NORTH CENTRAL REGION GRMP
EDSON / STONY PLAIN
SITE INSPECTION FORM

SITE NUMBER AND NAME:	HIGHWAY AND KM:	PREVIOUS INSPECTION:	CURRENT INSPECTION:
NC067 – Anthony Henday Bridge	216:06, km 10.528	May 21, 2020	June 28, 2021
LEGAL DESCRIPTION:	**NAD83 COORDINATES:**		**RISK ASSESSMENT:**
SE 4-52-25-W4	UTM12U 5926734N 326219E		PF: 4 CF: 10 Total: 40
AVERAGE ANNUAL DAILY TRAFFIC (AADT):		**CONTRACTOR MAINTENANCE AREA (CMA):**	
70,690 (2020)		AHD	

SUMMARY OF INSTRUMENTATION:	INSPECTED BY:
9 slope inclinometers, 22 pneumatic piezometers, and 26 vibrating wire piezometers functional **LAST READING DATE:** July 26, 2021	Stantec: Leslie Cho and Owen Zhang AT: Bernard Ching and Rishi Adhikari

PRIMARY SITE ISSUE:

Erosion along the lower slope of the land piers at the north abutment.
Slumping adjacent to outfall at south abutment.

APPROXIMATE DIMENSIONS:

North abutment: 50 m wide x 20 m long.
Outfall slump: 8 wide x 25 m long x 1.2 m deep.

DATE OF ANY REMEDIAL ACTION:

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

COMMENTS

- Aside from ongoing erosion at the north abutment piers, the site appeared mostly unchanged.
- 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 is not concerned with loss of soil support at its current elevation since some loss of lateral soil support was assumed in the original design.
- 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

m depth). 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.
- The erosion/slumping adjacent to the outfall at the south abutment appeared relatively unchanged. The scarp height decreased from 2 m to 1.2 m suggesting additional loss of ground upslope. Vegetation growth in this slump obscured site observations.
- The separation of the concrete pipe and the separation at the beveled end appeared similar to 2020. Slight water ponding was observed under the separated pipe.
- A perforated PVC pipe was exposed at the south end of the tapered wall at the south abutment. The pipe appeared damage and filled with soil.

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 $1,200,000, 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 $800,000, excluding engineering costs. Construction is scheduled for 2024.
- Site inspections should continue annually.
- Instrumentation monitoring should continue semi-annually.

PREPARED BY: Leslie Cho, M.Eng., P.Eng.	**REVIEWED BY:** Carrie Murray, M.Eng., P.Eng.
PROFESSIONAL ENGINEER ALBERTA LESLIE CHO 2021-10-08 ID# 139079	PERMIT TO PRACTICE STANTEC CONSULTING LTD. Signature Date 13-Oct-2021 PERMIT NUMBER: P 0258 The Association of Professional Engineers and Geoscientists of Alberta ID# 74389

2021 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.

