

**ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
NORTH CENTRAL (ATHABASCA AND FORT
McMURRAY DISTRICTS)
2025 SITE INSPECTION**



Site Number	Location	Name	Hwy	km
NC097	Fort McMurray	Parsons Road Overpass/Hwy 63	686:20	
Legal Description		UTM Co-ordinates (NAD 83)		
SW7-90-9-W4		12V N 6,293,600	E 473,700	

	Date	PF	CF	Total
Previous Inspection:	June 5, 2024	11	5	55 (Landslide basis)
Current Inspection:	May 14, 2025	11	5	55 (Landslide basis)
Road WAADT:	4,660		Year:	2024
Inspected By:	José Pineda, Bruce Nestor (Thurber) Arthur Kavulok, Rishi Adhikari (TEC)			
Report Attachments:	☒ Photographs ☒ Plans ☐ Maintenance Items			

Primary Site Issue:	A crack formed across both traffic directions along the top of the Parsons Road overpass (BF85178), ~6 m west of the west abutment (along the western edge of the approach slab); settlement of west approach slab causing a dip behind the west abutment (possibly due to bridge west headslope movement).
Dimensions:	The cracks are across eastbound and westbound lanes (26 m long), dip is within the boundaries of the approach slab (26 m wide x 6 m long).
Site History:	Based on information provided by TEC and an examination of the as-built drawings, weak soil overlying limestone bedrock existed at this overpass location. An instrumented test fill was built at the east headslope, supported on a wick drain perforated foundation soil. Based on the performance of that test fill it was determined that in order to meet the construction schedule demands the weak soils had to be completely excavated from the west headslope area (up to 7 m in depth), and the portion of the east headslope not covered by the instrumented test fill (up to 5 m in depth). Engineered fill, mainly consisting of clay shale, was placed to restore the grades, and then the headslope fills were constructed overtop original grade level (up to 13 m in height). The west headslope fill was built with geogrid reinforced clay shale. An extensive instrumentation program consisting of slope inclinometers, piezometers and settlement cells were installed to monitor construction activities, control fill placement rates, and provide post construction information. Thurber is currently monitoring these instruments as part of the GRMP geohazards contract.
Maintenance:	ACP Patch was placed in 2020 and 2022 on eastbound and westbound lanes. Between 2023 and 2024: Milled and patched the highway within the impacted area, placed a flexible filler to seal the gaps between the wing walls and the drain troughs, filled the void under the abutment seat with grout.

Observations:	Description	Worse?
☒ Pavement Distress	Up to 70 mm wide x 200 mm deep x 26 m long crack reflected through the patch along the western edge of the west approach slab, about 6 m west of the west abutment; previously noted dip on the eastbound and westbound lanes west of the finger plate joint were not visible in the 2025 site inspection.	☒
☒ Slope Movement	Bridge head slope was noted to have moved laterally and vertically by up to 300 in 2023. In 2024, additional movements of about 10 mm (lateral) and about 20 mm (vertical) were noted. A further 50 mm shift eastward was noted during the current inspection. A 10-30 mm drop has developed between the abutment seat and the grout fill placed after the 2023 inspection.	☒
☒ Erosion	Rutting at the toe of the headslope; erosion rills visible along the north highway sideslope west of the abutment.	☒
☒ Seepage	Ponding water at the toe of the headslope visible in current inspection.	☐
☒ Bridge/Culvert Distress	200 to 300 mm of head slope movement; no visible cracks on abutment walls, wing walls, and abutment slope concrete facing; bridge bearing plates movement maxed out	☒
☐ Other		☐

Instrumentation: (6 SIs, 29 VWs, 4SCs)

The following is a summary of the readings of the closest instruments to the bridge west headslope (between spring 2024 and spring of 2025):

SI14-05 located at the toe of the headslope is moving at 1.8 mm/yr over 1.5 and 4.6 m depth and at 1.0 mm/yr over 4.6 m to 9.4 m depth; The total lateral movement recorded in SI14-05 since 2014 is 103 mm; the increases in settlement values since the spring of 2024 in operational settlement cells are: SC14-09 = 123 mm, SC14-12 = 17 mm, SC15-04 = 6 mm, and SC15-06 = 6 mm.

Assessment (Refer to attached Figure):

The site observations and instrumentation monitoring results indicate “excessive” vertical and lateral movements of the west approach fill. The cracks and the dips noted on the driving lanes are reflections of the ongoing slope movement of the approach fill. The movement of the fill appears to have created voids below the approach slab.

The repair work completed by TEC between 2023 and 2024 improved the situation temporarily. The voids below the approach slab and the abutment seat will likely get bigger in size and additional movement of the head slope may impact the integrity of the highway and the bridge. Furthermore, surface water infiltration into open cracks on the road will likely saturate and soften the high plastic approach fill, and may result in an accelerated slope movement. A significant detour or road closure may occur as a result of accelerated slope movement.

The accumulated water at the bottom of the west headslope is likely a reflection of poor surface drainage in this area. The toe is also bare of vegetation and the water accumulating at the toe has created a soft zone with multiple rutting as a result of off terrain vehicle traffic in this area.

Recommendations:

It is recommended to visit the site again in the spring of 2026.

It is recommended to install at least two slope inclinometers at this site (one at the top of the slope and another one at the bottom of the slope) to assess the potential depth and the extent of headslope

movement. Consideration should also be given to installing extensometers/settlement cells within the severely impacted areas of the approach fill to fully characterize the bridge headslope movement.

A structural engineer should be consulted in the near future to (a) examine the condition of the bridge and assess whether the structure is performing as per the original design, and (b) provide recommendations for rehabilitation/repairs (if needed) and instrumentation monitoring of structural elements (if required).

Short Term:

The local MCI should periodically monitor existing cracks and dips (if developed on the highway surface due to excessive movement). The bridge abutment walls and seat; and bridge approach fill slopes should also be monitored for any signs of additional movements.

The cracks on the highway should be sealed, and ACP patch should also be placed if a significant dip occurs on the highway surface. As recommended in the past it is ideal to drill holes within the slab to and inject grout in the holes to fill any voids below the slab. This may lessen the frequency of milling and patching on the highway.

Existing and future gaps (if developed) under drain troughs, between drain troughs and wingwalls, and below the abutment seat under the bridge should be filled with low strength fillcrete.

The ground surface at the toe of the headslope should be slightly regraded to avoid ponding of water and the re-graded surface should be topsoiled, seeded, and covered with a heavy-duty erosion control product.

Medium to Long Term:

Preliminary engineering is recommended to assess the cause of the observed movements and provide potential remedial measures and associated "A" estimates. New geotechnical instrumentation should be installed and monitored to complete this assessment.

Closure

It is a condition of this letter report that Thurber's performance of its professional services will be subject to the attached Statement for Use and Interpretation of the Report.

José Pineda, M.Eng., P.Eng.
Associate | Senior Geotechnical Engineer

Bruce Nestor, M.Eng., P.Eng.
Geotechnical Engineer

STATEMENT FOR USE AND INTERPRETATION OF REPORT

1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE OF THE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT.** Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

