

<b>SITE NUMBER AND NAME:</b> NC067 – Anthony Henday Bridge	<b>HIGHWAY AND KM:</b> 216:06, km 10.528	<b>PREVIOUS INSPECTION:</b> June 28, 2021	<b>CURRENT INSPECTION:</b> June 15, 2022
<b>LEGAL DESCRIPTION:</b> SE 4-52-25-W4	<b>NAD83 COORDINATES:</b> UTM12U 5926734N 326219E		<b>RISK ASSESSMENT:</b> PF: 5 CF: 10 Total: 50
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 69,010 (2021)		<b>CONTRACTOR MAINTENANCE AREA (CMA):</b> AHD	

<b>SUMMARY OF INSTRUMENTATION:</b> 9 slope inclinometers, 22 pneumatic piezometers, and 26 vibrating wire piezometers functional <b>LAST READING DATE:</b> May 7, 2022	<b>INSPECTED BY:</b> Stantec: Leslie Cho, Sonja Pharand AT: Rocky Wang
<b>PRIMARY SITE ISSUE:</b> Erosion along the lower slope of the land piers at the north abutment. Slumping adjacent to outfall at south abutment.	
<b>APPROXIMATE DIMENSIONS:</b> North abutment: 50 m wide x 20 m long. Outfall slump: 8 m wide x 25 m long x 1.2 m deep.	
<b>DATE OF ANY REMEDIAL ACTION:</b> Armorflex channel south of bridge repaired in 2015. Riprap extended on outside edges of both sides of highway as part of bridge widening works in Fall 2020/Spring 2021.	

ITEM	CONDITIONS EXIST		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X			
Slope Movement	X		SI2 and SI7 continue to show movement in fill layer.		X
Erosion	X		Erosion around north abutment piers spanning both highway directions. Four scour holes adjacent to the downslope side of the pedestrian trail at the north abutment under the northbound lane (NBL).	X	
Seepage		X			
Bridge/Culvert Distress	X		Outfall pipe separated behind outlet. Ponding under separated pipe. Beveled end separated with about 50 mm gap.		X


<b>COMMENTS</b>
<ul style="list-style-type: none"> <li>Aside from ongoing erosion and slumping at the north abutment piers, the site appeared mostly unchanged.</li> <li>Significant erosion/slumping was observed at the land piers of the north bank. Ongoing erosion/slumping may be due to river scour. The extent of erosion appears to have increased resulting in additional loss of soil support around the piers. In discussion with AT, the bridge group was not concerned with loss of soil support at its current elevation since some loss of lateral soil support was assumed in the original design.</li> <li>SI2 and SI7 continue to show movement in the fill. SI2 is installed in the pile wall and shows an average rate of movement of about 3 mm/yr since 2014. SI7 shows a similar rate of movement for the middle movement zone (~7 m depth) since 2009 and a slightly higher rate of movement for the upper zone (4 mm/yr at about 3</li> </ul>

m depth). An increase in movement rate to 32 mm/year was observed in the upper zone of SI7 during the last instrument reading cycle which was likely due to excavations and spoil pile placed around the SI. SI7 is installed upslope of SI2. The other SIs installed in the pile wall (SI1 and SI3) suggests the observed movement is related to the deformation of the pile wall. It is surmised that the observed movement in SI2 and SI7 are also related to pile wall deformation and not a slope failure. Approximate SI locations are shown on Figure 2.

- Four erosion gullies were observed under the NBL downslope from the pedestrian trail at the north abutment. The gullies were up to 1 m deep and 0.9 m wide. Minor loss of trail observed upslope from the gullies.
- An erosion gully appeared to be forming on the south slope near the bend in the unpaved access road.
- Multiple erosion gullies existed along the access road, with the largest being approximately 200 mm wide and 150 mm deep.
- The erosion/slumping adjacent to the outfall at the south abutment appeared to have progressed. The scarp is now 6 m wide and 6 m from the catch basin.
- The separation of the concrete pipe and the separation at the beveled end could not be seen due to foaming/ frothing in the water around the outlet.
- A perforated PVC pipe was exposed at the south end of the tapered wall at the south abutment. The pipe appeared damaged and filled with soil.
- Armourflex channel south of bridge appears to be performing well.

**RECOMMENDATIONS**

- The site should be regularly monitored by the MCI and/or current Southwest Anthony Henday Drive (SWAHD) Lane Widening team until remediation can be undertaken.
- Pavement cracks along the pedestrian trail should be sealed to reduce surface water infiltration into the slope.
- The erosion gullies should be regraded and reseeded to improve erosion protection and reduce the risk of additional loss of trail.
- Stantec submitted two tender packages for site remediation
  - North abutment slope: remediation includes flattening the slope to 2.5H:1V and armoring the slope with riprap. Additional surface drainage improvements will also be constructed. The estimated cost for construction is approximately \$1,500,000, excluding engineering costs. Construction is scheduled for 2024.
  - Outfall remediation as part of NC79 work: Replace separated sections of pipe with 750 mm reinforced concrete pipe. Reline storm sewer with cured-in-place pipe installed at 5% slope. The estimated cost for construction is approximately \$900,000, excluding engineering costs. Construction is scheduled for 2024.
- Site inspections should continue annually.
- Instrumentation monitoring should continue semi-annually.