2021 Site Inspection Photos at NC067

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

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

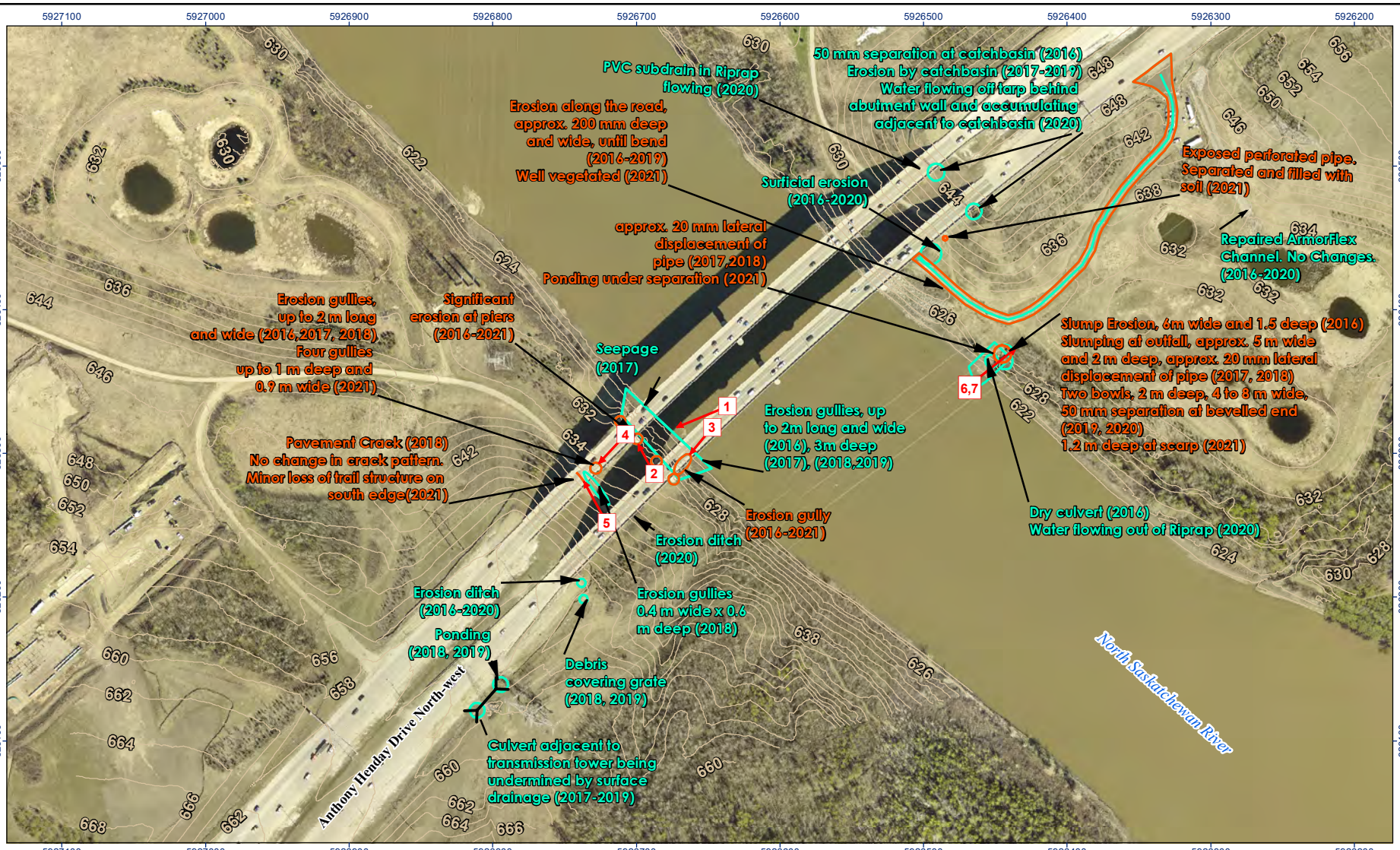
2021 Site Inspection Photos at NC067

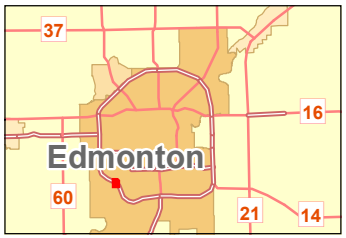
Photo 5: No change to trail crack pattern. Minor loss of trail. Looking northeast.

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

2021 Site Inspection Photos at NC067

Photo 7: Water ponding below the separated pipe at the outfall. Looking down.





Previous Observation
2021 Observation
Ground Elevation Contours (m AMSL, LiDAR April-May 2018)
Culvert
1 Photo Number and Direction

N

0 50 100 metres
(At original document size of 8.5x11)
1:4,000

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

Stantec

Project Location
03/04-052-25 W4M
City of Edmonton, Alberta

Prepared by AK on 2021-09-02
Quality Review by LC on 2021-09-14
Independent Review by CM on 2021-09-14

Client/Project
123315222
Alberta Transportation
Geohazard Monitoring Program
NC67 Anthony Henday Bridge

