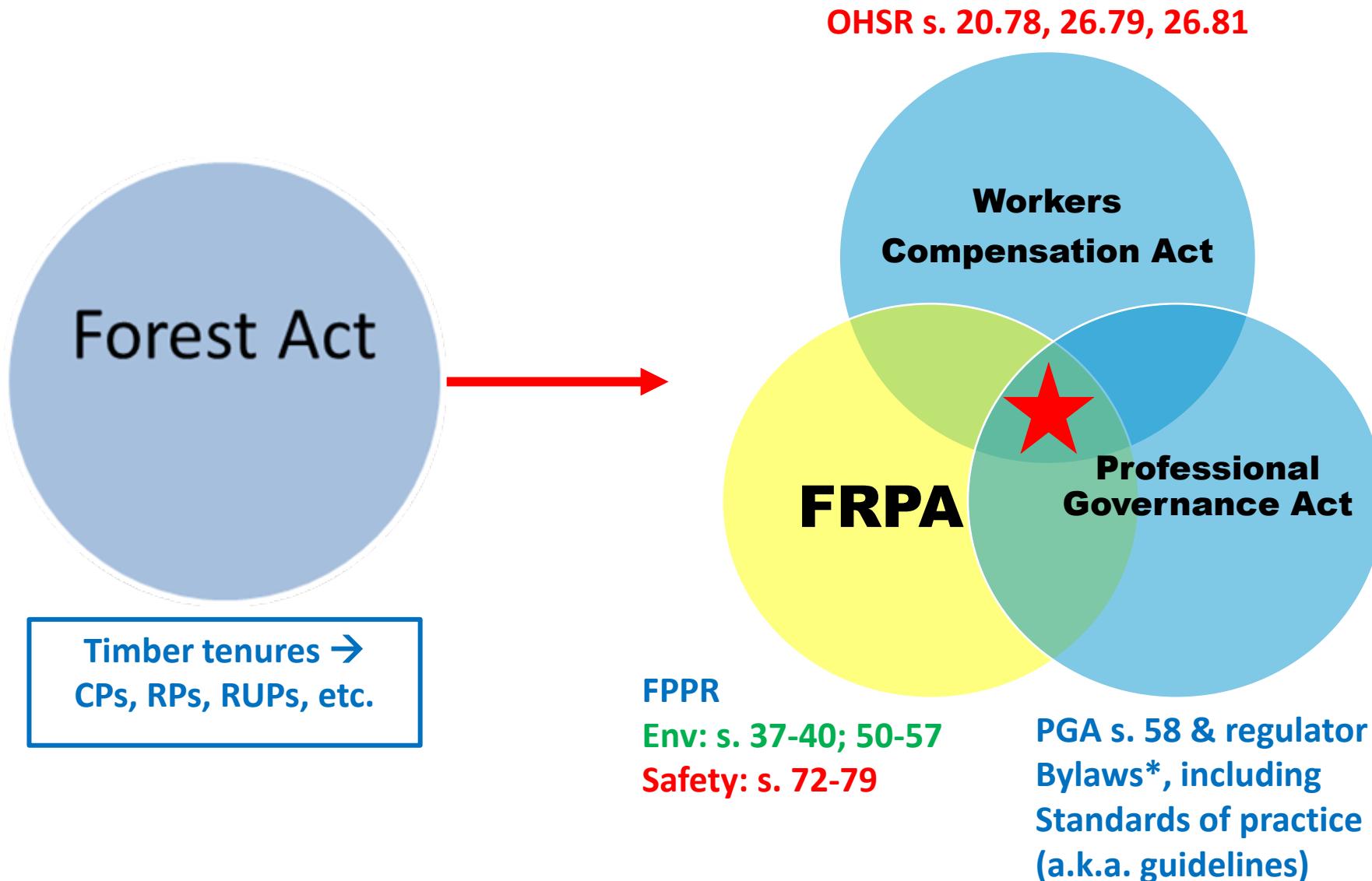
Safety & environment

Fundamental objectives are to protect road users and environmental resources/sites/features from harm

- Compliance with FRPA is the responsibility of a *Forest Act* tenure holder
- Regulated or reserved practice → they can't do it without competent professionals
 - professional obligations & practice standards → registrants of FPBC & EGBC
- Can't transfer or replace one obligation for the other
 - certain roads and bridges activities & practice areas are intertwined



Industrial use: construction & maintenance



What's the difference?

- Section 26.79 of the OHSR

“Haul road standards”

Roads, bridges, elevated platforms, and other structures used by vehicles transporting workers, logs or other forest products in forestry operations must be constructed and maintained to a standard which will permit safe transit.

- Section 72 of the FPPR

“Roads and associated structures”

A person who constructs or maintains a road must ensure that the road and bridges, culverts, fords and other structures associated with the road are structurally sound and safe for use by industrial users.



Tenure holder's obligation - safety

Part 5 (Roads) of the FPPR

Section 72 has parallel regulation(s) under the Workers' Compensation Act

Section #

- **72** – roads and bridges must be safe for industrial users
- **73/76** – bridges/culverts must be designed to meet or exceed applicable standards
- **74** – bridges must be designed to pass the highest expected peak flows
- **75** – structural defects must be addressed through repairs or signage
- **77** – certain records, as-built (record) drawings, and inspection records must be retained
- **79** – roads and crossings must be maintained until the road is deactivated, or the permit is transferred to another party

Tenure holder's obligation – environment

Part 4 (Practice Requirements) of the FPPR

These sections apply to “primary forest activities” and post-Code bridge construction

Section

- 39* – natural surface drainage patterns must be maintained both during and after T/PAS construction
- 55 – the stream channel and banks must be protected (specific to crossings)
- 56* – no material adverse effect on fish passage
 - Includes an obligation to not have MAE on fish passage for all crossings built post-Code
- 57 – activities must not harm fish or damage habitat

What about professionals?



Standards of Ethical & Professional Conduct

- Standard 2 – Independence
 - e) present clearly to employers and clients the possible consequences if professional decisions or judgements are overruled or disregarded
- Standard 6 – Forest Stewardship
- Standard 7 – Safety
- Standard 8 – Professionalism
 - d) be conscientious in providing professional services

Professionals' obligation

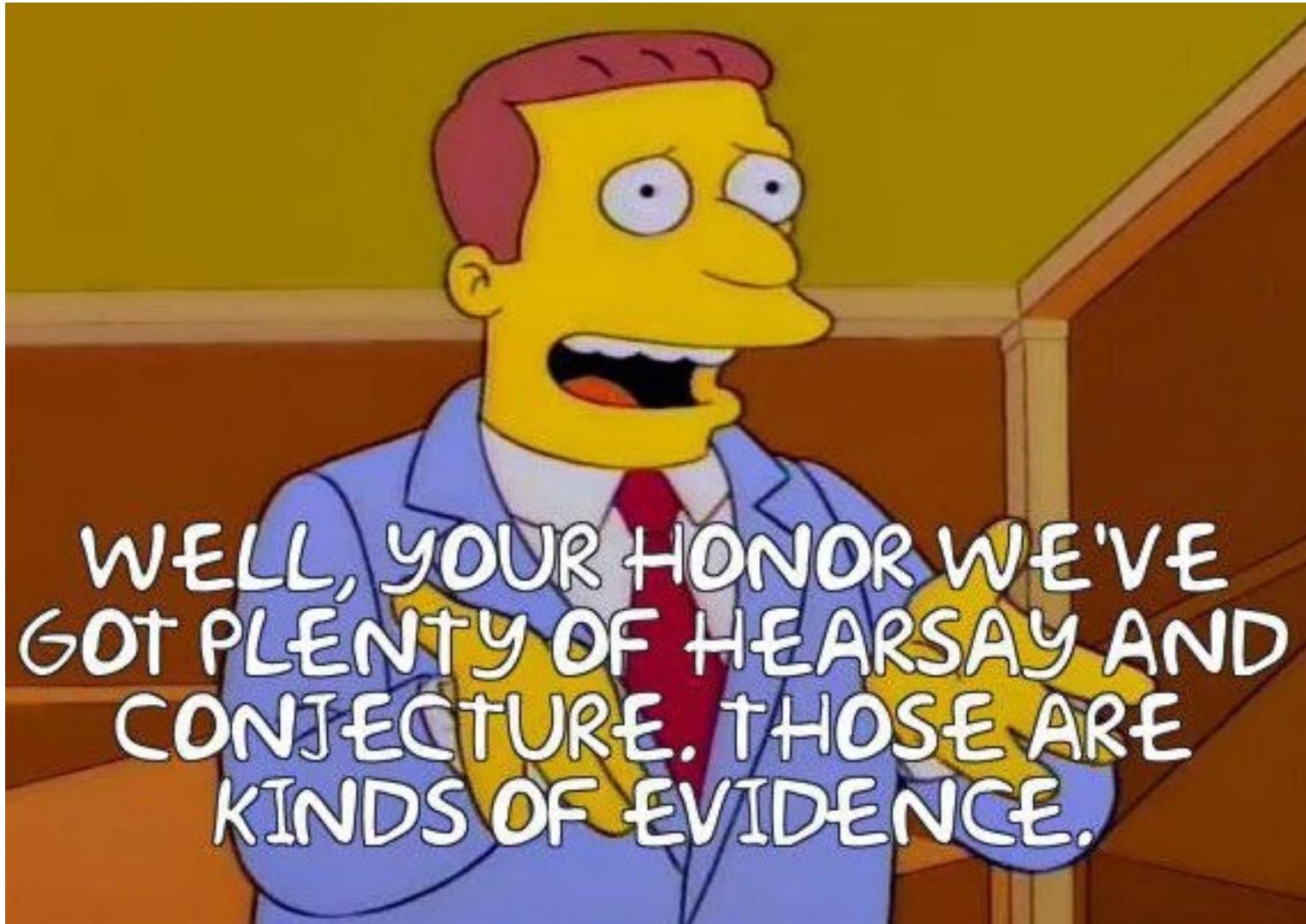
9-1: Code of Ethical and Professional Conduct

Standard 4 – Due diligence

Registrants work with constant and careful attention, and must:

- a) Ensure work is **complete, correct, and clear**;
- b) Provide professional work that is **measurable or verifiable**;
- c) Have regard for the common law and **applicable legislation or regulations, including relevant enactments of British Columbia, federal enactments, and enactments of other provinces**;
- d) Have regard for **applicable standards, policies, plans and practices established by the government or FPBC**;
- e) Undertake work and documentation with **due diligence and in accordance with any guidance developed to standardize professional documentation for the profession of forestry**.

Did it happen?



Not optional!

Bylaw 9-2: Forest resource activities

- (1) Subject to subsection (2) and any other applicable enactment, every registrant providing professional service in a forest resource activity **must comply with the standards of practice**, including any particular standards of competence or standards of ethical and professional conduct respecting that activity, that are described in the applicable guidelines specified in Schedule B to this Bylaw 9, as updated and amended from time to time by the ~~council~~ board.
- (2) In exceptional circumstances, **a registrant may depart from a particular standard set out in guidelines specified in Schedule B if it is appropriate to do so for an identified reason, which must be specifically documented and supported by a written rationale** that is consistent with the Code of Ethical and Professional Conduct.
- (3) Subsection (2) **does not apply** to a standard that is identified in the applicable guidelines as a mandatory requirement.

Required by regs AND practice standard

Bridge and major culvert construction

Section 73 (Design of bridges) or 76 (Culvert fabrication)

Section 74 – Peak flow

Section 77

- These must be retained until the bridge is removed or a person is no longer required to maintain the road
- For new bridges:
 - Pile driving records & soil compaction results
 - mill test certificates, in-plant steel fabrication drawings, concrete test results
 - “other relevant field and construction data” ← General arrangement design and crossing/construction assurance statements described in the *practice standard for Crossings*
 - As-built drawings (a.k.a. “record drawings”)



Practice standards: how're we doing?

1st Bridge Special (2014): 60% compliance with s. 73 & 77 of FPPR (s.74, too)

2nd Bridge Special (2020): ↑74%

2020-2025 Audits: ↑80%

Hang on there, fella

6 other bridges built before audit period: ↘73%

Context matters...

audit files in 6 seasons pre/post 2nd Bridge Special

2014-2019: 53

2020-2025: ↓30 – this is 56.6% of previous 6 audit seasons

bridges sampled

1st Bridge Special: 216

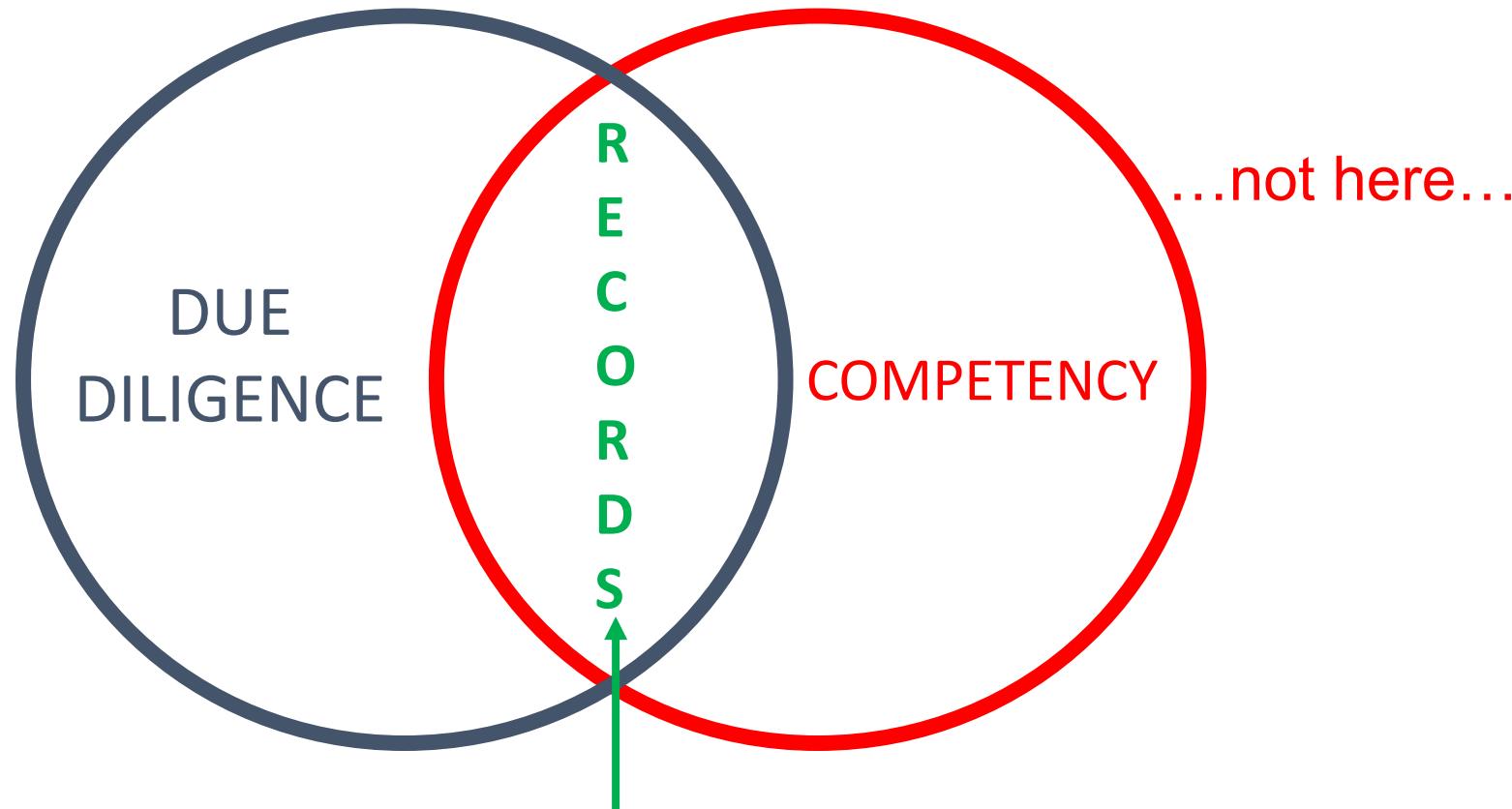
2nd Bridge Special: ↑269 – this is 124.5% of the # of bridges sampled in 1st Special

2020-2025 Audits: ↓ 64 – this is 29.6% of the # of bridges sampled in the 1st Special

+ 6 other bridges not to standard: 70 (32.4%)

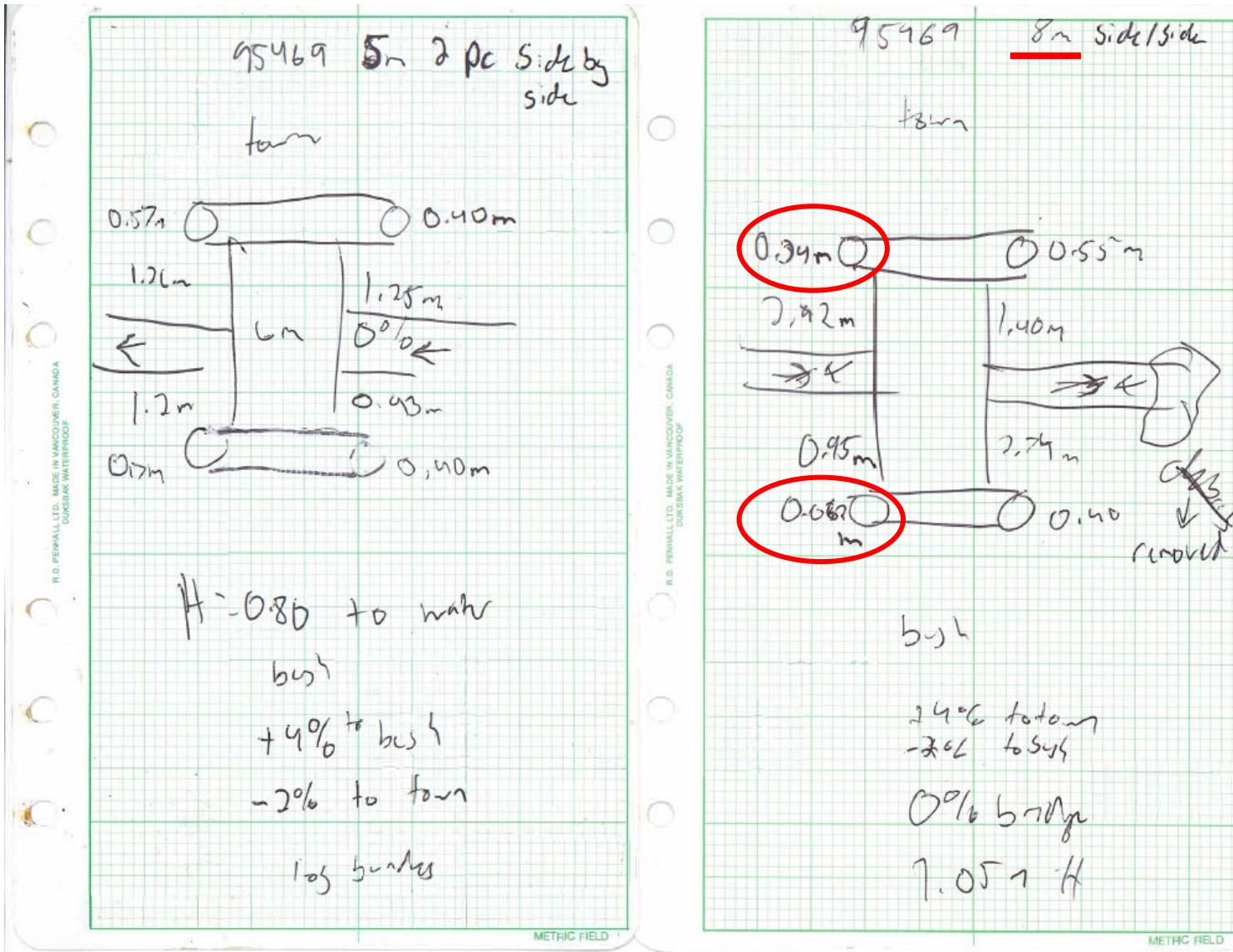
Important to keep in mind

FPB has jurisdiction here...



...but we can infer a great deal of this from here

Record drawing?



Some lowlights (some quotes have been abbreviated)

- ↑ CAS signed and sealed by RFT with statement:
“No site plan/design provided so will pull as soon as deactivations complete”
- CRP (RPF) took on POR responsibility during construction from design POR (P.Eng.)
 - Made major design changes but do not meet legislation, appropriate engineering design standards or professional guidelines
 - Rationale for design changes *“Temp crossing to be removed post harvest.”*
 - Changed the P.Eng. design for a 30' to a 20' over a class S3 stream
 - No sills were installed under bearing plates. Was sitting on geotextile on saturated soils (Si)
 - P.Eng. GA called for 1.4 m from channel bed to bottom of girder. At time of sample, < 30 cm to PWL.
- P.Eng. signed and sealed POR CAS, yet did not prepare a record drawing
 - Inspected the bridges after installation, noted installation flaws and approved as safe
 - “I felt it was not proper to provide record drawings, so inspection reports serve as ‘Record documents’”* and *“both bridges are complex”* but were simple crossings
- 2 portable bridges installed with no plans or peak flow calculations. Despite being asked for Q calculations, the answer was:
“they were considered benign with discharge rates <6.0m/s based on field calculations”

Road Construction

— Deep Excavations
another 6 m rule!



Work standards for deep excavations

Section 20.78 of the Occupational Health and Safety Regulations (abbreviated)

- 1) Excavation work must be done in accordance with the written instructions of a QRP if
 - a) More than 6 m (20 feet) deep,
 - b) An improvement or structure is adjacent to the excavation,
 - c) Is subject to vibration or hydrostatic pressure likely to result in ground movement, **OR**
 - d) The ground slopes away from the edge of the excavation at an angle steeper than 3 H:1 V (33%)
- 3) Written instructions must be
 - a) Certified by the QRP,
 - b) Available at the site, **AND**
 - c) Specify the support and sloping requirements, and expected subsurface conditions

Important to Keep in Mind

From an Occupational Safety Officer

- Section 20.78 of the OHSR applies to all excavations in BC workplaces regardless of industry
- QRPs may include RPFs/RFTs if appropriately qualified (i.e., training/experience)
- Written instructions:
 - Not “canned” statements but may not need to be specifically tailored for each and every instance
 - Need to be clearly stated and effectively communicated
 - Could be a combination of
 - Maps,
 - RoadEng-like designs,
 - Reference to slope angles/other templates in Eng. Manual
 - Specific instructions

Relevant regulations under FRPA

Section 72 and 78 (abbreviated below) of the FPPR

72) A person must ensure that roads are sound and **safe** for industrial use

78) A person must ensure that road clearing widths are at least the minimum width necessary to accommodate:

- a) The **safety** of industrial users;
- b) Topography of the area;
- c) Drainage of water in the area;
- d) Stability of terrain in the area;



Important to Keep in Mind

*Guidelines for Professional Services in the Forest Sector –
Terrain Stability Assessments (August 2010)*

Section 3, Page 9

TSAs typically do not include:

- Geotechnical design recommendations for specialized construction, retaining structures, etc.
- Written instructions for safe entry into or next to an excavation, such as a cut slope
 - Usually in a separate document to meet requirements of worker safety legislation
 - May be included if author is qualified

In this case...

