



Stantec Consulting Ltd.  
400, 10220 -103 Avenue NW  
Edmonton AB T5J 0K4  
Tel: (780) 917-7000  
Fax: (780) 917-7086

February 11, 2022  
File: 1135510101

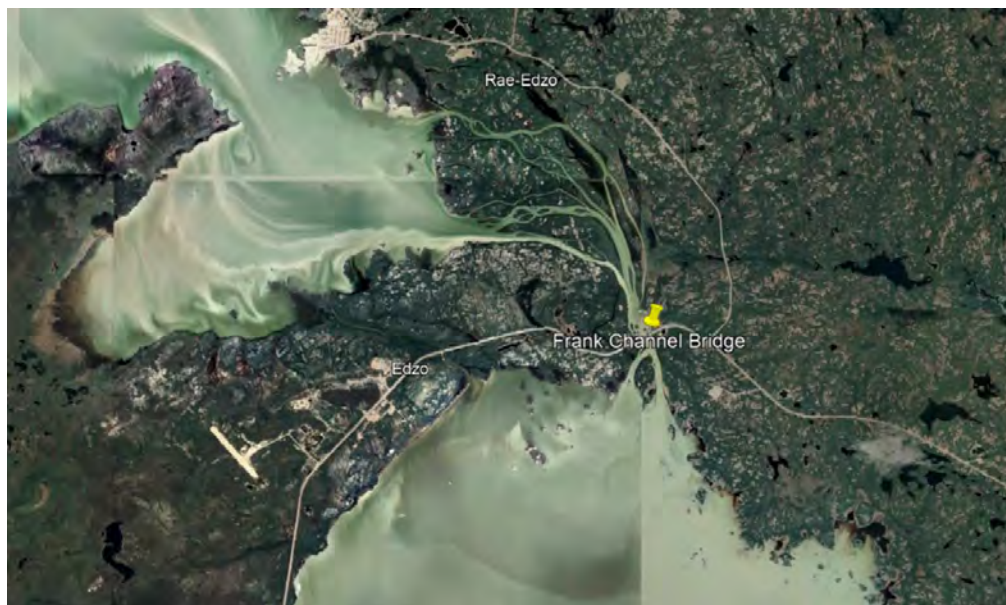
**Attention: Mr. Hayat Niazi, M.Eng., P.Eng., PMP**  
Project Manager, Structure Section-Bridges  
Transportation Division-Infrastructure  
Government of Northwest Territories  
5015 49 Street, NGB-2  
Yellowknife NT, X1A 2L9

Dear Mr. Hayat,

**Reference: 2021 Frank Channel Bridge Inspection Report**

## INTRODUCTION

The Construction of Frank Channel Bridge is located at km243.8 on Highway 3. The bridge was completed in 1960.



**Figure 1 Frank Channel Bridge Location From Google Map**

The bridge structure has two simply supported 260 ft (79.2 m) through truss spans and two simply supported 66 ft (20.2 m) steel girder spans. Each truss has ten bays. The flooring system consist of 8-inch-thick concrete slab supported by four equally spaced steel stringers placed in longitudinal direction and resting on steel floor beams. There are 11 transverse steel floor beams and forty (40) stringers in each truss span. Each end of the floor beams is connected with vertical and diagonal members of the truss and the bottom chords by rivets and bolts with gusset plates.



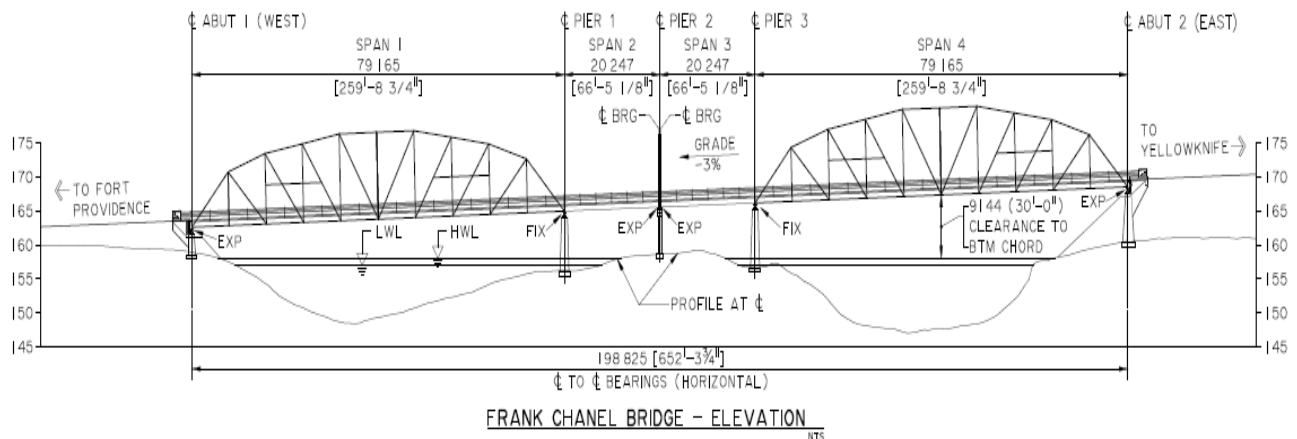
February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 2 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

Each girder span consists of four longitudinal steel girders supporting the deck. It presently has an 8-inch-thick concrete deck with a clear roadway of 7.32 m width for two traffic lanes and provide a 5.8 m vertical clearance.



**Figure 2 Elevation view of Existing Bridge**

The bridge configuration is straight and unskewed. The bridge has two concrete abutments and three piers supported on concrete spread footing dowelled to bedrock. Abutments and piers are supported on spread foundation over the bedrock.

All the existing expansion joints at both abutments and pier 2 are finger plate joints. Fixed joints at pier 1 and 3 are compressed sealed joints. At both abutments, the through truss span is free for expansion through rocker bearings and fixed in the longitudinal direction for translation at pier locations. The steel girder spans are fixed for translation at one end (pier 1 and 3) and free for expansion at pier 2.



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 3 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

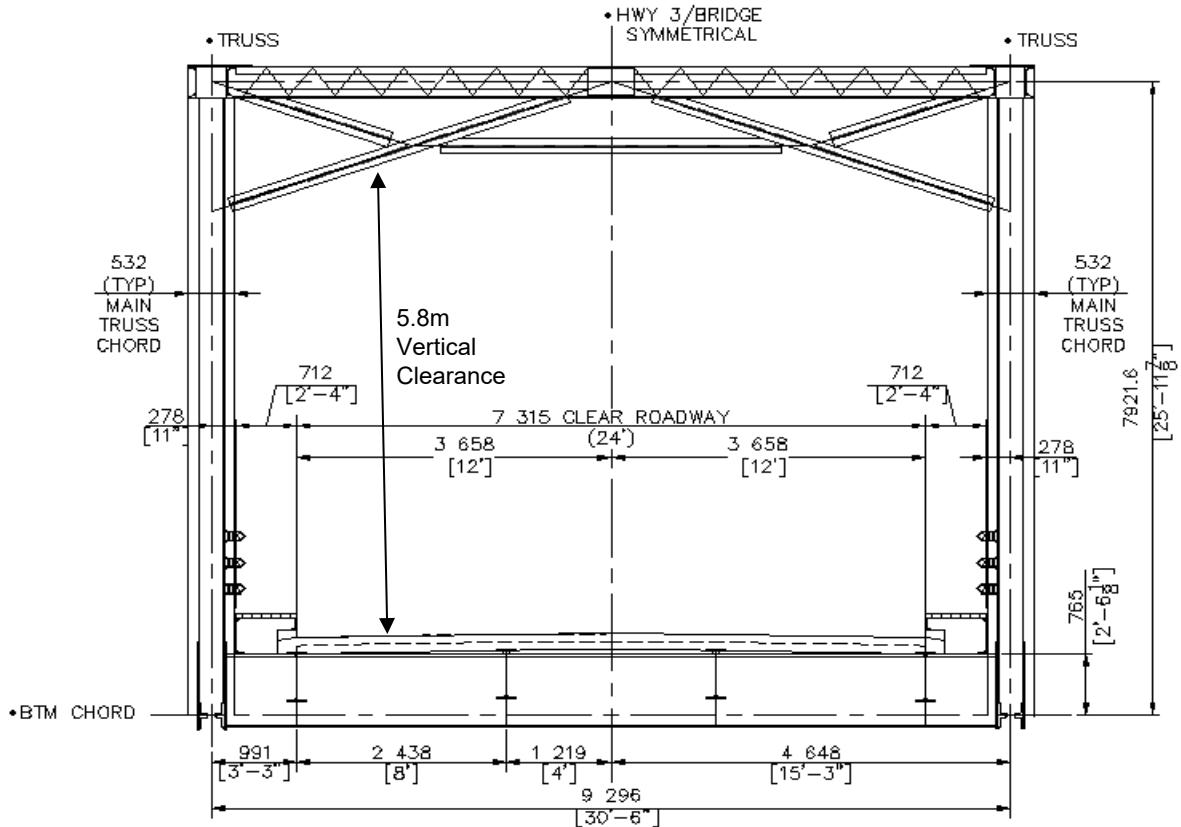


Figure 3 Truss Span (Span 1 and Span 4) Section

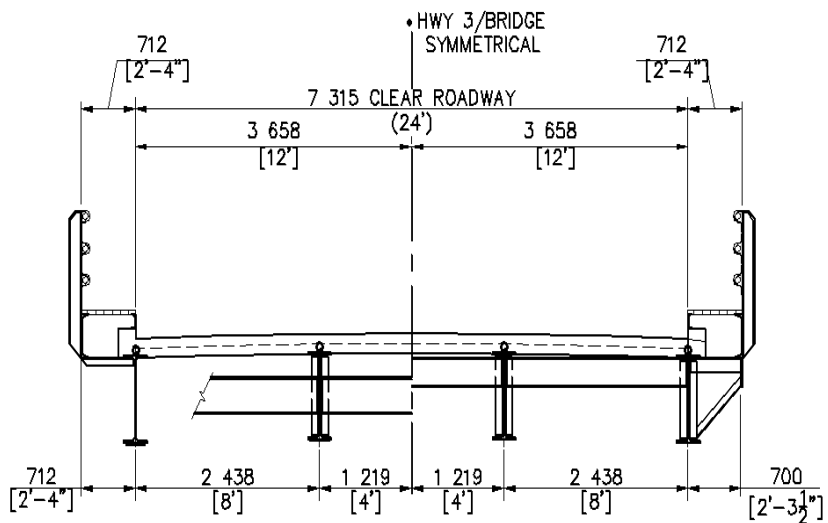


Figure 4 Girder Span (Span 2 and Span 3) Section



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 4 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

On July 24, 2021, six bridge inspectors from Stantec Consulting Ltd provided the visual inspection on the bridge by rope access.

Tlichio Investment Corporation & Group of Companies provided the traffic Control during the inspection. A safety boat was in place for emergency rescue if required. The bridge deck and bottom chords were cleaned by Tlichio prior to the inspection.