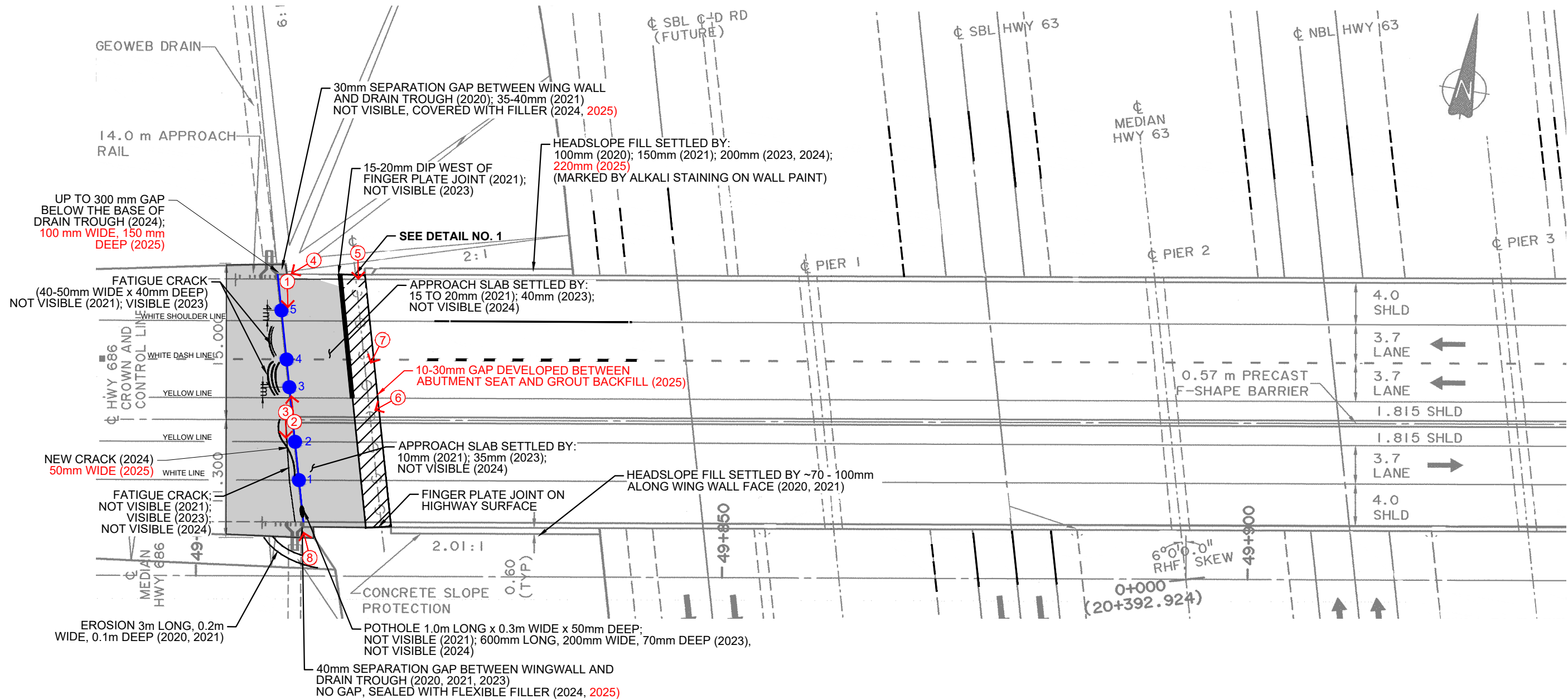
5. INTERPRETATION OF THE REPORT

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or other parties who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes, but is not limited to, decisions made to develop, purchase, or sell land, unless such decisions expressly form part of the stated purpose of the Report as described in Paragraph 3.

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LEGEND

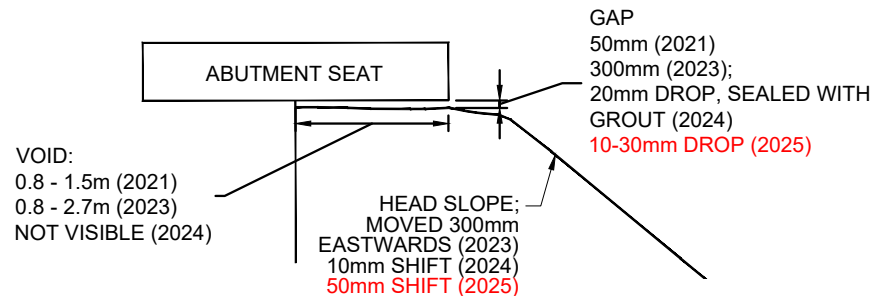
- CRACK MEASUREMENT LOCATION
- CRACK LOCATION
- ① PHOTOGRAPH NUMBER, AND APPROXIMATE DIRECTION AND LOCATION
- ACP PATCH PLACED IN 2022

NOTE:

MAY 14, 2025 SITE OBSERVATIONS ARE SHOWN IN RED.

CRACK LOCATION	JUNE 5, 2024			MAY 14, 2025		
	WIDTH (mm)	DEPTH * (mm)	DROP (mm)	WIDTH (mm)	DEPTH * (mm)	DROP (mm)
1	60	90	0	30	10	0
2	60	90	0	40	30	0
3	20	10	0	30	30	0
4	40	40	0	70	200	0
5	30	20	0	60	70	0

* SAND AND SALT WERE NOTED WITHIN BOTTOM OF CRACK.



DETAIL NO. 1 (NTS)



BASE PLAN 37507-C FROM ALBERTA TRANSPORTATION



NORTH CENTRAL REGION
(ATHABASCA AND FORT McMURRAY DISTRICTS)
2025 GEOHAZARD ASSESSMENT

NC097: HWY 686 (PARSONS ROAD OVERPASS) / HWY 63
SITE INSPECTION PLAN

FIGURE 1

DRAWN BY	ML
DESIGNED BY	JGP / BWN
APPROVED BY	TSA
SCALE	1:400
DATE	JUNE 2025
FILE No.	32122





Photo 1. Looking south at the crack developed across the westbound lanes towards the median. The main crack is 30 to 70 mm wide and 30 to 200 mm deep. The cracks are across both traffic lane directions and have formed between the approach slab and the pavement, about 6 m west of the west abutment fingerplate. Fatigue cracking is visible west of the main crack.



Photo 2. Looking north at same crack from Photo 1



Photo 3. Looking south at the eastbound lane. Cracks are up to 40 mm wide and 30 mm deep.



Photo 4. View of drain trough. A flexible filler was placed in 2024 to seal the 50 mm wide separation gap between the northwest wing wall and the drain trough. However, there is a gap beneath the drain trough in response to fill settlement (up to 100 mm wide and 150 mm deep).



Photo 5. Looking south at north end of abutment seat. Grout was placed between the 2023 and 2024 inspections to fill a void that had developed under the abutment seat.



Photo 6. Gap of up to 30 mm has developed between abutment seat and grout fill that was placed between 2024 and 2025 inspections.



Photo 7. Bridge bearings appear to be maxed out.



Photo 8. South drain trough. The gap between the drain trough and wing wall was sealed with a flexible filler.