<b>PREPARED BY:</b> Sonja Pharand, E.I.T.	<b>PREPARED BY:</b> Leslie Cho, M.Eng., P.Eng.	<b>REVIEWED BY:</b> Xiteng Liu, M.Sc., P.Eng., PMP
		

2022 Site Inspection Photos at NC067



**Photo 1:** Erosion of land piers at the north bank. Looking north.



**Photo 2:** Loss of soil support at pier. Looking northeast.

2022 Site Inspection Photos at NC067



**Photo 3:** Erosion at outermost pier of southbound lane. Looking southwest.



**Photo 4:** Four scour holes downslope of pedestrian trail under NBL. Looking northwest.

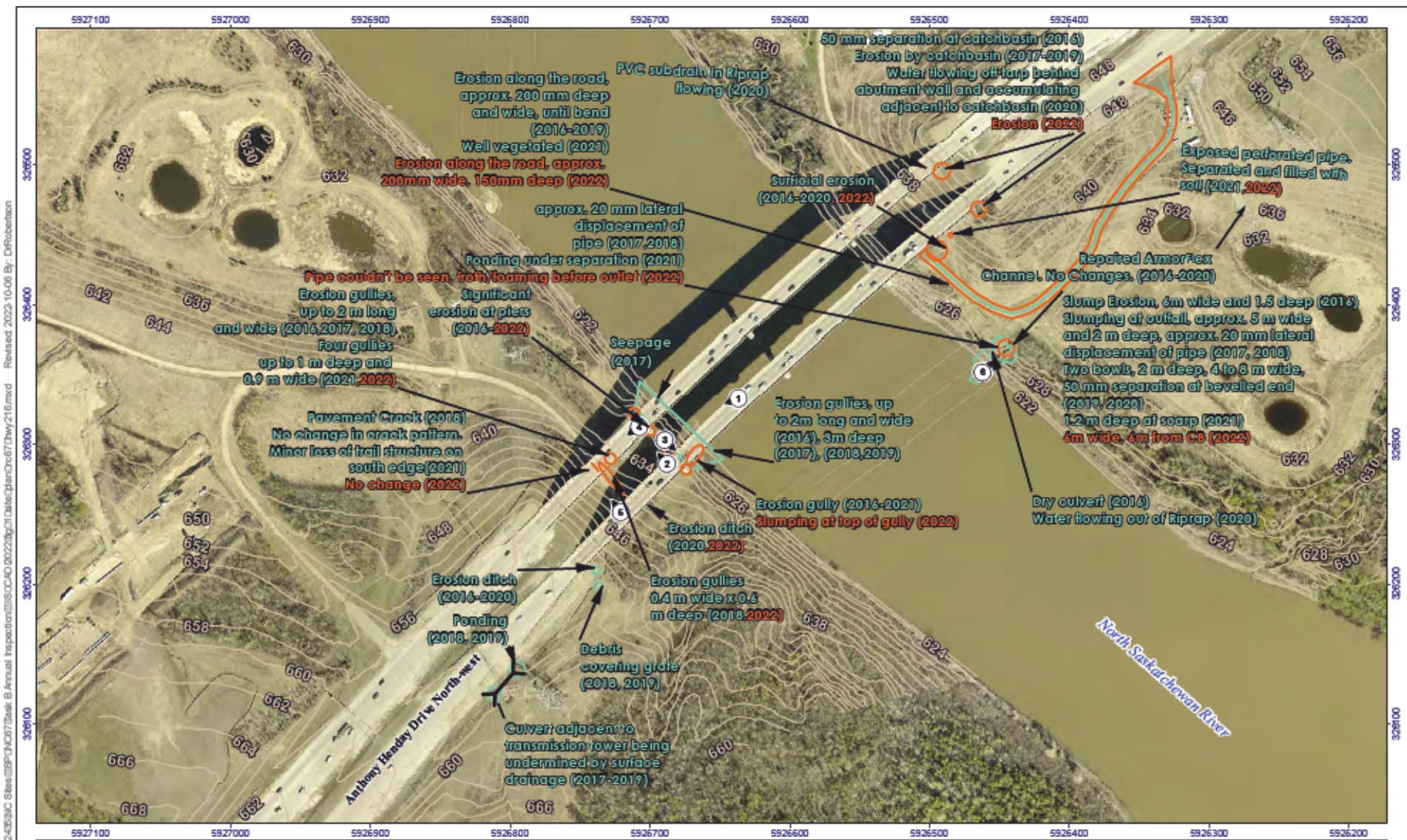
2022 Site Inspection Photos at NC067



**Photo 5:** No change to trail crack pattern. Minor loss of trail. Looking northeast.



**Photo 6:** Two bowl shaped slumps adjacent and behind the outfall on the south bank of the river. Looking southeast.



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 Revised: 2022-10-06 By: DfRobertson



- Photo Number and Direction
- Previous Observation
- 2022 Observation
- Ground Elevation Contours (m AMSL, LiDAR April-May 2018)
- Culvert

**Notes**  
 1. Coordinate System: North American 1983 CSRS UTM Zone 12N  
 2. Data Sources: Cogeomatics, Department of Natural Resources Canada,  
 3. Background: City of Edmonton 2020.

Project Location: 0504-053-25 Wild  
 City of Edmonton, Alberta  
 Prepared by DR on 2022-09-28  
 Quality Review by LC on 2022-09-28  
 Independent Review by XL on 2022-09-28  
 Client/Project: Alberta Transportation  
 Coordinated Monitoring Program  
 NC67 Anthony Henday Bridge  
 Figure No: 1  
 Title: Site Plan  
 123316222