The inspection data and findings are input into the GNWT's Bridge Management System (BMS) Software, developed by Stantec Consulting Ltd.

## BRIDGE INSPECTION FINDINGS

Following observations were observed during inspection. The photos can be found in the Appendix A. The details and recommendations can be found in BMS report included in Appendix C.

### ***Approaches***

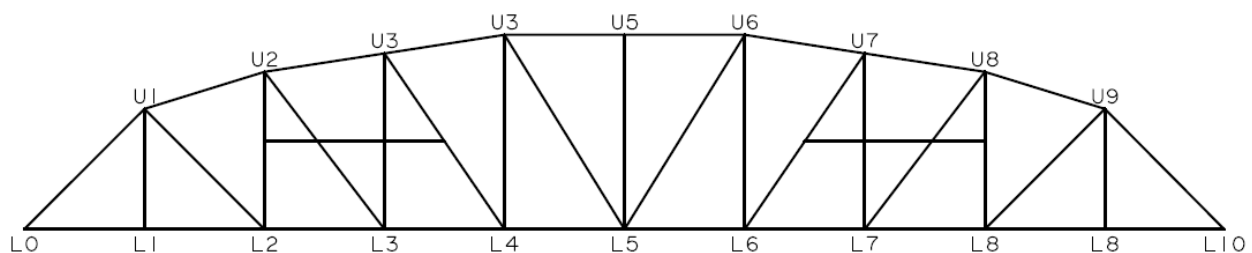
- Embankments are in stable condition
- Medium wheel truck rutting, edge crack, light flushing and ravelling throughout the wearing surface as well as light settlement at bridge ends.
- Approach guardrail and end treatment are in good condition.
- There is no connection between the approach rails and concrete parapet at all four corners.

### ***Abutment***

- Light scaling throughout abutment walls and ballast walls.
- Medium to wide vertical cracks and small spall area on the wingwalls and concrete parapets.
- Approx. 100mm headslope settlement observed on Abutment 1 visible at Abutment 1,
- Narrow to Medium crack with efflorescence at the underside of roof slab on Abutment 2.

### ***Truss***

The labels of the main truss members are marked in Figure 5.



**Figure 5 Main Truss Member Labels (looking from South)**

- Bottom Chord: Light surface corrosion through with paint peeling at most locations. No noticeable section loss (>5%) was noticed.
- Truss Top chord: Top Chord are general in excellent condition. The splash zone at end are rusted with coating peeled or failed. No section loss was reported.



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 5 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

- An impact damage was noted at U1 portal frame in Span 1 at west. This, however, would not affect the axial resistance of top chord.
- Truss verticals/Diagonals: Good to excellent condition up to mid height, coating in good condition up to mid height. Light surface corrosion with painting peel is observed in the lower half portion. No section loss or light section loss (<2%) was observed.
- Floor Beams: Light to medium corrosion was observed on one face of few floor beams on bottom of web directly above the bottom flange. About 2 to 4 mm section loss is reported. This is typically throughout for all the end floor beams and some intermediate floor beams (Span 1-L7, L9, Span 2 L7, L9). Since no section loss is reported in top and bottom flanges, the flexural resistance of the beam would not be affected.
- Stringers: light to medium rusting with negligible section loss and flakiness.
- Bridge Rail: Light corrosion with minor section loss. Coating condition is poor with more than 50% of area are peeled and has Category 4 rating on rust. The post 4 at downstream (south side) Span 4 is slightly rotated toward west.

### ***Girder Span***

- Girders in girder spans: Light corrosion on the exterior girder and end sections, flakiness. No noticeable section loss has been observed.
- Interior girders are in good condition.

### ***Paint***

- The coating has failed in the splash zone, along bottom chord, floor beam, stringers and connections and gutter area as well as deck joints. Pack rust between plates is noticed.

### ***Deck***

- The deck was patched in 2017. Light to median scale up to 20mm deep throughout the deck.
- From the chain drag inspection, the delamination area estimated at approximately 80m<sup>2</sup>.
- Several potholes are noticed.
- The exterior of the deck below the curb are severe spalled with rebar exposed at numeral locations.

### ***Bearings***

- Rock bearings of the trusses are in general good condition are functional as intend. Light corrosion with nor section loss.
- Some anchor bolts of bearings (Span 2, G1, G3 and G4) supporting steel girders at Pier 2 are sheared off. The bronze plate bearings were jammed and not function as intended
- Small concrete spalls around bearing seats observed.

### ***Deck Joints***

- Light wear and abrasion on the steel armoring devices, the gap of the finger joints was measured and are within the movement range



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 6 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

- Grave fell through the open finger joints accumulated in the drain trough

#### ***Pier***

- Overall piers are in good condition.
- Patching, spalling, staining, efflorescence, wet surface and vertical cracks observed at Pier 1. A minor spall was noticed on the cap, area 300mm x 500mm.
- Spalling, staining, wet surface and vertical crack noticed at Pier 3.
- Gravel accumulated on top of the pier caps.

#### ***Steel Sidewalk and grating***

- light to medium corrosion with minor section loss less than 5% is observed along the steel grating sidewalk and.

### **RECOMMENDATION**

The rehabilitation of the Franck Channel Bridge was planned in 2016 including deck rehab, repainting, bearings repair and strengthening of some elements. However, it was decided a new bridge will be constructed at the north side of the existing bridge to eliminate the clearance limits as per required by the industries and local community. The new bridge will be constructed with 5 years and the existing bridge will remain in use during construction and will be demolished after new bridge is in place.

Based on the inspection findings and 2021 load rating results, the bridge has capacity for the legal loads of CS1, CS2 and CS3. The load rating reports were provided separately and are included in appendix B

No immediately major repairs are recommended for the bridge. The potholes on the deck should be repaired. The bearings on the Pier 2 should be monitored due to the sheared off anchor bolts.

If the Department decide to not construct the new bridge in 5 years, the following rehabilitation options are recommended:

- Routing inspection for the bridge
- Whole deck area partial depth rehabilitation
- Repainting splash zone of the truss elements, girders, steel sidewalk grating and bridge rail.
- Replace the bearings on Pier 2
- Concrete repairs on the abutment and piers as well as the concrete parapets

If you have any questions regarding the report, please contact me directly.

Regards,

**STANTEC CONSULTING LTD.**



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 7 of 10

Reference: 2021 Frank Channel Bridge Inspection Report



**Ren Cheng, M. Eng., P. Eng.**

Senior Bridge Engineer

Phone: (780) 782-7378

[ren.cheng@stantec.com](mailto:ren.cheng@stantec.com)

Appendices:

- A. Inspection Photos
- B. 2021 load Rating Report
- C. OSIM Report

w:\active\1135510101\bridge inspection 2021\letter\_inspection report.docx



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 8 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

## **Appendix A**

# **INSPECTION PHOTOS**





Project No 1135510101

Project: Highway 3 Frank Channel Bridge Inspection

Location: Behchoko, NT

By: Ren Cheng, P. Eng.

Date: July 24, 2021


Page: 1 / 49



**Photo 1-**  
Elevation View  
Looking North

**Photo 2:**  
General View  
Looking East




	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 2 / 49	



**Photo 3 –  
Abutment Wall at  
Abut1, Headslope  
Settled**



**Photo 4 –  
Abutment seat at  
Abut 1, Southwest,  
Minor Concrete  
Spall**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.
Date: July 24, 2021	Page:	3 / 49



**Photo 5 –  
Bearing Seat at  
Abutment 2,  
Northwest, Gully at  
the Headslope**

**Photo 6 –  
Approach at  
Abutment 1**



	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>	
Date: <b>July 24, 2021</b>	Page: <b>4 / 49</b>	




**Photo 7 –**

**Gravel Collected in the Drain Trough at Abutment 1,**

**Photo 8 –**

**Concrete Spall with Rebar Exposed at Abutment 1 Wingwall, Southwest**




	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.	
Date: July 24, 2021	Page:	5 / 49	



**Photo 9 –  
Concrete Parapet and  
Curb at Abut 1, Wide  
Cracks and Minor  
Spall noticed**



**Photo 10-  
Concrete Parapet  
and Wingwall at  
Abut 1, North,  
Severe Scaling and  
Minor Spall**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 6 / 49	



**Photo 11 –  
General View of the  
Span 1**



**Photo 12 –  
Concrete Deck  
patching at Span 3**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 7 / 49	



**Photo 13 –  
Concrete Spall,  
severe scaling and  
delamination near  
Pier 3**



**Photo 14 –  
Delamination of  
Concrete Deck at  
Span 4 (Typical)**

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 8 / 49	




**Photo 15 –  
Delamination of  
Concrete Deck at  
Span 4 (Typical)**



**Photo 16 –  
Concrete Spall  
(Pothole) at Span 1**




	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By: Ren Cheng, P. Eng.		
Date: July 24, 2021	Page: 9 / 49		



**Photo 17-**  
**Wide Crack and Concrete Spall at Span 1**

**Photo 18-**  
**Deck top Severe Spall with Rebar Exposed (Typical)**




	Project No 1135510101
	Project: Highway 3 Frank Channel Bridge Inspection
Location: Behchoko, NT	By: Ren Cheng, P. Eng.
Date: July 24, 2021	Page: 10 / 49



**Photo 19 –  
Deck Soffit- Exterior,  
Severe Spall with  
Rebar Exposed  
(Typical)**



**Photo 020 –  
Deck Soffit at Span 1  
7<sup>th</sup> Intermedia Floor  
Beam, US,**


	Project No <b>1135510101</b>
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>
Date: <b>July 24, 2021</b>	Page: <b>11 / 49</b>



**Photo 021 –  
Deck Soffit at Span 1  
(typical)**



**Photo 022 –  
Deck Soffit at Span 3**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 12 / 49	



**Photo 023 –  
Deck Soffit Full Depth  
Patching at Span 2**



**Photo 024 –  
Deck Soffit Small at  
Span 1**


	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>	
Date: <b>July 24, 2021</b>	Page: <b>13 / 49</b>	



**Photo 025 –  
Deck Joint at Abutment1**



**Photo 026 –  
Deck Joint at Pier 1**


	Project No <b>1135510101</b>
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>
Date: <b>July 24, 2021</b>	Page: <b>14 / 49</b>



**Photo 027 –  
Deck Joint at Pier 2**



**Photo 028 –  
Deck Joint at Pier 3**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 15 / 49	



**Photo 029 –  
Deck Joint at  
Abutment 2**



**Photo 030 –  
Steel Grating/Curb at  
Span 1, light Corrosion,  
Rusting with Coating  
Failed**

	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.	
Date: July 24, 2021	Page:	16 / 49	




**Photo 031 –**  
**Steel Grating/Curb and Handrails at Span 1, light Corrosion, Rusting with Coating Failed**



**Photo 032 –**  
**Handrail Post at Span 4, 4th form Abutment 1 at Southside (DS), Slightly Rotated to the West.**  
**Light Corrosion with Paint Peeled**



	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 17 / 49	



**Photo 033 –**  
**Handrails at Span 2,**  
**Typical paint peeled,**  
**Light Corrosion with**  
**No Section Loss**



**Photo 034 –**  
**Underside of Concrete**  
**curb /Steel Grating,**  
**Light Corrosion.**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 18 / 49	




Photo 035 –

Floor Beam at Span1, L1, Typical, Light to Medium Corrosion on the Web at End with Section Loss 0-5%



Photo 036 –

Intermediate Floor Beam, Typical, Light Corrosion on the Web at End with Section Loss 0-5%


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 19 / 49	



**Photo 037 – Intermediate Floor Beam at Span 4, 9<sup>th</sup> bay, 4mm Section Loss on the web Near Bottom Flange**



**Photo 038 – Floor Beam at Span4, L10, Pack Rusting Along Bottom of Web, Just Above Bottom Flange with 2 mm Section Loss.**

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 20 / 49	




**Photo 039 –  
Underside of Span1,  
Stringers and lateral  
Bracings, Typical**



**Photo 040 –  
Stringers at Span 1,  
Typical in Good  
Condition**

2021.07.24


	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By: Ren Cheng, P. Eng.		
Date: July 24, 2021	Page: 21 / 49		



**Photo 041 –**  
**Underside of Span 1, Looking Abutment 1, Stringers and lateral Bracings, Typical Light Corrosion at the Bottom Flange of the Floor Beams and Exterior Stringers.**



**Photo 042 –**  
**Underside of Span 4, Looking Abutment 2, Stringers and Lateral Bracings, Typical Light Corrosion at the Bottom Flange of the Floor Beams and Exterior Stringers.**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 22 / 49	



**Photo 043 –  
Underside of Span 2,  
Looking Pier 1,  
Girders, Typical Light  
Corrosion at the  
Bottom Flange of the  
Exterior Girders.**



**Photo 044 –  
Connection of Floor  
Beam, Lateral Bracing  
and Bottom, Light  
Corrosion with Minor  
Section Loss**

	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.	
Date: July 24, 2021	Page:	23 / 49	




**Photo 045 –  
Pier 1 Looking East,  
In Fair Condition**



**Photo 046 –  
Concrete Spall at Pier 1  
Cap, 300mm x500mm.**

2021.07.24

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 24 / 49	




**Photo 047 –  
Bearing at Pier 1,  
Light Corrosion**



**Photo 048 –  
Rock Bearing at Pier 1**




	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 25 / 49	



**Photo 049 –  
Gravel on the Pier  
Cap, Pier 1**



**Photo 050 –  
Pier 2 Looking West.**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 26 / 49	



**Photo 051 –**  
**Anchor Bolt Bent on the Span 2 of Girder 3, US, Pier 2**



**Photo 052 –**  
**Girder 1 at US, Pier 2. Bottom Flange, Light Corrosion with Section Loss 0-5%.**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 27 / 49	



**Photo 053 –**  
**Girder 4 at DS, Pier 2,**  
**Web, Light Corrosion**  
**with Section Loss 0-**  
**5%.**



**Photo 054 –**  
**Top of Pier Cap, Pier 4.**  
**Light Corrosion at the**  
**End Diaphragm.**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 28 / 49	



**Photo 055 –  
Anchor Bolt Shear Off  
at Exterior Girder(G4),  
Span 2**



**Photo 056 –  
Anchor Bolt Shear Off  
at Interior Girder (G3),  
Span 2**

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 29 / 49	




**Photo 057 –  
Pier 3 Looking West,  
In General Fair  
Condition**



**Photo 058 –  
Pier Cap, Pier 3**

2021.07.24

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 30 / 49	



**Photo 059–  
Rock Bearing at Pier  
3, Light Corrosion**



**Photo 060 –  
Concrete Scaling and  
minor Spall on the  
Bearing Seat, Pier 3**



	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 31 / 49	



Photo 061 –  
Concrete/Grout spall  
at Bearing Seat, Pier  
3, US



Photo 062 –  
Span2 , West Exterior  
Girder Support on  
Floor Beam L10 of  
Span1, Light  
Corrosion, Minor  
Section Loss,  
200x200mm, 2 mm

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 32 / 49	




**Photo 063 –**  
**Typical Exterior**  
**Girder at Span 2,**  
**Light Corrosion with**  
**Minor Section Loss**



**Photo 064 –**  
**Floor Beam L1 of Span**  
**4 at Pier 3, Pack**  
**Rusting, Light**  
**Corrosion with Minor**  
**Section Loss**




	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 33 / 49	



**Photo 065 –  
Girder End of Exterior  
Girder at Span 3,  
Light Corrosion with  
Minor Section Loss**



**Photo 066 –  
Interior Girder at Span  
3, General in Good  
Condition**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 34/ 49	



**Photo 067 –  
Exterior Girder (G4)  
at Span 3, US, Light  
Corrosion with Minor  
Section Loss**



**Photo 068 –  
Concrete Parapet and  
Wingwall at Northeast,  
Abutment 2**


	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>	
Date: <b>July 24, 2021</b>	Page: <b>35 / 49</b>	



**Photo 069 –  
Riprap Slope  
Protection at  
Abutment 2**



**Photo 070 –  
Concrete Parapet and  
Wingwall at Southeast,  
Abutment 2**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 36 / 49	



**Photo 063 –  
Typical Exterior  
Girder at Span 2,  
Light Corrosion with  
Minor Section Loss**



**Photo 064 –  
Floor Beam L1 of Span  
4 at Pier 3, Pack  
Rusting , Light  
Corrosion with Minor  
Section Loss**

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.
Date: July 24, 2021	Page:	37 / 49



**Photo 073 –  
Bearing Seat at  
Southeast, Abutment  
2.**



**Photo 074 –  
Bearing Seat at  
Northeast, Abutment 2.**



	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 38 / 49	



Photo 075 –  
Rock Bearing at Southeast, Light Corrosion



Photo 076 –  
Rock Bearing at Southeast, Light Corrosion


	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>	
Date: <b>July 24, 2021</b>	Page: <b>39 / 49</b>	



**Photo 077 –  
Roof Slab at  
Abutment 2**



**Photo 064 –  
Light Scale and  
Efflorescence on Roof  
Slab**

	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 40 / 49	




**Photo 079 –  
Bottom of Ballast Wall  
at Abutment 2,  
Staining due to Rebar  
Corrosion with not  
Enough Cover**



**Photo 080 –  
Guardrail at Abutment  
1, Northwest, No  
Connection to Concrete  
Barrier**




	Project No <b>1135510101</b>
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>
Date: <b>July 24, 2021</b>	Page: <b>41 / 49</b>



**Photo 081 –  
Turndown End  
Treatment at  
Southwest, Typical in  
Good Condition**



**Photo 082 –  
Top Chord and  
Bracings are in Good  
Condition, Span 1**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.
Date: July 24, 2021	Page:	42 / 49



**Photo 083 –  
Span 1, Truss  
Element, Light  
Corrosion at the  
Connection of Sway  
Bracings**



**Photo 084 –  
Span 1 Portal, Minor  
Deformed on the  
Bracing Due to High  
Load Damage**


	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>	
Date: <b>July 24, 2021</b>	Page: <b>43 / 49</b>	



**Photo 085 –  
Top Chord and  
Bracings are in Good  
Condition, Span 4**



**Photo 086 –  
Connection of the top  
Chord and  
Vertical/Diagonal,  
Typical Good  
Condition, Span 4**

	Project No <b>1135510101</b>
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>
Location: <b>Behchoko, NT</b>	By: <b>Ren Cheng, P. Eng.</b>
Date: <b>July 24, 2021</b>	Page: <b>44 / 49</b>

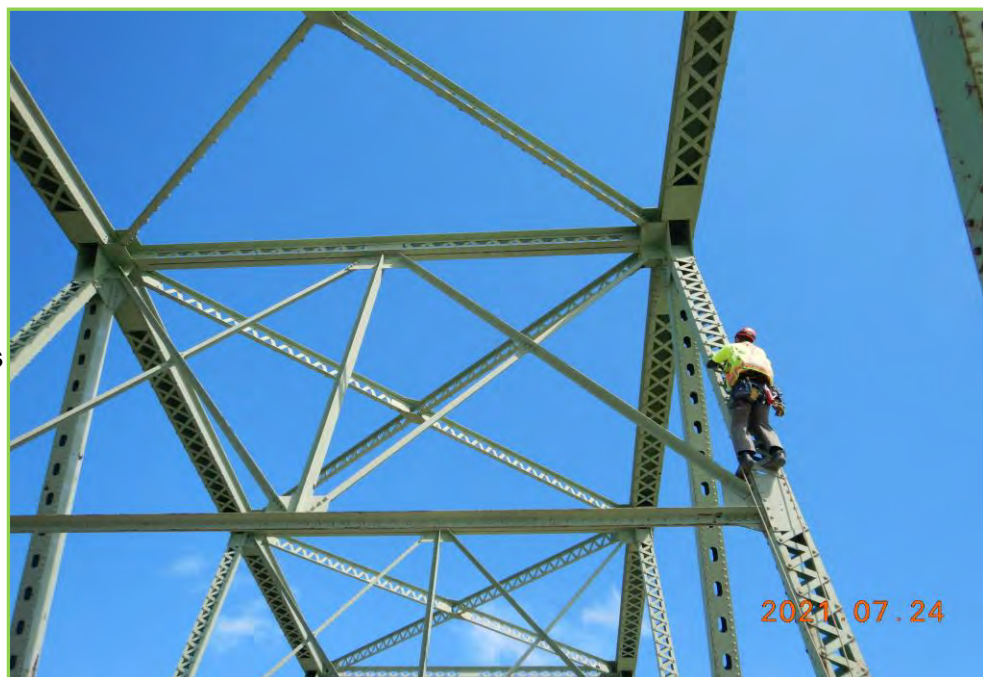



**Photo 087 –**

**Top Chord, Span 4,  
Excellent Condition**

**Photo 088 –**

**Rope Access  
Inspection of Truss  
Elements**




	Project No <b>1135510101</b>	
	Project: <b>Highway 3 Frank Channel Bridge Inspection</b>	
Location: <b>Behchoko, NT</b>	By:	<b>Ren Cheng, P. Eng.</b>
Date: <b>July 24, 2021</b>	Page:	<b>45 / 49</b>



