

ALBERTA INFRASTRUCTURE AND TRANSPORTATION INSTRUMENTATION MONITORING RESULTS FALL 2007

SECTION C

NORTH CENTRAL REGION

SITE NC 35: HWY 63 – KING STREET INTERCHANGE

1. OBSERVATIONS

1.1 Field Program and Instrumentation Status

Six slope inclinometers (SI01-2, 01-3A, 01-4, 02-1, 02-2, and 03-1) and seven pneumatic piezometers (PN01-3, PN01-5, PN01-7 to PN01-10, and PN01-4A) were read at the King Street Interchange site on October 9, 2007 by Mr. Tarek Abdelaziz, of Thurber Engineering Ltd. (Thurber). PN01-3 was not previously monitored; however, it was found to be operational and will be monitored on a regular basis starting this fall.

The SIs were read using a SINCO Digitilt probe with 2 ft wheelbase and Digitilt Datamate readout. Inclinometer reading depths were defined as per cable markings with respect to the top of the clamps.

The pneumatic piezometers were read using a Petur pneumatic piezometer reader supplied by RST Instruments.

2. INTERPRETATION

2.1 General

SI plots for A and B directions are presented in Section D and are summarized below. Where movement has been recorded the resultant plot (X direction) and rate of movement have also been provided.

Pneumatic piezometer results are also provided in Section D.

2.2 Zones of Movement

Zones of new movement were not observed in any SIs since the last set of readings in the Spring of 2007.

Zones of old movement are summarized in Table NC35-1 at the end of this report.

Table NC35-1 also provides a historical account of the total movement, the depth of movement, and the maximum rate of movement that has occurred at this site since the initialization of the slope inclinometers.

2.3 Interpretation of Monitoring Results

No discernable movements were observed in SI01-2, 01-4 and 01-3A since the Spring 2007 readings. However, rates of movement have increased in SI02-1 by 0.8mm/yr, in SI02-2 by 1.0mm/yr, and in SI03-1 by 2.3mm/yr. The current rate of movement is 1.0mm/yr, 1.7mm/yr, 4.3mm/yr in SI02-1, SI02-2, and SI03-1, respectively.

Water levels have increased in the pneumatic piezometers since the Spring 2007 readings except for PN01-4A, which showed a drop in water level by 0.27m. For the remaining piezometers, the increase in the pore water pressure head ranged from 0.02m in PN01-10 to 0.4m in PN01-9.

Table NC35-2 summarizes the piezometer readings.

3. RECOMMENDATIONS

3.1 Future Work

The instruments should be read again in the Spring of 2008.

3.2 Instrumentation Repairs

No repairs are warranted in the mean time.

TABLE NC35-1
Fall 2007 – King Street Interchange
Slope Inclinator Reading Summary

Date Monitored: October 9, 2007

SLOPE INCLINOMETER #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AND DEPTH OF MOVEMENT TO DATE (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS OF SI	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	CURRENT RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI01-2	11 Sept, 2001	6.6 over 2.5 to 3.7m depth in 196° direction	76.4 in Oct., 2001	Operational	September 30, 2006	No discernable movement	N/A	N/A
		19.9 over 4.3 to 6.7m depth in 196° direction	221.0 in Oct., 2001			No discernable movement	N/A	N/A
SI01-4	17 Dec., 2001	No discernible movement	6.9 in April, 2002	Operational	September 30, 2006	No discernable movement	N/A	N/A
SI01-3A	3 Nov., 2001	11.2 over 9.2 to 12.3 m depth in 201° direction	15.2 between Dec., 2001 and Feb., 2002	Operational	September 30, 2006	No discernable movement	N/A	N/A
SI02-1 (in Pile Wall)	11 Feb, 2002	3.1 over 0.8 to 2.7 m depth in 50° direction	9.6 between May, 2004 and July, 2004	Operational	September 30, 2006	0.4	1.0	0.8
SI02-2 (In Pile Wall)	19 Feb, 2002	15 over 1.8 to 12.2 m depth in 164° direction	39.4 in August 2002	Operational	September 30, 2006	0.5	1.7	1
SI03-1	16 May, 2003	10.3 over 8.2 to 11.3 m depth in 1° direction	5.0 between Fall 2004 and Spring 2005	Operational	September 30, 2006	1.3	4.3	2.3

TABLE NC-35-2
Fall 2007 – King Street Interchange
Pneumatic Piezometer Reading Summary

Date Monitored: October 9, 2007

PNEUMATIC PIEZOMETER #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. * (m)	CURRENT STATUS	MAXIMUM PORE PRESSURE (kPa)	MEASURED PORE WATER PRESSURE (kPa) (Fall 2007)	PREVIOUS READING (kPa) (Spring 2007)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN01-1	Sept 5, 2001	251.34	258.58	Not Active	24.1 on May 25, 2004	N/A	N/A	N/A
PN01-2	Sept 5, 2001	251.09	258.50	Not Active	10.3 on Nov 1, 2001	N/A	N/A	N/A
PN01-3	Sept 5, 2001	251.12	254.55	Active	10.3 on Nov 1, 2001	N/A	3.8 (3.0 mBGS)	N/A
PN01-4	Sept 5, 2001	251.09	259.94	Not Active	27.6 on Sept. 5, 2001	N/A	N/A	N/A
PN01-5	Sept 5, 2001	249.20	260.21	Active	20.0 on May 3, 2003	2.1 (10.8 mBGS)	1.2 (10.9 mBGS)	0.1
PN01-6	Sept 5, 2001	251.03	260.18	Not Active	37.8 on Nov 1, 2001	N/A	N/A	N/A
PN01-7	Sept 5, 2001	249.36	256.65	Active	6.9 on Sept. 9, 2001	4.1 (6.88 mBGS)	2.8 (7.0 mBGS)	0.1
PN01-8	Sept 5, 2001	252.00	256.73	Active	10.3 on Sept. 9, 2001	0.6 (4.67 mBGS)	0.3 (4.70 mBGS)	0.03
PN01-9	Sept 5, 2001	252.17	258.77	Active	24.1 on Nov 1, 2001	7.6 (5.83 mBGS)	3.7 (6.22 mBGS)	0.4
PN01-10	Sept 19, 2001	254.47	260.21	Active	16.2 on Sep. 30, 2006	2.3 (5.51 mBGS)	2.1 (5.53 mBGS)	0.02
PN01-4A	Nov 1, 2001	250.25	259.94	Active	18.3 on Oct., 2005	1.0 (9.59mBGS)	3.6 (9.32mBGS)	-0.27
PN01-5A	Nov 1, 2001	249.20	260.23	Not Active	8.9 on Nov. 5, 2001	N/A	N/A	N/A

Figure NC35-1 in Section D provides a sketch of the approximate locations of the monitoring instrumentation for this site