Ministry of Transportation and Infrastructure

Bridge Inspection and Assessment –
E&N Railway, Vancouver Island, BC Canada

Phase 3 - Inspection Report
Bridges from Mile 79.10 to Mile 135.10
(20 Bridges)

February 15, 2012
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Appendix A: Non-Destructive Testing Reports
Appendix B: Field Inspection Notes
INTRODUCTION

Bridge inspections were performed during October and November of 2011 on the Victoria Subdivision of the E&N Railway (currently the Southern Railway of Vancouver Island [SVI]). Twenty structures comprised of steel, timber and concrete were inspected between Nanaimo and Courtenay, British Columbia. This inspection was performed by the following individuals:

- Dale Harrison, P.Eng., Associated Engineering
- Mark Torrie, E.I.T., Associated Engineering
- Adam Laws, Associated Engineering
- Karam Bahi, Associated Engineering
- Nikola Cuperlovic, P.Eng., Associated Engineering
- Michael O’Connor, P.E., Alfred Benesch & Company
- Phil Walsh, P.E., Alfred Benesch & Company
- Scott Wojteczko, P.E., Alfred Benesch & Company
- Matthew Becker, E.I.T., Alfred Benesch & Company

All inspections were performed in teams of one to three persons and Bryon Reed or Al Kutaj of Southern Railway of Vancouver Island accompanied the inspection teams at all times.

The purpose of this inspection was to identify structural deficiencies within the bridges and to determine the extent of any section loss for rating purposes. This report describes our inspection techniques and summarizes the defects found at all bridges.

SCOPE OF INSPECTION

The primary focus of each bridge inspection was to evaluate and document the condition of all elements related to the bridges with particular attention given to non-redundant members of truss structures. The preferred method of inspection for bridges in this condition includes a close-proximity inspection of all bridge elements, however as stated in the project proposal dated September 14, 2011, the project budget constraints made it impossible to fully access and inspect all members. Ultimately, our approach focused on inspecting an appropriate sampling of representative and key structural members at all bridges. Therefore, when comments are made regarding condition of bridge elements they are based on only the elements inspected.

When water height allowed, inspection comments were made with respect to scour at substructure elements. Underwater inspection with divers was not completed. A snooper truck with hi-rail equipment was used to access difficult to access areas of large steel truss structures and structures located far off the ground. Non-destructive testing was performed on select bridges to search for internal defects within steel members of non-redundant structures. In addition, several bridges were observed as trains crossed to look for unexpected behaviors under loading.
Inspection Techniques

Several inspection techniques were utilized during this inspection:

**Visual** - A visual sampling of steel, timber and concrete components and their surrounding areas was conducted on each bridge.

**Sounding** - A sampling of timber, concrete and steel bridge elements were hammer sounded to help ascertain the presence of internal decay/voids or cracks.

**Boring** - Timber elements found to be deteriorated due to hammer sounding were drilled with a 3/8” diameter drill bit. These holes were then inspected, using a shell and void indicator, to confirm the presence of internal decay and evaluate the remaining sound wood. The inspection holes were then plugged with a treated wooden dowel.

On timber bridges, particular attention was paid to decay-vulnerable areas such as the ground line, waterline, brace bolt connections and bearing areas of the members. The size and location of internal voids were then recorded, along with any visual observations. Concrete and steel bridges were examined in areas which commonly develop structural deficiencies, such as bearing areas and connection points.

This inspection used subjective inspection techniques and also relied heavily upon human judgment. It is possible that some deficiencies may not have been discovered. The inspection does not guarantee that all defects have been identified in timber, steel and concrete members. Internal steel defects and defects in inaccessible areas may not have been located, as only visual inspection techniques were utilized. This inspection did not include underwater inspection or excavation of buried members. All field inspection notes are provided in Appendix B.

Methods of Access

All bridges were visually inspected from both track level and ground level. The team was able to view the majority of the critical bridge elements using this method of inspection. In some cases, ladders were used to gain access to abutment seats and bearings. A snooper truck was used to inspect bridges elevated great distances from the ground.

The snooper truck used was an Aspen Aerial UB-30 snooper truck equipped with hi-rail equipment. The snooper truck had a maximum reach of approximately 40 feet below the track level and 30 feet above the track level. Two inspectors were able to work from the snooper bucket at all times. Inspectors were able to view many difficult to reach superstructure areas at close proximity using the snooper.

Each individual bridge report specifies the access method used. If “Snooper” is specified in the report, the inspection was performed using a snooper truck as well as track and ground access by foot. If “None” is specified, the inspection was performed from the track and ground on foot as well as ladder access.
Non-Destructive Testing (NDT)

Non-destructive testing (NDT) was performed by Acuren Group Inc. on Bridge 125.5 and the results are located in the Appendix A. Note only a sampling of pins and eye bars were tested at this bridge. The results of this sampling do not declare that other elements in the structure do not have issues.

Bridges Observed Under Load

As a supplement to the field inspections, several bridges were observed under load. The primary intent of the load testing was to identify any significant bridge movements (sway, settlement, etc.) and to identify how critical members were behaving. The load observation process was led by Benesch and AE; members of SVI’s field staff assisted in the observations. The on-site team was spread throughout various locations on or around the bridge structures in an attempt to maximize the number of areas observed. It should be noted that only a sampling of each structure was seen under load; the loading was typically a short duration passing locomotive(s). For best results, the bridges should be observed under a full train of cars (at timetable speeds) providing sustained loading.

On 11/04/2011, the inspection team of Scott Wojtczko (Benesch) and Nik Cuperlovic (AE), assisted by Bryon Reed, Al Kutaj, and Mark Hughes (SVI), observed Bridges 79.1, 79.9 and 98.6 under the load of 2-GP9 locomotives at various speeds in both directions.

On 11/17/2011, the inspection team of Dale Harrison (AE), Jack Jiao (AE) and John Deenihan (AE), assisted by Bryon Reed (SVI), observed Bridge 125.5 under the load of 2-GP9 locomotives at various speeds in both directions.

The observations of the load testing are presented within the report at each relevant bridge location.
INSPECTION DOCUMENTATION

Inspection Report Layout

All bridge inspection reports contain the following information:

- Bridge Layout Photos
- General Bridge Data and Information
  - Feature crossed
  - Inspection date
  - Nearest town
  - Inspectors
  - Number of spans
  - Stream depth (if applicable)
  - Flow direction of stream (if applicable)
  - Deck type (open or ballast deck)
  - Presence of walkways or handrails
  - Span lengths and type (span length is center to center of bearing)
  - Height above ground
  - Total length of bridge (typically back to back of backwall)
  - Access method
  - Observed under load
  - NDT testing (if performed)
- Inspection Findings
- Bridge General Arrangement
- Photos of Bridge Defects
**Element Condition**

As mentioned in the Scope of Inspection section, all elements of a bridge structure were not inspected. Assigning a condition to each bridge element was therefore outside the scope of this report. General conditions (i.e. good, fair, poor, etc.) have been called out for groups of elements based on the defects observed collectively, however these conditions may not be indicative of the state of each individual member.

**Span Types**

Span types are documented in each inspection report. The following are the abbreviations used:

- **DPG** - Deck Plate Girder
- **HDPG** - Half-Depth Plate Girder
- **TPG** - Through Plate Girder
- **WFB** - Wide Flange Beam
- **TT** - Through Truss (Steel)
- **DT** - Deck Truss (Steel)
- **CDT** - Cantilevered Deck Truss (Steel)
- **TPT** - Timber Pile Trestle
- **TFT** - Timber Frame Trestle

**Element Numbering System**

All bridge elements perpendicular to the track, such as piers and bents, are numbered in increasing order from south to north (increasing milepost). All bridge elements parallel to the track, such as girders and stringers, are numbered from left to right looking north. Pins in pin-connected truss structures will be numbered, starting with zero, from low mile post number to high mile post number.

**Noted Deficiencies**

Deficiencies are noted throughout this report as observed at each bridge. Some of the deficiencies that were found are considered to be of low concern at this time while others are of a higher concern. In order to highlight the items that are of a higher concern, a section titled “Noted Deficiencies” has been added to relevant bridges at the end of the individual bridge reports. Noted deficiencies are defined as items that are in need of repair as a priority, preferably within the next year, in order to safely operate the bridge under train loadings.

If a bridge report does not have a “Noted Deficiencies” section it means that none of the deficiencies found were determined to be in need of high priority repair.
## BRIDGE INVENTORY

<table>
<thead>
<tr>
<th>Mileage</th>
<th>Subdivision</th>
<th>Feature Crossed</th>
</tr>
</thead>
<tbody>
<tr>
<td>79.10</td>
<td>Victoria</td>
<td>Dumont Rd</td>
</tr>
<tr>
<td>79.90</td>
<td>Victoria</td>
<td>Green Lake</td>
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<tr>
<td>86.90</td>
<td>Victoria</td>
<td>Bonell Creek</td>
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<td>Hamilton Creek</td>
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<td>93.00</td>
<td>Victoria</td>
<td>Englishman River</td>
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<td>Victoria</td>
<td>French Creek</td>
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<tr>
<td>103.70</td>
<td>Victoria</td>
<td>Little Qualicum River</td>
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<tr>
<td>110.70</td>
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<td>Big Qualicum River</td>
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<tr>
<td>113.20</td>
<td>Victoria</td>
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<tr>
<td>119.20</td>
<td>Victoria</td>
<td>Cook Creek (South Fork)</td>
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<td>119.50</td>
<td>Victoria</td>
<td>Cook Creek (North Fork)</td>
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<td>123.00</td>
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<td>125.50</td>
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<td>Tsable River</td>
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<tr>
<td>126.15</td>
<td>Victoria</td>
<td>Buckley Bay Rd</td>
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<tr>
<td>127.60</td>
<td>Victoria</td>
<td>Hindoo Creek</td>
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<tr>
<td>131.10</td>
<td>Victoria</td>
<td>Washer Creek</td>
</tr>
<tr>
<td>135.10</td>
<td>Victoria</td>
<td>Trent River</td>
</tr>
</tbody>
</table>
79.10 – Victoria Subdivision – Dumont Road

Track View (Looking North)

Elevation View (Looking North)
79.10 – Victoria Subdivision – Dumont Road

Inspection Findings:

END BENT NOTES
- End Bent Type: Timber Trestle
  - Minor ballast and debris on end bent cap
  - No significant defects noted at north end bent
  - Pile 4 at south end bent has rot (2" solid shell)

WINGWALL NOTES
- Wingwall Type: Timber Plank Wingwalls
  - Wingwall planks separating slightly, causing erosion of embankment behind wingwalls (see attached photo)
  - No other defects noted

INTERMEDIATE BENT NOTES
- Intermediate bents are generally in fair condition
- Several piles were noted to have some section loss due to rot
- Pile 1 of the north bents is not bearing for a width of 4 inches (see attached photo)
- Several piles are splitting
- Diagonal bracing members are split at several locations

DECK NOTES
- Track located on a tangent alignment
- Ties = 8" wide x 8" deep x 10'-4" long
- Tie spacing = 12"
- Approximately 30% of bridge ties are poor
- South approach is low

SPAN NOTES
- Stringers are generally in good condition
- Beam depths vary from 1'-4" to 2' (see attached photos)
- Bearing of deeper beam at Bents 1 & 5 is poor (only 4" of bearing on a 14" wide cap); (see attached photo)

OBSERVATIONS UNDER LOAD
- Low south approach and rail joint at south end of bridge are creating high impact at Span 1
79.10 – Victoria Subdivision – Dumont Road

History:

- New bents and spans installed around 1983
79.10 – Victoria Subdivision – Dumont Road

Bridge General Arrangement:
79.10 – Victoria Subdivision – Dumont Road

Additional Inspection Photos:

- End Bent View (Typical)
- Stringer View (Note Difference in Beam Depth)
- South Timber Wingwall (Looking South)
- Intermediate Bent in Roadway
- Pile Cap not Fully Bearing on Pile
- Small (4") Bearing Width of Deeper Stringer
79.90 – Victoria Subdivision – Green Lake

Track View (Looking South)

79.90 – Victoria Subdivision – Green Lake
Inspection Findings:

END BENT NOTES
- South End Bent Type: Five round timber piles (11”) with a timber cap (13” wide x 28” deep)
  - No significant defects noted
- North End Bent Type: Concrete Cap (Timber Piles are Below Grade)
  - No significant defects noted

WINGWALL NOTES
- Wingwall Type: Timber (South Wingwalls), Concrete (North Wingwalls)
  - Some erosion at base of south wingwalls
  - All wingwalls are generally in good condition

DECK NOTES
- Track located on a tangent alignment
- Ties = 8” wide x 8” deep x 12’-0” long
- Tie spacing = 11”
- 8 poor ties counted; bridge ties are generally in good condition
- Approach ties are swinging (pivoting with respect to rail) at north abutment

SPAN NOTES
  **Stringer Notes:**
  - Stringer Type: Two 4-ply stringers (each ply is 9” wide x 17” deep)
  - Many of the stringers have fire damage
    - Some stringers were replaced after fire
    - Stringers with damage have approximately 3/8” section loss on each charred face
  - Other than burn damage, stringers are in good condition

  **Intermediate Bent Notes:**
  - General Notes:
    - Many of the piles have significantly reduced sections due to fire damage (see attached photos)
    - All fire-damaged bent caps have reduced sections due to fire damage
    - Rot was found in approximately 25% of the piles (see notes in Appendix B for details)
    - Many of the piles have been posted (cut off and partially replaced)
Extra Timber Member Notes:
- Most longitudinal diagonal bracing members exhibit fire damage
- Longitudinal horizontal struts have been added since the fire
- New sash and sway bracing (transverse) have been added since the fire

OBSERVATIONS UNDER LOADING
- Minor pile shaking observed
- Noticeable tie movement at south end (mostly from expected bending)

History:
- Original construction year = 1992 (According to plans)
- Bridge sustained fire damage in 2005 or 2006

Noted Deficiencies:
- Several intermediate timber bents have two or more piles with section loss due to rot or fire damage
- Intermediate timber bent has three posted piles in a five pile bent
. 79.90 – Victoria Subdivision – Green Lake

Bridge General Arrangement:
79.90 – Victoria Subdivision – Green Lake

Additional Inspection Photos:

Intermediate Pile Bent Fire Damage (Typical)

Pile 4 at Bent 9 (Hollow and Fire Damaged)

Fire Damage of Pier (Typical)
86.90 – Victoria Subdivision – Bonell Creek

Girder View (Looking North)

Interior Diaphragm View (Typical)
86.90 – Victoria Subdivision – Bonell Creek

FEATURE CROSSED: Bonell Creek

| INSPECTION DATE: 10/25/2011 | STREAM DEPTH: 2 ft | HEIGHT: 20 ft |
| NEAREST TOWN: Nanoose Bay, BC | FLOW DIRECTION: East | TOTAL LENGTH: 66 ft |
| INSPECTORS: APW/AL | DECK TYPE: Open | SPANS: 63'-1" (DPG) |
| NO. OF SPANS: One | WALKWAY: No |
| ACCESS METHOD: None | HANDRAILS: No |
| NDT TESTING: No | OBSERVED UNDER LOAD: No |

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
- Abutment Type: Cast-In-Place Concrete
  - Horizontal cracking in south abutment backwall
  - South abutment backwall rotated in about 1 ½" at top
  - Minor horizontal cracks at both abutments

**WINGWALL NOTES**
- Wingwall Type: Cast-In-Place Concrete
  - Minor horizontal cracking in all wingwalls
  - South abutment Wingwalls are leaning in about 1 ½" at top
  - Crack at top corner of north wingwall

**DECK NOTES**
- Track located on a tangent alignment
- Ties = 10" wide x 16" deep x 12'-0" long (1/2" dap)
- Tie spacing = 16"
- Ties are in good condition overall (8 ties counted as poor)

**SPAN NOTES**
- **Bearing Notes:**
  - Expansion bearing at south abutment - no significant defects
  - Fixed bearing at north abutment – no significant defects

- **Girder Notes:**
  - Steel is in good condition overall
  - Pitting measured at approximately 1/8" near abutments (2' in length)
  - Top flange covered with timber
  - Pitting 1/8" up vertical leg of bottom flange angle for 2" near bearing

**History:**
- Original construction year = 1909
- Replaced steel span in 1976
86.90 – Victoria Subdivision – Bonell Creek

Bridge General Arrangement:
87.20 – Victoria Subdivision – Hamilton Creek

Interior Diaphragm View (Typical)

Corrosion of Bottom Flange Angle (Typical)
87.20 – Victoria Subdivision – Hamilton Creek

FEATURE CROSSED: Hamilton Creek

<table>
<thead>
<tr>
<th>Inspection Findings:</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUTMENT/BACKWALL NOTES</td>
</tr>
<tr>
<td>Abutment Type: Cast-In-Place Concrete</td>
</tr>
<tr>
<td>• Some gravel and ballast on abutment seats</td>
</tr>
<tr>
<td>• Moss growing on abutment seats</td>
</tr>
<tr>
<td>• Minor efflorescence on face of abutment</td>
</tr>
<tr>
<td>• No significant defects noted</td>
</tr>
<tr>
<td>WINGWALL NOTES</td>
</tr>
<tr>
<td>Wingwall Type: Cast-In-Place Concrete</td>
</tr>
<tr>
<td>• No significant defects noted</td>
</tr>
<tr>
<td>DECK NOTES</td>
</tr>
<tr>
<td>• Track located on a curved alignment (5 ½ degree curve per plans)</td>
</tr>
<tr>
<td>• Ties = 10” wide x 14” deep x 13-0” long at 16” centers (no dap in ties)</td>
</tr>
<tr>
<td>• Superelevation is taken in girders</td>
</tr>
<tr>
<td>• 10 poor ties counted; ties are generally in good condition</td>
</tr>
<tr>
<td>STEEL SPAN NOTES</td>
</tr>
<tr>
<td>Steel Notes:</td>
</tr>
<tr>
<td>• Web has a section loss of 1/16” for 2” up from vertical leg of bottom angle</td>
</tr>
<tr>
<td>• Bottom angle horizontal leg has a section loss of 1/16” for a length of 2” on the top surface</td>
</tr>
<tr>
<td>• No corrosion found on top flange or bearing stiffeners</td>
</tr>
</tbody>
</table>

History:

• Original construction year = 1909
87.20 – Victoria Subdivision – Hamilton Creek

Bridge General Arrangement:
93.00 – Victoria Subdivision – Englishman River

South Abutment Bearing

North Abutment Bearing
93.00 – Victoria Subdivision – Englishman River

FEATURE CROSSED: Englishman River
INSPECTION DATE: 10/26/2011  STREAM DEPTH: 2 ft.  HEIGHT: 80 ft
NEAREST TOWN: Parksville, BC  FLOW DIRECTION: East  TOTAL LENGTH: 335 ft
INSPECTORS: APW/AL  DECK TYPE: Open  SPANS: 103'-9" (DT), 128' (DT) & 103'-9" (DT)
NO. OF SPANS: Three  WALKWAY: No (2 Refuge Bays)
ACCESS METHOD: Snooper  HANDRAILS: No
NDT TESTING: No  OBSERVED UNDER LOAD: No

Inspection Findings:

ABUTMENT/BACKWALL NOTES
Abutment Type: Cast-In-Place Concrete
• Moss and debris on abutment seats
• Both abutments are in good condition with no significant defects

WINGWALL NOTES
Wingwall Type: Cast-In-Place Concrete
• South wingwalls are leaning slightly inwards (less than 1" at top of wall)
• Both wingwalls are in good condition with no significant defects

PIER NOTES
Pier 1 Notes:
• Bearing seat is cracked under both bearings from Span 1
• Bearing seat is clear of debris and vegetation
• Efflorescence on pedestals and north side of pier

Pier 2 Notes:
• Bearing seat is clear of debris and vegetation
• There is a potential for scour on south side of pier base; no scour present at this time
• No significant defects noted

DECK NOTES
• Track located on a tangent alignment
• Ties (Spans 1 & 3) = 10" wide x 14" deep x 12'-0" long (1" tie dap)
• Ties (Span 2) = 10" wide x 16" deep x 12'-0" long (2" tie dap)
• Tie spacing = 16"
• Poor tie count = 30 (Span 1), 27 (Span 2) and 42 (Span 3)
• Approximately 30% of ties counted as poor; ties are structural in nature and are bearing on top chord of truss
• Ties are generally in fair to poor condition
93.00 – Victoria Subdivision – Englishman River

TRUSS SPAN 1 NOTES

Bearing Notes:
- Rocker bearings at south end of span
  - Moderate surface corrosion; anchor bolts are in good condition
  - Bearings appear to be frozen
- Roller bearings at north end of span
  - Minor surface corrosion; anchor bolts are leaning north approximately 1”
  - Bearings appear to be frozen

Primary Truss Member Notes:
- Top chord members are experiencing moderate corrosion and pitting
- Bottom chord bottom plate is collecting water and debris
- Bottom chord members are experiencing moderate corrosion and pitting
- Diagonal members have been strengthened
- Diagonal members are experiencing minor surface corrosion and pitting

Secondary Truss Member Notes:
- All secondary truss members are experiencing minor surface corrosion

TRUSS SPAN 2 NOTES

Bearing Notes:
- Roller bearings at south end of span
  - Minor surface corrosion on bearings; anchor bolts are in good condition
  - Bearings appear to be frozen
- Rocker bearings at north end of span
  - Minor surface corrosion; anchor bolts are in good condition

Primary Truss Member Notes:
- Top chord members are experiencing surface corrosion
- Top and bottom chord members have bend in bottom flanges from installation (see attached photo)
- Bottom chord members are pitted at several locations
- Diagonal members are experiencing minor surface corrosion

Secondary Truss Member Notes:
- All secondary truss members are experiencing minor surface corrosion

TRUSS SPAN 3 NOTES

Bearing Notes:
- Fixed rotational bearings at south end of span
  - No surface corrosion noted; anchor bolts are in good condition
- Roller bearings at north end of span
  - Bearings appear to be frozen; anchor bolts are in good condition
  - No surface corrosion
93.00 – Victoria Subdivision – Englishman River

Primary Truss Member Notes:
- Top chord members are experiencing surface corrosion
- Bottom chord members have bend in bottom flanges from installation
- Bottom chord members are not experiencing surface corrosion
- Diagonal members are experiencing minor surface corrosion and pitting (see notes in Appendix B for details)

Secondary Truss Member Notes:
- All secondary truss members are experiencing minor surface corrosion

History:
- Original construction year = 1909 (Span 2), 1923 (Spans 1 & 3)
- Spans strengthened in 1941

Noted Deficiencies:
- Approximately 30% of ties counted as poor; ties are structural in nature and are bearing on top chord of truss
93.00 – Victoria Subdivision – Englishman River

Bridge General Arrangement:
93.00 – Victoria Subdivision – Englishman River

Additional Inspection Photos:

- Corrosion on Bottom Flange of Bottom Chord
- Corrosion on Secondary Bracing Members
- Bottom Chord Bottom Plate (Note Moss & Debris)
- Pier Bearing Pedestal (Pier 1)
- Bent Truss Flange from Installation Jacking
- Bowed Plate on Bottom Chord of Truss
98.60 – Victoria Subdivision – French Creek

Track View (Looking South)  Girder Span View (Looking North)
VANCOUVER ISLAND RAIL CORRIDOR

98.60 – Victoria Subdivision – French Creek

FEATURE CROSSED: French Creek
INSPECTION DATE: 11/01/2011 STREAM DEPTH: 2 ft HEIGHT: 92 ft
NEAREST TOWN: French Creek, BC FLOW DIRECTION: East TOTAL LENGTH: 1,063 ft
INSPECTORS: SCW/DBH DECK TYPE: Open SPANS: 40 @ 15’ (TFT), 2 @ 45’ (DPG),
NO. OF SPANS: 63 WALKWAY: No (Refuge Bays) 75’ (DPG) & 20 @ 15’ (TFT)
ACCESS METHOD: Snooper HANDRAILS: No
NDT TESTING: No OBSERVED UNDER LOAD: Yes

Inspection Findings:

TIMBER TRESTLE INSPECTION SUMMARY
• All timber trestle members were visually inspected; only west face of the upper storey inspected with snooper
  • Upper Storey:
    o Select exterior stringers were sounded; interior stringers were not sounded due to access
    o Ends of pile caps were sounded, interior were not sounded due to difficult access
    o The tops of all exterior posts and bottoms of select exterior posts were sounded
    o The interior posts were not accessible and none were sounded
  • Middle Storey:
    o Exterior and interior posts and sills and bracing were not accessible and were not sounded
  • Lower Storey:
    o All posts were sounded at the ground level, no exception noted
    o Posts, caps and bracing were not sounded above the ground level

END BENT NOTES
South End Bent Type: Timber sill (14” wide x 13” deep) on concrete pedestal
• Heavy brush around south end bent
• End bent is in good condition; no significant defects noted
North End Bent Type: Timber sill (14” wide x 13” deep) on concrete pedestal
• End bent is in good condition; no significant defects noted

WINGWALL/BACKWALL NOTES
Wingwall/Backwall Type: Timber
• All wingwalls and backwalls are overgrown by vegetation
• Minor cracks noted in the wingwalls

DECK NOTES
• Track located on a tangent alignment
• Ties (timber spans) = 7 ½” wide x 7 ½” deep x 10-0” long (12” spacing)
• Ties (deck plate girder spans) = 10” wide x 16” wide x 13’-0” long (16” spacing)
• Poor ties counted = 54 (south timber approaches), 6 (steel spans), 42 (north timber approaches)

TIMBER BENT NOTES
• All timber bent posts are bearing on concrete footings (five posts at cap; six posts at base)
• Exterior posts are connected to concrete footing with bolted angles
98.60 – Victoria Subdivision – French Creek

- Most concrete footings are covered in vegetation and/or moss
- Decay/degradation has been noted in the following posts (see attached photo)
  - Bent 4, Post 1 has a 6” deep check
  - Bent 7, Post 1 has a check
  - Bent 12, Post 1 has a 5” deep check on south face
  - Bent 19 has a split in tower brace
  - Bent 19, Post 1 has a check on west face
  - Bent 30, Post 1 has a split midway through post
  - Bent 34, Post 1 has a split in the upper storey
  - Bent 48, Post 5 appears creosote has leached out
  - Bent 54, Post 5 has a check on the east face in the middle storey
  - Bent 55, Post 1 has a crack on the west face at the base
- Some posts are not bearing fully on bent cap
- Bent caps 22, 38 & 39 are split (see attached photo)

STEEL TOWER BENT NOTES

General:
- Towers (double bents) are in fair condition
- Bottom horizontal struts have moderate corrosion
- Paint peeling

Tower 1:
- Trees growing through base of tower (see attached photo)
- NW base plate is corroded
- SW and SE top column plates are pitting around bearing plates
- Anchor bolts corroded at NW top column plate
- Bottom flange pitted on bottom leg 4’ from base at north end of Span 1

Tower 2 (see Appendix B sketches for more details):
- Top column plates at all locations are corroding and pitting
- Rust accumulating near anchor bolts
- NW column corroded above the base plate
- Bottom strut on north and west face corroded
- NE/NW bearings corroded

TIMBER SPAN NOTES

Timber Stringer Notes:
Stringer Type: Two 4-ply stringers (each ply is 9” wide x 17” deep)
- Stringers are generally in good condition
- Decay/degradation has been noted in the following posts
  - Span 9, Stringer 1 has a 2” check
  - Span 13, Stringer 1 has a shake at south end
  - Span 20, Stringer 5 has section loss on bottom 2” at Bent 21
  - Span 26, Stringer 5 has split on bottom
  - Span 27, Stringer 5 has loss of 2” x 2” on bottom face
  - Span 30, Stringer 5 has split on west face at mid-height
  - Spans 32 & 33, Stringer 2 has a bottom split
  - Span 33, Stringer 3 has a bottom split
  - Span 41, Stringer 1 has a gash at midspan on the bottom (likely from erection)
  - Span 46/47, Stringer 1 has a 2” deep check
98.60 – Victoria Subdivision – French Creek

- Car fire in 2010 between Bents 16 and 20 has added minor surface charring to stringers/caps
- Ties changed out near Bents 19 to 20

**Extra Timber Member Notes:**
- Broken cross brace member between Bents 26 and 27, near bottom on west side
- Broken cross brace member between Bents 27 and 28 on 3rd storey on west

**STEEL SPAN NOTES**

**Span1 Notes:**
- West Girder
  - Minor surface corrosion
- East Girder
  - Minor surface corrosion
  - Minor pitting of vertical leg of bottom angle (inside and outside)
  - Paint peeling from web

**Span2 Notes:**
- West Girder
  - Minor surface corrosion
- East Girder
  - Minor surface corrosion

**Span3 Notes:**
- West Girder
  - Minor surface corrosion
- East Girder
  - Minor surface corrosion
  - Pitting on inside of vertical leg of bottom flange angle
  - Slight corrosion of lateral bracing system (10% loss of lateral plates)

**REFUGE BAY NOTES**
- Timber floor board missing from refuge bay on west side of track; second from north end (see attached photo)

**OBSERVATIONS UNDER LOAD**
- Steel bases were observed; no more than 1/32” to 1/16” pumping noted
- Timber bases were observed; no visible movement
- Ties bending as expected
- Minor dip in track near south end

**History:**

- Original construction year = 1913 (Deck Plate Girders), 1977 (South and North Timber Approaches)

**Noted Deficiencies:**

- Timber floor board missing from refuge bay on west side of track; second from north end (safety concern)

Note: While no individual timber elements have been identified as “Noted Deficiencies”, many timber members could not be inspected in detail due to time and access limitations
98.60 – Victoria Subdivision – French Creek

Bridge General Arrangement (1 of 2):
98.60 – Victoria Subdivision – French Creek

Additional Inspection Photos:

- Split Base of Intermediate Timber Bent
- Trees Growing at Base of Tower 1
- Missing Floor Board in Refuge Bay
- Split Timber Bent Cap
- Split Stringer (Several Similar Locations)
103.70 – Victoria Subdivision – Little Qualicum Rvr

Typical Bearing at Steel Tower

Tower Base at River
103.70 – Victoria Subdivision – Little Qualicum Rvr

**FEATURE CROSSED:** Little Qualicum River

**INSPECTION DATE:** 10/28/2011  **STREAM DEPTH:** 4 ft  **HEIGHT:** 132 ft

**NEAREST TOWN:** Qualicum Beach, BC  **FLOW DIRECTION:** East  **TOTAL LENGTH:** 450 ft

**INSTRUCTORS:** APW/AL  **DECK TYPE:** Open

**NO. OF SPANS:** Seven  **WALKWAY:** No (two refuge bays)  2 @ 45’ (DPG)

**ACCESS METHOD:** Snooper  **HANDRAILS:** No

**NDT TESTING:** No  **OBSERVED UNDER LOAD:** No

---

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
- Abutment Type: Cast-In-Place Concrete
- Moss and debris on abutment seat
- No significant defects noted

**WINGWALL NOTES**
- Wingwall Type: Cast-In-Place Concrete
- No significant defects noted

**STEEL TOWER NOTES:**
- Steel towers 1 & 4 are single tower bents; towers 2 & 3 are double tower bents
- Minor surface corrosion on steel members; pitting at bearing locations
- Towers are generally in fair condition
- Base of towers could be susceptible to scour

**DECK NOTES**
- Track located on a tangent alignment
- Ties = 10” wide x 16” deep x 13’-0” long
- Tie spacing = 16”
- Approximately 99 poor ties counted; in general the ties are in fair condition
- Both approaches are low and a few of the approach ties are rotted

**SPAN NOTES**
- All spans exhibit minor surface corrosion on all steel faces
- In general, steel is in good condition
- Localized areas of minor section loss occur
- Bearings have moderate corrosion

**History:**
- Original construction year = 1913 (Spans 3, 4 & 5); 1926 (Spans 1, 2, 6 & 7)
103.70 – Victoria Subdivision – Little Qualicum Rvr

Bridge General Arrangement:
110.70 – Victoria Subdivision – Big Qualicum River

Steel Tower in River
110.70 – Victoria Subdivision – Big Qualicum River

FEATURE CROSSED: Big Qualicum River

<table>
<thead>
<tr>
<th>INSPECTION DATE: 10/28/2011</th>
<th>STREAM DEPTH: 4 ft</th>
<th>HEIGHT: 97 ft</th>
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<tbody>
<tr>
<td>NEAREST TOWN: Qualicum Beach, BC</td>
<td>FLOW DIRECTION: East</td>
<td>TOTAL LENGTH: 316 ft</td>
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<tr>
<td>INSPECTORS: APW/AL</td>
<td>DECK TYPE: Open</td>
<td>SPANS: 3 @ 75' (DPG) &amp; 2 @ 45' (DPG)</td>
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<tr>
<td>NO. OF SPANS: Five</td>
<td>WALKWAY: No (2 Refuge Bays)</td>
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<tr>
<td>ACCESS METHOD: Snooper</td>
<td>HANDRAILS: No</td>
<td></td>
</tr>
<tr>
<td>NDT TESTING: No</td>
<td>OBSERVED UNDER LOAD: No</td>
<td></td>
</tr>
</tbody>
</table>

Inspection Findings:

ABUTMENT/BACKWALL NOTES
- Abutment Type: Cast-In-Place Concrete
  - Moss and debris on abutment seats
  - Both abutments are in good condition with no significant defects

WINGWALL NOTES
- Wingwall Type: Cast-In-Place Concrete
  - Both wingwalls are in good condition with no significant defects

STEEL TOWER NOTES
- Both towers are double bent towers
- Minor surface corrosion over entire face of towers
- Localized areas of pitting at bracing points at top and bottom of towers
- Footings not inspected for scour due to water level

DECK NOTES
- Track located on a curved alignment
- Ties = 10" wide x 16" deep x 13'-0" long (ties are dapped on the east side)
- Poor tie count = 42
- Overall ties are in good condition
- Timber boards under the ties are rotten and crushing (see attached photo)
  - Timber boards at Span 3 are severely deteriorated
  - Timber boards at Spans 1, 2, 4 and 5 are beginning to deteriorate

SPAN NOTES
- Web plates exhibit minor surface corrosion throughout
- Top and bottom flange angles have localized areas of minor section loss
- Bottom flange angles and gusset plates are covered in debris at localized areas
- Lateral gusset plates have minor to moderate pitting
- Stiffeners are pitted at some locations
- Bearings exhibit surface corrosion (see attached photo)

WALKWAY NOTES
- Refuge bays are in poor condition
110.70 – Victoria Subdivision – Big Qualicum River

History:

- Original construction year = 1913 (Spans 2, 3 & 4); 1926 (Span 1); 1928 (Span 5)

Noted Deficiencies:

- Timber boards under the ties of Span 3 are severely deteriorated
- Refuge bays are in poor condition (safety concern)
110.70 – Victoria Subdivision – Big Qualicum River

Bridge General Arrangement:
110.70 – Victoria Subdivision – Big Qualicum River

Additional Inspection Photos:

- Crushed Timber beneath Ties
- Surface Corrosion on Bearings
- Debris on Bottom Flange Angles (Typical)
113.20 – Victoria Subdivision – Nile Creek

Track View
113.20 – Victoria Subdivision – Nile Creek

**FEATURE CROSSED:** Nile Creek

**INSPECTION DATE:** 10/27/2011  
**STREAM DEPTH:** 3 ft.  
**HEIGHT:** 55 ft  
**NEAREST TOWN:** Bowser, BC  
**FLOW DIRECTION:** East  
**TOTAL LENGTH:** 167 ft  
**INSPECTORS:** APW/AL  
**DECK TYPE:** Open  
**NO. OF SPANS:** Three  
**WALKWAY:** No (1 Refuge Bay)  
**ACCESS METHOD:** Snooper  
**HANDRAILS:** No  
**NDT TESTING:** No  
**OBSERVED UNDER LOAD:** No

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**

- Abutment Type: Cast-In-Place Concrete
- Moss and debris on abutment seats
- Both abutments are in good condition with no significant defects

**WINGWALL NOTES**

- Wingwall Type: Cast-In-Place Concrete
- Both wingwalls are in good condition with no significant defects

**PIER NOTES**

- Base of Pier 1 is susceptible to scour; appears to be in good condition currently
- Pier 1 is cracking on west side near the top
- Pier 1 has a spall on the SW corner (1 ½ ft x 6 in across)
- Pier 2 has a construction joint with efflorescence on the south side

**DECK NOTES**

- Track located on a tangent alignment
- Ties = 10” wide x 16” deep x 13'-0” long
- Tie Spacing = 16”
- Poor tie count = 11 (Span 1), 14 (Span 2) & 8 (Span 3)
- Overall ties are in good condition

**SPAN NOTES**

- Surface corrosion on all faces of steel
- Minor section loss on bottom angles
- Corrosion of bearings
- Lateral bracing angles are bent near bearings from jacking (see attached photo)

**WALKWAY NOTES**

- Refuge bays are in poor condition
  - One plank and one handrail are missing
  - Posts are loose
113.20 – Victoria Subdivision – Nile Creek

History:

- Original construction year = 1914 (Span 2); 1925 (Spans 1 & 3)

Noted Deficiencies:

- Refuge bays are in poor condition (safety concern)
  - One plank and one handrail are missing
  - Posts are loose
113.20 – Victoria Subdivision – Nile Creek

Bridge General Arrangement:
113.20 – Victoria Subdivision – Nile Creek

Additional Inspection Photos:

View of Abutment (Typical)

Girder with Varying Section

Bent Bottom Lateral Angle
VANCOUVER ISLAND RAIL CORRIDOR

119.20 – Victoria Subdivision – Cook Creek S Fork

Corrosion of Bottom Flange Angle (Typical)

Bridge Under View (Typical)
119.20 – Victoria Subdivision – Cook Creek S Fork

FEATURE CROSSED: Cook Creek (South Fork)

| INSPECTION DATE: 10/24/2011 | STREAM DEPTH: 3 ft. | HEIGHT: 14 ft |
| NEAREST TOWN: Mud Bay, BC | FLOW DIRECTION: East | TOTAL LENGTH: 31 ft |
| INSPECTORS: APW/AL | DECK TYPE: Open | SPANS: 28'-7" (DPG) |
| NO. OF SPANS: One | WALKWAY: No |
| ACCESS METHOD: None | HANDRAILS: No |
| NDT TESTING: No | OBSERVED UNDER LOAD: No |

Inspection Findings:

ABUTMENT/BACKWALL NOTES
Abutment Type: Cast-In-Place Concrete
- Rip rap has been placed in front of abutments
- Moss and ferns are growing on abutment seats
- No significant defects noted

WINGWALL NOTES
Wingwall Type: Cast-In-Place Concrete
- Wingwalls are in good condition; no significant defects noted

DECK NOTES
- Track located on a tangent alignment
- Ties = 10" wide x 14" deep x 13'-0" long
- Tie spacing = 16"
- Poor ties counted = 6
- Both approaches are low

SPAN NOTES
- Minor surface corrosion on face of girders
- Minor section loss of top flange plate at midspan (1/16")

History:
- Original construction year = 1914
119.20 – Victoria Subdivision – Cook Creek S Fork

Bridge General Arrangement:
119.50 – Victoria Subdivision – Cook Creek N Fork

Bridge Underside View
119.50 – Victoria Subdivision – Cook Creek N Fork

**FEATURE CROSSED:** Cook Creek (North Fork)

**INSPECTION DATE:** 10/24/2011  **STREAM DEPTH:** 1 ft  **HEIGHT:** 13 ft

**NEAREST TOWN:** Mud Bay, BC  **FLOW DIRECTION:** East  **TOTAL LENGTH:** 30 ft

**INSPECTORS:** APW/AL  **DECK TYPE:** Open  **SPANS:** 24'-0" (TFT)

**NO. OF SPANS:** One  **WALKWAY:** No

**ACCESS METHOD:** None  **HANDRAILS:** No

**NDT TESTING:** No  **OBSERVED UNDER LOAD:** No

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
- Abutment Type: Cast-In-Place Concrete
  - Abutments are in good condition; no defects noted

**WINGWALL NOTES**
- Wingwall Type: Cast-In-Place Concrete
  - South wingwall is being undermined
  - Wingwalls are in good condition

**DECK NOTES**
- Track located on a tangent alignment
- Ties = 8" wide x 8" deep x 12'-0" long
- Tie spacing = 12"
- Poor ties counted = 12
- South approach is low

**SPAN NOTES**
- Two sets of four timber stringers (14 ½" wide x 25 ¼" deep)
- Stringers are in good condition
- Minor splits in stringers

**History:**
- Original construction year = 1965
119.50 – Victoria Subdivision – Cook Creek N Fork

Bridge General Arrangement:
120.20 – Victoria Subdivision – Rosewell Creek

Underside Bridge View
# Inspection Findings:

## ABUTMENT/BACKWALL NOTES
- Abutment Type: Cast-In-Place Concrete
- Rip rap placed around south abutment
- Minor ballast accumulation on abutment seats
- Moss growing on abutments

## WINGWALL NOTES
- Wingwall Type: Cast-In-Place Concrete
- Wingwalls are in good condition; no significant defects noted

## DECK NOTES
- Bridge is located on a tangent alignment
- Ties = 10” wide x 16” deep x 13’-0” long (no dap)
- Tie spacing = 14”
- 18 poor ties counted; ties are generally in fair condition
- Ties have a 4” wide bearing length on the support angles

## SPAN NOTES

### Bearing Notes:
- Rocker bearing (fixed) at south abutment; roller bearing (expansion) at north abutment
- Moderate corrosion on both bearings; 1/16” pitting on bearing plates (see attached photo)
- Anchor bolt at SE bearing is bent slightly

### Stringer Notes:
- Minor surface corrosion on web and top flange angles
- Bottom flange angles have section loss
- Gusset plates for lateral bracing system are pitted at ends of span (1/8”)
- Snow plow has hit south end of west girder; end plate is damaged

## History:
- Original construction year = 1914

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**FEATURE CROSSED:** Rosewell Creek  
**INSPECTION DATE:** 10/24/2011  
**STREAM DEPTH:** 6 ft  
**HEIGHT:** 25 ft  
**NEAREST TOWN:** Mud Bay, BC  
**FLOW DIRECTION:** East  
**TOTAL LENGTH:** 71 ft  
**INSECTORS:** APW/AL  
**DECK TYPE:** Open  
**SPANS:** 67’-8” (HDPG)  
**NO. OF SPANS:** One  
**WALKWAY:** No  
**ACCESS METHOD:** None  
**HANDRAILS:** No  
**NDT TESTING:** No  
**OBSERVED UNDER LOAD:** No
120.20 – Victoria Subdivision – Rosewell Creek

Bridge General Arrangement:
120.20 – Victoria Subdivision – Rosewell Creek

Additional Inspection Photos:

- Bearing at North Abutment
- Corroded South Bearing (Typical)
- North Bearing (Looking Down)
122.00 – Victoria Subdivision – Waterloo Creek

Track View

Abutment View
122.00 – Victoria Subdivision – Waterloo Creek

**FEATURE CROSSED:** Waterloo Creek

- **INSPECTION DATE:** 10/25/2011
- **STREAM DEPTH:** 3 ft
- **HEIGHT:** 16 ft
- **NEAREST TOWN:** Mud Bay, BC
- **FLOW DIRECTION:** East
- **TOTAL LENGTH:** 66 ft
- **INSPECTORS:** APW/AL
- **DECK TYPE:** Open
- **NO. OF SPANS:** One
- **SPANS:** 64' (HDPG)
- **ACCESS METHOD:** None
- **WALKWAY:** No
- **HANDRAILS:** No
- **NDT TESTING:** No
- **OBSERVED UNDER LOAD:** No

### Inspection Findings:

#### ABUTMENT/BACKWALL NOTES

- **Abutment Type:** Cast-In-Place Concrete
- South abutment is being undermined (see attached photo)
- North abutment is in good condition
- Moss growing on both abutments

#### WINGWALL NOTES

- **Wingwall Type:** Cast-In-Place Concrete
- South wingwalls are being undermined similar to the abutment
- North wingwalls are in good condition

#### DECK NOTES

- Bridge is located on a tangent alignment
- Ties = 10" wide x 16" deep x 13'-0" long (no dap)
- 4 poor ties counted; ties are generally in good condition
- Both approaches are low

#### SPAN NOTES

- **Bearing Notes:**
  - Steel plate bearings (expansion) at south abutment; rotational bearing (fixed) at north abutment
  - No corrosion noted on bearings
  - Expansion bearings appear to be frozen

- **Stringer Notes:**
  - Minor surface corrosion on all girder surfaces
  - Lateral bracing system is corroding with moderate section loss (see attached photo)
  - Gusset plates in bracing system are severely corroded; some gusset plates have holes

#### History:

- Original construction year = 1928 (abutments) & 1930 (steel)
122.00 – Victoria Subdivision – Waterloo Creek

Noted Deficiencies:

- South abutment is being undermined (further investigation necessary)
122.00 – Victoria Subdivision – Waterloo Creek

Bridge General Arrangement:
122.00 – Victoria Subdivision – Waterloo Creek

Additional Inspection Photos:

- Close-Up View of Undermined South Abutment
- Corroded Lateral Bracing Members
123.00 – Victoria Subdivision – Coal Creek
123.00 – Victoria Subdivision – Coal Creek

**FEATURE CROSSED:** Coal Creek

| INSPECTION DATE: 10/27/2011 | STREAM DEPTH: 3 ft | HEIGHT: 35 ft |
| NEAREST TOWN: Mud Bay, BC | FLOW DIRECTION: East | TOTAL LENGTH: 118 ft |
| INSPECTORS: APW/AL | DECK TYPE: Open | |
| NO. OF SPANS: Three | WALKWAY: No | |
| ACCESS METHOD: None | HANDRAILS: No | |
| NDT TESTING: No | OBSERVED UNDER LOAD: No | |

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
- Abutment Type: Cast-In-Place Concrete
  - Moss and leaves on abutment seats
  - Efflorescence at construction joint on abutment face
  - Both abutments are in good condition; no significant defects noted

**WINGWALL NOTES**
- Wingwall Type: Cast-In-Place Concrete
  - Both wingwalls are in good condition; no significant defects noted

**PIER NOTES**
- Pier Type: Cast-In-Place Concrete
  - **Pier 1 Notes:**
    - Expansion bearings at this pier
    - Undermining at north side of pier (rip rap has been placed at this location)
    - Spalling on west face of cap and northeast corner of pier (see attached photo)
  - **Pier 2 Notes:**
    - Fixed bearings at this pier
    - Undermining at base of pier (see attached photo)

**DECK NOTES**
- Bridge is located on a tangent alignment
- Ties (Spans 1 & 3) = 10” wide x 16” deep x 12’-0” long (no dap)
- Ties (Span 2) = 10” wide x 12” deep x 12’-0” long (no dap)
- Tie Spacing = 16”
- Poor ties counted = 5 (Span 1), 16 (Span 2) & 8 (Span 3); ties are generally in good condition
- Both approaches are low

**SPAN NOTES**
- **Bearing Notes:**
  - Bearings are moderately corroded; expansion bearings appear frozen
**123.00 – Victoria Subdivision – Coal Creek**

**Span 1 Notes:**
- Minor surface corrosion on all steel surfaces
- Steel is in good condition; no significant defects noted

**Span 2 Notes:**
- Minor surface corrosion on all steel surfaces
- Gusset plates in bracing system are pitted (approximately 1/16”)

**Span 3 Notes:**
- Minor surface corrosion on all steel surfaces
- Steel is in good condition; no significant defects noted

**History:**

- Original construction year =1914

**Noted Deficiencies:**

- Undermining at base of Pier 2 (further investigation necessary)
123.00 – Victoria Subdivision – Coal Creek

Bridge General Arrangement:
123.00 – Victoria Subdivision – Coal Creek

Additional Inspection Photos:

Spall on NE corner of Pier 2

Pier 2 Undermining
124.10 – Victoria Subdivision – Mill Creek

Track View

Girder View (Deck Plate Girder Span)
124.10 – Victoria Subdivision – Mill Creek

**FEATURE CROSSED:** Mill Creek

**INSPECTION DATE:** 10/25/2011

**STREAM DEPTH:** 2 ft

**NEAREST TOWN:** Mud Bay, BC

**FLOW DIRECTION:** East

**HEIGHT:** 40 ft

**TOTAL LENGTH:** 173 ft

**INSPECTORS:** APW/AL

**DECK TYPE:** Open

**NO. OF SPANS:** Two

**WALKWAY:** No

**ACCESS METHOD:** None

**HANDRAILS:** No

**NDT TESTING:** None

**OBSERVED UNDER LOAD:** No

---

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
- Abutment Type: Cast-In-Place Concrete
- Minor debris around bearings
- Minor spalling at corners of north abutment seat (see attached photo)

**WINGWALL NOTES**
- Wingwall Type: Cast-In-Place Concrete
- Minor spalling along construction joints in the wingwalls

**PIER NOTES**
- Pier Type: Cast-In-Place Concrete
- Crack in pedestal of Span 1
- Pier in good condition

**DECK NOTES**
- Bridge is located on a tangent alignment
- Ties (Span 1) = 10” wide x 14” deep x 12’-0” long (no dap)
- Ties (Span 2) = 10” wide x 14” deep x 13’-0” long (no dap)
- Tie Spacing = 16”
- Poor ties counted = 12
- Both approaches are low

**SPAN NOTES**

**Bearing Notes:**
- Bearings are moderately corroded; expansion bearings appear frozen (see attached photo)

**Span 1 Notes:**
- Span Type: Deck Plate Girder
- Minor surface corrosion on all steel surfaces
- Gusset plates in bracing system are pitted (approximately 1/16”)
124.10 – Victoria Subdivision – Mill Creek

**Span 2 Notes:**
Span Type: Deck Truss
- Top Chord Members
  - Minor surface corrosion
  - Members have been strengthened – plates have stitch welds
  - Flanges are bent near abutment from jacking damage
- Bottom Chord Members
  - Minor surface corrosion
  - Members have been strengthened – plates have stitch welds
  - Flanges are bent near abutment from jacking damage
- Diagonal Members
  - Members have been strengthened – plates have stitch welds
  - No significant defects noted
- Bracing Members
  - Minor pitting on some of the bottom gusset plates
  - Secondary members have minor surface corrosion

**History:**
- Original construction year = 1925
124.10 – Victoria Subdivision – Mill Creek

Bridge General Arrangement:
124.10 – Victoria Subdivision – Mill Creek

Additional Inspection Photos:

Corrosion on Bearing (Typical)  
North Abutment Spalling
125.50 – Victoria Subdivision – Tsable River

Track View

Side View (DPG & Deck Truss)
## Inspection Findings:

### Timber Trestle Inspection Summary
- All timber trestle members were visually inspected; east and west face of upper storey inspected with snooper
- Upper Storey:
  - Select exterior stringers were sounded; interior stringers were not sounded due to access
  - Ends of pile caps were sounded, interior were not sounded due to difficult access
  - The tops of all exterior posts and bottoms of select exterior posts were sounded
  - The interior posts were not accessible and none were sounded
- Middle Storey:
  - Exterior and interior posts and sills and bracing were not accessible and were not sounded
- Lower Storey:
  - All posts were sounded at the ground level, no exceptions taken
  - Posts, caps and bracing were not sounded above the ground level

### South End Bent Notes
- End Bent Type: Concrete Abutment with a Timber Bent Cap
- Surface of concrete abutment is weathering
- End bent is generally in good condition

### North Abutment Notes
- Abutment Type: Cast-In-Place Concrete
- Concrete abutment is in good condition

### Wingwall Notes
- Wingwall Type: Timber (South Abutment); Concrete (North Abutment)
- Timber wingwalls are not leaning and are in good condition
- Concrete wingwalls are leaning approximately 1” at top of walls

### Intermediate Timber Bent Notes
- Intermediate Bent: Five square timber posts with a timber cap (14” wide x 14” deep)
- Intermediate bents are in fair condition except as noted below:
  - Bent 7: Base of Post 1 beginning to decay
  - Bent 12: Post 1 has approximately 50% section loss
  - Bent 13: Post 1 has heavy decay at base of first story from top (1 5/8” shell)
125.50 – Victoria Subdivision – Tsable River

- Bent 14: Post 1 has a rotten core (2" sound shell)
- Bent 14: Post 4 top of post is poorly cut creating a bearing gap (typical throughout)
- Bent 15: Post 1 deteriorated (approximately 30% section loss)
- Bent 16: Post 1 (4’ from base) showing signs of decay
- Bent 22: Cross brace is split on east side, one story down from top
- Bent 23: Post 2 intermediate cap dapped slightly for post; Post 3 rotated on intermediate cap
- Bent 23: Fracture cross bracing one level down from top
- Bent 24: Post 1 twisted

PIER NOTES
Pier Type: Cast-In-Place Concrete
- Pier 1
  - Moss located on pier seat
  - Minor spalling at SW and SE corners of pier cap
  - Minor spall on south face of pier, 10’ above ground
- Pier 2
  - Moss located on pier seat

DECK NOTES
- Bridge is located on a tangent alignment
- Ties (Trestle Spans) = 8" wide x 8" deep x 10'-0" long (no dap)
- Ties (Deck Truss Spans) = 10" wide x 10" deep x 12'-0" long (no dap)
- Ties (Deck Plate Girder Span) = 10" wide x 16" deep x 12'-0" long (no dap)
- Tie Spacing = 16"
- Poor ties counted = 14 (Deck Truss Span), 2 (DPG Span)
- Ties are generally in good condition

SPAN NOTES
Timber Stringer (Spans 1 through 21)
- Timber stringers are in good condition; no significant defects noted

Deck Truss (Span 22)
- Bearings
  - South bearings fixed
  - North bearings are roller bearings; expansion (appear to be frozen)
  - Surface corrosion and minor pitting on bearing plates
- Top Chord Members
  - Top plate of top chord has 3/16” to ¼” pitting (see attached photo)
  - Bent lacing members at U1 (East)
- Bottom Chord Members
  - No section loss noted
  - Minor surface corrosion at L1 (West)
  - Bottom chord pin at L1 (West) has minor surface corrosion
- Diagonal Members
  - Surface corrosion on diagonals, typical
  - Cracked eye members at L4 (West)
- Post Members
  - Surface corrosion, typical
125.50 – Victoria Subdivision – Tsable River

- **Floor Beam Members**
  - Floor beams have strengthening plates welded on
  - Floor beams located at U1 and U2 have bent bottom flange cover plates
- **Stringer Members**
  - Surface corrosion throughout; bottom flanges have 1/16” section across entire width
- **Bracing Members**
  - Surface corrosion on all bracing members
  - Several rods of bottom lateral system are loose
  - One cotter pin missing in top lateral bracing

**Deck Plate Girder (Span 23)**

- **Bearings**
  - South bearings are fixed (good condition)
  - North bearings are rocker bearings; expansion (good condition)
- **Steel Tower Bent**
  - Located at south end of DPG span (in good condition)
- **Steel**
  - Generally steel is in good condition; paint peeling
  - Gusset plates in bottom lateral bracing have 1/8” pitting (full width)
  - Horizontal stiffener has section loss (1/16” x 12”, full width)

**OBSERVATIONS UNDER LOAD**

- No significant deflection noted in timber trestle substructure, timber superstructure/ties deflect as expected
- Only movement noted in truss span in diagonals at center of span (vibration), greater with increased speed

**Non-Destructive Testing:**

- Non-destructive testing was performed on October 19 of 2011; for photos and more details see Appendix A
- Pins (8 total) were tested ultrasonically
  - All pins tested were found to be acceptable
  - Heavy corrosion was observed on pins
- Several components (12 total) were magnetic particle tested
  - Components consisted of eyebars, diagonals and turnbuckles
  - Inherent defects were noted visually and confirmed with testing at end of one diagonal
  - Inherent defects were noted visually and confirmed with testing at end of one eyebar
  - A crack was found in the turnbuckle of one of the Queen Post trusses
  - Remaining components tested were found to be acceptable

**History:**

- Original construction year =1914 (Deck Truss), 1977 (Deck Plate Girder and Timber Trestle replaced)

**Noted Deficiencies:**

- Heavy corrosion was found on pins during NDT testing
- Cracks were found in one diagonal member, one eye bar member and a turnbuckle in a Queen Post truss

Note: Many timber elements could not be inspected in detail due to time and access limitations. Of the timber members inspected in detail, several in the intermediate trestle bents were identified as having significant deterioration.
125.50 – Victoria Subdivision – Tsable River

Bridge General Arrangement:
125.50 – Victoria Subdivision – Tsable River

Additional Inspection Photos:

- **Timber Trestle View (Looking North)**
- **South End Bent View**
- **Top Plate of Top Chord Pitting (Deck Truss Span)**
- **Deck Truss Side View (Looking North)**
126.15 – Victoria Subdivision – Buckley Bay Road

Track View (Looking North)
126.15 – Victoria Subdivision – Buckley Bay Road

FEATURE CROSSED: Buckley Bay Road

| INSPECTION DATE: 10/25/2011 | STREAM DEPTH: N/A | HEIGHT: 22 ft |
| NEAREST TOWN: Buckley Bay, BC | FLOW DIRECTION: N/A | TOTAL LENGTH: 65 ft |
| INSPECTORS: APW/AL | DECK TYPE: Ballast | SPANS: 32'-1" (TPG) |
| NO. OF SPANS: One | WALKWAY: Yes |
| ACCESS METHOD: None | HANDRAILS: Yes |
| NDT TESTING: No | OBSERVED UNDER LOAD: No |

Inspection Findings:

ABUTMENT/BACKWALL NOTES
- Abutment Type: Cast-In-Place Concrete
  - Abutments are in good condition; no significant defects noted

WINGWALL NOTES
- Wingwall Type: Cast-In-Place Concrete
  - Wingwalls are in good condition; no significant defects noted

DECK NOTES
- Bridge is located on a tangent alignment
- Ties = 9” wide x 6” deep x 8’-0” long (no dap)
- Tie Spacing = 22”
- Poor ties counted = 0 (ties are in good condition)

SPAN NOTES
- Bearing Notes:
  - Bearings are spherical type
  - Bearings are in good condition and functioning properly

- Steel Notes
  - Surface corrosion on all steel surfaces
  - No significant defects noted

WALKWAY NOTES
- Walkways on both sides are new and in good condition

History:
- Original construction year = 1998
126.15 – Victoria Subdivision – Buckley Bay Road

Bridge General Arrangement:
126.15 – Victoria Subdivision – Buckley Bay Road

Additional Inspection Photos:

Surface Corrosion (Typical)
127.60 – Victoria Subdivision – Hindoo Creek

Track View
127.60 – Victoria Subdivision – Hindoo Creek

<table>
<thead>
<tr>
<th>FEATURE CROSSED: Hindoo Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSPECTION DATE: 10/25/2011</td>
</tr>
<tr>
<td>NEAREST TOWN: Buckley Bay, BC</td>
</tr>
<tr>
<td>INSPECTORS: APW/AL</td>
</tr>
<tr>
<td>NO. OF SPANS: One</td>
</tr>
<tr>
<td>ACCESS METHOD: None</td>
</tr>
<tr>
<td>NDT TESTING: No</td>
</tr>
<tr>
<td>STREAM DEPTH: 0.5 ft</td>
</tr>
<tr>
<td>FLOW DIRECTION: East</td>
</tr>
<tr>
<td>DECK TYPE: Open</td>
</tr>
<tr>
<td>WALKWAY: No</td>
</tr>
<tr>
<td>HANDRAILS: No</td>
</tr>
<tr>
<td>HEIGHT: 25 ft</td>
</tr>
<tr>
<td>TOTAL LENGTH: 21 ft</td>
</tr>
<tr>
<td>SPANS: 19'-6&quot; (TFT)</td>
</tr>
<tr>
<td>OBSERVED UNDER LOAD: No</td>
</tr>
</tbody>
</table>

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**

- Abutment Type: Cast-In-Place Concrete
  - Concrete abutments are in good condition
  - Moisture and moss on seat and face of abutments
  - Apron in front of abutments drops off approximately 6 feet due to scour (monitor)

**WINGWALL NOTES**

- Wingwall Type: Cast-In-Place Concrete
  - Wingwalls are in good condition; no significant defects noted

**DECK NOTES**

- Bridge is located on a tangent alignment
- Ties = 8" wide x 8" deep x 12'-0" long (no dap)
- Tie Spacing = 12"
- Poor ties counted = 6; ties are in good condition

**SPAN NOTES**

- Span Type: Two four-ply timber stringers (each stringer is 12" wide x 22" deep)
  - Stringers are in good condition
  - No section loss noted
  - Mud sills on north side are starting to crush (under NW stringers)

**History:**

- Original construction year =1974

**Noted Deficiencies:**

- Apron in front of abutments drops off approximately 6 feet due to scour (further investigation necessary)
127.60 – Victoria Subdivision – Hindoo Creek

Bridge General Arrangement:
127.60 – Victoria Subdivision – Hindoo Creek

Additional Inspection Photos:

North Abutment View

South Abutment View

Stringers at Bearing (Typical)
131.10 – Victoria Subdivision – Washer Creek
131.10 – Victoria Subdivision – Washer Creek

FEATURE CROSSED: Washer Creek

| Inspection Date: 11/02/2011 | Stream Depth: 3 ft | Height: 13 ft |
| Nearest Town: Union Bay, BC | Flow Direction: East | Total Length: 111 ft |
| Inspectors: SCW/DBH | Deck Type: Open | Spans: 28’-2” (DPG), 49’-4” (DPG) & |
| No. of Spans: Three | Walkway: No | 28’-2” (DPG) |
| Access Method: Snooper | Handrails: No | |
| NDT Testing: No | Observed Under Load: No | |

**Inspection Findings:**

**ABUTMENT/BACKWALL NOTES**
Abutment Type: Concrete Spill-Through Abutments
- Minimal ballast and debris located on abutment seats
- Moss exhibited on abutments
- Minor spalling at corners of abutment seats
- Very minor cracking on abutment face

**WINGWALL NOTES**
Wingwall Type: Cast-In-Place Concrete
- Minor cracks in wingwalls
- Spalling occurs at corner between backwall and wingwall (see attached photo)
- Minor efflorescence and moss exhibited throughout faces of wingwalls

**PIER NOTES**
Pier Type: Cast-In-Place Concrete

**Pier 1 Notes:**
- No cracking noted
- No signs of undermining noted
- Minor surface spalling on west and east face of pier

**Pier 2 Notes:**
- Minor cracking in concrete wall
- Top of footing on west side (where creek flows) is spalling
- Creek flows alongside Pier 2; no voids found under pier footing; probed during inspection (see attached photo)
- Erosion of embankment at upstream side on north end of pier (sand)

**DECK NOTES**
- Bridge is located on a tangent alignment
- Ties = 10” wide x 16” deep x 13’-0” long (no dap)
- Tie Spacing = 15”
- Poor ties counted = 14; ties are generally in fair condition
- Several hook bolts missing
131.10 – Victoria Subdivision – Washer Creek

SPAN NOTES

Bearing Notes:
• Bearings exhibit surface corrosion

Span 1 Notes:
• Paint flaking on all surfaces of girders
• Minor corrosion on top flange plate

Span 2 Notes:
• Minor surface corrosion and paint flaking on web
• Pack rust between cover plates 1 and 2 where plate 2 ends; all locations (see attached photo)
• Moderate corrosion of bottom flange angles (worse than Spans 1 & 3); especially near bearings
• Minor corrosion of top flange plate
• Angles and bottom plates have been added to strengthen girder (see attached photo)
• Exterior web stiffeners are bent at bottom in multiple locations (see attached photo)

Span 3 Notes:
• Paint flaking on all surfaces of girders
• Minor corrosion on top flange plate
• Minor section loss on bottom flange angle
• West girder, south bearing, top plate bent down above bearing; end plate bent at top (see attached photo)

History:

• Original construction year =1914 (Span 2); 1925 (Spans 1 & 3)
• Flanges of Span 2 reinforced for larger locomotives in 1941
131.10 – Victoria Subdivision – Washer Creek

Bridge General Arrangement:
131.10 – Victoria Subdivision – Washer Creek

Additional Inspection Photos:

- Bent Intermediate Stiffener in Span 2
- Bent End Plate at Span 3
- Pack Rust between Cover Plates (Typical)
- Creek Alongside Pier 2
135.10 – Victoria Subdivision – Trent River

Track View (From Above)
135.10 – Victoria Subdivision – Trent River

FEATURE CROSSED: Trent River

<table>
<thead>
<tr>
<th>Inspection Date: 11/02/2011</th>
<th>Stream Depth: 2-5 ft</th>
<th>Height: 80 ft</th>
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</thead>
<tbody>
<tr>
<td>Nearest Town: Royston, BC</td>
<td>Flow Direction: East</td>
<td>Total Length: 289 ft</td>
</tr>
<tr>
<td>Inspectors: SCW/DBH</td>
<td>Deck Type: Open</td>
<td>Spans: 2 @ 73'-1 (DPG), 2 @ 43' (DPG) &amp;</td>
</tr>
<tr>
<td>No. of Spans: Five</td>
<td>Walkway: No (1 Refuge Bay)</td>
<td>48'-0&quot; (DPG)</td>
</tr>
<tr>
<td>Access Method: Snooper</td>
<td>Handrails: No</td>
<td></td>
</tr>
<tr>
<td>NDT Testing: No</td>
<td>Observed Under Load: No</td>
<td></td>
</tr>
</tbody>
</table>

Inspection Findings:

ABUTMENT/BACKWALL NOTES

- Abutment Type: Concrete Spill-Through Abutments
  - North Abutment
    - Abutment is in good condition; no cracking or spalling noted
    - Debris is accumulating on abutment seat
  - South Abutment
    - Abutment is in good condition; no cracking or spalling noted
    - Slope erosion occurring in front of south abutment (see attached photo)

WINGWALL NOTES

- Wingwall Type: Concrete with Timber Extensions
  - West wingwall extension at north abutment and both south wingwall extensions are being undermined slightly

STEEL BENT TOWER NOTES

Tower 1 Notes

- Base of tower is in fair condition; minor spalls noted
- Heavy rust on column near top of columns due to build up of moss
- Anchor bolts corroded at top of columns
- Minor pitting below bearing plate and above column top plate (near top of columns)
- Tower legs near base have some section loss; angle leg thickness reduced from 5/8" to 7/16" (0.2" loss)
- SW leg of Tower 1 undermined; extent of undermining not measured but previous measurements by SVI suggest that up to 1/3 of the footing is undermined

Tower 2 Notes

- Base of tower is in good condition; no detectable undermining
- Heavy rust on column near top of columns due to build up of moss
- Anchor bolts corroded at top of columns
- Minor pitting below bearing plate and above column top plate (near top of columns)
- Tower legs near base have some section loss; angle leg thickness reduced from 5/8" to 1/2"
- Moss and debris on top of footing
- SE tower footing has a 3" deep by 2" wide crack extending from tower base
- NW tower footing is deteriorating on the south face (spall 2" deep by 6" high)
- South strut at base has 3/8" pack rust and is corroded to a knife edge (localized) in top flange

Feature Crossed: Trent River

Inspector: SCW/DBH

Deck Type: Open

Spans: 2 @ 73'-1 (DPG), 2 @ 43' (DPG) & 48'-0" (DPG)

No. of Spans: Five

Walkway: No (1 Refuge Bay)

Access Method: Snooper

NDT Testing: No

Observed Under Load: No
135.10 – Victoria Subdivision – Trent River

- East strut at base has section loss in bottom flange (approximately 1/8” at midspan)
- North strut exhibits 1/8” pitting and 1/16” corrosion
- Timber retaining wall at NW footing is rotted and collapsing (retains approximately 3’ of soil)

DECK NOTES
- Bridge is located on a tangent alignment
- Ties = 10” wide x 16” deep x 13’-0” long (no dap)
- Poor ties counted = 42; ties are generally in fair condition

SPAN NOTES

**Bearing Notes:**
- Bearings exhibit some surface corrosion

**Span 1 Notes:**
- Minor corrosion on web, bottom flange plate and top flange plate
- Large amount of moss on bottom flange angle and bottom of top shelf angle
- Lateral bracing system is in fair condition; debris accumulating at connections
- Bearing stiffeners appear newer than rest of girder
- Heavy debris at bearings

**Span 2 Notes:**
- Section loss on bottom flange angles (see note in Appendix B for details)
- Minor corrosion on web, bottom flange plate and top flange plate
- Large amount of moss on bottom flange angle
- Lateral bracing system is in fair condition; debris accumulating at connections
- Bearing stiffeners appear newer than rest of girder
- Heavy debris at bearings

**Span 3 Notes:**
- Top flange angle bending down on outside above bearings (east girder)
- Minor corrosion on web, bottom flange plate and top flange plate
- Large amount of moss on bottom flange angle
- Lateral bracing system is in fair condition; debris accumulating at connections
- Bearing stiffeners appear newer than rest of girder
- Heavy debris at bearings

**Span 4 Notes:**
- Minor corrosion on web, bottom flange plate and top flange plate
- Small amount of moss on bottom flange angle
- Lateral bracing system is in fair condition
- Heavy debris at bearings
- West girder better condition than east
Span 5 Notes:
- Minor corrosion on web, bottom flange plate and top flange plate
- Lateral bracing system is in fair condition; gusset plate exhibits 1/16" section loss
- Bottom flange angles exhibit loss in the following locations:
  - Pitting in vertical leg of interior angle (west and east girder) at 1/3 points of spans (2" x 1/8")
  - Pitting in vertical leg of exterior angle (west girder) at 1/3 points of span (2" x 1/8")
  - Pitting on top surface of horizontal leg (east girder) at north end of span (3" x 1/16")
- Heavy debris at bearings
- Rolling defect in east girder top shelf angle, 4th stiffener from south
- Pitting in vertical leg of bottom interior flange angles (2" x 1/8")

REFUGE BAY NOTES
- One broken floor plank in refuge bay

History:
- Original construction year =1914 (Spans 2, 3 & 4); 1925 (Spans 1 & 3)
- SVI found that the SE leg of Tower 1 was undermined
  - Extend of undermining measured at approximately 1/3 of the footing width
  - Plans show timber piles under footing; the existence of piles could not be confirmed by inspection.

Noted Deficiencies:
- Footing of SE leg at Tower 1 has been undermined (further investigation necessary)
135.10 – Victoria Subdivision – Trent River

Bridge General Arrangement:
135.10 – Victoria Subdivision – Trent River

Additional Inspection Photos:

- Bird’s Nest at Longitudinal Stiffener
- Corroded Gusset Plate inside Girder
- Broken Floor Plank in Refuge Bay
- Slope Erosion in front of South Abutment
- Bent Top Shelf Angle (Span 5)
- Bearing at Top of Steel Towers
Closure

The services provided by Associated Engineering and Alfred Benesch & Company in preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession practising under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,

Prepared by:

Michael J. O'Connor, PE
Project Manager
Alfred Benesch & Company

Reviewed by:

N. Cuperlovic, P.Eng.
Project Manager
Associated Engineering

Michael J. O'Connor, 2/15/2012
N. Cuperlovic
Appendix A: Non-Destructive Testing Reports
ASSOCIATED ENGINEERING  
COMOX, BC  
ATTENTION: DALE B. HARRISON  
BRIDGE 125.5  
OCTOBER 19, 2011  

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NONDESTRUCTIVE EXAMINATION REPORT

TO: ASSOCIATED ENGINEERING
1994 COMOX AVENUE
COMOX, BC
V9M 3M7

DATE: October 19, 2011
TIME: ---

ACUREN JOB #: 6057420
P.O.:

ATTENTION: DALE B. HARRISON

WORK LOCATION: On Site

TO: ASSOCIATED ENGINEERING
1994 COMOX AVENUE
COMOX, BC
V9M 3M7

DATE: October 19, 2011
TIME: ---

ACUREN JOB #: 6057420
P.O.:

To: DALE B. HARRISON

WORK LOCATION: On Site

ACCETANCE
STANDARD: Client's information
REV./DATE: ---

PROCEDURE #: UT-0017
REV./DATE: Apr 07

ITEM(S) TESTED: Various Components as per Client

TECHNIQUE #: ---
REV./DATE: ---

PART #: ---

MATERIAL: Carbon steel

THICKNESS: varied

SCOPE: Ultrasonic testing of pins and magnetic particle testing of various components on the bridge as directed by client.

TYPE(S) OF INSPECTION: Magnetic Particle; Ultrasonic

RESULTS: (Imperial)

Ultrasonic Testing:

In total, eight (8) pins were tested ultrasonically on the 125.5 Sable River Bridge. See Table 1 below for complete list and results. The pins range in length from approximately 15"-40". No test pins were provided as reference and the instrument was initially calibrated for distance using an IIW block. A lower pin was tested, in situ, and measured with a tape measure to confirm length. The amplitude on the instrument was adjusted until the back wall signal was at 80% full screen height. This amplitude (52DB) was used as a reference level for the rest of the pins. Scanning was performed at 6DB above reference level.

The pin's surface condition varied between each location. At some locations, the surface condition was extremely rough, mostly machine marks from installation. Where necessary and accessible a power grinder with grinding stone was used to provide an appropriate surface for testing. Other pin ends had a convex geometry with an inverted dimple in the centre making probe coupling difficult. Where possible the pins were read from both ends.

A note on the instrument's settings; Although the frequency of the available probe used was 2.25MHz the frequency on the instrument was set to 2.00MHz and sometimes to 1.00MHz. This provided a cleaner signal, in most cases, due to the material being tested. In addition, the filter settings were set to match the actual frequency of the probe used, this provided a cleaner signal, and is recommended in the Epoch XT user manual; "Due to the shifting of the frequency spectrum in most materials, it might be necessary to adjust filter settings to maximize instrument performance" (Photo 1).

Pins were numbered from 0-9 starting from the south end. Right and Left sides (looking north) were designated using an R or an L. The pins were also labelled as Upper (U), and Lower (L). All pins inspected found to be acceptable.
Magnetic Particle Testing:

As requested, several areas and components were magnetic particle tested. See Table 2 below for the full scope and results of the testing, as well as the photos for more details (Photos 2-12).

Columns were numbered from 0-9 starting from the south end. Right and Left sides (looking north) were designated using an R or an L. Upper and Lower areas more with a U or an L.

<table>
<thead>
<tr>
<th>Location</th>
<th>Number</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>Left Upper</td>
<td>0</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Left Lower</td>
<td>1</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Left Lower</td>
<td>4</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Left Upper</td>
<td>4</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Right Upper</td>
<td>5</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Right Lower</td>
<td>5</td>
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<tr>
<td>Right Upper</td>
<td>9</td>
<td>100% back wall</td>
</tr>
<tr>
<td>Right Lower</td>
<td>9</td>
<td>100% back wall</td>
</tr>
</tbody>
</table>

### TABLE 2: LOCATION AND DESCRIPTION OF THE MAGNETIC PARTICLE TESTING

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Lower 1</td>
<td>End of Eyebar #2 (counting from left to right)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Left Lower 2 - Upper 1</td>
<td>End of diagonal.</td>
<td>Inherent defects noted visually and confirmed with MPI. See photos.</td>
</tr>
<tr>
<td>Left Lower 4 to Upper 5</td>
<td>End of diagonal.</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Left Lower 4 to Lower 3</td>
<td>End of Eyebar #1 (counting from left to right)</td>
<td>Inherent defects noted visually and confirmed with MPI. See photos.</td>
</tr>
<tr>
<td>Between Upper 4 and Upper 5 on Queen Post Truss #4</td>
<td>Turnbuckle on #4 Queen Post Truss (counting left to right)</td>
<td>1” crack indication noted - see photos.</td>
</tr>
<tr>
<td>Between Upper 5 and Upper 6 on Queen Post Truss #3</td>
<td>Threaded Clevis #3 (counting left to right)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Between Upper 5 and Upper 6 on Queen Post Truss #3</td>
<td>1’ portion of threaded rod at bend approximately 4’ from Clevis #3</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Between Upper 7 and Upper 8 on Queen Post Truss #4</td>
<td>Turnbuckle #4 (counting left to right)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Right Upper 4 to Lower 5</td>
<td>Turnbuckle #4 (counting left to right)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Right Lower 5</td>
<td>End of Eyebar #4 (outside eyebar)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Right Lower 7</td>
<td>End of Eyebar #4 (outside eyebar)</td>
<td>MT Ok.</td>
</tr>
<tr>
<td>Right Lower 7 to Upper 8</td>
<td>End of Diagonal</td>
<td>MT Ok.</td>
</tr>
</tbody>
</table>
Photo 1:
Screen shot showing typical inspection results. This one from Left side Upper pin number 4.

Photo 2:
Overview of the Queen Post Truss.

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Photo 3:

Testing performed on Right Lower 5 eyebar end. MT Ok.

Photo 4:

Overview of turnbuckle #4 on the Queen Post Truss running between Upper 4 and Upper 5.

Location of 1" crack shown in Photo 5.
Photo 5:

Close up of the 1” crack indication found on the turnbuckle #4 on the Queen Post Truss running between Upper 4 and Upper 5.

Photo 6:

Overview of the end of eyebar #1 (outside) running from LL4 to LL3 showing the location of the inherent defects noted visually and confirmed with MPI.

Photo 7

Photo 8
Photo 7:

Manufacturing defects noted at neck of eyebar. This pattern could be seen visually before magnetic particle test was performed.

Photo 8:

Original manufacturing defects noted at bottom of eyebar. This pattern could be seen visually before magnetic particle test was performed. Appears to be shrinkage cracks.

This bar in behind eyebar not attached to it. See overview in Photo 6.
Photo 9:
Overview of Left Lower 2 to Upper 1 Diagonal eyebars where inherent manufacturing defects were noted.

---

Markings in Photo 10 found here.

---

Photo 10:
Markings noted on edge of eyebar located at of Left Lower 2 to Upper 1 Diagonal eyebar. Magnetic Particle testing showed no crack indications coming off of these grooves.
Photo 11:
Opening on sheave at pin Lower Left 1 allowing moisture to corrode pin.

Photo 12:
Corrosion noted on outer surface of pin at Lower Left 1. The corrosion on the side could not be seen with the ultrasonic test from the end of the pin.
**TEST DETAILS: MAGNETIC PARTICLE**

<table>
<thead>
<tr>
<th>TYPE: Wet Visible</th>
<th>METHOD: Yoke</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARTICLE BRAND: Ardrox</td>
<td>PRODUCT NO.: 8031</td>
</tr>
<tr>
<td>PARTICLE COLOUR: Black</td>
<td></td>
</tr>
<tr>
<td>SUSPENSION: Oil</td>
<td></td>
</tr>
<tr>
<td>CONTRAST PAINT: Ardrox</td>
<td>PRODUCT NO.: 8901W</td>
</tr>
<tr>
<td>MAG TIME (SECONDS): 20</td>
<td>DEMAG REQUIRED?: No</td>
</tr>
<tr>
<td>CURRENT: AC</td>
<td>MT INSTRUMENT S/N: see &quot;APPENDIX&quot;</td>
</tr>
<tr>
<td>MT INSTRUMENT: Parker B-300</td>
<td>CAL DUE: see &quot;APPENDIX&quot;</td>
</tr>
<tr>
<td>BLKLIGHT S/N: ---</td>
<td>MAKE: ---</td>
</tr>
<tr>
<td>LIGHTING EQUIPMENT: ---</td>
<td></td>
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<tr>
<td>BLACKLIGHT S/N: ---</td>
<td>LIGHT METER S/N: ---</td>
</tr>
<tr>
<td>LIGHT INTENSITY: ---</td>
<td>CAL DUE: ---</td>
</tr>
<tr>
<td>THE TECHNIQUE HAS BEEN DEMONSTRATED OVER A PAINTED SURFACE: Yes</td>
<td></td>
</tr>
<tr>
<td>SURFACE CONDITION: As ground</td>
<td>SURFACE TEMPERATURE: 57°C/135°F to 316°C/600°F</td>
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**TEST DETAILS: ULTRASONIC**

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<th>TYPE: Flaw Detection</th>
<th>METHOD: Contact</th>
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<tr>
<td>INSTRUMENT: Panametrics</td>
<td>MODEL: Epoch XT</td>
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<tr>
<td>CAL. BLOCK: IIW</td>
<td>S/N: see &quot;APPENDIX&quot;</td>
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<tr>
<td>CAL. BLOCK: ---</td>
<td>S/N: ---</td>
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<tr>
<td>CAL. BLOCK: ---</td>
<td>S/N: ---</td>
</tr>
<tr>
<td>CABLE-TYPE: Coaxial</td>
<td>LENGTH: see &quot;APPENDIX&quot;</td>
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<td>COUPLANT: UTX</td>
<td>SPECIAL EQUIP.: ---</td>
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**TRANSDUCER MANUFACTURER & TECHNIQUE DETAILS:**

<table>
<thead>
<tr>
<th>Test Angle</th>
<th>Probe Type</th>
<th>Frequency (MHz)</th>
<th>Serial Number</th>
<th>Probe Ø</th>
<th>Transfer Value</th>
<th>Test From</th>
<th>Reference Reflector</th>
<th>Reference dB</th>
<th>% FSH</th>
<th>Scan Sensitivity</th>
<th>Range</th>
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<tr>
<td>1</td>
<td>GE</td>
<td>2.25</td>
<td>022LDX</td>
<td>1&quot;</td>
<td>0</td>
<td>Surface</td>
<td>Backwall</td>
<td>76</td>
<td>100</td>
<td>+6DB</td>
<td>50&quot;</td>
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</table>

**SURFACE CONDITION:** As ground

**SURFACE TEMPERATURE:** 0°C/32°F to 120°C/250°F
Appendix B: Field Inspection Notes
# HDG SPANS

**E&N Railway**  
**SECTION:** Victoria to Nanaimo  

**MILE POST #** 79.1

<table>
<thead>
<tr>
<th>CROSSING:</th>
<th>ROAD</th>
<th>STREAM:</th>
<th>N/A</th>
<th>SPAN TYPE: TIMBER TRESTLE</th>
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<tbody>
<tr>
<td>INSPECTION DATE:</td>
<td>OCT 6, 2011</td>
<td>STREAM DEPTH:</td>
<td>N/A</td>
<td>HEIGHT: VALIES</td>
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<tr>
<td>LOCATION:</td>
<td>6V-79.1</td>
<td>FLOW DIRECTION:</td>
<td>N/A</td>
<td>LENGTH: 105.0&quot; (APPROX)</td>
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<tr>
<td>INSPECTORS:</td>
<td>MT/KB</td>
<td>DECK TYPE:</td>
<td>Open / Ballast</td>
<td>RATING:</td>
</tr>
<tr>
<td>NO. OF SPANS:</td>
<td>7</td>
<td>WALKWAY:</td>
<td>(Yes) NO - EW side</td>
<td>SPAN LENGTH(S):</td>
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<tr>
<td>NO. OF TRACKS:</td>
<td>1</td>
<td>HANDRAILS:</td>
<td>(Yes) NO - EW side</td>
<td></td>
</tr>
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</table>

**13'-9" - 13'-3" - 14'-10" - 18'-4" - 13'-3"

### Inspection Findings:

#### ABUTMENT NOTES

*Type of Abutment Construction = TIMBER TRESTLE*

**South:**

1. Evidence of scour / undermining = N/A
2. Drift accumulated = N/A
3. Ballast/debris on bearings = MINOR
4. Vegetation on face/seat = SOME MINOR GROWTH
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) = N/A

**Other Notes:**

**North:**

1. Evidence of scour / undermining = N/A
2. Drift accumulated = N/A
3. Ballast/debris on bearings = MINOR
4. Vegetation on face/seat = MINOR GROWTH
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) = N/A

**Other Notes:**
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = TIMBER

Type of Backwall Construction = TIMBER

South Abutment:
1. Undermining = __________
2. Cracks = __________
3. Spalling = __________
4. Leaning = __________
5. Exposed reinforcing steel = __________

Other Notes:
TIMBER PLANKS SEPARATING SLIGHTLY - SOME EROSION DUE TO THIS

North Abutment:
1. Undermining = __________
2. Cracks = __________
3. Spalling = __________
4. Leaning = __________
5. Exposed reinforcing steel = __________

Other Notes:
TIMBER PLANKS SEPARATING SLIGHTLY - SOME EROSION DUE TO THIS

DECK NOTES

Ballast / Open deck = OPEN

Track Alignment Notes:
1. Bridge on tangent or curve = STRAIGHT
2. Max. superelevation at midspan = NOT NOTED
3. Chord offset at midspan (distance from center of track to center of girders) = NO

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 8" wide x 8" deep x 10/4" long with bearing-bearing length =
2. Tie spacing = 12" OC
3. Ties dapped for superelevation =
4. Rail plates cutting into ties = NO
5. Overall tie condition = 70% GOOD - 30% BAD
6. Approach ties swinging = NO
7. Approx. number of bad ties = 30
8. Section loss to be used in rating flexural ties = VIA

Other Notes:

Tie Support Angles (if applicable):
1. Size of angles =
2. Overall condition =
3. Cracks evident =
4. Bearing length of tie on angle =

Other Notes:
Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good = Appears to be good
5. Approaches low = Yes! 

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES
Girder spacing = 5'6"C/C (CONFIRM)
Girder depth = 1'4" 21/64" wood
General steel condition = Good

Bearing Notes:
1. Type of bearings = Wood on wood
2. Full bearing = Yes
3. Bearing corrosion = Moderate
4. Anchor bolt condition =
5. Expansion bearings functioning properly or frozen =
6. Bearings punching into abutment seat = No

Other Notes:

Span 1 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Timber Trestles

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST # 79.9

CROSSING:
INSPECTION DATE: 10/15/11
LOCATION:
INSPECTORS: D. MFG/DBH
NO. OF SPANS: 14
NO. OF TRACKS: 1

STREAM:
STREAM DEPTH: 1 FT
FLOW DIRECTION: EAST
DECK TYPE: Open
WALKWAY: (Yes/No - E/W side)
HANDRAILS: (Yes/No - E/W side)

SPAN TYPE: Timber Trestle
HEIGHT:
LENGTH:
RATING:
SPAN LENGTH(S):

Inspection Findings:

END BENT NOTES
Type of End Bent Construction =
1. # of piles = 5
2. Pile diameter = 11"
3. Pile cap size = 28" deep x 13" wide

South End (Bent 1):
1. Drift accumulated = No
2. Bent rotation = None
3. Pile cap general condition = Good
4. Pile cap bulging/splitting = No
5. Pile cap has excessive internal/external decay = No
6. Pile general condition = Good, mostly buried below ground
7. Piles have excessive internal/external decay = No
8. Piles bulging/splitting = No

Other Notes:

North End (Bent TBD):
1. Drift accumulated = No
2. Bent rotation = No
3. Pile cap general condition = Concrete cap, no cracks
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =

Other Notes:

INTERMEDIATE BENT NOTES
Use timber schematic to mark up section loss in individual piles.
1. # of piles =
2. Pile diameter =
3. Pile cap size = _____ deep x _____ wide
4. Bents plumb =
5. Signs of pumping piles =
6. Signs of scour/erosion =
7. Posted piles =

[Handwritten note: "See detailed sheet" and "Fiber optic at west side"]
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = 

Type of Backwall Construction = 

South End:
1. Undermining = NO
2. Cracks =
3. Leaning = NO
Other Notes:

North End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

DECK NOTES
Ballast / open deck = open

Track Alignment Notes:
1. Bridge on tangent or curve = tangent
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of stringers) =
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = 8" wide x 8" deep x 12" long
2. Tie spacing =
3. Ties dapped for superelavation = NO
4. Rail plates cutting into ties = NO
5. Overall tie condition = good
6. Approach ties swinging =
7. Approx. number of bad ties = (x) bad ties
8. Method of tie connection =
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes:
**Walkways/Refuge Bay Notes:**
1. Walkways on bridge = No
2. Walkway condition = N/A
3. Refuge bays on bridge = Yes
4. Refuge bay condition = Good condition w/ adequate railing

**Other Notes:**

**SPAN NOTES**
1. # of stringers = 2
2. Stringer size = 17" deep x 9" wide (4 ply, 2 stringers)
3. Out-out of exterior stringers =
4. General stringer condition = Charred, 2/3 loss on exposed faces
   Use timber span schematic for marking up section loss in individual stringers where required
5. Ends of stringers crushing = No
6. Horizontal shear cracks in stringers =
7. Fractured stringers =
8. Decay/insect damage =

**Other Notes:**

**EXTRA TIMBER MEMBER NOTES (WHERE IN PLACE)**
1. Longitudinal bracing =
2. Longitudinal bracing size =
3. Longitudinal bracing condition =
4. Sway bracing =
5. Sway bracing size =
6. Sway bracing condition =
7. Sash bracing =
8. Sash bracing size =
9. Sash bracing condition =
10. Mud sills @ bents = N/A
11. Mud sill condition = N/A

**Other Notes:**

---

**History:**
- Original construction year =
- Summary of bridge updates =

**Recommended Work:**

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Fire in 2005/2006?
RAILROAD BRIDGE INSPECTION REPORT

**DATE:** 10/15/11

**Bridge:** 79.9

**TIMBER TRESTLE CONDITION FOR RATING**

**CAP SIZES:**

- Dia.

- Dia.

- Dia.

- Dia.

- Dia.

- Dia.

- Dia.

- Dia.

**REMARKS:**

- 2 1/4" shell/void (below post)
- 5" shell/rot (above post)

**DRILLED:**

- 2" sound

- C = CHAPPED

- S = SOUND

- B = BANED

- P = POSTED

- 14" x 14" x 4 ply (2)

- 17 1/8" x 9" x 4 ply (2)

- Pile cap has lost up to 1/3"

- Bent 6: Pile 6 has a 4" deep crack

- Point 4: Pile 3 is not bearing uniformly
BRIDGE SKETCHES (AS REQUIRED)

- Take 3/8" off bottom and sides.
- Charred off stringers.
- IN GENERAL TAKE 3/8" OFF ALL STRINGERS.
- Spans 1, 2, Strips 8.
  - Check 3 inches deep (half-length).
  - Bracing between Bents 1/2.
  - Charred and a little loose.

1/2" Sand

12 x 12" Piles

5 Square Timbers on concrete foundations.

5 Square on concrete steps.

13 1/4" sand

Six (circular piles)

1/2" Sand

Bent 15 - Concrete Cap
- CCC

Bent 14 - CCC Charred Stringers

Bent 13 - CCC Charred 70%

Bent 12 - CCC Charred

Bent 11 - CCC Charred

Bent 10 - CCC Charred

Pile 6 is off-center.
**Measuring / object data**

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<tr>
<th>Measurement no.</th>
<th>13</th>
</tr>
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<tbody>
<tr>
<td>ID number</td>
<td>MILE 79.9</td>
</tr>
<tr>
<td>Drilling depth</td>
<td>28.51 cm</td>
</tr>
<tr>
<td>Date</td>
<td>15.10.2011</td>
</tr>
<tr>
<td>Time</td>
<td>10:58:51</td>
</tr>
<tr>
<td>Feed speed</td>
<td>50 cm/min</td>
</tr>
</tbody>
</table>

| Needle speed    | 5000 r/min |
| Needle state    | ok |
| Tilt            | 97° (1°) |
| Avg. curve      | off |
| Species         | Doug-Fir |

**Cavity detector**

<table>
<thead>
<tr>
<th>Start / stop level</th>
<th>---</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum start depth</td>
<td>---</td>
</tr>
<tr>
<td>Mode</td>
<td>---</td>
</tr>
<tr>
<td>Level / width</td>
<td>---</td>
</tr>
<tr>
<td>Start / stop</td>
<td>---</td>
</tr>
<tr>
<td>Resulting length</td>
<td>---</td>
</tr>
<tr>
<td>Cavity</td>
<td>---</td>
</tr>
</tbody>
</table>

**Assessment**

- From 0.0 cm to 6.0 cm: Sound
- From 6.0 cm to 23.0 cm: Rot
- From 23.0 cm to 28.0 cm: Sound
- From 0.0 cm to 0.0 cm:
- From 0.0 cm to 0.0 cm:
- From 0.0 cm to 0.0 cm:

**Comment**

BENT 7 PILE4
### Measuring / object data

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<td>MILE 79.9</td>
</tr>
<tr>
<td>Drilling depth</td>
<td>20.00 cm</td>
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<tr>
<td>Date</td>
<td>15.10.2011</td>
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<tr>
<td>Time</td>
<td>10:38:10</td>
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<tr>
<td>Feed speed</td>
<td>50 cm/min</td>
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<td>Needle speed</td>
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<td>Needle state</td>
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<tr>
<td>Level</td>
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<tr>
<td>Tilt</td>
<td>92° (1°)</td>
</tr>
<tr>
<td>Offset</td>
<td>141/526</td>
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<tr>
<td>Species</td>
<td>Doug-Fir</td>
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<tr>
<td>Avg. curve</td>
<td>off</td>
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<tr>
<td>Location</td>
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<tr>
<td>Name</td>
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### Cavity detector

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<tr>
<td>Mode</td>
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<tr>
<td>Level / width</td>
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<tr>
<td>Start / stop</td>
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<td>Resulting length</td>
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</tr>
<tr>
<td>Cavity</td>
<td>---</td>
</tr>
</tbody>
</table>

### Assessment

- **Sound**
  - From 0.0 cm to 3.5 cm
  - From 16.0 cm to 20.0 cm

- **Void**
  - From 3.5 cm to 16.0 cm

- **Comment**
  - BENT 8 PILE 5

---

Measurement004.rgp
### Measuring / object data

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<th>Measurement no.</th>
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<tbody>
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<td>MILE 79.9</td>
<td>28.83 cm</td>
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<td>10:40:56</td>
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<td>Offset</td>
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<tr>
<td>5</td>
<td>5000 r/min</td>
<td>ok</td>
<td>92° (1°)</td>
<td>130/451</td>
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<tr>
<td>Diameter</td>
<td>28.0 cm</td>
<td>Level</td>
<td>Direction</td>
<td>Species</td>
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<tr>
<td>28.0 cm</td>
<td></td>
<td></td>
<td></td>
<td>Doug-Fir</td>
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### Cavity detector

<table>
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<th>Maximum start depth</th>
<th>Mode</th>
<th>Level / width</th>
<th>Start / stop</th>
<th>Resulting length</th>
<th>Cavity</th>
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<td>--</td>
<td>--</td>
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<td>--</td>
</tr>
</tbody>
</table>

### Assessment

- From 0.0 cm to 3.0 cm: Sound
- From 3.0 cm to 26.0 cm: Void
- From 26.0 cm to 28.5 cm: Sound
- From 0.0 cm to 0.0 cm: Void
- From 0.0 cm to 0.0 cm: Void
- From 0.0 cm to 0.0 cm: Void
- From 0.0 cm to 0.0 cm: Void

### Comment

BENT 8 PILE 5
### Measuring / object data

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<td>7</td>
<td>5000 r/min</td>
<td>30.0 cm</td>
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</table>

<table>
<thead>
<tr>
<th>ID number</th>
<th>Needle state</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILE 79.9</td>
<td>ok</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Drilling depth</th>
<th>Tilt</th>
<th>Direction</th>
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</thead>
<tbody>
<tr>
<td>30.19 cm</td>
<td>91° (1°)</td>
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<table>
<thead>
<tr>
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<th>Offset</th>
<th>Species</th>
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</thead>
<tbody>
<tr>
<td>15.10.2011</td>
<td>194/383</td>
<td>Doug-Fir</td>
</tr>
</tbody>
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<table>
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<th>Time</th>
<th>Avg. curve</th>
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<td>50 cm/min</td>
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### Cavity detector

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<table>
<thead>
<tr>
<th>Maximum start depth</th>
<th>---</th>
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</table>

| Mode | --- |
| Level / width | --- |
| Start / stop | --- |
| Resulting length | --- |
| Cavity | --- |

### Assessment

- **Sound**
  - From 0.0 cm to 30.0 cm

### Comment

- BENT 8 PILE 4
### Measuring / object data

| Measurement no. | ID number   | Drilling depth | Date      | Time     | Feed speed | Needle speed | Needle state | Tilt          | Offset     | Avg. curve | Direction | Species   | Location | Name |
|-----------------|-------------|----------------|-----------|----------|------------|--------------|--------------|---------------|-------------|------------|-----------|-----------|-----------|---------|------|
| 8               | MILE 79.9   | 27.97 cm       | 15.10.2011| 10:47:20 | 99 cm/min  | 5000 r/min   | ok           | 97° (1°)     | 199/358    | off        |           | Doug-Fir  |          |       |

### Cavity detector

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<th>Mode</th>
<th>Level / width</th>
<th>Start / stop</th>
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<th>Cavity</th>
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### Assessment

- **Sound**
  - From 0,0 cm to 5,0 cm
  - From 25,0 cm to 28,0 cm

- **Rot**
  - From 5,0 cm to 25,0 cm

### Comment

- BENT 8 PILE 3
### Measuring / object data

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<th>ID number</th>
<th>Drilling depth</th>
<th>Date</th>
<th>Time</th>
<th>Feed speed</th>
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<tr>
<td>9</td>
<td>MILE 79.9</td>
<td>40.00 cm</td>
<td>15.10.2011</td>
<td>10:53:00</td>
<td>99 cm/min</td>
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<table>
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<th>Needle state</th>
<th>Level</th>
<th>Tilt</th>
<th>Offset</th>
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<td>ok</td>
<td></td>
<td>156° (1°)</td>
<td>220/387</td>
<td>Doug-Fir</td>
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### Cavity detector

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<th>Mode</th>
<th>Level / width</th>
<th>Start / stop</th>
<th>Resulting length</th>
<th>Cavity</th>
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### Assessment

- **From 0.0 cm to 40.0 cm**: Sound

### Comment

BENT 8 STR 2
**Measuring / object data**

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<tr>
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<th>Direction</th>
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<tr>
<td>31.86 cm</td>
<td>138/338</td>
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<table>
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<tr>
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<th>Name</th>
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**Cavity detector**

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<table>
<thead>
<tr>
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<th>Level / width</th>
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<table>
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<tr>
<th>Start / stop</th>
<th>Resulting length</th>
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<tr>
<th>Cavity</th>
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<tbody>
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**Sound**

From 0.0 cm to 4.0 cm: Sound
From 4.0 cm to 28.0 cm: Partial Rot
From 28.0 cm to 31.0 cm: Sound
From 0.0 cm to 0.0 cm:
From 0.0 cm to 0.0 cm:
From 0.0 cm to 0.0 cm:

**Assessment**

**Comment**

BENT 8 PILE 1
DPG SPANS: STEEL BENTS

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST # B6

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<th>STREAM:</th>
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<th>HEIGHT:</th>
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<td></td>
<td></td>
<td>HARRY Ck.</td>
<td>DPG</td>
<td>14'6&quot; top of trestle</td>
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<th>FLOW DIRECTION:</th>
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<td>2'</td>
<td>E</td>
<td>66'</td>
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<th>RATING:</th>
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<tr>
<td>10 CROSSER EM</td>
<td>Open / Ballast</td>
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<th>INSPECTORS:</th>
<th>NO. OF SPANS:</th>
<th>HANDRAILS:</th>
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<tr>
<td>ARI / AL</td>
<td>1</td>
<td>No</td>
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<th>WALKWAY:</th>
<th>SPAN LENGTH(S):</th>
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<tbody>
<tr>
<td>1</td>
<td>Yes (No - EW side)</td>
<td>1 @ 66'</td>
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Inspection Findings:

**ABUTMENT NOTES**

Type of Abutment Construction = Concrete

South:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Leaves / minor
4. Vegetation on face/seat = No
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = Not on per Backwell has horizontal cracking
8. Rotation = Backwell rotated in about 1½" at top
9. Exposed reinforcing steel = No
10. Efflorescence = On Backwell
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining =
2. Drift accumulated = No
3. Ballast/debris on bearings = Minor debris
4. Vegetation on face/seat = No
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = Backwell No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = Yes / 1/4
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = \textit{Concrete}
Type of Backwall Construction = \textit{Concrete}
South Abutment:
1. Undermining = \textit{No}
2. Cracks = \textit{Yes} - minor horizontal
3. Spalling = \textit{No}
4. Leaning = \textit{Yes} \(1/2\) towards
5. Exposed reinforcing steel = \textit{No}
Other Notes: \\
North Abutment:
1. Undermining = \textit{No}
2. Cracks = \textit{Yes} - minor horizontal in Backwall
3. Spalling = \textit{No}
4. Leaning = \textit{No}
5. Exposed reinforcing steel = \textit{No}
Other Notes:

STEEL TOWER BENT NOTES
Tower 1:
1. Single or double bent =
2. Tower general condition =
Misc. Notes (braces, plumbness, etc):

Tower 1. Base of Legs:
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

Tower 1. Top of Legs:
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

Tower 2:
1. Single or double bent =
2. Tower general condition =
Misc. Notes (braces, plumbness, etc):

Tower 2. Base of Legs:
1. SW Base Notes =
2. SE Base Notes =

3. NW Base Notes (if double bent) =

4. NE Base Notes (if double bent) =

Tower 2, Top of Legs:
1. SW Top Notes =

2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

Tower 3:
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc.):

Tower 3, Base of Legs:
1. SW Base Notes =

2. SE Base Notes =

3. NW Base Notes (if double bent) =

4. NE Base Notes (if double bent) =

Tower 3, Top of Legs:
1. SW Top Notes =

2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

Tower 4:
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc.):

Tower 4, Base of Legs:
1. SW Base Notes =

2. SE Base Notes =

3. NW Base Notes (if double bent) =

4. NE Base Notes (if double bent) =

Tower 4, Top of Legs:
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

DECK NOTES

Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = ___ wide x ___ deep x ___ long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:
Girder spacing = 9' 1" 
Girder depth = 68' 1/2" 
General steel condition = Good

**Span 1 Notes:**
1. Web corrosion = No
2. Bottom flange plate corrosion = Covered with timber
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = Good
6. Bearing stiffener condition = Good
7. # of cross frames and spacing = 11' 6" 
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

**Other Notes:** Horizontal stiffener 8' 2" below flange = 19' 8"

**Span 2 Notes:**
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 

**Other Notes:**

**Span 3 Notes:**
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 

**Other Notes:**

**Span 4 Notes:**
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frame and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 

**Other Notes:**
Span 5 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 6 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 7 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

<table>
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<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
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DPG SPANS: CONC. PIERS

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST #

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<td>ADJ / AL</td>
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<tr>
<td>NO. OF TRACKS:</td>
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| STREAM: | Hamilton CR |
| STREAM DEPTH: | 2' |
| FLOW DIRECTION: | E |
| DECK TYPE: | Open / Ballast |
| WALKWAY: | (Yes/No - E/W side) |
| HANDRAILS: | (Yes/No - E/W side) |

| SPAN TYPE: | DEEP |
| HEIGHT: | 18'9" |
| RATING: | |
| SPAN LENGTH(S): | 1 & 45' |

Inspection Findings:

ABUTMENT NOTES

Type of Abutment Construction = Concrete

South:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Some
4. Vegetation on face/seal = Miss on seal
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Ballast
4. Vegetation on face/seal = Miss on seal
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = Cone
Type of Backwall Construction = Cone

South Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

North Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

CONCRETE PIER NOTES
Pier 1:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 2:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 3:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 4:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:
DECK NOTES

Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = \(10\) wide x \(14\) deep x \(13\) long
2. Tie spacing = \(16\)"
3. Ties dapped for superelevation = \(10\)
4. Rail plates cutting into ties = \(10\)
5. Overall tie condition = \(Good\)
6. Approach ties swinging = \(10\)
7. Approx. number of bad ties = \(10\)

Other Notes:

Track Notes:
1. Rail section weight = 100 lb
2. CWR or jointed rail = \(16\)
3. Inner guardrail size/weight (if applicable) = \(16\)
4. Is line of track good = \(Yes\)
5. Approaches low = \(Yes\)

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES

Girder spacing =
Girder depth =
General steel condition =

Span 1 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion = \(None\)
5. Lateral bracing system condition = \(Good\)
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts = 
9. Welds on tension flange = Y
10. Any cracks observed = 
Other Notes: 

Span 2 Notes:
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 
Other Notes: 

Span 3 Notes:
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 
Other Notes: 

Span 4 Notes:
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 
Other Notes: 

Span 5 Notes:
1. Web corrosion = 
2. Bottom flange plate corrosion = 
3. Bottom flange angle corrosion = 
4. Top flange plate corrosion = 
5. Lateral bracing system condition = 
6. Bearing stiffener condition = 
7. # of cross frames and spacing = 
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 
Other Notes: 

Span is superheated for case
**DECK TRUSS SPANS**

**MILE POST #** 93.0

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<tr>
<td>NO. OF TRACKS:</td>
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<td>WALKWAY:</td>
<td>(Yes/No - E/W side)</td>
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<tr>
<td>HANDRAILS:</td>
<td>(Yes/No - E/W side)</td>
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<td>2 = 107'</td>
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**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction = Conc.

**South:**
1. Evidence of scour / undermining = No.
2. Drift accumulated = No.
3. Ballast/debris on bearings = Yes
4. Vegetation on face/seat = Moss/Grass
5. Spalling = No.
6. Cracking under bearings = No.
7. Cracking elsewhere = No.
8. Rotation = No.
10. Efflorescence = No.
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

**North:**
1. Evidence of scour / undermining = No.
2. Drift accumulated = No.
3. Ballast/debris on bearings = Moss & Debris
4. Vegetation on face/seat =
5. Spalling = No.
6. Cracking under bearings = No.
7. Cracking elsewhere = No.
8. Rotation = No.
10. Efflorescence = No.
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

**BACKWALL/WINGWALL NOTES**
Type of Wingwall Construction =

Type of Backwall Construction =

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling = 
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

DECK NOTES
Open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Tie Notes:
1. Tie size =
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
TRUSS MEMBER NOTES

General steel condition =

**Bearing Notes:**
1. Type of bearings = Yes
2. Full bearing = Yes
3. Bearing corrosion = Good
4. Anchor bolt condition = Yes
5. Expansion bearings functioning properly or frozen = No
6. Bearings punching into abutment seat = No

**Other Notes:**

**Top Chord Notes:**
1. Section loss at critical locations = Yes
2. Adequate bracing = Good
3. Cracks at chord splices = No
4. Wear in web pin holes = No
5. Fasteners condition = Good

Notes (by nodal location established in field):

**Bottom Chord Notes:**
1. Section loss at critical locations =
2. Eyebar tightness =
3. Pack rust at eyebars =
4. Eyebars section loss =
5. Plms worn, scored or corroded =
6. Chord cracks = No
7. Condition of splices =

Notes (by nodal location established in field):

Extra plate on web of chord, panels to panel tab. Rusted and sheet metal welded. 1 1/8" high at guage. At (1 8 1/2 side) putting up to 3/8" thick. 1/16" high at guage. Chord with rust, putting 2" up.

