Tutela Heights Road Slope Stability Monitoring Program

The below program has been developed to monitor the slope along Tutela Heights Road, from the east end of the Bell Homestead property to approximately one kilometre east, as noted as the "Slope Area" below.



Item/Action	Frequency
Observations of the surface movements by survey of Monitoring Points - Standard Iron Bars (SIB). Monitoring point locations shown on attached Plan	Semi Annually
Observations of the subsurface movements by monitoring the 3 installed inclinometers located on Tutela Heights Road including geotechnical conditions evaluation. Inclinometer locations shown on attached Plan	Quarterly – 4 time per year
Geotechnical review of Monitoring Data	Subject to the observation results of the current monitoring of the survey points and the inclinometers subsurface movements if unstable slope condition noted
Updates on slope monitoring	Annually on the County and City Website
In River Groynes condition	Once and as required thereafter

																٨	MONITOR	ING POI	NT -	MOVEM	ENT SU	JMMARY (PL	ANTED	BARS)																	
		MP-01-14	М	P-02-14	MP-03-	14	MP	-04-14		MF	P-05-14	М	IP-06-14	MF	P-07-14	MP-08-	-14	М	P-09-14		M	P-10-14	1	MP-11-14	N	MP-12-14		MP-13-1	4	MP	-14-14		MP-15-14	M	MP-16-14	MP-1	17-14	MP-18-14	4	MP-	-19-14
	ELEV	HORZ. N.S.E CHANGE CHAN	I.W. ELEV.	HORZ. N.S.E.W. CHANGE CHANGE	ELEV. HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. N.: CHANGE CH	S.E.W. HANGE	ELEV.	HORZ. N.S.E.W. CHANGE	ELEV.	HORZ. N.S.E.W. CHANGE	ELEV.	HORZ. N.S.E.W. CHANGE CHANGE	ELEV. HORZ. CHANGI	N.S.E.W. E CHANGE	ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV.	HORZ. N.S.E.W. CHANGE CHANGE	ELEV.	HORZ. N.S.E CHANGE CHAN	I.W. ELEV.	HORZ. N.S.E CHANGE CHAI	E.W. ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. C	IORZ. N.S.E HANGE CHAN	.W. ELEV	HORZ. N.S.E.V	W. GE ELEV.	HORZ. N.S.E. CHANGE CHANG	.W. ELEV. HO	ORZ. N.S.E.W. ANGE CHANGE	ELEV. HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. H	ORZ. N.S.E.W. HANGE CHANGE
JAN. 13/2015	225.9	9	224.16		216.41		205.93		19	99.24		203.01		198.54		202.13		198.52			200.05		207.59		204.28		202.96			212.07		223.2	4	204.28		210.25 -	-	218.75	2	21.72	
APR. 24/2015	225.9	9 0.02m	224.17	0.02m	216.39 0.02m		205.95	0.02m	19	99.16	0.01m	203.00	0.05m	198.54	0.04m	202.11 0.04m	1	198.52	0.03m		200.08	0.02m	207.60	0.01m	204.22	0.04m	202.98	0.01m		212.07	.05m	223.2	4 0.04m	204.27	0.02m	210.25 0.0)1m	218.73 0.03m	:	221.71 0.	04m
NOV. 5/2015	225.9	9 0.02m	224.15	0.02m	216.43 0.03m		205.91	0.05m	19	99.23	0.02m	203.00	0.02m	198.55	0.02m	202.10 0.02m	1	198.50	0.00m		200.01	0.04m	207.60	0.04m	204.27	0.02m	202.96	0.01m		212.04	.05m	223.2	1 0.01m	204.28	0.01m	210.26 0.0)1m	218.74 0.02m	:	221.71 0.	01m
MAY 8/2018	225.9 (DIS	5 0.16m TURBED)	224.13	0.04m	216.37 0.03m		205.88	0.05m	19	99.16	0.05m	202.94	0.02m	198.52	0.07m	202.06 0.31m	1	198.48	0.05m		200.00	0.04m	207.57	0.21m	204.27	0.02m	202.95	0.06m		212.03	.27m	223.1	6 0.04m	204.21	0.05m	210.24 0.0)3m	218.73 0.03m	2	21.69 0.	03m
DEC. 11/2018	225.9	4 0.14m S 0.1 W 0.0	2m 07m 224.12	0.03m N 0.03n E 0.02n	n 216.87 0.04m	N 0.04m E 0.01m	205.85	0.04m N E	0.04m 0.02m	99.15	0.07m N 0.07m E 0.02m	202.96	0.05m N 0.05m E 0.02m	198.50	0.07m N 0.07m W 0.01m	202.09 0.37m	N 0.35m E 0.11m	198.46	0.04m	N 0.04m E 0.02m	200.03	0.03m N 0.03m W 0.01m	207.53	0.23m N 0.1 W 0.1	5m 204.21	0.04m N 0.0 W 0.0	04m 01m 202.99	0.05m	N 0.05m E 0.00m	212.02	.27m N 0.2 E 0.0	7m 223.2	2 0.01m S 0.01 E 0.01	lm 204.21	0.04m N 0.03 E 0.02	3m 2m 210.24 0.0	S 0.01m E 0.03m	218.72 0.02m	N 0.02m E 0.01m	21.70 0.	02m N 0.01m E 0.02m