**Photo 089 –  
Upstream Looking  
North, Safety Boat**



**Photo 090 –  
Downstream Looking  
South, Safety Boat**


	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 46 / 49	



**Photo 091 –  
Bottom Chord at Span 4, DS. Light Corrosion with Minor Section Loss**



**Photo 092 –  
Bottom Chord at Span 1, DS. Light Corrosion with Minor Section Loss**

	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By: Ren Cheng, P. Eng.		
Date: July 24, 2021	Page: 47 / 49		

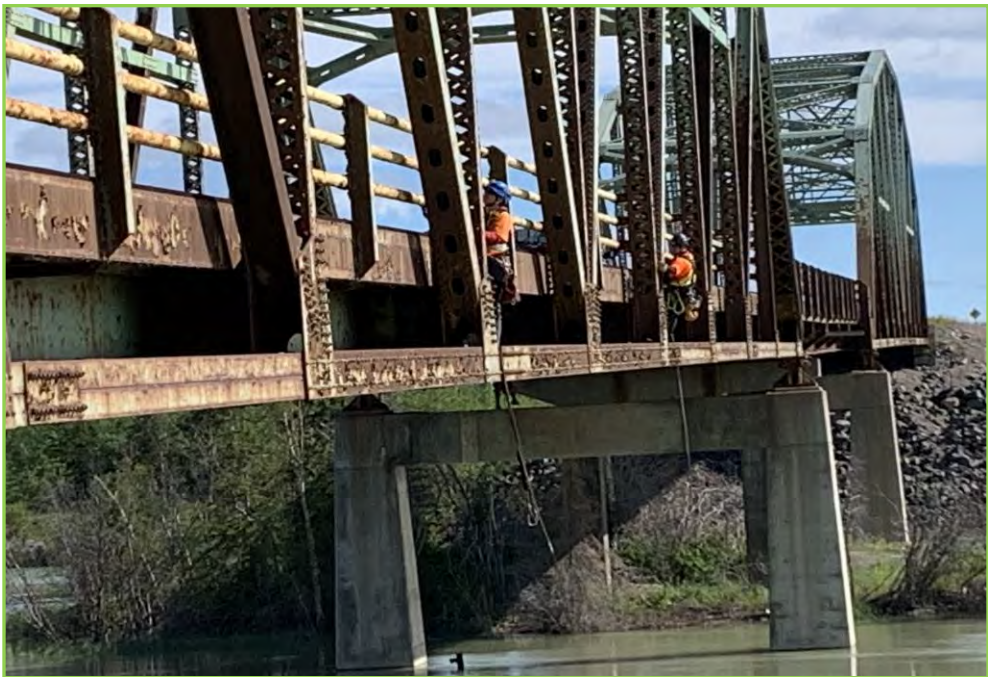



Photo 093 –  
Rope Inspection of  
the Truss Element



Photo 094 –  
Truss Connections at  
Span 4, Typical Light  
Corrosion with Minor  
Section Loss

	Project No 1135510101		
	Project: Highway 3 Frank Channel Bridge Inspection		
Location: Behchoko, NT	By:	Ren Cheng, P. Eng.	
Date: July 24, 2021	Page:	48 / 49	




**Photo 095 –  
Vertical at Span 4,  
Typical Light  
Corrosion and Minor  
Section Loss at  
Splash Zone**



**Photo 096 –  
Truss Connections at  
Pier 1, Span 1, Light  
Corrosion with Minor  
Section Loss**



	Project No 1135510101	
	Project: Highway 3 Frank Channel Bridge Inspection	
Location: Behchoko, NT	By: Ren Cheng, P. Eng.	
Date: July 24, 2021	Page: 49 / 49	



**Photo 097 –**  
**Vertical at Span 1,**  
**Looking inside.**  
**Typical Light**  
**Corrosion and Minor**  
**Section Loss at**  
**Splash Zone**



**Photo 098 –**  
**Truss Connections at**  
**Span 1, Light Corrosion**  
**with Minor Section**  
**Loss**



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 9 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

## **Appendix B**

# **LOAD RATING REPORTS**



February 11, 2022

Mr. Hayat Niazi, M.Eng., P.Eng., PMP, Structure Section-Bridges

Page 10 of 10

Reference: 2021 Frank Channel Bridge Inspection Report

## **Appendix C**

# **2021 OSIM INSPECTION REPORT**