- 1 criterion listed in s. 20.78 of OHSR was met
- No written instructions were prepared
- TSA report expected “loose, well-drained colluvium”
- Road was designed using 100-400% cutbank angles
- Reasonable guidance in Eng Manual* → 67%



Industrial use:
Maintenance

Safety
— Guardrails



What do Engineers say?

Guardrails are not structural

- “only structural when the mods (deck panels?) are being moved (installed)”
- “Guardrails...are safety features. They serve primarily as visual guides for traffic”
- “The structure will be closed if the rails fall off completely”
**from a bridge inspection report and the GVW limit was not downrated*

Guardrails are structural

- “if steel or concrete with guardrails attached as one unit, then structural”
- “need to have structural integrity...need to be substantial and well secured”...”provide both a visual barrier as well as a measure of impact warning...provide a degree of containment”
**Chief Engineer’s testimony in 2018/9 FAC case*



What do manuals say?

Structural vs Surface Maintenance

Structural maintenance does not include guardrails

- Interior ECE Procedures
- Engineering Manual version dated July 26, 2019

Structural maintenance does include guardrails

- Coast ECE Procedures
- Engineering Manual versions dated December 2023 & May 2025



What does the FPB think?

- Guardrails provide resistance and have a function to contain vehicles on the deck
- Structural means anything that is part of the overall design of the bridge and is a feature that makes it safe for industrial use
 - Superstructure, substructure, foundation
- Regulations under WCA that are relevant to guardrails help to define what is “safe for industrial use.”
- **Bottom line:** The FPB views guardrails as structural safety components of the superstructure
 - Necessary to ensure the crossing structure is safe
 - Contradictory language in the various manuals and opposing views in Eng community does not sway FPB’s position.
 - Legal interpretation: will cite the most specific and relevant regulation



Does s.75 of FPPR apply to guardrails?



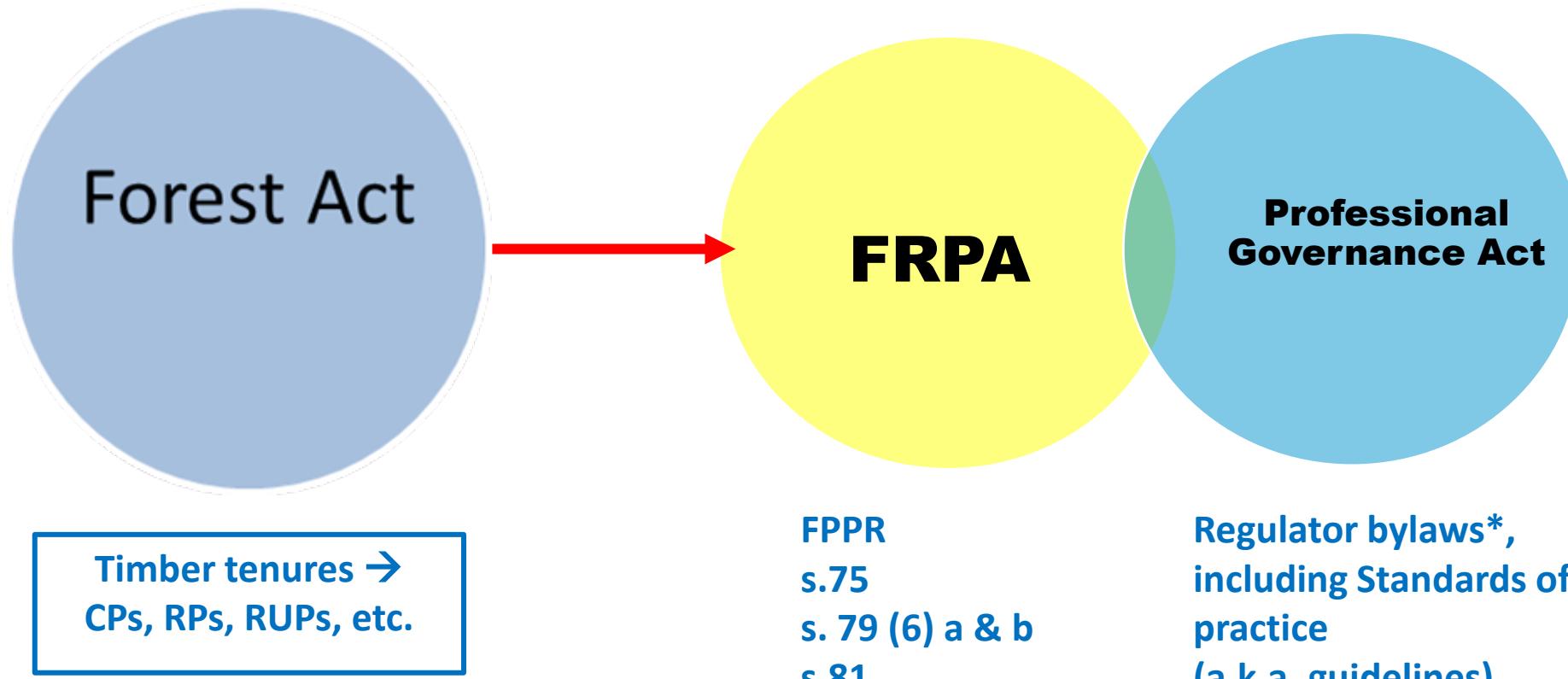
YES NO! Why?