Bottom chord plate. Drainage holes blocked. Generally estimate 1/4" corrosion per 100' on surface. At cover plate 1/2 tab. Surface corrosion must putting at bearing 1/8". 1/8" bottom L.
**Hanger Notes:**
1. Section loss in body above floorbeam connection =
2. Cracks at upper truss connection, lower row of fasteners =
3. Stress concentrations in the form of welds, edge corrosion =
4. Accident damage =
   *Notes (by nodal location established in field):*

**Diagonal Notes:**
1. Section loss =
2. Compression/tension members =
3. End connection condition =
4. Tight (if tension members) =
   *Notes (by nodal location established in field):*

**Post Notes:**
1. Alignment of post =
2. Internal bracing =
3. Member end condition =
   *Notes (by nodal location established in field):*

**End Post Notes:**
1. Alignment of post =
2. Internal bracing =
3. Section loss =
   *Notes (by nodal location established in field):*
TRUSS BRACING NOTES

Top Laterals Notes:
1. Section loss =
2. Connection condition =
3. Rod system components =
Notes (by nodal location established in field):

Bottom Laterals Notes:
1. Section loss =
2. Connection condition (truss/stringers) =
3. Rod system components =
Notes (by nodal location established in field):

Sway Frame Notes:
1. Section loss =
2. Connection condition (top chords/verticals) =
3. Fatigue cracks =
4. Rod system components =
Notes (by nodal location established in field):

FLOOR SYSTEM NOTES
Floorbeam spacing =
Floorbeam depth =
Stringer spacing =
Stringer depth =
General steel condition =

Floorbeam Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =
Other Notes:
**Stringer Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

**Other Notes:**

---

**History:**

- Original construction year =
- Summary of bridge updates =

---

**Recommended Work:**

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<td>Clean &amp; drill drain holes btm chord</td>
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Pie 1:
- Bar coat cracked under Span L.
- No detail
- No drift
- No rust
- Affirmative on pedestrian & underneath
- Good bond no cracks

Pie 2:
- No detail
- No drift
- Note for scour SW side
- No cracks
- Good Condition
### DECK TRUSS SPANS

**E&N Railway**  
SECTION: Victoria to Nanaimo

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<th>SPAN (93)</th>
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<td>LOCATION:</td>
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<td>INSPECTORS:</td>
<td>DECK TYPE: Open / Ballast</td>
<td>RATING:</td>
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<td>NO. OF SPANS:</td>
<td>WALKWAY: (Yes/No – E/W side)</td>
<td>SPAN LENGTH(S):</td>
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<tr>
<td>NO. OF TRACKS:</td>
<td>HANDBRAILS: (Yes/No – E/W side)</td>
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### Inspection Findings:

**ABUTMENT NOTES**

Type of Abutment Construction = 

**South:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

**North:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

### BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =

Type of Backwall Construction =

**South Abutment:**
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
*Other Notes:*

**North Abutment:**
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
*Other Notes:*

**DECK NOTES**

Open deck =

**Track Alignment Notes:**
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =
*Other Notes:*

**Tie Notes:**
1. Tie size = ____ wide x ____ deep x ____ long with bearing-bearing length = ____
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =
*Other Notes:*

**Track Notes:**
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
*Other Notes:*

**Walkways/Refuge Bay Notes:**
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
TRUSS MEMBER NOTES

General steel condition = Good - surface corrosion

Bearing Notes:
1. Type of bearings = H.D. Fixed - not restrained with bolts
2. Full bearing = Yes
3. Bearing corrosion = No
4. Anchor bolt condition = OK - washer sliding on East side
5. Expansion bearings functioning properly or frozen =
6. Bearings punching into abutment seat = No

Other Notes:

Top Chord Notes:
1. Section loss at critical locations = No - Surface corrosion
2. Adequate bracing = Yes
3. Cracks at chord splices =
4. Wear in web pin holes =
5. Fasteners condition = Rusts good.
Notes (by nodal location established in field):
Bad flanges on btm flange L both sides - from rubbing

Bottom Chord Notes:
1. Section loss at critical locations = No - Surface corrosion on bottom L's both sides
2. Eyebars:tightness =
3. Rack rust at eyebars =
4. Eyebars:section-loss =
5. Pins worn,scored or corroded =
6. Chord cracks =
7. Condition of splices = Good
Notes (by nodal location established in field):
Bad flanges in front of bearing from wobble
**Hanger Notes:**
1. Section loss in body above floorbeam connection =
2. Cracks at upper truss connection, lower row of fasteners =
3. Stress concentrations in the form of welds, edge corrosion =
4. Accident damage =
   Notes (by nodal location established in field):

**Diagonal Notes:**
1. Section loss =
2. Compression/tension members =
3. End connection condition =
4. Tight (if tension members) =
   Notes (by nodal location established in field):

**Post Notes:**
1. Alignment of post =
2. Internal bracing =
3. Member end condition =
   Notes (by nodal location established in field):

**End Post Notes:**
1. Alignment of post = Good
2. Internal bracing = No
3. Section loss =
   Notes (by nodal location established in field):

\[ \frac{1}{8} \]" pitting between angles

\[ \frac{1}{8} \]" pitting between angles
TRUSS BRACING NOTES

Top Laterals Notes:
1. Section loss = Good
2. Connection condition = Good
3. Rod system components =
Notes (by nodal location established in field):

Bottom Laterals Notes:
1. Section loss = Good
2. Connection condition (truss/stringers) =
3. Rod system components =
Notes (by nodal location established in field):

Sway Frame Notes:
1. Section loss =
2. Connection condition (top chords/verticals) =
3. Fatigue cracks =
4. Rod system components =
Notes (by nodal location established in field):

FLOOR SYSTEM NOTES

Floorbeam spacing =
Floorbeam depth =
Stringer spacing =
Stringer depth =
General steel condition =

Floorbeam Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =
Other Notes:
Stringer Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

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DECK TRUSS SPANS

MILE POST # 93.0

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<td>WALKWAY: (Yes/No – E/W side)</td>
<td>SPAN LENGTH(S):</td>
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<td>NO. OF TRACKS</td>
<td>HANDRAILS: (Yes/No – E/W side)</td>
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**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction =

**South:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

**North:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

**BACKWALL/WINGWALL NOTES**
Type of Wingwall Construction =

Type of Backwall Construction =

**South Abutment:**
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

**North Abutment:**
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

**DECK NOTES**
Open deck =

**Track Alignment Notes:**
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =
Other Notes:

**Tie Notes:**
1. Tie size = ____ wide x ____ deep x ____ long with bearing-bearing length = ____
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =
Other Notes:

**Track Notes:**
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes:

**Walkways/Refuge Bay Notes:**
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
**TRUSS MEMBER NOTES**

**General steel condition =**

**Bearing Notes:**
1. Type of bearings =
2. Full bearing = Yes
3. Bearing corrosion = Surface corrosion
4. Anchor bolt condition = Good
5. Expansion bearings functioning properly or frozen = Frozen

**Other Notes:**

**Top Chord Notes:**
1. Section loss at critical locations = No
2. Adequate bracing = Yes
3. Cracks at chord splices = No
4. Eyebars, web-pin holes =
5. Fasteners condition = Good

Notes (by nodal location established in field):

**Bottom Chord Notes:**
1. Section loss at critical locations = See notes
2. Eyebar tightness =
3. Pack rust at eyebars =
4. Eyebar section loss =
5. Pins worn, scored or corroded =
6. Chord cracks = No
7. Condition of splices =

Notes (by nodal location established in field):

Bottom chord rating:

Bottom chord condition:

Length of chord:

Condition of various parts:
**Hanger Notes:**
1. Section loss in body above floorbeam connection =
2. Cracks at upper truss connection, lower row of fasteners =
3. Stress concentrations in the form of welds, edge corrosion =
4. Accident damage =
   Notes (by nodal location established in field):

**Diagonal Notes:**
1. Section loss = 
   Surface corrosion - some minor pitting etching between angles
2. Compression/tension members = good
3. End connection condition = good
4. Tight (if tension members) = yes
   Notes (by nodal location established in field):

**Post Notes:**
1. Alignment of post = good
2. Internal bracing = good
3. Member end condition = rusted - good
   Notes (by nodal location established in field):

**End Post Notes:**
1. Alignment of post = good
2. Internal bracing = good
3. Section loss = evidence corrosion on member only.
   Notes (by nodal location established in field):
TRUSS BRACING NOTES

Top Laterals Notes:
1. Section loss =  
   
2. Connection condition =  

3. Rod system components = 
   Notes (by nodal location established in field):

Bottom Laterals Notes:
1. Section loss =  
   Surface corrosion only

2. Connection condition (truss/stringers) =  Good

3. Rod system components =
   Notes (by nodal location established in field):

Sway Frame Notes:
1. Section loss =  

2. Connection condition (top chords/verticals) =  
   
3. Fatigue cracks =  
   
4. Rod system components =
   Notes (by nodal location established in field):

FLOOR SYSTEM NOTES

Floorbeam spacing =

Floorbeam depth =

Stringer spacing =

Stringer depth =

General steel condition =

Floorbeam Notes:
1. Web corrosion =

2. Bottom flange plate corrosion =

3. Bottom flange angle corrosion =

4. Top flange plate corrosion =

5. Lateral bracing system condition =

6. Bearing stiffener condition =

7. # of cross frames and spacing =

8. Loose rivets/bolts =

9. Welds on tension flange =

10. Any cracks observed =

Other Notes:
**Stringer Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

**Other Notes:**

---

**History:**

- Original construction year =
- Summary of bridge updates =

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**Recommended Work:**

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**Timber Trestles**

**E&N Railway**

**SECTION: Victoria to Nanaimo**

**MILE POST # 98.6 (South Approach)**

**CROSSING:** French Creek

**STREAM:** Yes

**SPAN TYPE:** Timber Trestle

**INSPECTION DATE:** 10/31-11/01

**STREAM DEPTH:** 2'

**HEIGHT:**

**LOCATION:** French Creek

**FLOW DIRECTION:** East

**LENGTH:**

**DECK TYPE:** Open/ Ballast

**RATING:** E6O DESIGN

**NO. OF SPANS:** 4 (X 1)

**WALKWAY:** (Yes/ No: E/W side)

**NO. OF TRACKS:** 1

**HANDBAILS:** (Yes/ No: E/W side)

**Inspection Findings:**

**END BENT NOTES**

Type of End Bent Construction = Timber Still on Concrete Pedestal

1. # of piles =
2. Pile diameter =
3. Pile cap size = 13' deep x 14' wide

**South End (Bent 1):**

1. Drift accumulated = Heavy Brush
2. Bent rotation =
3. Pile cap general condition = Good
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splintering =

**Other Notes:** Buried under vegetation

**North End (Bent TBD):**

1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splintering =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splintering =

**Other Notes:**

**INTERMEDIATE BENT NOTES** (Some poles inaccessible @ base due to brush)

Use timber schematic to mark up section loss in individual piles. (See裸体 installation)

1. # of piles = 5 (13' x 12')
2. Pile diameter = 13' x 12'
3. Pile cap size = 14' deep x 14' wide x 13' long
4. Bents plumb =
5. Signs of pumping piles =
6. Signs of scours/erosion =
7. Pinned piles =

- Watch interior piles for pumping under freight (not held down)
- All piles on concrete footings (taller beams have one pedestal pile)
- Most concrete footings covered in vegetation moss
- Minor cracks on face of bottom piles (seen regularly for middle)
- Remove any debris/brush @ base of piles (moisture build up => split pile)
- Exterior piles connected to footing by plated angles (photo of typ)
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = ______
Type of Backwall Construction = Timber

South End:
1. Undermining = N/A
2. Cracks = N/A
3. Leaning = N/A
Other Notes: Overgrown

North End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

DECK NOTES
Ballast / open deck = OPEN

Track Alignment Notes:
1. Bridge on tangent or curve = TANGENT
2. Max. superelevation at midspan = ______
3. Chord offset at midspan (distance from center of track to center of stringers) = ______
Other Notes:

Ballast Deck Notes (if applicable): N/A
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = 1 1/4" wide x 1 1/4" deep x 10" long (on Timber spans)
2. Tie spacing = 12"
3. Ties dapped for superelevation = NO SUPER
4. Rail plates cutting into ties = N/A
5. Overall tie condition = FAIR
6. Approach ties swinging = N/A
7. Approx. number of bad ties = SEE BELOW —>
8. Method of tie connection = SPIKE TO STRUNKER
Other Notes:

Track Notes:
1. Rail section weight = 85 LB
2. CWR or jointed rail = ______
3. Inner guardrail size/weight (if applicable) = 85 LB - IRON RAIL
4. Is line of track good = YES
5. Approaches low = N/A
Other Notes:

Notes From Snopper (Bents 81-40)

Steelers:
- SP80,55 = Bottom 2" loss @ B21
- SP86,55 = SPKT ON BOTTOM
- SP27,55 = N/A (PHOTO)
- SP30,55 = SPKT ON WEST FACE MID-HEIGHT
- SP32/33 = Bottom SPKT
- SP33, S3 = ""

Poles:
- B22, B1, B26, B1, B38, P4, B34, P2-4
- B30, P1 = SPKT MIDWAY THRU POST (PHOTO)
- B34, P1 = "" CAP TO SPKT 1 (PHOTO)
- Some poles do not have full bracings @ CAP

Caps:
- B22/B34 = SPKT TURN TOP FACE
- B38 = TURN SPKT FULL DEPTH

2010 FIRE COMMENTS

• Best 16-20 car fire
- Ties changed out near B1, B20
- Floor surface cracking on caps / steelers

Notes From Snopper (Bents 1-22)

BAD TIES
* 42 = N.A.
* 60 = STEEL

• B7, P1 6" DEEP CHECK (OK)
• B7, P1 CHECK (OK)
• SP9, S1 2" CHECK (OK)
• B12, P1 6" DEEP CHECK SOUTH FACE (OK)
• B13, P1 6" DEEP CHECK SOUTH FACE (OK)
• SP13, S1 HAS SPKT @ SOUTH END
• B14, P1 CHECK ON WEST FACE

Other Notes:
Walkways/Refuge Bay Notes:
1. Walkways on bridge = 100
2. Walkway condition = __
3. Refuge bays on bridge = YES (ARM SAWD)
4. Refuge bay condition = FAIR

Other Notes:
* MISSISSAUGA TIMBER; WEST SIDE, 2" FROM ADJACENT (PHOTO)

SPAN NOTES
1. # of stringers = 8 (2,824)
2. Stringer size = 15" deep x 9" wide (3,240)
3. Cut-out of exterior stringers = 8'-3"
4. General stringer condition = GOOD

Use timber span schematic for marking up section loss in individual stringers where required (N/A, GOOD CONDITION)
5. Ends of stringers crushing = N/A
6. Horizontal shear cracks in stringers = N/A
7. Fractured stringers = 0
8. Decay/insect damage = N/A

Extra Timber Member Notes (Where in Place) (CANNOT INSPECT INTERIOR OF PLY)
1. Longitudinal bracing = YES
2. Longitudinal bracing size = 4 x 6
3. Longitudinal bracing condition = FAIR, EXCEPT N/A
4. Sway bracing = 4 x 6
5. Sway bracing size = 4 x 6
6. Sway bracing condition = FAIR
7. Sash bracing = 4 x 6
8. Sash bracing size = FAIR
9. Sash bracing condition = N/A
10. Mud sills @ bents = N/A, ONLY B1
11. Mud sill condition = __

Other Notes:
* BROKEN X-BRACE B26 B27 NEAR BOTTOM ON WEST (PHOTO)
* " B27 B28 2ND Story on West (PHOTO)

History:
- Original construction year = 1971
- Summary of bridge updates = NO TRESTLE UPDATES (ONLY MINOR TB SHEAR CHANGES)
- Timber = Douglas-Fir (unsure of 2nd growth)

Recommended Work:

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BRIDGE SKETCHES (AS REQUIRED)

Middle Post Spot (Starts @ B12)

Top Post

Int. Cap

Spot Bottom Level
DPG SPANS: STEEL BENTS

MILE POST # 98.6 (STEEL SPANS)

CROSSING: " STREAM: " SPAN TYPE: ABG
INSPECTION DATE: " STREAM DEPTH: " HEIGHT: _
LOCATION: " FLOW DIRECTION: " LENGTH: _
INSPECTORS: " DECK TYPE: Open / Ballast RATING: _
NO. OF SPANS: 3 WALKWAY: (Yes/No - E/W side) SPAN LENGTH(S): 45' 75' 45'
NO. OF TRACKS: 1 HANDRAILS: (Yes/No - E/W side)

Inspection Findings:

ABUTMENT NOTES
Type of Abutment Construction = 

South:
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = ___
Type of Backwall Construction = ___

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaking =
5. Exposed reinforcing steel =
Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaking =
5. Exposed reinforcing steel =
Other Notes:

STEEL TOWER BENT NOTES

Tower 1:
1. Single or double bent = Double Bent
2. Tower general condition = Fair
Misc. Notes (braces, plumbness, etc):
   * Bottom horizontal struts have moderate corrosion
   * Trees growing turn SW-SE strut to SE-NE strut
   * No P Cannons
Tower 1, Base of Legs:
1. SW Base Notes =
   * No major defects (2 photos)
2. SE Base Notes = Buried
   * No major defects (1 photo)
3. NW Base Notes (if double bent) = Buried
   * Corroded base plate (1 photo)
4. NE Base Notes (if double bent) = Not Buried
   * Steel fins & plates missing, supports suspending NW Base should not scour (1 photo)

Tower 1, Top of Legs:
1. SW Top Notes =
   * Partial peeling
   * P Cannons as at SE
2. SE Top Notes =
   * Top column plate peeling around bending plate
3. NW Top Notes (if double bent) = Anchor bolts corroded
4. NE Top Notes (if double bent) =
   * Bottom flange peeling on bottom leg B, from base
   * AT normal end of span 1 (photo)

Tower 2:
1. Single or double bent = Double Bent
2. Tower general condition = Fair
Misc. Notes (braces, plumbness, etc):
   * Surface rust on tower legs/bracing
   * North bottom strut, 1/16-1/8 corrosion on top of bottom flange
   * NW column has 1/16 corrosion, pitfitch @ cover plate strut
Tower 2, Base of Legs:
1. SW Base Notes =
   * Spalled concrete on west side (1'-3')
   * Anchor hole/base plate corrosion
   * Least tower leg corrosion
2. **SE Base Notes** = *MISS COVERED  * AVERAGE SMALL * CORROSION ON UNDERSIDE OF SOLE PLATE

3. **NW Base Notes (if double bent)** = ¼" CORROSION ON TOP SPIKE OR BOTTOM ANGLE
   * ¼" CORROSION PORES ON INTERIOR LEG ANGLE

4. **NE Base Notes (if double bent)** = *STRAIGHT LEG / LIGHT CORROSION
   * ¼" PAINT OXYD & SOLE PLATE IN CRACKS * ⅛" SOLE PLATE CORROSION

**Tower 2: Top of Legs:**
1. **SW Top Notes** = *ACCUMULATED PAINT FLAKES / DEBRIS NEAR ANCHOR BOLTS (ALL TOWERS)

2. **SE Top Notes** = *CORROSION / PITTING AROUNDENDER BASE PLATE & COLUMN TOP PLATE (ALL TOWERS)

3. **NW Top Notes (if double bent)** = *PARTS OF RUST ACCUMULATED NEAR ANCHOR BOLTS

4. **NE Top Notes (if double bent)** = *NO DEFECTS

**Tower 3:**
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc):

**Tower 3: Base of Legs:**
1. **SW Base Notes** =

2. **SE Base Notes** =

3. **NW Base Notes (if double bent)** =

4. **NE Base Notes (if double bent)** =

**Tower 3: Top of Legs:**
1. **SW Top Notes** =

2. **SE Top Notes** =

3. **NW Top Notes (if double bent)** =

4. **NE Top Notes (if double bent)** =

**Tower 4:**
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc):

**Tower 4: Base of Legs:**
1. **SW Base Notes** =

2. **SE Base Notes** =

3. **NW Base Notes (if double bent)** =

4. **NE Base Notes (if double bent)** =

**Tower 4: Top of Legs:**
1. **SW Top Notes** =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

DECK NOTES

Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate x floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = \( \frac{1}{8} \) wide x \( \frac{1}{16} \) deep x \( \frac{1}{4} \) long
2. Tie spacing = \( \frac{1}{16} \)
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition = \( \text{Grade} \)
6. Approach ties swinging =
7. Approx. number of bad ties = \( \text{X} \)

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:
SPAN NOTES

Girder spacing =
Girder depth =
General steel condition =

Span 1 Notes:
1. Web corrosion = NO; PRINT PECULIAR
2. Bottom flange plate corrosion = MAJOR
3. Bottom flange angle corrosion = MAJOR
4. Top flange plate corrosion = MAJOR
5. Lateral bracing system condition = FAIR
6. Bearing stiffener condition = OK
7. # of cross frames and spacing = SEE PLANS
8. Loose rivets/bolts = NO
9. Welds on tension flange = NO
10. Any cracks observed = NO

Other Notes:

Span 2 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition = SEE SPAN 1
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 3 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 4 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
**Span 5 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

**Other Notes:**

**Span 6 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

**Other Notes:**

**Span 7 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

**Other Notes:**

**History:**
- Original construction year =
- Summary of bridge updates = SEE SOUR APPR.

**Recommended Work:**

<table>
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<th>ITEM #</th>
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</tbody>
</table>
Timber Trestles

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST # 93.6 (North Approach)

| CROSSING: " | STREAM: " | SPAN TYPE: " |
| INSPECTION DATE: " | STREAM DEPTH: " | HEIGHT: " |
| LOCATION: " | FLOW DIRECTION: " | LENGTH: " |
| INSPECTORS: " | DECK TYPE: [Open Ballast] | RATING: " |
| NO. OF SPANS: 30 | WALKWAY: [Yes/No - E/W side] | SPAN LENGTH(S): " |
| NO. OF TRACKS: " | HANDRAILS: [Yes/No - E/W side] |

Inspection Findings:

END BENT NOTES
Type of End Bent Construction = Timber Saw Cut Pedestal
1. # of piles = ______
2. Pile diameter = ______
3. Pile cap size = 13" deep x 14" wide

South End (Bent 1):
1. Drift accumulated = ______
2. Bent rotation = ______
3. Pile cap general condition = ______
4. Pile cap bulging/splitting = ______
5. Pile cap has excessive internal/external decay = ______
6. Pile general condition = ______
7. Piles have excessive internal/external decay = ______
8. Piles bulging/splitting = ______

Other Notes:

North End (Bent TBD):
1. Drift accumulated = ______
2. Bent rotation = ______
3. Pile cap general condition = OK
4. Pile cap bulging/splitting = ______
5. Pile cap has excessive internal/external decay = ______
6. Pile general condition = ______
7. Piles have excessive internal/external decay = ______
8. Piles bulging/splitting = ______

Other Notes:

INTERMEDIATE BENT NOTES
Use timber schematic to mark up section loss in individual piles.
1. # of piles = ______
2. Pile diameter = ______
3. Pile cap size = ______ deep x ______ wide
4. Bents plumb = SEE SOUTH
5. Signs of pumping piles = ______
6. Signs of scour/erosion = ______
7. Posted piles = ______
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction =

Type of Backwall Construction =

South End:
1. Undermining = 
2. Cracks = 
3. Leaning = 
Other Notes:

North End:
1. Undermining = 
2. Cracks = 
3. Leaning = 
Other Notes:

DECK NOTES

Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of stringers) =
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = ____ wide x ____ x ____ long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =
8. Method of tie connection =
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes
Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
Other Notes:

SPAN NOTES
1. # of stringers =
2. Stringer size = ____ deep x ____ wide
3. Out-of-out of exterior stringers =
4. General stringer condition =
Use timber span schematic for marking up section loss in individual stringers where required
5. Ends of stringers crushing =
6. Horizontal shear cracks in stringers =
7. Fractured stringers =
8. Decay/insect damage =
Other Notes:

EXTRA TIMBER MEMBER NOTES (WHERE IN PLACE)
1. Longitudinal bracing =
2. Longitudinal bracing size =
3. Longitudinal bracing condition =
4. Sway bracing =
5. Sway bracing size =
6. Sway bracing condition =
7. Sash bracing =
8. Sash bracing size =
9. Sash bracing condition =
10. Mud sills at bents =
11. Mud sill condition =
Other Notes:

Notes From Base:
- CENX IN BS5, PI ON WEST FACE (Sound)
- CENK IN BS4, P5 on EAST FACE 2nd Story
- BS4, PS5 appears crevice has leaked out

Inspection Method:
- Same As South Approach

Notes From Snapper:
- Piles:
  - See South General Comments
- Stringers:
  - SP41, S1 = C5199 @ Bottom Member
  - SP43, S1 = C5176 (Faulted from erection)
  - SP46, S1 = 2" DEEP CHECK IN STRINGER (DBR Photos)

History:
- Original construction year = 1977
- Summary of bridge updates = None

Recommended Work:

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</table>
FRENCH CK - MILE 98.6

BENT #4 - POST #1
6" DEEP CHECK
SOUNDS OK

POST #7 - 1 - CHECK
SOUNDS OK

SOUNDED STRINGERS : 1-4

SOUNDED PILE CAP #6 - WEST

POST #8-1 - DRILLED WEST FACE 8' FROM BELOW CAP
SOUND BESIDE CHECK

STRINGER #1 - SPAN 9
DRILLED BELOW 2" DEEP CHECK SOUND

POST #12-1 - TOP STOREY
42 5" DEEP CHECK - SOUTH FACE - DRILLED W. FACE
6' BELOW SASH SOUND

FRENCH CK - MILE 98.6

STRINGER 13-1 - SHAKE @ SOUTH END

POST 15-1 - BOTTOM DRILLED WEST FACE S

POST 19-2 - DAYLIGHT UNDER CAP
TOWER BRACE @ 19 SPLIT

POST 19-1 - CHECK - WEST FACE
FRENCH CK - MILE 98.6
BRILL 56-5 - SOUND
DRILL 55-1 - DIRT IN WEST FACE CRACK
- SOUND
POST 54-5 - CHECK - EAST FACE - 2nd STOREY
POST 48-5 - EAST FACE APPEARS THAT CREO LEACHED OUT

MILE 98.6 -
PIER #4 - EAST LEG
- STRAIGHT
- LIGHT CORROSION

PIER #4 - EAST BASE PL
- ANCHOR BOLT ✓
- SOLE PL - 1/16" CORROSION (WITH PITTING (1/4" PACK RUST)

PIER #3 - WEST FOOTING
- SPALLED CONC - WEST FACE 1"-3"
- ANCHOR BOLTS ✓
- SOLE PL + BASE PL MINOR CORROSION
- TOWER LEG - LIGHT CORROSION
MILE 98.6

PIER #3 - EAST FTG
- MINOR SPALL
- ALL FTG MOSS COVERED
- CORROSION UNDER SIDE SOLE PL

MILE 98.6

PIER #4 - WEST

1/8" CORROSION

1/8" CORROSION POCKETS
1/8" x 3/8" HIGH CORROSION

1/8" CORROSION

# LI-N TOWER LEG
MILE 98.6  NOV 11

PIER 4 - WEST

BOTTOM LACED STRUT - CORROSION

1/8" TO 1/4" PITTING

1/8" - 1/4" LOCALLY

BOTT FLG

PIER 8 - WEST COLUMN

COVER PL STRUT - PITTED

1/16" CORROSION

MILE 98.6  NOV 11

BENT 45-1

STOREY 1 - SOUND

(DROVE 5" SPIKE)

STRINGER 45-1

NOTE - (ADDED NOV 15/11)

INSPECTED UPPER STOREY

&WEST FACE

-SOUNDED EXTERIOR POSTS

-& SOME EXTERIOR STR.

-SOUNDED ALL POSTS AT

FOOTING (GROUND) LEVEL
## DPG SPANS: STEEL BENTS

**MILE POST #** 103.7  
**SECTION:** Victoria to Nanaimo  

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<td>Open/ Ballast</td>
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<th>WALKWAY: (Yes/No - E/W side)</th>
<th>SPAN LENGTH(S):</th>
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<th>NO. OF TRACKS:</th>
<th>HANDRAILS: (Yes/No - E/W side)</th>
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<td>(Yes/No - E/W side)</td>
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### Inspection Findings:

#### ABUTMENT NOTES

**Type of Abutment Construction:** Cone

**South:**
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = No
4. Vegetation on face/seat = No
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

---

**North:**
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = No
4. Vegetation on face/seat = No
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =
Type of Backwall Construction =

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

STEEL TOWER BENT NOTES
Tower 1:
1. Single or double bent =
2. Tower general condition =
Misc. Notes (braces, plumbness, etc):
Bottom end Big buried
Putting up to %" on bottom horizontal & round bars

Tower 1, Base of Legs:
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

Tower 1, Top of Legs:
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

Tower 2:
1. Single or double bent =
2. Tower general condition =
Misc. Notes (braces, plumbness, etc):

Tower 2, Base of Legs:
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes =
4. NE Base Notes =

Vegetation & Moss around steel,
Big not accessible.
2. SE Base Notes = Bad - Surface corrosion

3. NW Base Notes (if double bent) = Not accessible - Surface corrosion

4. NE Base Notes (if double bent) =

**Tower 2, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

**Tower 3:**
1. Single or double bent = Double
2. Tower general condition = Good

**Misc. Notes (braces, plumbness, etc):**

Good - no pitting observed, however, signs of it about to start at tower braces, Btm. not accessible

**Tower 3, Base of Legs:**
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

**Tower 3, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

**Tower 4:**
1. Single or double bent = Single
2. Tower general condition = Good

**Misc. Notes (braces, plumbness, etc):**

Top half good condition - surface erosion. Btm. not accessible

**Tower 4, Base of Legs:**
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

**Tower 4, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

DECK NOTES

Ballast / open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve = Tangent
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 16 wide x 16 deep x 13 long
2. Tie spacing = 16
3. Ties dapped for superelevation = No
4. Rail plates cutting into ties =
5. Overall tie condition = Good
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight = B5
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) = B5
4. Is line of track good = Yes
5. Approaches low = Yes

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge = Each | West
4. Refuge bay condition =

Other Notes:
## SPAN NOTES

### General
- Girdar spacing =
- Girdar depth =
- General steel condition =

### Span 1 Notes:
- Web corrosion =
- Bottom flange plate corrosion =
- Bottom flange angle corrosion =
- Top flange plate corrosion =
- Lateral bracing system condition =
- Bearing stiffener condition =
- # of cross frames and spacing =
- Loose rivets/bolts =
- Welds on tension flange =
- Any cracks observed =

### Other Notes:

### Span 2 Notes:
- Web corrosion =
- Bottom flange plate corrosion =
- Bottom flange angle corrosion =
- Top flange plate corrosion =
- Lateral bracing system condition =
- Bearing stiffener condition =
- # of cross frames and spacing =
- Loose rivets/bolts =
- Welds on tension flange =
- Any cracks observed =

### Other Notes:

### Span 3 Notes:
- Web corrosion =
- Bottom flange plate corrosion =
- Bottom flange angle corrosion =
- Top flange plate corrosion =
- Lateral bracing system condition =
- Bearing stiffener condition =
- # of cross frames and spacing =
- Loose rivets/bolts =
- Welds on tension flange =
- Any cracks observed =

### Other Notes:

### Span 4 Notes:
- Web corrosion =
- Bottom flange plate corrosion =
- Bottom flange angle corrosion =
- Top flange plate corrosion =
- Lateral bracing system condition =
- Bearing stiffener condition =
- # of cross frames and spacing =
- Loose rivets/bolts =
- Welds on tension flange =
- Any cracks observed =

### Other Notes:
Span 5 Notes:
1. Web corrosion = GOOD
2. Bottom flange plate corrosion = GOOD
3. Bottom flange angle corrosion = GOOD
4. Top flange plate corrosion = GOOD
5. Lateral bracing system condition = GOOD
6. Bearing stiffener condition = GOOD
7. # of cross frames and spacing = 10' 6½''
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

