

# 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

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## 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*

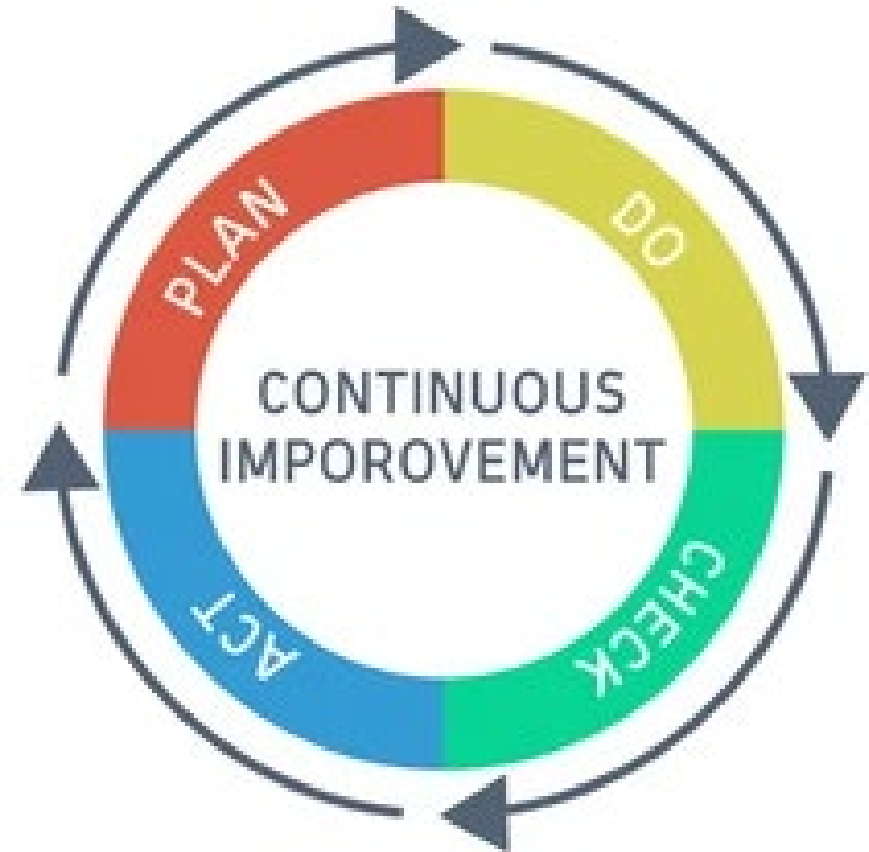
**DO:** Forest Practices

- *Crossing structure installation*

**CHECK:** Audits, Investigations

- Findings

**ACT:** Recommendations lead to revisions & fine-tuning





# Attribution of FPB findings

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- **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)]*

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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