- a. Correct the defect or deficiency to the extent necessary to protect
 - i. Industrial users of the bridge, and
 - ii. Downstream property, improvements or forest resources that could be affected if the bridge fails;
- b. Close, remove or replace the bridge;
- c. Restrict traffic loads to a safe level;
- d. Place a sign, stating the max. load capacity of the bridge.

Defective/deficient guardrails are unsafe for industrial use → Section 72 of FPPR

Non-industrial use (wilderness roads)

The forgotten, or ignored, obligation



Please choose responsibly



What is the obligation?

Some knowledge about the state of roads under permit

(Do you know where your dog is and what it's up to?)

- What?
 - Road prism (RP) stability
 - Drainage system (DS) functionality
- If RP stable and DS functioning as intended, then ✓
- If not, then
 - Where?
 - What happened/is happening?
 - What is impacted and what are the impacts?
 - Should something be done about it?

From v.2 of the Roads standard (Oct 2024)

- All roads should have a maintenance plan (RMP) even if inactive or abandoned
- At minimum, make licensee/operator aware of the potential consequences - similar to Standard 2 (e)
- RMPs may include inspection frequencies and schedules, and may have different requirements for wilderness roads
- RMP musts are listed in section 3.7 on page 23



Summary

- Bridge and road construction

- You cannot opt out of conforming to the standards
 - You may vary but you need to document the reason(s) why
 - There's no cookbook but you must ensure all required elements are included
 - The simplest way for a tenure holder & professional to demonstrate due diligence is to **follow the standards**
 - Pay attention to cut banks approaching or exceeding 6 m
 - Section 20.78 of the OHSR overlaps with sections 72 and 78 of the FPPR
 - Specific written instructions are required



Summary continued

- Bridge maintenance
 - I think section 72 of the FPPR is appropriate for guardrails but not s. 75
 - I will revise audit reports if there is agreement in FPB
 - This does not mean that guardrails are not structural components of the superstructure
- Wilderness roads
 - The RMS and level of execution should match the risk
 - Section 75 still applies to bridges on Wilderness Roads
 - This dog will continue to bark about negligence/abandonment of roads under permit



Some parting words

- Lots of great resources available
- Please remember that you may have to prove it
- **Be on the record**
- Remind yourself of Standard 1 – Competence



Questions?



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