Other Notes:

Span 6 Notes:
1. Web corrosion = GOOD
2. Bottom flange plate corrosion = GOOD
3. Bottom flange angle corrosion = GOOD
4. Top flange plate corrosion = GOOD
5. Lateral bracing system condition = GOOD
6. Bearing stiffener condition = GOOD
7. # of cross frames and spacing = 10' 7''
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

Other Notes:

Span 7 Notes:
1. Web corrosion = GOOD
2. Bottom flange plate corrosion = GOOD
3. Bottom flange angle corrosion = GOOD
4. Top flange plate corrosion = GOOD
5. Lateral bracing system condition = GOOD
6. Bearing stiffener condition = GOOD
7. # of cross frames and spacing = 10' 7''
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
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</tbody>
</table>
DPG SPANS: STEEL BENTS

MILE POST #: 11017

E&N Railway
SECTION: Victoria to Nanaimo

| CROSSING: | STREAM: BIG QUALICAN R. | SPAN TYPE: H0-9 07 |
| LOCATION: | FLOW DIRECTION: E | HEIGHT: |
| INSPECTORS: | DECK TYPE: Open / Ballast | LENGTH: |
| NO. OF SPANS: | WALKWAY: (Yes/No - E/W side) | RATING: |
| NO. OF TRACKS: | HANDRAILS: (Yes/No - E/W side) | SPAN LENGTH(S): |

3 75
2 45

Inspection Findings:

ABUTMENT NOTES

Type of Abutment Construction = Conc

South:
1. Evidence of scour / undermining = No
2. Drift accumulated =
3. Ballast/debris on bearings = Dark moss
4. Vegetation on face/seat = moss
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Some ballast
4. Vegetation on face/seat = moss
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = Concrete

Type of Backwall Construction = Concrete

South Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:

North Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:

STEEL TOWER BENT NOTES

Tower 1:
1. Single or double bent = Double
2. Tower general condition = Good

Misc. Notes (braces, plumbness, etc):

Tower 1, Base of Legs:
1. SW Base Notes = Good
2. SE Base Notes = Good
3. NW Base Notes (if double bent) = Good
4. NE Base Notes (if double bent) = Good

Tower 1, Top of Legs:
1. SW Top Notes = Good
2. SE Top Notes = Good
3. NW Top Notes (if double bent) = Good
4. NE Top Notes (if double bent) = Good

Tower 2:
1. Single or double bent = Good
2. Tower general condition = Double

Misc. Notes (braces, plumbness, etc):

Tower 2, Base of Legs:
1. SW Base Notes = Good
2. SE Base Notes = Good

3. NW Base Notes (if double bent) = Good

4. NE Base Notes (if double bent) = Good

**Tower 2, Top of Legs:**
1. SW Top Notes =

2. SE Top Notes =

3. NW Top Notes (if double bent) = Good

4. NE Top Notes (if double bent) =

**Tower 3:**
1. Single or double bent = Double Good.

2. Tower general condition =

**Misc. Notes (braces, plumbness, etc.):**

---

**Tower 3, Base of Legs:**
1. SW Base Notes =

2. SE Base Notes =

3. NW Base Notes (if double bent) =

4. NE Base Notes (if double bent) =

**Tower 3, Top of Legs:**
1. SW Top Notes =

2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

**Tower 4:**
1. Single or double bent =

2. Tower general condition =

**Misc. Notes (braces, plumbness, etc.):**

---

**Tower 4, Base of Legs:**
1. SW Base Notes =

2. SE Base Notes =

3. NW Base Notes (if double bent) =

4. NE Base Notes (if double bent) =

**Tower 4, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

DECK NOTES

Ballast / open deck = open

Track Alignment Notes:
1. Bridge on tangent or curve = Curve
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10 wide x 16 deep x 13' long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties = No
5. Overall tie condition = Good
6. Approach ties swinging = No
7. Approx. number of bad ties = 42

Other Notes:

Track Notes:
1. Rail section weight = 85
2. CWR or jointed rail = Jt
3. Inner guardrail size/weight (if applicable) = 85
4. Is line of track good = Yes
5. Approaches low = Yes

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge = No
2. Walkway condition =
3. Refuge bays on bridge = 2 on west side
4. Refuge bay condition = Poor

Other Notes:
<table>
<thead>
<tr>
<th>Span 1 Notes:</th>
</tr>
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<tbody>
<tr>
<td>1. Web corrosion = Surface</td>
</tr>
<tr>
<td>2. Bottom flange plate corrosion = N/A</td>
</tr>
<tr>
<td>3. Bottom flange angle corrosion = N/A</td>
</tr>
<tr>
<td>4. Top flange plate corrosion = 1/8&quot; full width for side purling</td>
</tr>
<tr>
<td>5. Lateral bracing system condition = Good</td>
</tr>
<tr>
<td>6. Bearing stiffener condition = Some putting on gussets</td>
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<tr>
<td>7. # of cross frames and spacing =</td>
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<tr>
<td>8. Loose rivets/bolts = Yes</td>
</tr>
<tr>
<td>9. Welds on tension flange =</td>
</tr>
<tr>
<td>10. Any cracks observed = Yes</td>
</tr>
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<table>
<thead>
<tr>
<th>Other Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubers under two deteriorating. Some sanding soft</td>
</tr>
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<table>
<thead>
<tr>
<th>Span 2 Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Web corrosion = Surface</td>
</tr>
<tr>
<td>2. Bottom flange plate corrosion = 1/8&quot; full width at midspan. Inside 1/4&quot; deep x 1/2&quot; high</td>
</tr>
<tr>
<td>3. Bottom flange angle corrosion =</td>
</tr>
<tr>
<td>4. Top flange plate corrosion =</td>
</tr>
<tr>
<td>5. Lateral bracing system condition =</td>
</tr>
<tr>
<td>6. Bearing stiffener condition =</td>
</tr>
<tr>
<td>7. # of cross frames and spacing =</td>
</tr>
<tr>
<td>8. Loose rivets/bolts = Yes</td>
</tr>
<tr>
<td>9. Welds on tension flange = Yes</td>
</tr>
<tr>
<td>10. Any cracks observed = Yes</td>
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<table>
<thead>
<tr>
<th>Other Notes:</th>
</tr>
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<tbody>
<tr>
<td>Side purling</td>
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<table>
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<tr>
<th>Span 3 Notes:</th>
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<tbody>
<tr>
<td>1. Web corrosion =</td>
</tr>
<tr>
<td>2. Bottom flange plate corrosion =</td>
</tr>
<tr>
<td>3. Bottom flange angle corrosion =</td>
</tr>
<tr>
<td>4. Top flange plate corrosion = 1/8&quot; full width</td>
</tr>
<tr>
<td>5. Lateral bracing system condition =</td>
</tr>
<tr>
<td>6. Bearing stiffener condition =</td>
</tr>
<tr>
<td>7. # of cross frames and spacing =</td>
</tr>
<tr>
<td>8. Loose rivets/bolts =</td>
</tr>
<tr>
<td>9. Welds on tension flange = No</td>
</tr>
<tr>
<td>10. Any cracks observed = No</td>
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<table>
<thead>
<tr>
<th>Other Notes:</th>
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<tbody>
<tr>
<td>Some putting on stiffeners above housecold</td>
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<table>
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<th>Span 4 Notes:</th>
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<tbody>
<tr>
<td>1. Web corrosion =</td>
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<tr>
<td>2. Bottom flange plate corrosion =</td>
</tr>
<tr>
<td>3. Bottom flange angle corrosion =</td>
</tr>
<tr>
<td>4. Top flange plate corrosion =</td>
</tr>
<tr>
<td>5. Lateral bracing system condition =</td>
</tr>
<tr>
<td>6. Bearing stiffener condition =</td>
</tr>
<tr>
<td>7. # of cross frames and spacing =</td>
</tr>
<tr>
<td>8. Loose rivets/bolts =</td>
</tr>
<tr>
<td>9. Welds on tension flange = No</td>
</tr>
<tr>
<td>10. Any cracks observed =</td>
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<table>
<thead>
<tr>
<th>Other Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top horizontal</td>
</tr>
</tbody>
</table>

| 10' 1/4 |
| 7' 0' 4' |

| 10' 9' |
| Midspan. |
| 1/2 high |

| 1/8 |
| Midspan. |
| 1/8 x 3 |
| 1/16 x 3 |

| 2x1/16 |
| 2x1/16 |

| 1/8 |
| 2x1/16 |
| 2x1/16 |

| 1/8 |
| 1/8 |
| 1/8 |

| 1/8 |
| 1/8 |
| 1/8 |

| 1/8 |
| 1/8 |
| 1/8 |
Span 5 Notes:
1. Web corrosion = [Signature]
2. Bottom flange plate corrosion = [Signature]
3. Bottom flange angle corrosion = [Signature]
4. Top flange plate corrosion = [Signature]
5. Lateral bracing system condition = [Signature]
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 6 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 7 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

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<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
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75' spans

1-25' @ rail to @ web

24' @ rail to @ web

25 1/4 @ rail to @ web

28' @ rail to @ web.

45' Tower spans
# DPG SPANS: CONC. PIERS

**E&N Railway**

**SECTION:** Victoria to Nanaimo

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<th>Metric</th>
<th>Value</th>
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<td><strong>MILE POST #</strong></td>
<td>113.2</td>
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<tr>
<td><strong>CROSSING:</strong></td>
<td></td>
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<tr>
<td><strong>INSPECTION DATE:</strong></td>
<td>10/27/11</td>
</tr>
<tr>
<td><strong>LOCATION:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>INSPECTORS:</strong></td>
<td>M &amp; L</td>
</tr>
<tr>
<td><strong>NO. OF SPANS:</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>NO. OF TRACKS:</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>STREAM:</strong></td>
<td>NILE Ck</td>
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<tr>
<td><strong>STREAM DEPTH:</strong></td>
<td>31</td>
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<tr>
<td><strong>FLOW DIRECTION:</strong></td>
<td>E</td>
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<tr>
<td><strong>DECK TYPE:</strong></td>
<td>Open / Ballast</td>
</tr>
<tr>
<td><strong>WALKWAY:</strong> (Yes/No)</td>
<td>E/W side</td>
</tr>
<tr>
<td><strong>SPAN TYPE:</strong></td>
<td>OPA</td>
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<tr>
<td><strong>HEIGHT:</strong></td>
<td>85'</td>
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<tr>
<td><strong>LENGTH:</strong></td>
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<td><strong>RATING:</strong></td>
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<tr>
<td><strong>SPAN LENGTH(S):</strong></td>
<td>10 55</td>
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<tr>
<td><strong>HANDRAILS:</strong> (Yes/No)</td>
<td>E/W side</td>
</tr>
<tr>
<td><strong>Other Notes:</strong></td>
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</tr>
</tbody>
</table>

---

### Inspection Findings:

**ABUTMENT NOTES**

Type of Abutment Construction = Conc

- **South:**
  1. Evidence of scour / undermining = No
  2. Drift accumulated = No
  3. Ballast/debris on bearings = Some ballast & dirt
  4. Vegetation on face/seat = Moss
  5. Spalling = No
  6. Cracking under bearings = No
  7. Cracking elsewhere = No
  8. Rotation = No
  9. Exposed reinforcing steel = No
  10. Efflorescence = No
  11. Missing or fractured stones (masonry abutment) = 
  12. Missing mortar from joints (masonry abutment) = 
  13. Evidence of stone movement (masonry abutment) = 

**Other Notes:**

---

**North:**

1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Some stone & vegetation
4. Vegetation on face/seat = Moss
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) = 
12. Missing mortar from joints (masonry abutment) = 
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

---

### BACKWALL/WINGWALL NOTES

Type of Wingwall Construction =
Type of Backwall Construction =

South Abutment:
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

North Abutment:
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

CONCRETE PIER NOTES

Pier 1:
Type of Construction = Cem 
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

Pier 2:
Type of Construction = Cem 
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

Pier 3:
Type of Construction =
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

Pier 4:
Type of Construction =
1. Undermining = 
2. Cracks = 
3. Spalling = 
4. Leaning = 
5. Exposed reinforcing steel = 
Other Notes:

DECK NOTES
Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
Other Notes:

Tie Notes:
1. Tie size = __ wide x __ deep x __ long
2. Tie spacing = __
3. Ties dapped for superelevation = __
4. Rail plates cutting into ties = __
5. Overall tie condition = __
6. Approach ties swinging = __
7. Approx. number of bad ties = __
Other Notes:

Track Notes:
1. Rail section weight = __
2. CWR or jointed rail = __
3. Inner guardrail size/weight (if applicable) = __
4. Is line of track good = __
5. Approaches low = __
Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge = __
2. Walkway condition = __
3. Refuge bays on bridge = __
4. Refuge bay condition = __
Other Notes:

SPAN NOTES
Girder spacing =
Girder depth =
General steel condition =

Span 1 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed = NO
Other Notes:

**Span 2 Notes:**
1. Web corrosion = Surface of flange along edge.
2. Bottom flange plate corrosion = Good
3. Bottom flange angle corrosion = Good
4. Top flange plate corrosion = Surface
5. Lateral bracing system condition = Good
6. Bearing stiffener condition = Good
7. # of cross frames and spacing = 6 @ 12 1/2" 10 1/2" 11 1/2" 11 3/4" 2 7/8"
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

**Span 3 Notes:**
1. Web corrosion = Surface & 3/16" edge pitting in place.
2. Bottom flange plate corrosion = 1/16" 2 1/2" high on vertical 1. Yes 2 1/2" on inside.
3. Bottom flange angle corrosion = Ground - pitting on top flange.
4. Top flange plate corrosion = 7 @ 9 3/8" outside 1/8 & flange L adjacent.
5. Lateral bracing system condition = Good
6. Bearing stiffener condition = Good
7. # of cross frames and spacing = " chants.
8. Loose rivets/bolts = 7 @ 9 3/8"
9. Welds on tension flange = No
10. Any cracks observed = No

**Span 4 Notes:**
1. Web corrosion = Surface of flange along edge.
2. Bottom flange plate corrosion = Good
3. Bottom flange angle corrosion = Good
4. Top flange plate corrosion = Surface
5. Lateral bracing system condition = Good
6. Bearing stiffener condition = Good
7. # of cross frames and spacing = 7 @ 9 3/8"
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

**Span 5 Notes:**
1. Web corrosion = Surface of flange along edge.
2. Bottom flange plate corrosion = Good
3. Bottom flange angle corrosion = Good
4. Top flange plate corrosion = Surface
5. Lateral bracing system condition = Good
6. Bearing stiffener condition = Good
7. # of cross frames and spacing = 7 @ 9 3/8"
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

**Other Notes:**
DPG SPANS: CONC. PIERS

MILE POST # 11912

CROSSING: Stewi
INSPECTION DATE: 10/24/11
LOCATION: Mud Bay
INSPECTORS: A.01/AL
NO. OF SPANS: 1
NO. OF TRACKS: 1

STREAM: Cook Ce Stw
STREAM DEPTH: 3′
FLOW DIRECTION: E
DECK TYPE: Open / Ballast
WALKWAY: (Yes/No) – E/W side
HANDRAILS: (Yes/No) – E/W side

SPAN TYPE: Deep
HEIGHT: 12′3″ top of tie
LENGTH: 31′
RATING:
SPAN LENGTH(S): 1 @ 31′

E & N Railway
SECTION: Victoria to Nanaimo

Inspection Findings:

ABUTMENT NOTES

Type of Abutment Construction = Concrete

South:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = No
4. Vegetation on face/seat = Yes – moss / lichen
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining = Lava slabs 10/10 side
2. Drift accumulated = No
3. Ballast/debris on bearings = No
4. Vegetation on face/seat = Moss / Lichen
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction =

Type of Backwall Construction =

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

CONCRETE PIER NOTES

Pier 1:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

Pier 2:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

Pier 3:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

Pier 4:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:
DECK NOTES

Ballast / open deck = Open.

Track Alignment Notes:
1. Bridge on tangent or curve = tangent
2. Max. superelevation at midspan = 0
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10 wide x 14 deep x 18 long
2. Tie spacing =
3. Ties dapped for superelevation = No
4. Rail plates cutting into ties = No
5. Overall tie condition = Good
6. Approach ties swinging = No
7. Approx. number of bad ties = 6

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good = Yes
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES

Girder spacing = 10'
Girder depth = 3' 2 1/2''
General steel condition = Good

Span 1 Notes:
1. Web corrosion = Minor surface
2. Bottom flange plate corrosion = Minor surface
3. Bottom flange angle corrosion = About 1/16 on top flange at midspan
4. Top flange plate corrosion =
5. Lateral bracing system condition = Good
6. Bearing stifferener condition =
7. # of cross frames and spacing = 4 @ 9' 4''
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

**Span 2 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

**Span 3 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

**Span 4 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

**Span 5 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
Timber Trestles

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST #  119.5

CROSSING:  119 5
INSPECTION DATE:  
LOCATION:  MUNO BAY
INSPECTORS:  A.R./L.
NO. OF SPANS:  
NO. OF TRACKS:  
STREAM:  COOK Ck NTH PARK
STREAM DEPTH:  
FLOW DIRECTION:  E
DECK TYPE:  Open / Ballast
HANDRAILS: (Yes/No) - E/W side
SPAN TYPE:  Timber
HEIGHT:  28'
LENGTH:  1 @ 28'
SPAN LENGTH(S):  
WALKWAY: (Yes/No) - E/W side
RATING:  

Inspection Findings:

END BENT NOTES
Type of End Bent Construction = Concrete
1. # of piles =
2. Pile diameter =
3. Pile cap size = ___ deep x ___ wide

South End (Bent 1):
1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =
Other Notes:

North End (Bent TBD):
1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =
Other Notes:

INTERMEDIATE BENT NOTES
Use timber schematic to mark up section loss in individual piles.
1. # of piles =
2. Pile diameter =
3. Pile cap size = ___ deep x ___ wide
4. Bents plumb =
5. Signs of pumping piles =
6. Signs of scour/erosion =
7. Posted piles =

Steinvale, 1977 - July 26 x 28'
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = Cone of Shotcrete
Type of Backwall Construction = Cone

South End:
1. Undermining = Yes
2. Cracks = No
3. Leaning = No
Other Notes:

North End:
1. Undermining = No
2. Cracks = No
3. Leaning = No.
Other Notes:

DECK NOTES
Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve = Tangent
2. Max. super-elevation at midspan =
3. Chord offset at midspan (distance from center of track to center of stringers) =
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = 6" wide x 6" deep x 12" long
2. Tie spacing = 12"
3. Ties dapped for super-elevation = No
4. Rail plates cutting into ties = Yes
5. Overall tie condition = Good
6. Approach ties swinging = No
7. Approx. number of bad ties =
8. Method of tie connection = Spiked / Tubo Good
Other Notes:

Track Notes:
1. Rail section weight = CWR
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good = Yes
5. Approaches low = Approached
Other Notes:
Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
Other Notes:

SPAN NOTES
1. # of stringers =
2. Stringer size = \( \frac{35}{4} \) deep x \( \frac{14}{8} \) wide
3. Out-of-exterior stringers =
4. General stringer condition = Good
   - Use timber span schematic for marking up section loss in individual stringers where required
5. Ends of stringers crushing =
6. Horizontal shear cracks in stringers =
7. Fractured stringers =
   - N/A splits @ mid.
8. Decay/insect damage =
   - No
Other Notes:

EXTRA TIMBER MEMBER NOTES (WHERE IN PLACE)
1. Longitudinal bracing =
2. Longitudinal bracing size =
3. Longitudinal bracing condition =
4. Sway bracing =
5. Sway bracing size =
6. Sway bracing condition =
7. Sash bracing =
8. Sash bracing size =
9. Sash bracing condition =
10. Mud sills @ bents = \( 6" \) deep + 16" wide @ abutments
11. Mud sill condition =
   - Good
Other Notes:

History:
- Original construction year =
- Summary of bridge updates =

Recommended Work:

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HDPG SPANS

MILE POST #130

CROSSING:  
INSPECTION DATE: 10/24/11  
LOCATION:  
INSPECTORS:  
NO. OF SPANS: 1  
NO. OF TRACKS: 1  
STREAM: ROGUEW  
STREAM DEPTH: 5'-6"  
FLOW DIRECTION:  
DECK TYPE: Open / Ballast  
WALKWAY: (Yes/No) - EW side  
HANDRAILS: (Yes/No) - EW side  
SPAN TYPE: HDPG  
HEIGHT: 18'  
LENGTH: 71'  
SPAN LENGTH(S): 71'  

E&N Railway  
SECTION: Victoria to Nanaimo

Inspection Findings:

ABUTMENT NOTES

Type of Abutment Construction = Concrete

South:
1. Evidence of scour / undermining = No - Rip rap placed around abutment
2. Drift accumulated =
3. Ballast/debris on bearings = Minw ballot & dirt
4. Vegetation on face/seat =
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining = No
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat = Moss
5. Spalling = No
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation = No
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = Concrete

Type of Backwall Construction = Concrete

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaking =
5. Exposed reinforcing steel =

Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaking =
5. Exposed reinforcing steel =

Other Notes:

DECK NOTES

Ballast / open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve = Tangent
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) = 0

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10 wide x 10 deep x 12 long with bearing-bearing length = 12 11/2 - 5/2
2. Tie spacing = 14
3. Ties dapped for superelevation = No
4. Rail plates cutting into ties = No
5. Overall tie condition = Good
6. Approach ties swinging = No
7. Approx. number of bad ties = 18
8. Section loss to be used in rating flexural ties = 0 - 5% ties 78/79

Other Notes:

Tie Support Angles (if applicable):
1. Size of angles = 5 1/4 wide 3 1/2 deep - pulled at girders about 1/8 in 12
2. Overall condition = Good
3. Cracks evident = No
4. Bearing length of tie on angle = 4

Other Notes:
Track Notes:
1. Rail section weight = \[85\]
2. CWR or jointed rail = \[\frac{1}{8}\]
3. Inner guardrail size/weight (if applicable) = \[85\]
4. Is line of track good = \[\frac{1}{8}\]
5. Approaches low = \[\frac{1}{8}\]

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge = \[\frac{1}{8}\]
2. Walkway condition = \[\frac{1}{8}\]
3. Refuge bays on bridge = \[\frac{1}{8}\]
4. Refuge bay condition = \[\frac{1}{8}\]

Other Notes:

SPAN NOTES
Girder spacing = 6 1/2, 5 1/2 @ 6" \\
Girder depth = 5 1/2 @ 6" \\
General steel condition = Surface condition

Bearing Notes:
1. Type of bearings = 5th floor bry. 4th floor br. \\
2. Full bearing = \[\frac{1}{8}\] Not on rounding 1/8" putting on it. \\
3. Bearing corrosion = \[\frac{1}{8}\] Bent at 1/8", s. e. comes otherwise good 7/8" @ 1/8" \\
4. Anchor bolt condition = \[\frac{1}{8}\] Expansion bearings functioning properly or frozen = \[\frac{1}{8}\]
5. Bearings punching into abutment seat = \[\frac{1}{8}\]

Other Notes:

Span 1 Notes:
1. Web corrosion = Surface only \\
2. Bottom flange plate corrosion = \[\frac{1}{8} \text{ 2" horizontal 2" 1/8"} \] \\
3. Bottom flange angle corrosion = \[\frac{1}{8} \text{ new 1" 3/8" up flange 1" vertical 1/8" horizontal access} \] \\
4. Top flange plate corrosion = \[\frac{1}{8} \text{ Surface only 1/8" rolling at end of span} \]
5. Lateral bracing system condition = \[\frac{1}{8} \text{ good 8 @ 11'9"} \] \\
6. Bearing stiffener condition = \[\frac{1}{8}\]
7. # of cross frames and spacing = \[\frac{1}{8}\]
8. Loose rivets/bolts = \[\frac{1}{8}\]
9. Welds on tension flange = \[\frac{1}{8}\]
10. Any cracks observed = \[\frac{1}{8}\]

Other Notes:

History:
- Original construction year =
- Summary of bridge updates =

Recommended Work:
**HDPG SPANS**

**E&N Railway**  
SECTION: Victoria to Nanaimo

**MILE POST #1,330**

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<td>AMS, FAL</td>
<td>DECK TYPE:</td>
<td>Open / Ballast</td>
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<td>WALKWAY:</td>
<td>(Yes/No – E/W side)</td>
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<tr>
<td>NO. OF TRACKS:</td>
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<td>HANDRAILS:</td>
<td>(Yes/No – E/W side)</td>
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**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction =

**South:**
1. Evidence of scour / undermining = Yes – to watch
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

**North:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = Core

Type of Backwall Construction = Core

South Abutment:
1. Undermining = Yes - same as adjacent
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:

North Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = No
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:

DECK NOTES

Ballast / open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve = Tangent
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) = 0

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 1 1/2 wide x 16 deep x 1 1/2 long with bearing-bear bearing length =
2. Tie spacing =
3. Ties dapped for superelevation = No
4. Rail plates cutting into ties = No
5. Overall tie condition = Good
6. Approach ties swinging = No
7. Approx. number of bad ties = 4
8. Section loss to be used in rating flexural ties = 0%

Other Notes:

Tie Support Angles (if applicable):
1. Size of angles = 
2. Overall condition =
3. Cracks evident = No
4. Bearing length of tie on angle =

Other Notes:
Track Notes:
1. Rail section weight = 85
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) = 85
4. Is line of track good = Yes
5. Approaches low = Yes

Other Notes

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes

SPAN NOTES
Girder spacing = 18' 0 1/2"
Girder depth = 6' 4 1/2" @ midspan
General steel condition = Good

Bearing Notes:
1. Type of bearings = Plate at 8th, Rotational at 9th
2. Full bearing =
3. Bearing corrosion = No
4. Anchor bolt condition = OK
5. Expansion bearings functioning properly or frozen = Never frozen
6. Bearings punching into abutment seat = No

Other Notes

Span 1 Notes:
1. Web corrosion = Surface minor
2. Bottom flange plate corrosion = Minor surface
3. Bottom flange angle corrosion = Minor surface
4. Top flange plate corrosion =
5. Lateral bracing system condition = Good
6. Bearing stiffener condition =
7. # of cross frames and spacing = 7 & 10'
8. Loose rivets/bolts = No
9. Welds on tension flange = No
10. Any cracks observed = No

Other Notes

History:
- Original construction year =
- Summary of bridge updates =

Recommended Work:

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<th>RECOMMENDED WORK</th>
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DPG SPANS: CONC. PIERS

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST # 123.0

CROSSING:   STREAM: Gold Creek   SPAN TYPE: DPG
INSPECTION DATE: 10/27/11   STREAM DEPTH:   HEIGHT: 32'
LOCATION:   FLOW DIRECTION: E   LENGTH:
INSPECTORS: Arno/Al      DECK TYPE: Open/Ballast   RATING:
NO. OF SPANS: 3      WALKWAY: (Yes/No) - E/W side   SPAN LENGTH(S): 1 = 32', 2 = 50'
NO. OF TRACKS: 1      HANDRAILS: (Yes/No) - E/W side

Inspection Findings:

ABUTMENT NOTES
Type of Abutment Construction = Conc.

South:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = No
4. Vegetation on face/seat = Moss & Lichen
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Yes, moss on foot
4. Vegetation on face/seat = Moss & Lichen
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =
Type of Backwall Construction =

**South Abutment:**
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**North Abutment:**
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**CONCRETE PIER NOTES**

**Pier 1:**
Type of Construction =
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**Pier 2:**
Type of Construction =
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**Pier 3:**
Type of Construction =
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**Pier 4:**
Type of Construction =
1. Undermining = \(\text{\checkmark}\)
2. Cracks = \(\text{\checkmark}\)
3. Spalling = \(\text{\checkmark}\)
4. Leaning = \(\text{\checkmark}\)
5. Exposed reinforcing steel = \(\text{\checkmark}\)

*Other Notes:*

**DECK NOTES**

Ballast / open deck = \(\text{\checkmark}\)
Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10 wide x 12 deep x 12 long — Span 2
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES
Girder spacing =
Girder depth =
General steel condition =

Span 1 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =

Other Notes:
10. Any cracks observed = No

Other Notes:

Span 2 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed = No

Other Notes:

Span 3 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 4 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 5 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
**DPG SPANS: CONC. PIERS**

**MILE POST #**

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<th>WALKWAY: (Yes/No – E/W side)</th>
<th>SPAN LENGTH(S):</th>
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<tr>
<th>NO. OF TRACKS:</th>
<th>HANDRAILS: (Yes/No – E/W side)</th>
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**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction = Conc.

**South:**

1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings = Minor Debris
4. Vegetation on face/seat = No
5. Spalling = No
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

**North:**

1. Evidence of scour / undermining = No
2. Drift accumulated = No
3. Ballast/debris on bearings =
4. Vegetation on face/seat = No
5. Spalling = Mains of corner of bearing seat
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = Conc
Type of Backwall Construction = Conc

South Abutment:
1. Undermining = No
2. Cracks = No
3. Spalling = On construct
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

North Abutment:
1. Undermining = No
2. Cracks = Poor construct at top & btm.
3. Spalling = at top construct on S side
4. Leaning = No btm, " on Nth side
5. Exposed reinforcing steel = No
Other Notes:

CONCRETE PIER NOTES

Pier 1:
Type of Construction = Conc
1. Undermining =
2. Cracks = closed crack in NW corner of PI;
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 2:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 3:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 4:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:
**DECK NOTES**

Ballast / open deck =

**Track Alignment Notes:**
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

**Other Notes:**

**Ballast Deck Notes (if applicable):**
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

**Other Notes:**

**Tie Notes:**
1. Tie size = 1 0 ½ wide x 1 4 deep x 1 2 long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

**Other Notes:**

**Track Notes:**
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

**Other Notes:**

**Walkways/Refuge Bay Notes:**
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

**Other Notes:**

**SPAN NOTES**

Girder spacing =
Girder depth =
General steel condition =

**Span 1 Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stifferner condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed = 

Other Notes:

Span 2 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 3 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 4 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 5 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
## Inspection Findings:

### ABUTMENT NOTES

Type of Abutment Construction =

**South:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

**North:**
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =
Type of Backwall Construction =

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

DECK NOTES
Open deck = Yes

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =
Other Notes:

Tie Notes:
1. Tie size = 10 in wide x 1 in deep x 13 in long with bearing-bearing length =
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
Other Notes:
TRUSS MEMBER NOTES

General steel condition = Good

Bearing Notes:
1. Type of bearings = Roller
2. Full bearing =
3. Bearing corrosion =
4. Anchor bolt condition =
5. Expansion bearings functioning properly or frozen =
6. Bearings punching into abutment seat =

Other Notes:

Top Chord Notes:
1. Section loss at critical locations =
2. Adequate bracing = Yes
3. Cracks at chord splices =
4. Wear-in-web pin holes =
5. Fasteners condition = Good

Notes (by nodal location established in field):

Bottom Chord Notes:
1. Section loss at critical locations =
2. Eyebar tightness =
3. Pack rust at eyebars =
4. Eyebar section loss =
5. Pins worn, scored or corroded =
6. Chord cracks = No
7. Condition of splices = Good

Notes (by nodal location established in field):

Welded gusset plate on chord face at midspan.
**Hanger Notes:**
1. Section loss in body above floorbeam connection =
2. Cracks at upper truss connection, lower row of fasteners =
3. Stress concentrations in the form of welds, edge corrosion =
4. Accident damage =

Notes (by nodal location established in field):

---

**Diagonal Notes:**
1. Section loss =
2. Compression/tension members =
3. End connection condition =
4. Tight (if tension members) =

Notes (by nodal location established in field):

---

**Post Notes:**
1. Alignment of post =
2. Internal bracing =
3. Member end condition =

Notes (by nodal location established in field):

---

**End Post Notes:**
1. Alignment of post =
2. Internal bracing =
3. Section loss =

Notes (by nodal location established in field):

---

Strengthening is added to 4 centre diagonals, nodded & stitch welded.
TRUSS BRACING NOTES

**Top Laterals Notes:**
1. Section loss = 
2. Connection condition = 
3. Rod system components = 
   Notes (by nodal location established in field):

**Bottom Laterals Notes:**
1. Section loss = 
2. Connection condition (truss/stringers) = 
3. Rod system components = 
   Notes (by nodal location established in field):

**Sway Frame Notes:**
1. Section loss = 
2. Connection condition (top chords/verticals) = 
3. Fatigue cracks = 
4. Rod system components = 
   Notes (by nodal location established in field):

FLOOR SYSTEM NOTES

Floorbeam spacing = 
Floorbeam depth =
Stringer spacing =
Stringer depth =
General steel condition =

**Floorbeam Notes:**
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange/plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
Stringer Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

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**DPG SPANS: STEEL BENTS**

E&N Railway

SECTION: Victoria to Nanaimo

MILE POST # 125.5

CROSSING: 

INSPECTION DATE: 10/26/11

LOCATION: 

INSPECTORS: 

NO. OF SPANS: 1

NO. OF TRACKS: 1

STREAM: Table R

STREAM DEPTH: 

FLOW DIRECTION: E

HEIGHT: 

LENGTH: 101'

SPAN TYPE: DPG

DECK TYPE: Open / Ballast

WALKWAY: (Yes/No - E/W side)

HANDRAILS: (Yes/No - E/W side)

RATING: 

**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction = Conc

South:
1. Evidence of scour / undermining = 
2. Drift accumulated = 
3. Ballast/debris on bearings = 
4. Vegetation on face/seat = 
5. Spalling = 
6. Cracking under bearings = 
7. Cracking elsewhere = 
8. Rotation = 
9. Exposed reinforcing steel = 
10. Efflorescence = 
11. Missing or fractured stones (masonry abutment) = 
12. Missing mortar from joints (masonry abutment) = 
13. Evidence of stone movement (masonry abutment) = 

Other Notes:

North:
1. Evidence of scour / undermining = No 
2. Drift accumulated = No 
3. Ballast/debris on bearings = 
4. Vegetation on face/seat = 
5. Spalling = 
6. Cracking under bearings = 
7. Cracking elsewhere = 
8. Rotation = 
9. Exposed reinforcing steel = 
10. Efflorescence = 
11. Missing or fractured stones (masonry abutment) = 
12. Missing mortar from joints (masonry abutment) = 
13. Evidence of stone movement (masonry abutment) = 

Other Notes:
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction = Cone
Type of Backwall Construction = Cone

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

North Abutment:
1. Undermining = No - wings same
2. Cracks =
3. Spalling = No, 1" at top
4. Leaning = No
5. Exposed reinforcing steel =
Other Notes:

STEEL TOWER BENT NOTES
Tower 1:
1. Single or double bent = single
2. Tower general condition = good
Misc. Notes (braces, plumbness, etc):

Tower 1, Base of Legs:
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

Tower 1, Top of Legs:
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

Tower 2:
1. Single or double bent =
2. Tower general condition =
Misc. Notes (braces, plumbness, etc):

Tower 2, Base of Legs:
1. SW Base Notes = Beargs
2. SE Base Notes = Fixed
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

Nth Good - Rocker
HD bolts good
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

**Tower 2, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

**Tower 3:**
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc):

**Tower 3, Base of Legs:**
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

**Tower 3, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

**Tower 4:**
1. Single or double bent =
2. Tower general condition =
   Misc. Notes (braces, plumbness, etc):

**Tower 4, Base of Legs:**
1. SW Base Notes =
2. SE Base Notes =
3. NW Base Notes (if double bent) =
4. NE Base Notes (if double bent) =

**Tower 4, Top of Legs:**
1. SW Top Notes =
2. SE Top Notes =
3. NW Top Notes (if double bent) =
4. NE Top Notes (if double bent) =

DECK NOTES
Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10 wide x 16 deep x 12' long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight = 85
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) = 85
4. Is line of track good = Yes.
5. Approaches low =

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge = 3 West, 2 East.
4. Refuge bay condition =

Other Notes:
Span Notes:

1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 2 Notes:

1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 3 Notes:

1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 4 Notes:

1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
Span 5 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 6 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 7 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:
- Original construction year =
- Summary of bridge updates =

Recommended Work:

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DECK TRUSS SPANS

E&N Railway
SECTION: Victoria to Nanaimo

MILE POST # 125.5

STREAM: CREASE
SPAN TYPE: DT
HEIGHT: 154'
LENGTH: 
RATING: 
SPAN LENGTH(S): 154'

CROSSING: 
INSPECTION DATE: 10/27/11
LOCATION: 
INSPECTORS: DMRDAPW
NO. OF SPANS: 1
NO. OF TRACKS: 1

STREAM DEPTH: 12 FEET
FLOW DIRECTION: E
DECK TYPE: Over / Ballast
WALKWAY: (Yes/No - E/W side)
HANDRAILS: (Yes/No - E/W side)

Inspection Findings:

ABUTMENT NOTES
Type of Abutment Construction =

South:
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:

North:
1. Evidence of scour / undermining =
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling =
6. Cracking under bearings =
7. Cracking elsewhere =
8. Rotation =
9. Exposed reinforcing steel =
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) =
12. Missing mortar from joints (masonry abutment) =
13. Evidence of stone movement (masonry abutment) =

Other Notes:
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =
Type of Backwall Construction =

South Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

DECK NOTES
Open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =
Other Notes:

Tie Notes:
1. Tie size = ___ wide x ___ deep x ___ long with bearing-bearing length = ___
2. Tie spacing = ___
3. Ties dapped for superelevation = No
4. Rail plates cutting into ties = No
5. Overall tie condition = Good
6. Approach ties swinging = ___
7. Approx. number of bad ties = ___
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
Other Notes:
TRUSS MEMBER NOTES

General steel condition = Good

Bearing Notes:
1. Type of bearings = NORTH - ROLLER  SOUTH - FIXED
2. Full bearing = OK
3. Bearing corrosion = SURFACE/MINOR PITTING ON BARE PLATE - SOUTH - PITTING SOLE PLATE
4. Anchor bolt condition = GOOD
5. Expansion bearings functioning properly or frozen = FROZEN
6. Bearings punching into abutment seat = NO

Other Notes:

Top Chord Notes:
1. Section loss at critical locations = YES
2. Adequate bracing = Varies - SOME LOOSE
3. Cracks at chord splices = NO
4. Wear in web pin holes = NO
5. Fasteners condition = Varies GOOD - 1/8" at random locations

Notes (by nodal location established in field):
- EAST SOUTH WI - BENT LACE

Bottom Chord Notes:
1. Section loss at critical locations = NO
2. Eyebar tightness = Varies - SOME LOOSE
3. Pack rust at eyebars = NO
4. Eyebar section loss = NO
5. Pins worn, scored or corroded = NO
6. Chord cracks = NO
7. Condition of splices = NO

Notes (by nodal location established in field):
- LEFT NORTH WEST BEARING - PITTING ON BATTEN PL - MAX 1/16"  WEST - TRUSS LI - NORTH - MINOR SURFACE CORROSION
- BOTT CHORD PIN - NW - LI - MINOR SURFACE
Hanger Notes:  
1. Section loss in body above floorbeam connection = 
2. Cracks at upper truss connection, lower row of fasteners = 
3. Stress concentrations in the form of welds, edge corrosion = 
4. Accident damage = 
Notes (by nodal location established in field):

Diagonal Notes: 
1. Section loss = SURFACE CORROSION 
2. Compression/tension members = BOTH 
3. End connection condition = PINNED GOOD. 
4. Tight (if tension members) = NO 
Notes (by nodal location established in field):

L4 - NW = WEST - OUTSIDE CRACKED EYE

Post Notes: 
1. Alignment of post = OK GOOD 
2. Internal bracing = GOOD; SURFACE - ONE CHECKED - GOOD. 
3. Member end condition = GOOD PINNED 
Notes (by nodal location established in field):
~SURFACE CORROSION

End Post Notes: 
1. Alignment of post = GOOD 
2. Internal bracing = GOOD 
3. Section loss = SURFACE CORROSION 
Notes (by nodal location established in field):
TRUSS BRACING NOTES

Top Laterals Notes:
1. Section loss =
2. Connection condition = RIVE - MISSING COTTER
3. Rod system components =
   Notes (by nodal location established in field):

Bottom Laterals Notes:
1. Section loss = SURFACE CORROSION
2. Connection condition (truss/stringers) = BRAINED
3. Rod system components = SOME LOOSE - APPEAR TO EYE
   Notes (by nodal location established in field):

Sway Frame Notes: — SEE ABOVE
1. Section loss =
2. Connection condition (top chords/verticals) =
3. Fatigue cracks =
4. Rod system components =
   Notes (by nodal location established in field):

FLOOR SYSTEM NOTES
Floorbeam spacing =
Floorbeam depth =
Stringer spacing =
Stringer depth =
General steel condition =

Floorbeam Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =
   Other Notes:
   FB@ N-01 - DENT BOTT FlG COVE PL
   N-02 - DENT - SIMILAR
**Stringer Notes:**
1. Web corrosion = Surface corrosion
2. Bottom flange plate corrosion = Blank flange at one slinger @ 3/4 span
3. Bottom flange angle corrosion = Surface only
4. Top flange plate corrosion = Blank flange width on inside
5. Lateral bracing system condition = Deterioration
6. Bearing-stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts = No
9. Welds on tension flange = Yes - queen posts welded to angles of flange
10. Any cracks observed = No

**Other Notes:**

---

**History:**
- Original construction year =
- Summary of bridge updates =

---

**Recommended Work:**

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
PIER #2 - CONCRETE
- MOSS ON TOP.
- NO CRACKS @ BEARING
- MINOR SPALLING @ SW PIER CAP & SE SAME
- SOUTH FACE ~ 10' ABOVE GND - MINOR SPALL

PIER #1 - CONCRETE
- MOSS ON TOP.
**Timber Trestles**

**E&N Railway**
SECTION: Victoria to Nanaimo

**MILE POST #** 125.5

<table>
<thead>
<tr>
<th>CROSSING:</th>
<th>STREAM:</th>
<th>SPAN TYPE:</th>
</tr>
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<tbody>
<tr>
<td>LOCATION:</td>
<td>FLOW DIRECTION:</td>
<td>LENGTH:</td>
</tr>
<tr>
<td>INSPECTION DATE:</td>
<td>DECK TYPE:</td>
<td>RATING:</td>
</tr>
<tr>
<td>NO. OF SPANS:</td>
<td>WALKWAY: (Yes/No - E/W side)</td>
<td>SPAN LENGTH(S):</td>
</tr>
<tr>
<td>NO. OF TRACKS:</td>
<td>HANDBRAILS: (Yes/No - E/W side)</td>
<td></td>
</tr>
</tbody>
</table>

---

**Inspection Findings:**

**END BENT NOTES**

Type of End Bent Construction = *Cone*

1. # of piles = 
2. Pile diameter = 
3. Pile cap size = ____ deep x ____ wide

**South End (Bent 1):**

1. Drift accumulated = Yes
2. Bent rotation = No
3. Pile cap general condition = *Good*
4. Pile cap bulging/splitting = *Yes*
5. Pile cap has excessive internal/external decay = *Yes*
6. Pile general condition = *Good*
7. Piles have excessive internal/external decay = *Yes*
8. Piles bulging/splitting = *No*

Other Notes:

---

**North End (Bent TBD):**

1. Drift accumulated = 
2. Bent rotation = 
3. Pile cap general condition = 
4. Pile cap bulging/splitting = 
5. Pile cap has excessive internal/external decay = 
6. Pile general condition = 
7. Piles have excessive internal/external decay = 
8. Piles bulging/splitting = 

Other Notes:

---

**INTERMEDIATE BENT NOTES**

Use timber schematic to mark up section loss in individual piles,

1. # of piles = 5
2. Pile diameter = 
3. Pile cap size = ____ deep x ____ wide
4. Bents plumb = Yes
5. Signs of pumping piles = No
6. Signs of scour/erosion = No
7. Posted piles = No

---

All sound except as noted back page
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =

Type of Backwall Construction =

South End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

North End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

DECK NOTES
Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. super elevation at midspan =
3. Chord offset at midspan (distance from center of track to center of stringers) =
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = 8 wide x 8 deep x 10 long
2. Tie spacing =
3. Ties dapped for super elevation =
4. Rail plates cutting into ties =
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =
8. Method of tie connection =
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =
Other Notes
Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES
1. # of stringers =
2. Stringer size = ________ deep x ________ wide
3. Out-of-exterior stringers =
4. General stringer condition =

Use timber span schematic for marking up section loss in individual stringers where required
5. Ends of stringers crushing =
6. Horizontal shear cracks in stringers =
7. Fractured stringers =
8. Decay/insect damage =

Other Notes:

EXTRA TIMBER MEMBER NOTES (WHERE IN PLACE)
1. Longitudinal bracing =
2. Longitudinal bracing size =
3. Longitudinal bracing condition =
4. Sway bracing =
5. Sway bracing size =
6. Sway bracing condition =
7. Sash bracing =
8. Sash bracing size =
9. Sash bracing condition =
10. Mud sills @ bents =
11. Mud sill condition =

Other Notes:

History:

- Original construction year =
- Summary of bridge updates =

Recommended Work:

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
</tr>
</thead>
</table>
BRIDGE SKETCHES (AS REQUIRED)

 extract as noted below

Bent 7 - watch base P1: OK but indications of
Bent 16 - deck sloping P1 & 4' up - indications of OK
Bent 12 - Pile 1 - Replace

Bent 14 - Pd
Bore 5" OK

Bent 15 - Pd
**Timber Trestles**

**E&N Railway**

**SECTION:** Victoria to Nanaimo

<table>
<thead>
<tr>
<th>MILE POST #</th>
<th>125.5</th>
<th><strong>(Timber Superstructure)</strong></th>
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<tbody>
<tr>
<td>CROSSEING:</td>
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<tr>
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<td>11/01/13</td>
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<tr>
<td>LOCATION:</td>
<td>Table River</td>
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<tr>
<td>INSPECTORS:</td>
<td>G.W. / B.A.</td>
<td></td>
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<tr>
<td>NO. OF SPANS:</td>
<td></td>
<td></td>
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<tr>
<td>NO. OF TRACKS:</td>
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<tr>
<td>STREAM:</td>
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<tr>
<td>STREAM DEPTH:</td>
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<td></td>
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<tr>
<td>FLOW DIRECTION:</td>
<td>Open / Ballast</td>
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<tr>
<td>DECK TYPE:</td>
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<td></td>
</tr>
<tr>
<td>WALKWAY: (Yes/No - E/W side)</td>
<td>Yes/No</td>
<td></td>
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<tr>
<td>HANDRAILS: (Yes/No - E/W side)</td>
<td>Yes/No</td>
<td></td>
</tr>
<tr>
<td>SPAN TYPE:</td>
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</tr>
<tr>
<td>HEIGHT:</td>
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<td>SPAN LENGTH(S):</td>
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<tr>
<td>NOTES</td>
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</table>

**Inspection Findings:**

**END BENT NOTES**

Type of End Bent Construction = 
1. # of piles =
2. Pile diameter =
3. Pile cap size = ___ deep x ___ wide

South End (Bent 1):
1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =

**North End (Bent TBD):** Bent 24
1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =

**INTERMEDIATE BENT NOTES**

Use timber schematic to mark up section loss in individual piles.
1. # of piles =
2. Pile diameter =
3. Pile cap size = ___ deep x ___ wide
4. Bents plumb =
5. Signs of pumping piles =
6. Signs of scour/erosion =
7. Posted piles =

**GENERAL:**

- Exterior checks on many piles
- Streakers in and condition

*This Inspection was started by P.W. [AL]*

All that is covered here is the Timber Superstructure from Bent 10 to the North.

**Method of Superstructure Check:**

- **Hammer Sound Pike 1** *(Exposed to Worst Weather)*
- Enter Span W Snajper 2F Stiegers 1 or 5 Sound Decay
- **Sound Stieger 1**

+ Interior Posts Inaccessible

**Piles:**

- **B13,P1 = Heavy Decay @ Base of 1st Story from Top: 1 1/8" Sull in Place (Marked W X)**
- **B14, P4 = Top of Post Poorly Cut => Gap in Brk Between Cap & Post (Typical Throughout)**
- **B23, P2 = Intermediate Cap Dapped Slightly For Post**
- **B23, P3 = Routed on Intermediate Cap**
- **B24, P1 = Pike Twisted (End Bent)**

**Miscellaneous:**

- **B23 = Fractured X-Brace One Level Down from Top (X-Brace from 23 => 24)** *(Dale Pinto)*
- **B23 = X-Brace Spent on East Side One Story Down from Top*
<table>
<thead>
<tr>
<th>MILE 125.5</th>
<th>NOV 17/81</th>
<th>3</th>
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<tbody>
<tr>
<td>LOAD TEST</td>
<td>BT DBH</td>
<td>JJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BR</td>
</tr>
<tr>
<td>2-GP @ 15 MPH</td>
<td>Run #1</td>
<td></td>
</tr>
<tr>
<td>NORTH - WALKING - STOPP</td>
<td>OBSEVERE TIMBER TRESTLE</td>
<td></td>
</tr>
<tr>
<td>CENTRE OF DECK/DOSS</td>
<td>WEST SIDE - DBH, JJ, BR</td>
<td></td>
</tr>
<tr>
<td>SOUTH - 15 MPH</td>
<td>Run #2</td>
<td></td>
</tr>
<tr>
<td>NORTH - 3 MPH</td>
<td>OBSEVERE TIMBER TRESTLE</td>
<td></td>
</tr>
<tr>
<td>SOUTH - 15 MPH</td>
<td>EAST SIDE - DBH, JJ, BR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NO SIGNIFICANT REFLECTION</td>
<td></td>
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<tr>
<td></td>
<td>NOTED IN TIMBER</td>
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</tr>
<tr>
<td>Run #3</td>
<td>OBSEVERE DECID TRESTLE</td>
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<tr>
<td>APPROACHES FROM DECK</td>
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<tr>
<td>LEVEL</td>
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<tr>
<td>DBH - EAST REFUGE - SOUTH</td>
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<tr>
<td>END D.T</td>
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<td>BR - WEST REFUGE - NORTH</td>
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<td>END D.T</td>
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<tr>
<td>S.S - WEST REFUGE - BENT</td>
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<tr>
<td>a BENT 12</td>
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</tbody>
</table>
MILE 125.5

LOAD TEST

RUN 1, 2, 3

SS - VISIBLE - TIMBER
STRINGER DEF-L-N

DBH - VISIBLE - TIMBER
STRINGER Δ - (23-24)
- DECIC TRUSS STRINGER
- STIFFER THAN
- TIMBER

BR - VISIBLE TIE Δ
DUE TO GAPS/SHIMMING
MILE 125.5 - TSABLE  NOV/11

TIMBER TRESTLE  DBN 0
  SN

1. INSPECTED 12 NORTH BENTS
   FROM SNOOPER - WEST SIDE - TOP STOREY ONLY.

2. MOSTLY VISUAL
   SOUND EXTERIOR POST STRINGERS - VISUAL ONLY
   EXCEPT SOUNDED A FEW ON WEST FACE.

3. VISUAL OR EAST FACE
   OF 12 NORTH BENTS
   TOP STOREY ONLY.

   POST 13-1 - BOTTOM OF 1ST STOREY - DRILLED
   - 1\%" SHELL, ROT
   - 1\%8" SHELL, ROT

   STRINGER 13-1 - DRILLED - SOUND.

---

MILE 125.5  NOV/11

WEST TRUSS

DIAGONALS - WEST TRUSS

<table>
<thead>
<tr>
<th>#1</th>
<th>#2</th>
<th>#3</th>
<th>#4</th>
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<tbody>
<tr>
<td>U0-L1</td>
<td>24</td>
<td>20</td>
<td>24</td>
</tr>
<tr>
<td>U1-L2</td>
<td>31</td>
<td>29</td>
<td>X</td>
</tr>
<tr>
<td>U2-L3</td>
<td>22</td>
<td>25</td>
<td>X</td>
</tr>
<tr>
<td>U3-L4</td>
<td>25</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>COUNTER</td>
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<tr>
<td>U3-L2</td>
<td>26</td>
<td>X</td>
<td>X</td>
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<tr>
<td>U4-L5</td>
<td>TIGHT</td>
<td>SLIGHTLY</td>
<td>X</td>
</tr>
<tr>
<td>US-L4</td>
<td>TIGHT SLIGHTLY</td>
<td>LOOSE</td>
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</tbody>
</table>

DIAGONAL

<p>| U6-L5 | 28 | 29 | X  | X  |
| U7-L6 | TIGHT | 33 | X  |    |
| U8-L7 | 28 | 26 | X  | X  |
| U9-L8 | 25 | 27 | 29 | 27 |</p>
<table>
<thead>
<tr>
<th>MILE</th>
<th>125.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>O</td>
</tr>
<tr>
<td>DIAGONAL - EAST TRUSS</td>
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</tr>
<tr>
<td>1 19 25 19 19 16 11</td>
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<tr>
<td>4 12 2 1 2</td>
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<td>88 38 27 10</td>
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Note: Eyebars numbered from left to right.
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<tr>
<td>10-L3</td>
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<td>10</td>
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<tr>
<td>10-L4</td>
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<tr>
<td>10-L8</td>
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</table>

**NOTE**

1) CYL. 1/5 SEC.

2) EYEBARS ARE NUMBERED FROM LEFT TO RIGHT LOOKING UP MILEAGE.
<table>
<thead>
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<td>COUNTERS</td>
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<tr>
<td>#1</td>
<td>#2</td>
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<tr>
<td>U4-L3</td>
<td>LOOSE</td>
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<tr>
<td>U5-L4</td>
<td>TIGHT</td>
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<tr>
<td>U5-L6</td>
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<td>U6-L7</td>
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### TPG SPANS

**E&N Railway**  
SECTION: Victoria to Nanaimo

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<td>RELATIVE MILE</td>
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<td>INPECTORS</td>
<td>April/May</td>
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<tr>
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<tr>
<td>NO. OF TRACKS</td>
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<td>DECK TYPE</td>
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<td>RATING</td>
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<tr>
<td>WALKWAY: Yes/No</td>
<td>E/W side</td>
</tr>
<tr>
<td>HANDRAILS: Yes/No</td>
<td>E/W side</td>
</tr>
</tbody>
</table>

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### Inspection Findings:

#### ABUTMENT NOTES

- Type of Abutment Construction = Cane

**South:**
1. Evidence of scour / undermining = N/A
2. Drift accumulated = N/A
3. Ballast/debris on bearings = N/A
4. Vegetation on face/seat = N/A
5. Spalling = N/A
6. Cracking under bearings = N/A
7. Cracking elsewhere = N/A
8. Rotation = N/A
9. Exposed reinforcing steel = N/A
10. Efflorescence = N/A
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**

---

**North:**
1. Evidence of scour / undermining = N/A
2. Drift accumulated = N/A
3. Ballast/debris on bearings = N/A
4. Vegetation on face/seat = N/A
5. Spalling = N/A
6. Cracking under bearings = N/A
7. Cracking elsewhere = N/A
8. Rotation = N/A
9. Exposed reinforcing steel = N/A
10. Efflorescence = N/A
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) =

**Other Notes:**
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction =

Type of Backwall Construction =

South Abutment:
1. Undermining = No
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

North Abutment:
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =

Other Notes:

DECK NOTES

Ballast / open deck =

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of girders) =

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth = 20" to top of tie
2. Ballast retainer size =
3. Floor plate / floor-timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 9" wide x 6" deep x 28" long with bearing-bearing length =
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties = Yes
5. Overall tie condition =
6. Approach ties swinging =
7. Approx. number of bad ties =

Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) =
4. Is line of track good =
5. Approaches low =

Other Notes:
Walkways/Refuge Bay Notes:
1. Walkways on bridge = 
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =

Other Notes:

SPAN NOTES
Girder spacing =
Girder depth =
Floorbeam spacing =
Floorbeam depth =
Stringer spacing =
Stringer depth =
General steel condition = As new

Bearing Notes:
1. Type of bearings =
2. Full bearing =
3. Bearing corrosion =
4. Anchor bolt condition =
5. Expansion bearings functioning properly or frozen =
6. Bearings punching into abutment seat =

Other Notes:

Girder Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral-bracing-system-condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Floorbeam Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:
Stringer Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Knee Brace Notes:
1. Corrosion =
2. Cracks in connection angles =
3. Loose/missing rivets =
4. Accident damage =

Other Notes:

History:
- Original construction year =
- Summary of bridge updates =

Recommended Work:

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BRIDGE SKETCHES (AS REQUIRED)
**Timber Trestles**

**E&N Railway**

**SECTION:** Victoria to Nanaimo

<table>
<thead>
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<th>127.50</th>
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</thead>
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**CROSSING:**

**INSPECTION DATE:** 10/25/11

**LOCATION:**

**INSPECTORS:** Arndt

**NO. OF SPANS:** 1

**NO. OF TRACKS:** 1

<table>
<thead>
<tr>
<th>STREAM:</th>
<th>SPAN TYPE:</th>
<th>TIMBER SLINGE</th>
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<tbody>
<tr>
<td>STREAM DEPTH:</td>
<td>HEIGHT:</td>
<td>13'</td>
</tr>
<tr>
<td>FLOW DIRECTION:</td>
<td>LENGTH:</td>
<td>21'</td>
</tr>
<tr>
<td>DECK TYPE: Open Ballast</td>
<td>RATING:</td>
<td>SPAN LENGTH(S):</td>
</tr>
</tbody>
</table>

**WALKWAY:** (Yes/No – EW side)

**HANDBAILS:** (Yes/No – EW side)

---

**Inspection Findings:**

**END BENT NOTES**

Type of End Bent Construction =

1. # of piles =
2. Pile diameter =
3. Pile cap size = ____ deep x ____ wide

**South End (Bent 1):**

1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =

**Other Notes:**

[Handwritten notes: Concrete upon under slabs. 6' drop-off from slab... crumbling to watch.]