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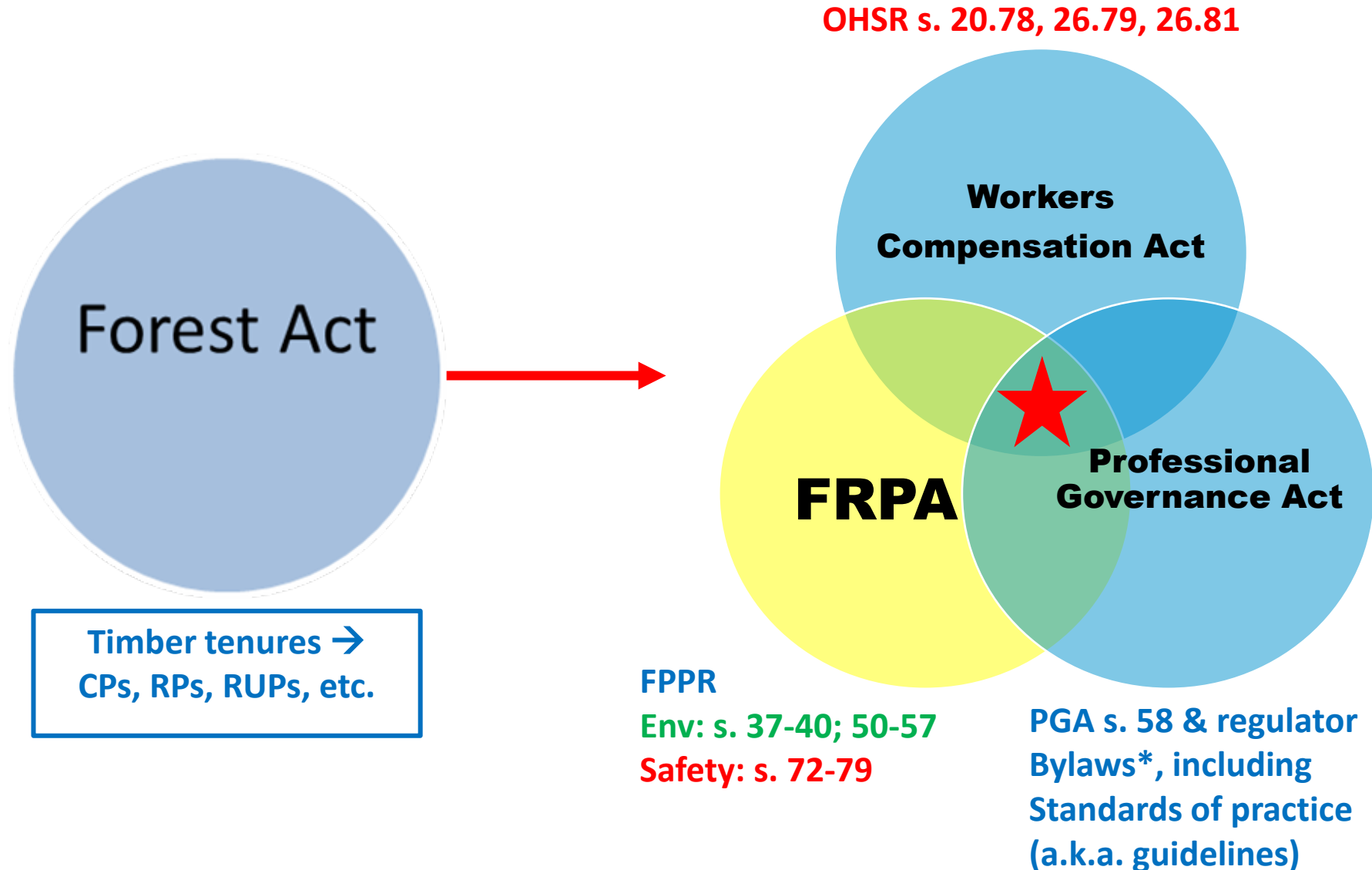
Fundamental objectives are to protect road users and environmental resources/sites/features from harm

- 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?

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- Section 26.79 of the OHSR

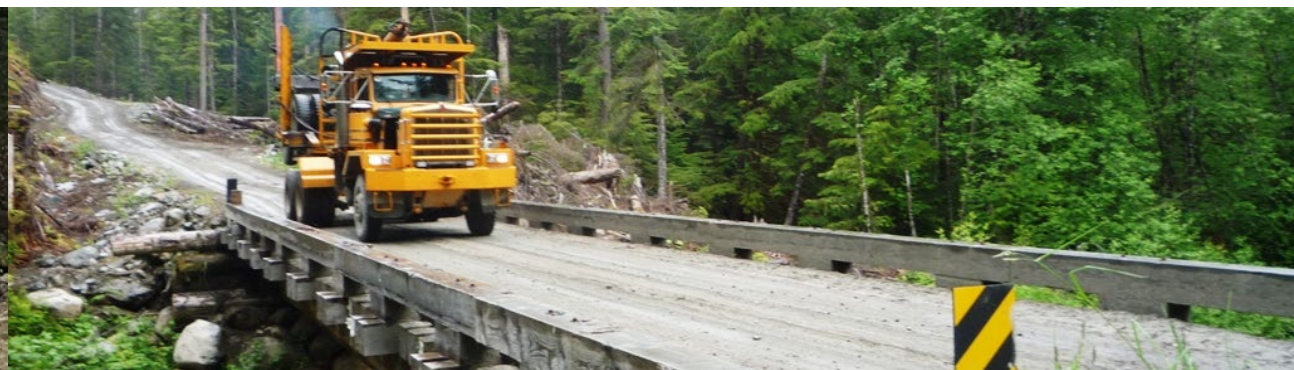
## *"Haul road standards"*

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

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## *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

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## *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?

