

## BRIDGE INSPECTION

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**BRIDGE NO./NAME** N4-059: Shelter Bay FSR (26.7 KM)

**Inspection Date:** September 21<sup>st</sup> 2012

**Inspected By:** R. Veitch, M. Hanson

**Year Built:** 1995

**Number of Spans:** 1



**Span Lengths:** 21,100 mm

**Superstructure Type:** Two simply supported steel girders. Steel girders are riveted and may be from an old rail bridge.

**Deck:** Timber deck with single layer of deck planks; deck width 4200 mm. Deck ties are 200 mm x 250 mm spaced at 400 mm c/c

**Curb:** Timber curbs and risers.

**Substructure:** Cast-in-place concrete sill. Creosote treated timber ballast planks 140 mm x 300mm. Concrete lock blocks with geogrid for wingwalls.

# BRIDGE INSPECTION

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## GENERAL BRIDGE CONDITION:

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|                                                      |                                |
|------------------------------------------------------|--------------------------------|
| <b>Superstructure Condition:</b>                     | Fair                           |
| <b>Substructure Condition:</b>                       | Fair                           |
| <b>Deck Condition:</b>                               | Fair (Curbs in poor condition) |
| <b>Load Posting:</b>                                 | No sign noted.                 |
| <b>Date for the Next Close Proximity Inspection:</b> | 2017                           |
| <b>Projected Replacement Date:</b>                   | 2022                           |

## BRIDGE INSPECTION SUMMARY/ RECOMMENDATIONS:

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The bridge is generally in fair condition. There is limited access to inspect the concrete sills due to debris accumulation. The curb rails and risers have significant rot and require replacing. Since the actual age of the steel girders is unknown, we estimate that the steel girders have remaining service life of 10-15 years.

## INSPECTION NOTES:

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### Approaches:

- The approaches are generally in good condition.
- Tight horizontal curve on woods end approach.
- Both Bridge Ahead signs are present.
- Brushing is required.
- The camp end upstream delineator is missing.

### Deck:

- The deck is generally in fair condition.
- Curb rails are loose and were found to have 50 mm of heart rot.
- The risers are rotten.
- The deck planks have been replaced since the previous inspection and several deck ties were replaced at the same time.
- 10 mm gaps were observed between the deck planks.
- A number of ties have end checks and shakes.

### Abutments:

- The both abutments are generally in fair condition.
- Debris accumulation limiting access to the abutments and bearings.
- Concrete lock block wing walls are in good condition, no signs of movement.
- Brushing is required.

### Girders:

- The steel girders are generally in fair condition

## BRIDGE INSPECTION

- Several bracing members are bent.
- The coating on the bottom flange and lower portion of the web has failed, remainder of the coating exhibiting signs of undercutting (corrosion below the coating). Loose rust formation on underside of bottom flange, no noticeable section loss, pitting of coating on remainder of girder.
- A few rivets are missing.

### LIST OF MAINTENANCE ITEMS TO BE COMPLETED:

| Items | Description                                   | Priority |
|-------|-----------------------------------------------|----------|
| 1.    | Replace timber curb rails and risers          | High     |
| 2.    | Replace missing delineator                    | High     |
| 3.    | Clean dirt and debris from bearing areas      | Low      |
| 4.    | Brushing required at abutments and approaches | Low      |

### MONITOR DURING FUTURE INSPECTIONS:

- No monitoring items.

Prepared by:



Mike Hanson, EIT.  
Project Engineer

Reviewed by:



David Chen, P.Eng.  
Project Manager

APR 24 2013

Attached:

1. CBR Report
2. Annotated Photo Sheets

# BRIDGE INSPECTION

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## NOTES:

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### Directional & Numbering Conventions Used:

Girders and piles are numbered from upstream to downstream. Left end or right end is determined facing downstream (except for delineators). Spans and piers are numbered from the left end when facing downstream.

### Projected Replacement Date:

The projected date for the bridge replacement is based on the remaining service life of the bridge. We estimate the remaining service life as the greater of:

For Glulam Girder Bridges:

1. Original design life, typically 50 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of five years.

For Steel and Concrete Bridges:

1. Original design life, typically 60 years.
2. If a bridge is nearing the end of its estimated service life but is still in fair condition, we recommend that the Ministry assume a remaining service life of ten years.