**North End (Bent TBD):**

1. Drift accumulated =
2. Bent rotation =
3. Pile cap general condition =
4. Pile cap bulging/splitting =
5. Pile cap has excessive internal/external decay =
6. Pile general condition =
7. Piles have excessive internal/external decay =
8. Piles bulging/splitting =

**Other Notes:**

**INTERMEDIATE BENT NOTES**

Use timber schematic to mark up section loss in individual piles.

1. # of piles =
2. Pile diameter =
3. Pile cap size = ____ deep x ____ wide
4. Bents plumb =
5. Signs of pumping piles =
6. Signs of scour/erosion =
7. Posted piles =
BACKWALL/WINGWALL NOTES
Type of Wingwall Construction =

Type of Backwall Construction =

South End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

North End:
1. Undermining =
2. Cracks =
3. Leaning =
Other Notes:

DECK NOTES
Ballast / open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve =
2. Max. superelevation at midspan =
3. Chord offset at midspan (distance from center of track to center of stringers) = 0
Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =
5. Floor timber size =
Other Notes:

Tie Notes:
1. Tie size = #6 wide x 6 deep x 12 long
2. Tie spacing =
3. Ties dapped for superelevation =
4. Rail plates cutting into ties =
5. Overall tie condition = Good
6. Approach ties swinging =
7. Approx. number of bad ties =
8. Method of tie connection = Spike
Other Notes:

Track Notes:
1. Rail section weight =
2. CWR or jointed rail =
3. Inner guardrail size/weight (if applicable) = N/A
4. Is line of track good = Yes
5. Approaches low =
Other Notes
Walkways/Refuge Bay Notes:
1. Walkways on bridge =
2. Walkway condition =
3. Refuge bays on bridge =
4. Refuge bay condition =
Other Notes:

SPAN NOTES
1. # of stringers =
2. Stringer size = 22" deep x 12" wide
3. Out-of-under exterior stringers =
4. General stringer condition =
Use timber span schematic for marking up section loss in individual stringers where required
5. Ends of stringers crushing =
6. Horizontal shear cracks in stringers =
7. Fractured stringers =
8. Decay/insect damage =
Other Notes:

EXTRA TIMBER MEMBER NOTES (WHERE IN PLACE)
1. Longitudinal bracing =
2. Longitudinal bracing size =
3. Longitudinal bracing condition =
4. Sway bracing =
5. Sway bracing size =
6. Sway bracing condition =
7. Sash bracing =
8. Sash bracing size =
9. Sash bracing condition =
10. Mud sills @ bents =
11. Mud sill condition =
Other Notes:

History:

• Original construction year =
• Summary of bridge updates =

Recommended Work:

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<tr>
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</table>
**DPG SPANS: CONC. PIERS**

MILE POST: 31.1

**E&N Railway**
SECTION: Victoria to Nanaimo
Nanaimo to Courtenay

**CROSSING:** Washcr Creek  
**INSPECTION DATE:** Nov 2  
**LOCATION:** Union Bay  
**INSPECTORS:** SDH/DBH  
**NO. OF SPANS:** 3  
**NO. OF TRACKS:** 1

**STREAM:** Yks  
**STREAM DEPTH:** 3'  
**FLOW DIRECTION:** East  
**FLOW TYPE:** Open/Ballast  
**WALKWAY:** (Yes/No - E/W side)  
**HANDBRAILS:** (Yes/No - E/W side)

**SPAN TYPE:** DPG  
**HEIGHT:** See C.A.  
**LENGTH:** See C.A.  
**RATING:** T.S.D

**SPAN LENGTH(S):** 30', 51', 30'

**Inspection Findings:**

**ABUTMENT NOTES**
Type of Abutment Construction = Concrete Spill - Turn Abutment

**South:**
1. Evidence of scour / undermining = No (Away From Creek/Spill Turn)
2. Drift accumulated =
3. Ballast/debris on bearings =
4. Vegetation on face/seat =
5. Spalling = Minor Surface
6. Cracking under bearings = No
7. Cracking elsewhere = No
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence =
11. Missing or fractured stones (masonry abutment) = NA
12. Missing mortar from joints (masonry abutment) = NA
13. Evidence of stone movement (masonry abutment) = NA

**Other Notes:**

**North:**
1. Evidence of scour / undermining = No (Water Between Piers)
2. Drift accumulated =
3. Ballast/debris on bearings = Minimal
4. Vegetation on face/seat = Yes - 5 Pounds Per Foot
5. Spalling = Major @ Causes
6. Cracking under bearings =
7. Cracking elsewhere = Very Minor
8. Rotation = No
9. Exposed reinforcing steel = No
10. Efflorescence = No
11. Missing or fractured stones (masonry abutment) = NA
12. Missing mortar from joints (masonry abutment) = NA
13. Evidence of stone movement (masonry abutment) = NA

**Other Notes:**
* Photos under Abutment of Spill Turn Void; Sides Likely Deeper, But Could*  
* Fill Void*
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = Concrete (90°)

Type of Backwall Construction = Concrete

South Abutment:
1. Undermining = No
2. Cracks = Minor
3. Spalling = Minor
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

North Abutment:
1. Undermining = No
2. Cracks = Minor
3. Spalling = Minor
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

CONCRETE PIER NOTES

Pier 1:
Type of Construction = Concrete on Foundation (Possibly on Piles)
1. Undermining = No
2. Cracks = Minor
3. Spalling = Minor on West Face
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes:

Pier 2:
Type of Construction = Concrete on Foundation (Possibly on Piles)
1. Undermining = No; Sand Erosion Eroded E35 at upstream end
2. Cracks = Minor
3. Spalling = Top of Foundation on West Side, Where Creek Flows
4. Leaning = No
5. Exposed reinforcing steel = No
Other Notes: Creek flows right at Pier 2; 15 ft. Wide Found Under Pier, but water for Scour (Photos)

Pier 3:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:

Pier 4:
Type of Construction =
1. Undermining =
2. Cracks =
3. Spalling =
4. Leaning =
5. Exposed reinforcing steel =
Other Notes:
DECK NOTES
Ballast / open deck = Open

Track Alignment Notes:
1. Bridge on tangent or curve = W
2. Max. superelevation at midspan = —
3. Chord offset at midspan (distance from center of track to center of girders) = —

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 16" wide x 16" deep x 13" long
2. Tie spacing = TS
3. Ties dapped for superelevation = CD
4. Rail plates cutting into ties = CD
5. Overall tie condition = FPR
6. Approach ties swinging = SA = CD (REAL SPANS FROM APPROX. TIE TO BRIDGE)
7. Approx. number of bad ties = AD

Other Notes: GENERAL TIE GIRDERS SPILES MISSING

Track Notes:
1. Rail section weight = 95.5 k
2. CWR or jointed rail = JS JPN
3. Inner guardrail size/weight (if applicable) = JS W
4. Is line of track good = YPS
5. Approaches low = CL

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge = CD
2. Walkway condition = —
3. Refuge bays on bridge = CD
4. Refuge bay condition = —

Other Notes:

SPAN NOTES
Girder spacing = L
Girder depth = 36" (13"
General steel condition = N

Span 1 Notes:
1. Web corrosion = N (SURFACE OR INSIDE FLAWS)
2. Bottom flange plate corrosion = W (SURFACES, INSIDE FLAWS)
3. Bottom flange angle corrosion = S (SURFACE EXPOSED OR INSIDE FLAWS)
4. Top flange plate corrosion = M (SURFACES, INSIDE FLAWS)
5. Lateral bracing system condition = F (FRAMES OR BAY ORNAMENT)
6. Bearing stiffener condition = N (SURFACES, INSIDE FLAWS)
7. # of cross frames and spacing = 2, INTERIOR, 2 END
   9.5" SPACING
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed =  

Other Notes: 5/16 IN BEARER ANGLE BOLTS HAVE SURFACE CORROSION

Span 2 Notes:
1. Web corrosion = PUNCH FLANGING, MINOR SURFACE CORROSION
2. Bottom flange plate corrosion = FAUCET BETWEEN Curv. P1.1 & 2 END OF P1.2 (PHOTO). All 4 ENDS
3. Bottom flange angle corrosion = FOUR PLACES ACUMULATED INCREASED CORROSION (WORSE THAN SP. 1-5)
4. Top flange plate corrosion = 
5. Lateral bracing system condition = FAIR
6. Bearing stiffener condition = OK; SEE COMMENTS ON OTHER STEIFFENERS
7. # of cross frames and spacing = SEE PLANS
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed =  

Other Notes: Extra Angle added top/bottom on outside @ midspan = 3' long.

Span 3 Notes:
1. Web corrosion = SURFACE ONLY +\| FLANGING
2. Bottom flange plate corrosion = NULL
3. Bottom flange angle corrosion = HOSS ON BOTTOM FLANGE; SEE CORROSION SKETCH
4. Top flange plate corrosion = WEST CORNER (South Br), Top Plate Bent Down Above. Br., End Plate Bent & Tip (Pasta)
5. Lateral bracing system condition = FAIR
6. Bearing stiffener condition =  
7. # of cross frames and spacing = SEE PLANS
8. Loose rivets/bolts = 
9. Welds on tension flange = 
10. Any cracks observed =  

Other Notes: 5/16 IN BEARER ANGLE BOLTS HAVE SURFACE CORROSION

Span 4 Notes:
1. Web corrosion =  
2. Bottom flange plate corrosion =  
3. Bottom flange angle corrosion =  
4. Top flange plate corrosion =  
5. Lateral bracing system condition =  
6. Bearing stiffener condition =  
7. # of cross frames and spacing =  
8. Loose rivets/bolts =  
9. Welds on tension flange = 
10. Any cracks observed =  

Other Notes:

Span 5 Notes:
1. Web corrosion =  
2. Bottom flange plate corrosion =  
3. Bottom flange angle corrosion =  
4. Top flange plate corrosion =  
5. Lateral bracing system condition =  
6. Bearing stiffener condition =  
7. # of cross frames and spacing =  
8. Loose rivets/bolts =  
9. Welds on tension flange = 
10. Any cracks observed =  

Other Notes:
History:

- Original construction year = 1914 (center), 1926 (end spans)
- Summary of bridge updates = Some panels replaced

Recommended Work:

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BRIDGE SKETCHES (AS REQUIRED) [MUST COME BACK IN PHASE 5]

**SPAN 1 MEASUREMENTS (Also span 2)**

- 15.71/12
- 15.78
- 6.43/2
- 15.4/6
- 15.71/12

**SPAN 2 MEASUREMENTS**

- 8-B ANGLES = 36°
- 6.3/2
- 8-B ANGLES = 46°
MILE 131.1 - NOV 2

PIER #2 - (NORTH)
SOUTH FACE - CREEK
FLOWING AGAINST
EROSION OF EMBANKMENT
(SAND) @ UPSTREAM FACE
APPROACH
PROBED TO CREEK RED @
UPSTREAM & DOWNSTREAM
ENDS OF PIER FTG -
NO UNDERMINING DETECTED
DEPTH WATER TO FIRM
RED APPROX 3'
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<th>SPAN #1</th>
<th>SOUTH - EAST BEARING</th>
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<td>ANCHOR BOLT - NORTH - WEST</td>
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<td>CORROSION - SURFACE</td>
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<tr>
<td>B SPAN #2</td>
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<td>NORTH - EAST BEARING</td>
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<th>PIER # 1</th>
<th>UNDERMINING - NO</th>
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<tr>
<td></td>
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<td>CRACKS - NO</td>
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<td>SPALL - WEST FACE MINOR</td>
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<td>SURFACE SPALL &amp; EAST FACE</td>
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<tr>
<td></td>
<td></td>
<td>LEAVING - NO</td>
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<td></td>
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<td>REINF - NO</td>
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</table>
MILE 131.1

TIES
10x16 x 1/3 0/16 0/1600

GIRDER CENTRES 10'

TIES # GOOD - FAIR

2 TIES REPLACE
**DPG SPANS: STEEL BENTS**

E&N Railway  
SECTION: Victoria to Nanaimo

**MILE POST #: 135**

**CROSSING:** TREAT RIVER  
**STREAM:** RIVER  
**SPAN TYPE:** DPG

**INSPECTION DATE:** N/A  
**STREAM DEPTH:** 5' (max)  
**HEIGHT:** SEE G.A.

**LOCATION:** PROTON  
**FLOW DIRECTION:** EAST  
**LENGTH:**

**INSPECTORS:** SCD/DBN  
**DECK TYPE:** Open/Ballast  
**RATING:** TBD

**NO. OF SPANS:** 5  
**WALKWAY:** (Yes/No - E/W side)  
**SPAN LENGTH(S):** 45' (2), 35' (2), 45'

**NO. OF TRACKS:** 1  
**HANDRAILS:** (Yes/No - E/W side)

---

**Inspection Findings:**

**ABUTMENT NOTES**

Type of Abutment Construction = Concrete Spill-Turn Abutments w/Langwiths

**South:** (1939)
1. Evidence of scour / undermining = N/A, Spill-Turn
2. Drift accumulated = N/A
3. Ballast/debris on bearings = N/A
4. Vegetation on face/seat = N/A
5. Spalling = N/A
6. Cracking under bearings = N/A
7. Cracking elsewhere = N/A
8. Rotation = N/A
9. Exposed reinforcing steel = N/A
10. Efflorescence = N/A
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) = N/A

**Other Notes:** Surface Corrosion of Beams, Steel

**North:**
1. Evidence of scour / undermining = N/A, Spill-Turn
2. Drift accumulated = N/A, Spill-Turn
3. Ballast/debris on bearings = N/A
4. Vegetation on face/seat = N/A
5. Spalling = N/A
6. Cracking under bearings = N/A
7. Cracking elsewhere = N/A
8. Rotation = N/A
9. Exposed reinforcing steel = N/A
10. Efflorescence = N/A
11. Missing or fractured stones (masonry abutment) = N/A
12. Missing mortar from joints (masonry abutment) = N/A
13. Evidence of stone movement (masonry abutment) = N/A

**Other Notes:** *New Beams*, Surface Corrosion on Sole Plate  
* New Beams Singular
BACKWALL/WINGWALL NOTES

Type of Wingwall Construction = \(90^\circ\) Concrete (All Part of Abutment)

Type of Backwall Construction = Concrete

South Abutment:
1. Undermining = No
2. Cracks = Minor
3. Spalling = Minor
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:
- SE/SW Timber Wall Extends Undermining Slightly (Part)

North Abutment:
1. Undermining = No
2. Cracks = Minor
3. Spalling = Minor
4. Leaning = No
5. Exposed reinforcing steel = No

Other Notes:
- NW Timber Extension Undermining Slightly

STEEL TOWER BENT NOTES

Tower 1:
1. Single or double bent = Double
2. Tower general condition = Fair
3. Misc. Notes (braces, plumbness, etc.): ___

Tower 1. Base of Legs:
1. SW Base Notes = Minor Concrete Stains
   - 10 Square Feet Under Concrete Pedestal
2. SE Base Notes = Minor Corrosion on Outstanding Leg @ Base ("0.2 x 0.2 Max."")
   - PacRust = Minor, Rust Attenuation to SW Base, May Have Slight Undermining
3. NW Base Notes (if double bent) = No Comments
4. NE Base Notes (if double bent) = No Comments

Tower 1. Top of Legs:
1. SW Top Notes = Similar To SE
2. SE Top Notes = Heavy Rust on Top of Column From Build Up Of Moss, Flakes, Etc.
   - Anchor Bolts Corroded, Leg Itself Ok
3. NW Top Notes (if double bent) = Minor Rust Build Up @ Anchor Bolts, Debris on Column Plate
   - Anchor, Partial Below Box Plate above Column Top Plate
4. NE Top Notes (if double bent) = Minor, Partial To NW

Tower 2:
1. Single or double bent = Double
2. Tower general condition = Fair
3. Misc. Notes (braces, plumbness, etc.):
   - South Span C. Base 3/8" PacRust w/ Knowledge (Local) in Top Flange
   - 1/8" Pitting of Web Under Flange Paint

Tower 2. Base of Legs:
1. SW Base Notes = No Rust Build Up @ Anchor Bolts, Debris on Column Plate
   - Minor Pitting, Below Box Plate Above Column Top Plate
2. SE Base Notes = SAME AS SW

3. NW Base Notes (if double bent) = SUPPORTS BRACKET FOR SMALLER SPAN 5; BRACKET ON 2 x 4 x 4 x 4" X 1-3/4" SPANS 4 1/2, FIRST 4" FROM BRS. (MISSES)

4. NE Base Notes (if double bent) = SEE DRAWING

Tower 2, Top of Legs:
1. SW Top Notes = YOUNG, SMALL, BURST & LEAK, JORT @ LEFT Joist, 1" OF WATER OVER SQUARE BASE
   * 1/2" CORROSION OF BRS. & SOLE PLATE, RUSTY DEBRIS ON FOOTING
2. SE Top Notes = 3" DEEP X 2"-wide CRACK IN CONCRETE PEDESTAL
   * MISS-NEGLIGENT GENERAL
3. NW Top Notes (if double bent) = CONCRETE DETECTING ON SOUTH FACE
   * TIMBER RET. WALL TIGHT (CALLIPSING 3" HIGH
4. NE Top Notes (if double bent) =

Tower 3:
1. Single or double bent =
2. Tower general condition =
3. Misc. Notes (braces, plumbness, etc.):
2. SE Top Notes =

3. NW Top Notes (if double bent) =

4. NE Top Notes (if double bent) =

DECK NOTES
Ballast / open deck = OPEN

Track Alignment Notes:
1. Bridge on tangent or curve = TANGENT
2. Max. superelevation at midspan = 0°
3. Chord offset at midspan (distance from center of track to center of girders) = 0°

Other Notes:

Ballast Deck Notes (if applicable):
1. Ballast depth =
2. Ballast retainer size =
3. Floor plate / floor timber condition =
4. Deck width =

Other Notes:

Tie Notes:
1. Tie size = 10" wide x 1" deep x 13" long
2. Tie spacing =
3. Ties dapped for superelevation = —
4. Rail plates cutting into ties = 10
5. Overall tie condition = FAIR
6. Approach ties swinging = 10
7. Approx. number of bad ties = 10

Other Notes:

Track Notes:
1. Rail section weight = 95 k
2. CWR or jointed rail = JOINED
3. Inner guardrail size/weight (if applicable) = JOINED 95 k
4. Is line of track good = YES
5. Approaches low = 10

Other Notes:

Walkways/Refuge Bay Notes:
1. Walkways on bridge = 10
2. Walkway condition = —
3. Refuge bays on bridge = WEST SIDE
4. Refuge bay condition = BROKEN FLOOR TIMBER

Other Notes:
SPAN NOTES
Girder spacing = \( \text{SEE PHASE 5 MEASUREMENTS} \)
Girder depth =
General steel condition = FAIR

Span 1 Notes: (South End Expansion)
1. Web corrosion = MAXIMAL, MOSTLY FLAKING
2. Bottom flange plate corrosion = MINOR
3. Bottom flange angle corrosion = LARGE AMOUNT OF MOLD ON FLANGE (NOTES)
4. Top flange plate corrosion = MINOR
5. Lateral bracing system condition = FAIR, DEBRIS ON CONNECTIONS
6. Bearing stiffener condition = GOOD, APPEAR NEWER THAN MOST GIRDER ELEMENTS
7. # of cross frames and spacing = —
8. Loose rivets/bolts = \( \text{NO} \)
9. Welds on tension flange = \( \text{NO} \)
10. Any cracks observed = \( \text{NO} \)

Other Notes: * MOSS ON BOTTOM OF TOP SHELF ANGLE (PHOTO) * INTERIOR OF SPAN HAS LESS MOSS THAN EXTERIOR * LOTS OF DEBRIS ON BOLTS

Span 2 Notes:
1. Web corrosion = MUST BE PLAIN, NO REAL WEB CORROSION
2. Bottom flange plate corrosion = MINOR
3. Bottom flange angle corrosion = MOSS ACCUMULATING \( \Rightarrow \)
4. Top flange plate corrosion = MINOR
5. Lateral bracing system condition = FAIR, MINOR CORROSION
6. Bearing stiffener condition = GOOD
7. # of cross frames and spacing = —
8. Loose rivets/bolts = \( \text{NO} \)
9. Welds on tension flange = \( \text{NO} \)
10. Any cracks observed = \( \text{NO} \)

Other Notes:

Span 3 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes: * TOP FLANGE ANGLE BENDING DOWN ON OUTSIDE ABOVE BRK. STEEL, EAST GIRDER (PHOTO) * SEE SPAN 1

Comments

* LESS FLAKING, MOSS GROWTH THAN SP. 2
* CORROSION WORSE @ BOTTOM CONNECTION PLATES (MINOR)

Span 4 Notes:
1. Web corrosion = MINIMAL
2. Bottom flange plate corrosion = MINOR
3. Bottom flange angle corrosion = \( \text{NO MOSS SPOTS (MINIMAL COMPARED TO JOWERS)} \) (WEST); \( \text{NO MOSS EAST} \)
4. Top flange plate corrosion = MINOR
5. Lateral bracing system condition = FAIR
6. Bearing stiffener condition = GOOD
7. # of cross frames and spacing = —
8. Loose rivets/bolts = \( \text{NO} \)
9. Welds on tension flange = \( \text{NO} \)
10. Any cracks observed = \( \text{NO} \)

Other Notes: WEST CORNER BETTER THAN EAST
Span 5 Notes: (SUTURE CORNER)
1. Web corrosion = MINOR
2. Bottom flange plate corrosion = MINOR
3. Bottom flange angle corrosion = 2x18 "FILM IN VERTICAL LEG, BOTH SIDES, INTERIOR
4. Top flange plate corrosion = MINOR
5. Lateral bracing system condition = FAIR
6. Bearing stiffener condition = FAIR
7. # of cross frames and spacing = 
8. Loose rivets/bolts = NA
9. Welds on tension flange = NA
10. Any cracks observed = NA

Other Notes: * RUSTY DEFECT IN EAST CORNER Top Shelf Angle 4th STIFFENER FROM SOUTH (Photo)

* EAST CORNER: WED MEND; 1/4 x 3" CORROSION ON TOP SURFACE OF BOTTOM ANGLE HORIZONTAL LEG

* BLOTS OF CORROSION INSIDE SPAN

Span 6 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

Span 7 Notes:
1. Web corrosion =
2. Bottom flange plate corrosion =
3. Bottom flange angle corrosion =
4. Top flange plate corrosion =
5. Lateral bracing system condition =
6. Bearing stiffener condition =
7. # of cross frames and spacing =
8. Loose rivets/bolts =
9. Welds on tension flange =
10. Any cracks observed =

Other Notes:

History:
- Original construction year =
- Summary of bridge updates = SEE PLANS

Recommended Work:

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>RECOMMENDED WORK</th>
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TOWER #1 SW FOOTING

CONCRETE - MINOR SPALLS - SOUND.

MILE 135.5
TRENT NOV 2/11

SE TOWER LEG

LACING - COVER PL

OUTSTANDING LEG - THICKNESS
- L6X4

PACK RUST - SEE PHOTO

ANCHOR BOLT
MILE 135.5

TOWER #1 - SW FOOTING

STREAM 3'-6" DEEP WATER

- 10'-0" SQ PIER

SLO DEEP WATER

NUDGERED

UNDERMINED DEPTH ??

4'-0" DEEP

SE FIG

MILE 135.5

NORTH ABUTMENT

- CONCRETE
- SPALLING - NO
- LEANING - NO
- UNDERMINING - NO
- CRACKING - NO
- REINF - NO

DEBRIS ON SEAT.
MILE 135.5

SPAN 5 - NW BEARING
- SURFACE CORROSION ON SOLE PL
- ANCHOR BOLT - GOOD
- CONCRETE SEAT - SOUND
- NO CRACKS

NE BEARING SIMILAR

SPAN 5 - NORTH END - GIRDER
- BOTTOM FLG - PLAN BRACE
- GUSSET - 1/16" CORROSION

BOTTOM FLG -

OUTSIDE FACE

1/8" 3/4" WIDE CORROSION
(BOTH FACES)

MILE 135.5

TOWER #2

SW FOOTING
- SPALLING / EROSION AT LIFT JOINT - MINOR

WATER

14.5' (ESTIMATE)

SW FOOTING

BEARING - NO detectable under-

LEAVING - NO

REINF - NO

MOSS & DEBRIS, TYPICAL ON FTG TOP & BEARING

BEARING & SOLE PL - 1/16" CORROSION
(1/8" RUST)
MILE 135.5
TOWER 2 - EAST RABE
- LACING TOP & BOTT
- C-BOTT FLG - LOCAL @ MIDSPAN
- BOTT FLG - 1/8" LOSS - LOCAL @ MIDS

NORTH STRUT
- 1/8" DEEP PITTNG
- 1/16" CORROSION

MILE 135.5
TOWER 2 - SOUTH STRUT
3/8" FLAKE PULL
1/8" PITTIN
KINIFE EDGE LOCAL
UNDERFLAKING
PAINT

SE FIG

TOWER 2 - SE FIG

3" DEEP V 2" WIDE CRACK - SHOWS WITH ROOT UNDER PLATE (REMOVED)
MILE 135.5

SOUTH ABUTMENT

SPILL THRU CONC

1927 - NO OR ACKING

NO LEAK
NO SPALL
NO REPAIR

REARING

SURFACE CORROSION

- ROLLER BEARING
- ANCHOR BOLTS

MILE 135.5

TOWER #2

N.W. FOOTING

CONC DETEGERATING ON SOUTH FACE

TIMBER WALL ROTTED AND COLLAPSING

5' HIGH