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## *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

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## 9-1: Code of Ethical and Professional Conduct

### *Standard 4 – Due diligence*

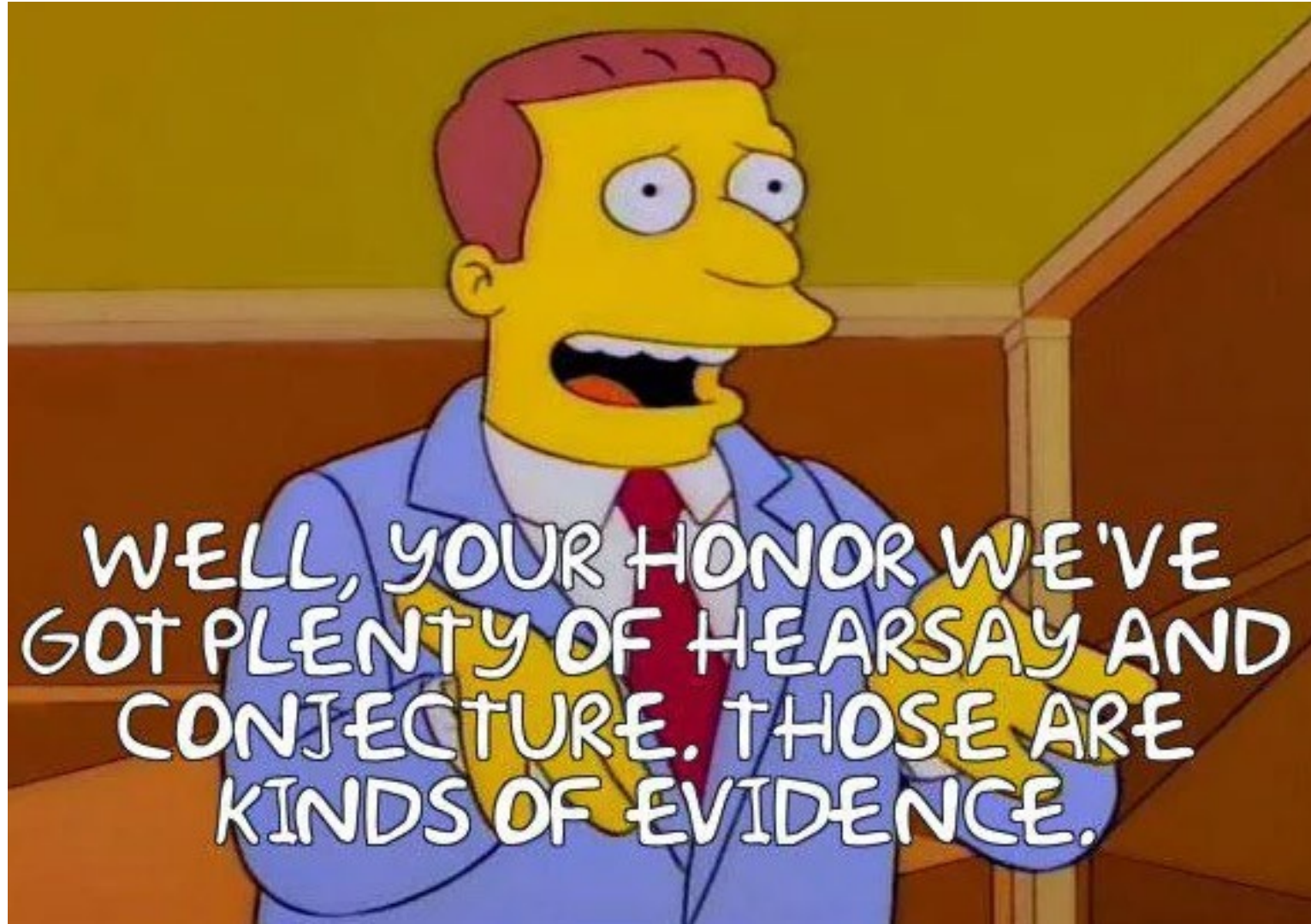
Registrants work with constant and careful attention, and must:

- 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?