### Condition Ratings:

|            |                                                                                          |
|------------|------------------------------------------------------------------------------------------|
| Excellent: | New or almost new condition and properly installed                                       |
| Good:      | Structurally sound, in good repair with minimal wear                                     |
| Fair:      | Structurally functional, shows moderate wear or preliminary indications of deterioration |
| Poor:      | Structurally unsound, items typically in need of repair or replacement                   |

### Maintenance Priority (Typical Usage):

|         |                                                                                                                                                                        |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High:   | Critical items that need to be addressed to protect safety of users (curbs, structural decks, delineators, major structural repairs, etc.); schedule work immediately. |
| Medium: | Items that maintain the service life of the bridge (wearing planks, deck joints, etc.)                                                                                 |
| Low:    | Items that will extend the service life of the structure or general maintenance.                                                                                       |

### Cost Estimate:

The cost estimate for individual maintenance items, shown in the CBR report, reflects the cost of materials and labour for completing a task; it does not include any costs associated with mobilization, demobilization, engineering or contract administration.



# BC Ministry of Forests and Range

## Permanent Bridge Inspection Report

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Date Printed: 2013/03/25  
User Id: BCEID\WRILEY1  
Database: PROD  
Report Id: CBR001A

|                        |                                                                    |              |        |                          |                                         |                       |            |
|------------------------|--------------------------------------------------------------------|--------------|--------|--------------------------|-----------------------------------------|-----------------------|------------|
| Structure #:           | N4-059                                                             | Site #:      | N4-059 | Road Name:               | SHELTER BAY                             | Inspection Date:      | 2012/09/21 |
| KM:                    | 26.67                                                              | User km:     | 25.50  | Crossing Name:           | PINGSTON Cr                             | Next Inspection Date: | 2015/10/15 |
| Project File ID #:     | 9354                                                               | Br.          | 01     | Forest District:         | Columbia Forest District                |                       |            |
| Deck Type:             | Timber - Untreated                                                 |              |        | Running Surface:         | Timber Planks                           |                       |            |
| Superstructure         | Steel I-beam                                                       |              |        | Abutments (Left/Right):  | Concrete Cast in Place/Concrete Precast |                       |            |
| Total Length (metres): | 21.1                                                               | # Spans:     | 1      | Span Length(s) (metres): | 21.1                                    |                       |            |
| UTM Zone:              | 11                                                                 | UTM Easting: | 431066 | UTM Northing:            | 5587761                                 |                       |            |
| Inspector Name:        | R. Veitch, M. Hanson                                               |              |        | Year Built:              | 1995                                    |                       |            |
| Access:                | Utilized peeper inspection in 2009, reinspect with peeper in 2015. |              |        |                          |                                         |                       |            |

### ABUTMENTS

|                        |                |                                      |
|------------------------|----------------|--------------------------------------|
| Bearings               | Unrated        | Debris accumulation limiting access. |
| Bracing                | Not Applicable |                                      |
| Ballast Wall           | Good           | Creosote treated timbers.            |
| Concrete Cast in Place | Fair           | Debris accumulation limiting access. |
| Concrete Precast       | Good           | Concrete lock block wing walls.      |
| Corrosion Protection   | Not Applicable |                                      |
| Caps or Sills          | Fair           | Debris accumulation limiting access. |
| Fill                   | Good           |                                      |
| Hardware               | Good           |                                      |
| Piles or Posts         | Not Applicable |                                      |
| Riprap                 | Not Applicable |                                      |
| Wing Wall              | Good           | No signs of movement.                |

### APPROACHES

|                            |      |                                               |
|----------------------------|------|-----------------------------------------------|
| Alignment                  | Fair | Tight horizontal curve on woods end approach. |
| Bridge Ahead Signs Missing | 0    |                                               |
| Brushing Required          | Yes  |                                               |
| Delineator Missing Left    | 0    |                                               |
| Delineator Missing Right   | 1    | Camp end upstream delineator is missing.      |
| Fender Condition           | None |                                               |
| Road Surface               | Fair |                                               |

### DECK

#### Span 1

|                        |      |                                                                                        |
|------------------------|------|----------------------------------------------------------------------------------------|
| Curb Rail/Blocks/Posts | Poor | Curb rails are loose and were found to have 50 mm of heart rot, the risers are rotten. |
|------------------------|------|----------------------------------------------------------------------------------------|