Figure No.
1

Title
Site Plan

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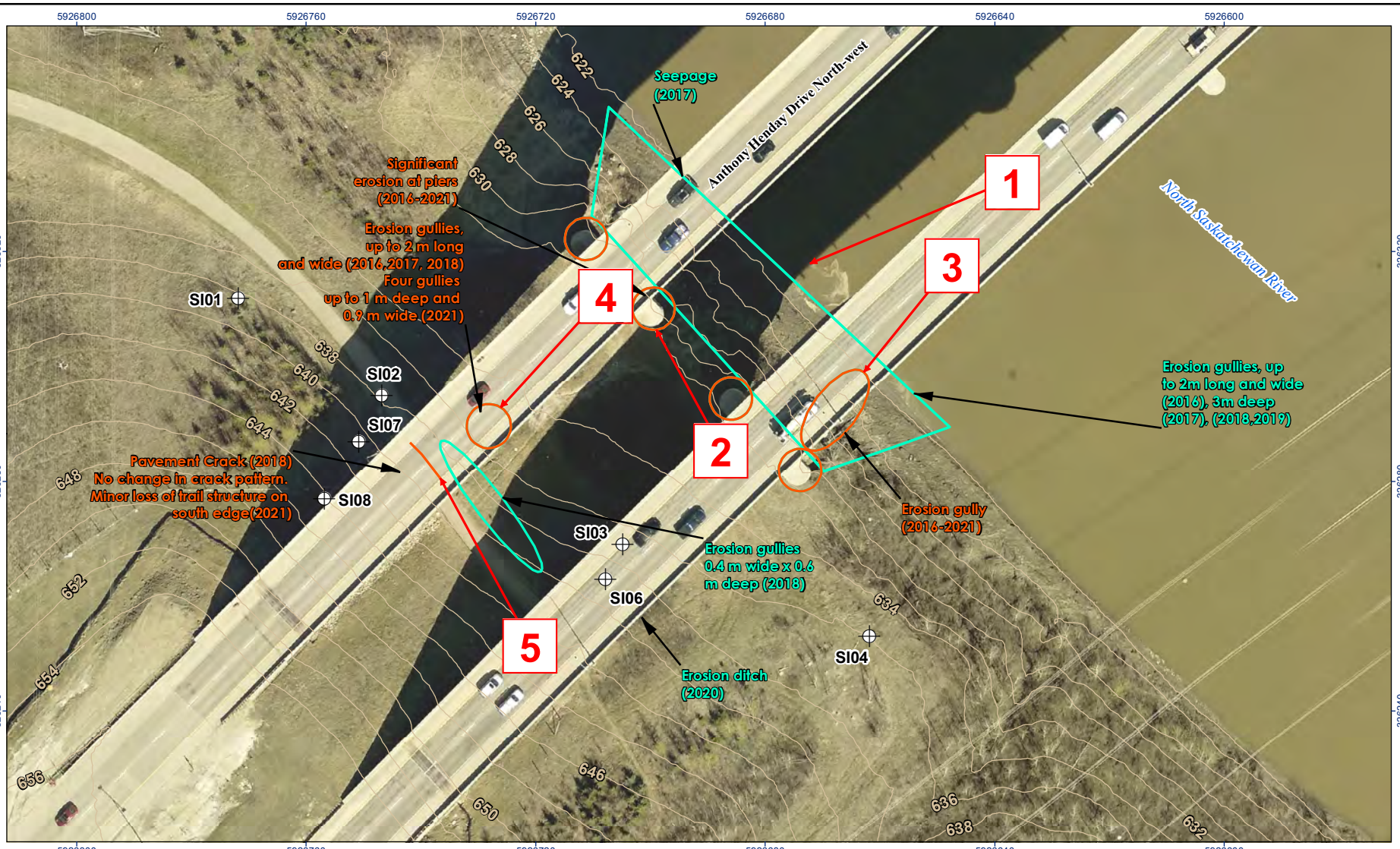

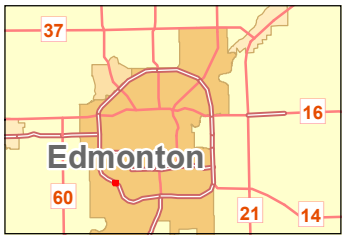

Previous Observation

2021 Observation

Ground Elevation Contours (m AMSL, LiDAR April-May 2018)

Approximate Slope Inclinometer Location

1 Photo Number and Direction

N

0 20 40 metres

(At original document size of 8.5x11)

1:1,000

Notes

1. Coordinate System: North American 1983 CSRS UTM Zone 12N

2. Data Sources: Geogratis, ©Department of Natural Resources Canada,

3. Background: City of Edmonton 2020.

Stantec

Project Location
03/04-052-25 W4M
City of Edmonton, Alberta

Prepared by AJ on 2021-10-05
Quality Review by LC on 2021-10-05
Independent Review by CM on 2021-10-05

Client/Project
123315222
Alberta Transportation
Geohazard Monitoring Program
NC67 Anthony Henday Bridge

Figure No.
2

Title
Slope Inclinometer Locations

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