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# Not optional!

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## 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?

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

2<sup>nd</sup> 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 2<sup>nd</sup> Bridge Special

2014-2019: 53

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

# bridges sampled

1<sup>st</sup> Bridge Special: 216

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

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

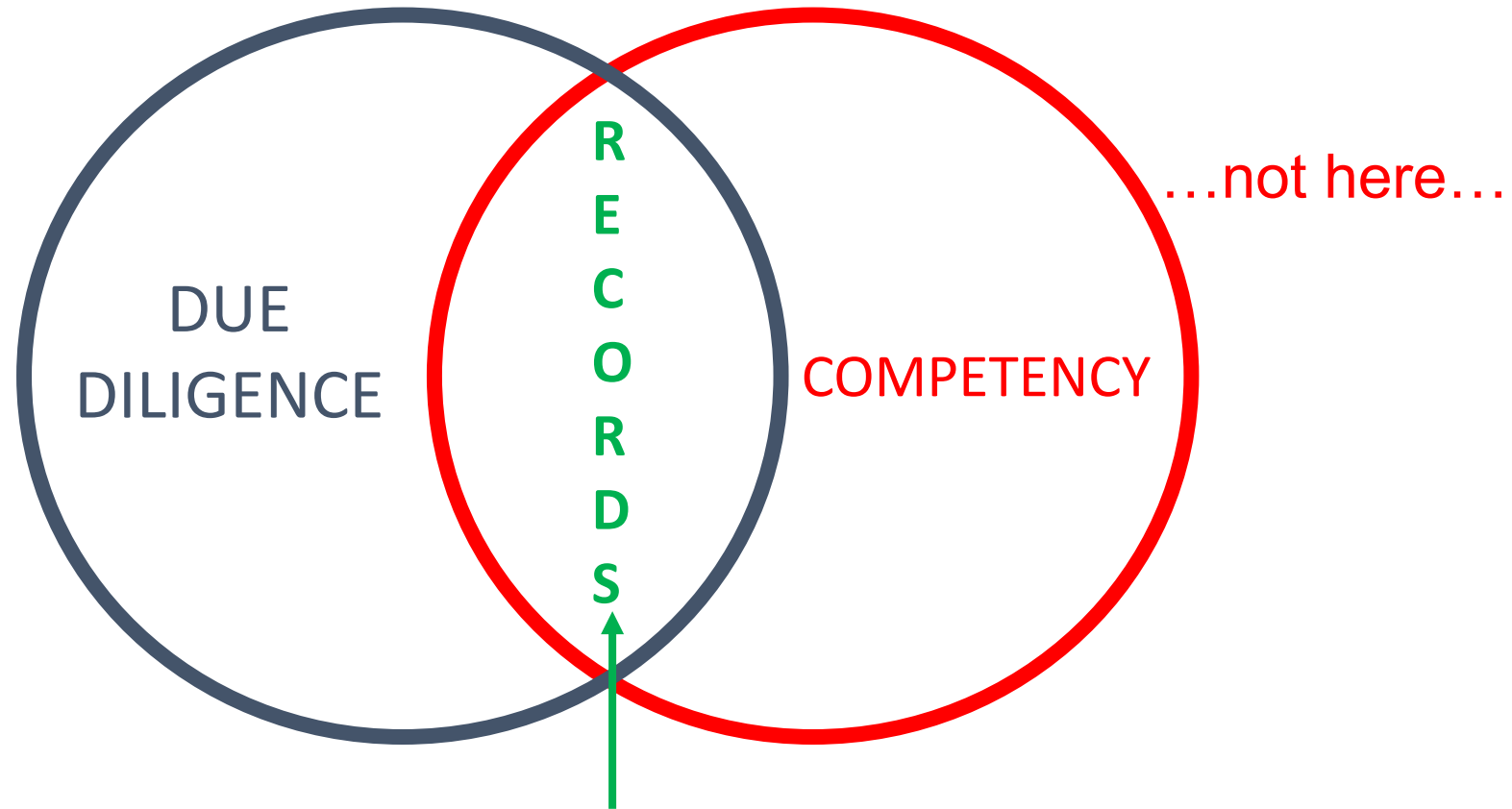
+ 6 other bridges not to standard: 70 (32.4%)



# Important to keep in mind

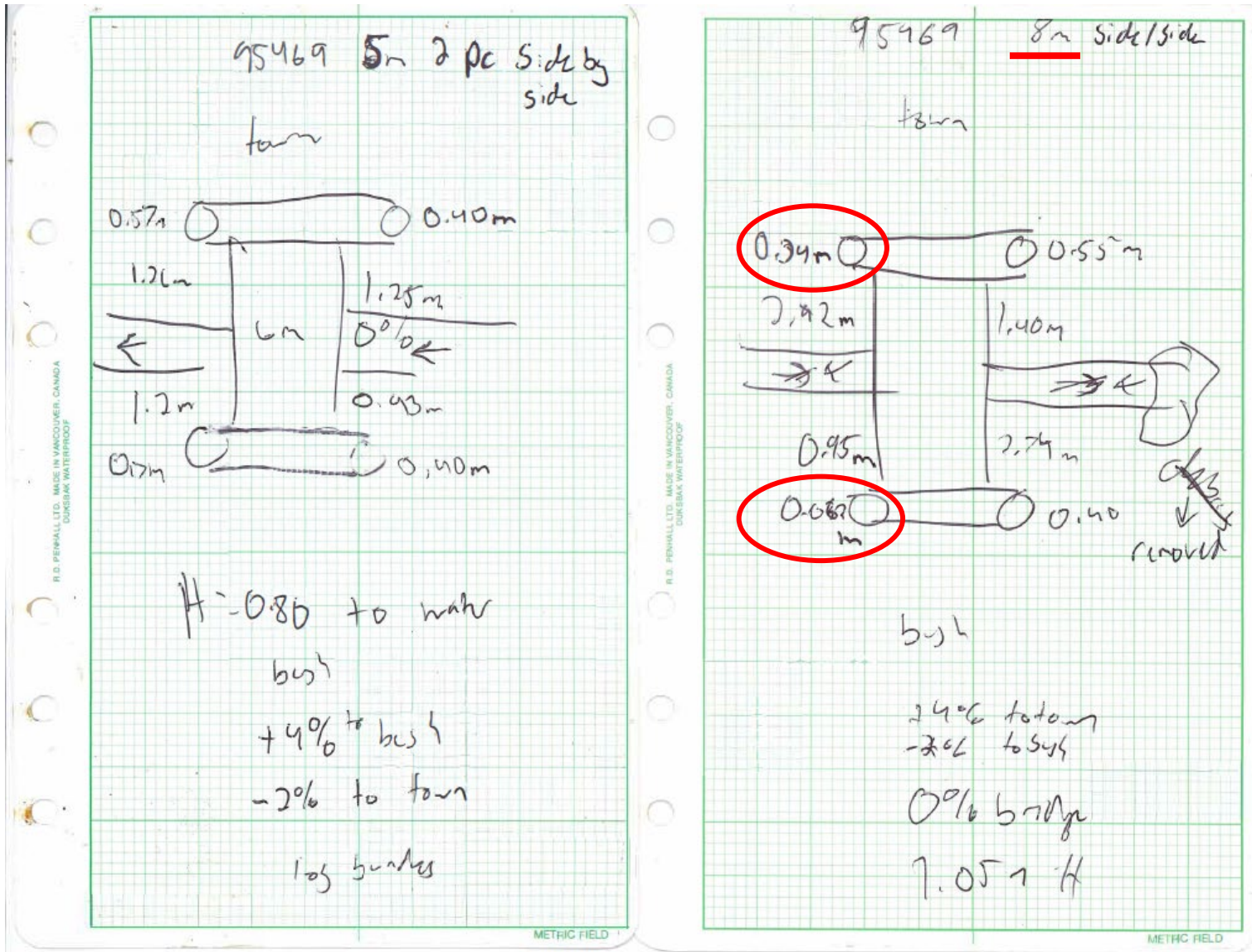
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FPB has jurisdiction here...



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

# Record drawing?



# Some lowlights (some quotes have been abbreviated)

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- ↑ 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

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

Section 3, Page 9

TSA's 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

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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?

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- 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?

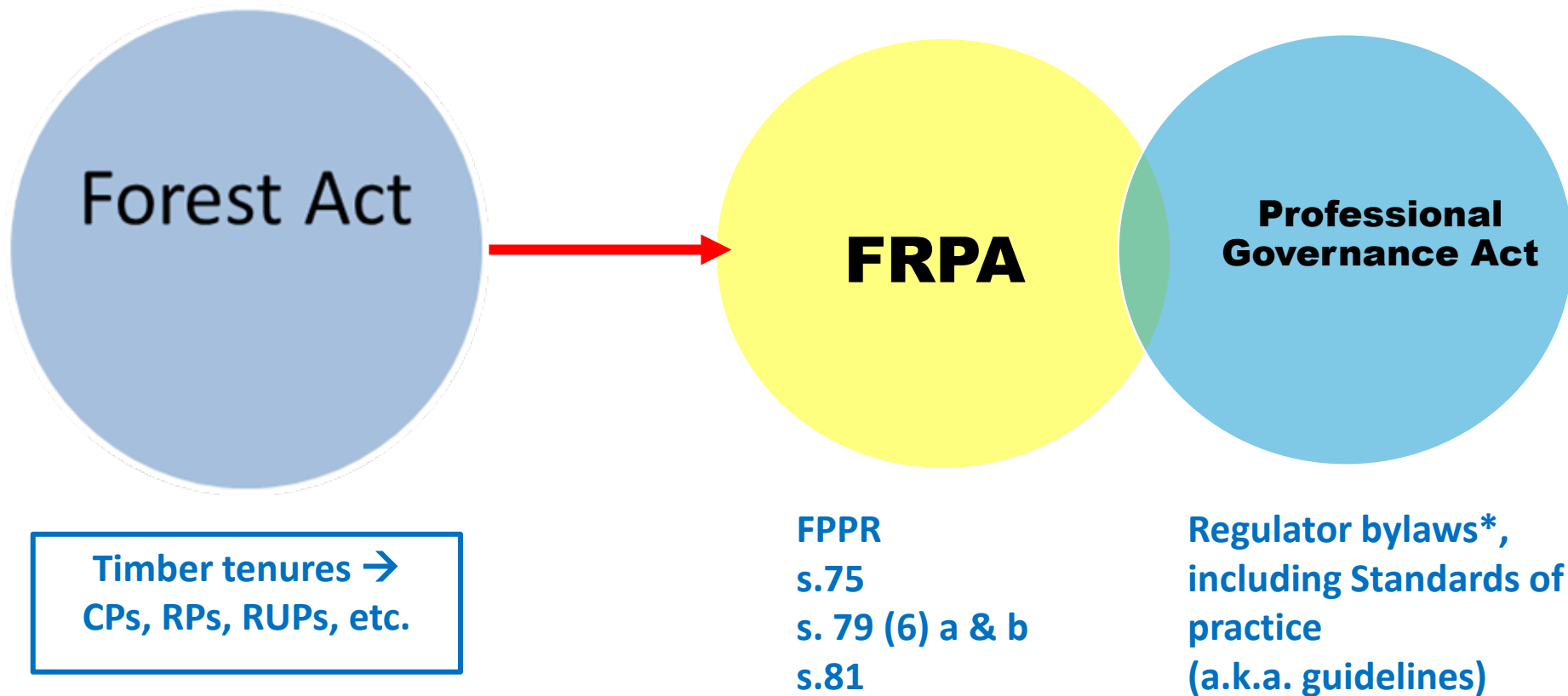
- a. Correct the defect or deficiency to the extent necessary to protect
  - i. Industrial users of the bridge, and
  - ii. Downstream property, improvements or forest resources that could be affected if the bridge fails;
- b. Close, remove or replace the bridge;
- c. Restrict traffic loads to a safe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

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*The forgotten, or ignored, obligation*





# Please choose responsibly




# What is the obligation?

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*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

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- 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

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- 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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