- MONITORING POINTS IN THIS CHART PLANTED ON JAN. 13/2015.
 DISTANCE CHANGE IS FROM THE JAN. 13/2015 LOCATIONS.
 NORTH/SOUTH/EAST/WEST (N.S.E.W.) CHANGE IS FROM THE JAN. 13/2015 LOCATIONS.

	MONITORING POINT - MOVEMENT SUMMARY (PLANTED BARS)																																						
	MP-01-14	MP-02-14		MP-03-	14	MP-	-04-14		MP-05-14		MP-06-14		MP-07-14		MP-08-1	14	MP-09-	-14	MP-1	0-14	MP-	-11-14	MP-12	2-14	N	/P-13-14	MP-	14-14		MP-15-1	4	MP-16	14 – ر	MP	P-17-14		MP-18-14		MP-19-14
	ELEV. HORZ. N.S.E.W. CHANGE	ELEV. HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. H	HORZ. N.S.E.W HANGE CHANG	V. ELEV.	HORZ. N.: CHANGE CH	S.E.W. ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. HORZ. CHANGE	N.S.E.W.	ELEV. HORZ	. N.S.E.W. E CHANGE	ELEV. HOI	RZ. N.S.E.W. ELE	EV. H	IORZ. N.S.E.W. ELE	/. HOR	RZ. N.S.E.W. NGE CHANGE	ELEV.	HORZ. N.S.E.W. CHANGE	ELEV. HO	ORZ. N.S.E ANGE CHAN	E.W. ELEV.	HORZ. CHANGE	N.S.E.W. CHANGE	ELEV. HOR	RZ. N.S.E.W. NGE CHANGE	ELEV. C	HORZ. N.S.E.V CHANGE CHANG	.W. GE ELEV.	HORZ. N.S CHANGE CHA	.E.W. ANGE ELEV.	HORZ. CHANGE
JAN. 13/2015	225.99	224.16		216.41	2	05.93		199.24		203.0	1	1	98.54		202.13		198.52		200.05 -	_ 207.	.59	204.	28	-	202.96		212.07 -		223.24			204.28		210.25		218.75		221.72	
APR. 24/2015	225.99 0.02m	224.17 0.02m		216.39 0.02m	2	05.95 0	.02m	199.16	0.01m	203.00	0.05m	1	98.54 0.04m		202.11 0.04m		198.52 0.03n	1	200.08 0.03	2m 207.	.60 0.	.01m 204.	22 0.04	4m	202.98	0.01m	212.07 0.0	05m	223.24	0.04m		204.27 0.02	m	210.25 0).01m	218.73	0.03m	221.71	0.04m
NOV. 5/2015	225.99 0.02m	224.15 0.02m		216.43 0.03m	2	05.91 0	.05m	199.23	0.02m	203.00	0.02m	1	98.55 0.02m		202.10 0.02m		198.50 0.00n	1	200.01 0.0	4m 207.	.60 0.	.04m 204.	27 0.02	2m	202.96	0.01m	212.04 0.0	05m	223.21	0.01m		204.28 0.01	m	210.26 0	J.01m	218.74	0.02m	221.71	0.01m
MAY 8/2018	225.95 0.16m (DISTURBED)	224.13 0.04m		216.37 0.03m	2	05.88 0	.05m	199.16	0.05m	202.94	4 0.02m	1	98.52 0.07m	:	202.06 0.31m		198.48 0.05n	1	200.00 0.0	4m 207.	.57 0.	.21m 204.	27 0.02	2m	202.95	0.06m	212.03 0.:	27m	223.16	0.04m		204.21 0.05	m	210.24 0).03m	218.73	0.03m	221.69	0.03m
DEC. 11/2018	225.94 0.14m S 0.12m W 0.07m	224.12 0.03m	N 0.03m E 0.02m	216.87 0.04m	N 0.04m E 0.01m	05.85 0	.04m N 0.04i	m 199.15	0.07m N E	0.07m 0.02m 202.96	0.05m	N 0.05m E 0.02m	98.50 0.07m N	0.07m 0.01m	202.09 0.37m	N 0.35n E 0.11n	n 198.46 0.04n	N 0.04m E 0.02m	200.03 0.03	3m N 0.03m W 0.01m 207.	.53 0.	.23m N 0.15m W 0.18m 204.	21 0.04	4m N 0.04m W 0.01m	202.99	0.05m N 0.05m E 0.00m	212.02 0.:	27m N 0.2 E 0.0	27m 223.22	0.01m	S 0.01m E 0.01m	204.21 0.04	m N 0.03m E 0.02n	n 210.24 ().03m S 0.01 E 0.07	1m 3m 218.72	0.02m N 0 E 0	.02m .01m 221.70	0.02m R
1 MONITORING F	OINTS IN THIS CHART PLANTE	D ON IAN 13/2015				<u> </u>	<u> </u>	<u> </u>								<u> </u>							<u> </u>					<u> </u>		<u> </u>		1							