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## Permanent Bridge Inspection Report

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Date Printed: 2013/03/25  
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|              |        |         |        |            |             |                  |            |
|--------------|--------|---------|--------|------------|-------------|------------------|------------|
| Structure #: | N4-059 | Site #: | N4-059 | Road Name: | SHELTER BAY | Inspection Date: | 2012/09/21 |
|--------------|--------|---------|--------|------------|-------------|------------------|------------|

|                        |                |                                                                                                                        |
|------------------------|----------------|------------------------------------------------------------------------------------------------------------------------|
| Deck to Girder Bolts   | Good           |                                                                                                                        |
| Hardware               | Fair           |                                                                                                                        |
| Hand Rails/Walkouts    | Not Applicable |                                                                                                                        |
| Nails                  | Good           |                                                                                                                        |
| Overall Deck Condition | Fair           | The deck planks have been replaced since the previous inspection and several deck ties were replaced at the same time. |
| Running Planks         | Good           | 10 mm gaps were observed between the deck planks.                                                                      |
| Sub Deck               | Unrated        | Single layer of deck planks.                                                                                           |
| Ties                   | Fair           | A number of ties have end checks and shakes.                                                                           |

### SUPERSTRUCTURE

#### Span 1

|                |                |                                                                                                                                                                                                                                                                                               |
|----------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bracing        | Fair           | Several bracing members are bent.                                                                                                                                                                                                                                                             |
| Diaphragms     | Good           |                                                                                                                                                                                                                                                                                               |
| Girders        | Fair           | The coating on the bottom flange and lower portion of the web has failed, remainder of the coating exhibiting signs of undercutting (corrosion below the coating). Loose rust formation on underside of bottom flange, no noticeable section loss, pitting of coating on remainder of girder. |
| Hardware       | Fair           | A few rivets are missing.                                                                                                                                                                                                                                                                     |
| Under Trussing | Not Applicable |                                                                                                                                                                                                                                                                                               |

|         |                                       |      |                                      |      |
|---------|---------------------------------------|------|--------------------------------------|------|
| CHANNEL | Estimated Present Water Level Depth:  | 2.0  | Estimated Present Water Level Width: | 10.0 |
|         | Estimated High Water Level Clearance: | 30.0 |                                      |      |

|         |             |    |        |    |      |    |         |    |              |    |
|---------|-------------|----|--------|----|------|----|---------|----|--------------|----|
| HAZARDS | High Water: | No | Scour: | No | Ice: | No | Debris: | No | Aggradation: | No |
|         | Comment:    |    |        |    |      |    |         |    |              |    |

|         |   |             |          |            |                                                |
|---------|---|-------------|----------|------------|------------------------------------------------|
| REPAIRS | # | Status      | Priority | Estimate   | Description                                    |
|         | 1 | Recommended | High     | \$5,000.00 | Replace timber curb rails and risers           |
|         | 2 | Recommended | High     | \$200.00   | Replace missing delineator                     |
|         | 3 | Recommended | Low      | \$150.00   | Clean dirt and debris from bearing areas       |
|         | 4 | Recommended | Low      | \$300.00   | Brushing required at abutments and approaches. |

|          |   |             |
|----------|---|-------------|
| MONITORS | # | Description |
|          |   |             |

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|



# BC Ministry of Forests and Range

## Permanent Bridge Inspection Report

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Date Printed: 2013/03/25  
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|                         |                                                         |                                                                                                                                                                                                                                                                                                                                         |                                                    |            |                         |                  |            |  |
|-------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------|-------------------------|------------------|------------|--|
| Structure #:            | N4-059                                                  | Site #:                                                                                                                                                                                                                                                                                                                                 | N4-059                                             | Road Name: | SHELTER BAY             | Inspection Date: | 2012/09/21 |  |
| GENERAL                 | Professional Inspection Required?                       | No                                                                                                                                                                                                                                                                                                                                      | Regional Review Date:                              |            | P. Eng Reviewer Name:   |                  |            |  |
|                         | Replacement Date for full log haul traffic (year):      | 2022                                                                                                                                                                                                                                                                                                                                    | Replacement Date for light vehicle traffic (year): | 2022       |                         |                  |            |  |
|                         | Current Load Rating GVW (tonnes):                       | 55                                                                                                                                                                                                                                                                                                                                      | Design Load GVW (tonnes):                          | 55         | Design Vehicle Config.: |                  |            |  |
|                         | Inspector's Estimated Full Log Haul Replacement (year): | 2022                                                                                                                                                                                                                                                                                                                                    |                                                    |            |                         |                  |            |  |
|                         | Inspector's Comment:                                    | The bridge is generally in fair condition. There is limited access to inspect the concrete sills due to debris accumulation. The curb rails and risers have significant rot and require replacing. Since the actual age of the steel girders is unknown, we estimate that the steel girders have remaining service life of 10-15 years. |                                                    |            |                         |                  |            |  |
|                         | P.Eng Reviewer's Comment:                               |                                                                                                                                                                                                                                                                                                                                         |                                                    |            |                         |                  |            |  |
| District Staff Comment: |                                                         |                                                                                                                                                                                                                                                                                                                                         |                                                    |            |                         |                  |            |  |

| Structure # | Crossing Name  | Forest Service Road | User km | CBR km |  |  |
|-------------|----------------|---------------------|---------|--------|--|--|
| N4-059      | Pingston Creek | Shelter Bay         | 25.5    | 26.7   |  |  |



**Figure 1-1: Upstream elevation.**



**Figure 1-2: Looking towards woods end.**



**Figure 1-3: Looking towards camp end.**

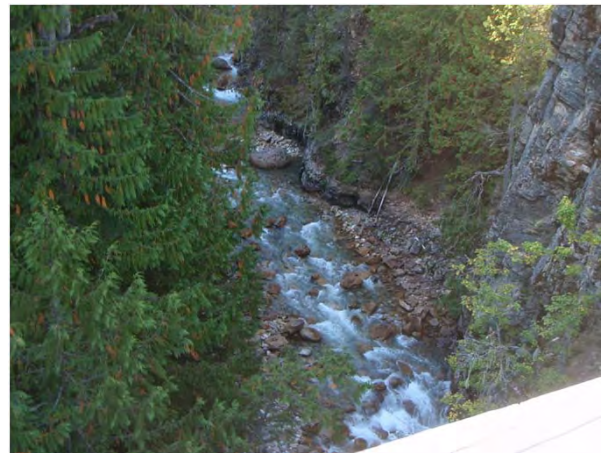


**Figure 1-4: Looking upstream.**

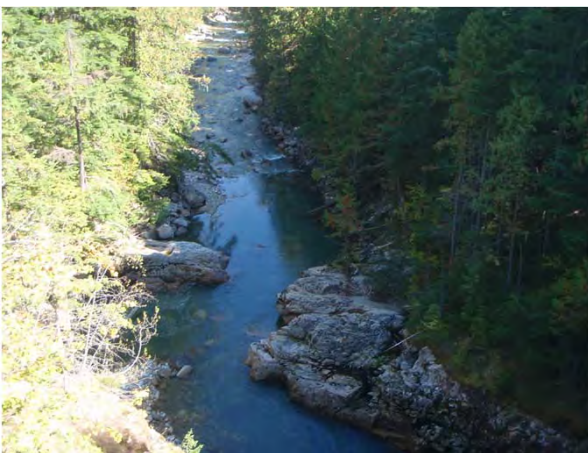


**Figure 1-5: Looking downstream.**



**Figure 1-6: Typical running plank condition.**

| Structure # | Crossing Name  | Forest Service Road | User km | CBR km |  |  |
|-------------|----------------|---------------------|---------|--------|--|--|
| N4-059      | Pingston Creek | Shelter Bay         | 25.5    | 26.7   |  |  |



**Figure 1-7: Typical wide checks in curb rails.**



**Figure 1-8: Underside of deck planks and deck ties.**



**Figure 1-9: Typical condition of ends of deck ties.**



**Figure 1-10: Downstream face looking towards camp end.**

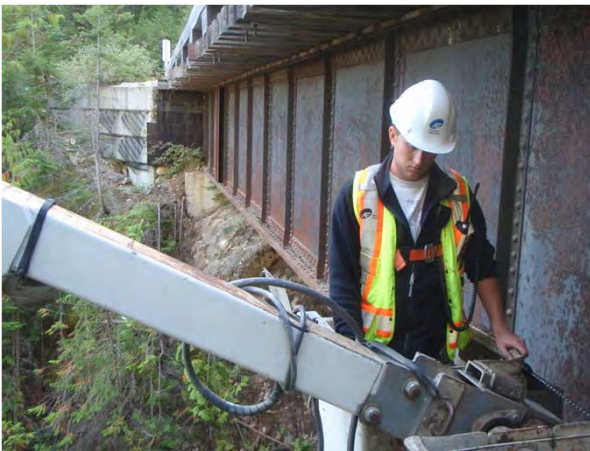


**Figure 1-11: Downstream face looking towards woods end.**



**Figure 1-12: Typical condition of steel girders (note minor paint flaking).**

| Structure # | Crossing Name  | Forest Service Road | User km | CBR km |  |  |
|-------------|----------------|---------------------|---------|--------|--|--|
| N4-059      | Pingston Creek | Shelter Bay         | 25.5    | 26.7   |  |  |



**Figure 1-13: Additional stiffeners welded on interior face of girders.**



**Figure 1-14: Plate welded to bottom flange of girders on woods end.**

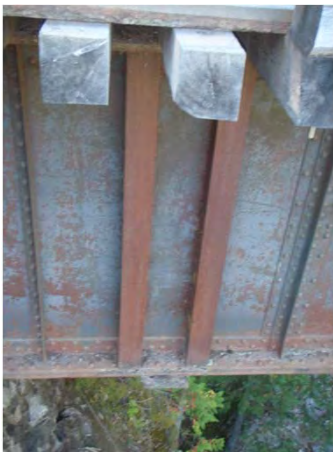


**Figure 1-15: Stiffeners welded on exterior face of girders.**



**Figure 1-16: Bent plan brace near mid span.**



**Figure 1-17: Camp end abutment.**



**Figure 1-18: Debris at camp end abutment.**

| Structure # | Crossing Name  | Forest Service Road | User km | CBR km |  |  |
|-------------|----------------|---------------------|---------|--------|--|--|
| N4-059      | Pingston Creek | Shelter Bay         | 25.5    | 26.7   |  |  |



**Figure 1-19: Camp end upstream wingwall.**



**Figure 1-20: Camp end upstream bearing.**



**Figure 1-21: Camp end downstream bearing.**

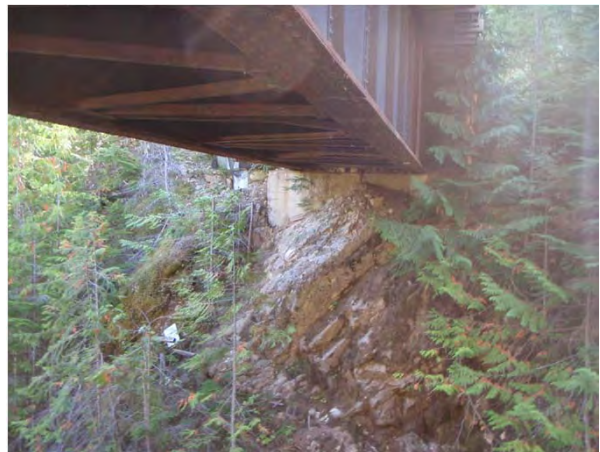


**Figure 1-22: Woods end abutment.**



**Figure 1-23: Woods end downstream wingwall.**



**Figure 1-24: Debris at woods end abutment.**

|                                                                                                                                                                        |                |                                                                    |         |                                                                                                                                                                                                  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  <b>Associated Engineering</b><br><small>GLOBAL PERSPECTIVE.<br/>LOCAL FOCUS.</small> |                | <b>BRIDGE INSPECTION REPORT</b><br><b>BRIDGE INSPECTION PHOTOS</b> |         |  <b>BRITISH COLUMBIA</b><br><small>Ministry of<br/>Forests, Lands and<br/>Natural Resource Operations</small> |  |
| Structure #                                                                                                                                                            | Crossing Name  | Forest Service Road                                                | User km | CBR km                                                                                                                                                                                           |  |
| N4-059                                                                                                                                                                 | Pingston Creek | Shelter Bay                                                        | 25.5    | 26.7                                                                                                                                                                                             |  |



*Figure 1-25: Woods end downstream bearing.*