- 1. ALL ELEVATIONS & DISTANCES SHOWN ARE METRIC.
- 2. MONITORING POINTS PLANTED ON JAN. 13/2015.

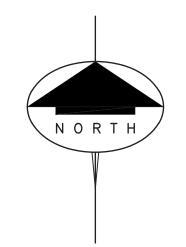
EXISTING ELEVATIONS

— — — EXISTING TOP OF SLOPE (JAN. 15, 2015)

- - - EXISTING TOP OF SLOPE (APR. 24, 2015)

GENERAL DIRECTION OF MOVEMENT

3. HORIZONTAL MEASUREMENTS ACCURATE TO ±0.02m



4	ADDED DEC. 11/2018 SURVEY	12/11/18	K.P.B.
3	ADDED MAY 8/2018 SURVEY	08/10/18	K.P.B.
2	ADDED NOV. 5/2015 SURVEY	11/05/15	K.P.B.
1	ADDED APR. 24/2015 SURVEY	04/24/15	K.P.B.
NO.	REVISION	DATE (MM/DD/YY)	BY



440 HARDY ROAD , UNIT #1 , BRANTFORD — ONTARIO , N3T 5L8 EL. (519) 753—2656 FAX. (519) 753—4263 www.cohooneng.com

TUTELA HEIGHTS ROAD SLOPE STABILITY COUNTY OF BRANT

ENGLOBE CORP

SITE PLAN

ESIGN:		SCALE:	1:1000
RAWN:	K.P.B.	JOB No:	4054
CHECKED:	J.H.C.	1	1051

HEET: 1 of 1 11051-M1 FEB. 19/15

		201.96 • MP-13-14
		204.28 • MP-12-14
		Mass Mass
OMP-05-14		2011-14 ATT-5 ATT-
oMP-04-14 GRAN	ND RIVER Patrings OMP-10-14	## 3 PART OF SLOPE 11
○ MP-02-14 ○ MP-01-14	-07-14 MP-09-14 0 38.52 OMP-08-14 MP-08-14 MP-09-14 OMP-08-14	NO.
20 MP-06-14 0 MP-16-14 0 MP-19-14	OMP-08-14 OMP-08-14 OMP-08-14 OMP-08-14	440 HA TEL. (519 PROJECT:
OMP-19-14 OMP-18-14		
A Section of the sect		CLIENT:
A A A A A A A A A A A A A A A A A A A		DESIGN: DRAWN: CHECKED:
		SHEET: DATE:

