

August 2, 2011

PML Ref.: 06TF033A
Index No.: 2463ADD

Mr. Francois Doyon, P.Eng.
Project Manager
McCormick Rankin Corporation
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8

Dear Mr. Doyon

Technical Memorandum No. Sett-33A-1
Addendum to Foundation Design Report
Swamp and High Fill Crossings, Phase 1
Highway 69 Four-Laning
From 2.9 km North of Highway 609 to 4.5 km North of Highway 64
Township of Bigwood and Delamere
G.W.P. 5206-06-00 (Part of G.W.P. 5378-02-00)
Sudbury Area, Ontario

This technical memorandum reports the recalculated rockfill settlements in the swamps and high fill crossings (101 to 118) of the Phase 1 section of the Highway 69 four-laning project from 2.9 km North of Highway 609 to 4.5 km North of Highway 64. The settlements were recalculated in accordance with the MTO Memorandum dated April 12, 2010 titled *"Post-Construction Rock Fill Settlement and Guidelines For Estimating Rock Fill Quantity"* and are provided in Table 3, appended.

Further, the magnitude of the post-construction settlements for each of the swamps and including the approach embankments to Highway 64, were checked for conformance with the criteria outlined in the MTO Memorandum dated March 2, 2010 "Embankment Settlement Criteria For Design". The results of the analysis are presented in Table 7, attached. The analysis indicated that the criteria were met for the recommended embankment construction.

In accordance with instructions from MTO during the meeting of November 18, 2010, the foundation treatment for swamp crossings recommended in the PML Swamp and High Fill crossings dated September 18, 2008 remain unchanged. The surcharge periods were reviewed and the optimized recommendations were included in Table 7. Table 1 was updated with the optimized recommended treatments.

As a result of the settlement recalculations and analyses, the minimum recommended preloading and surcharging periods were revised from those in the Foundation Design Report (PML Ref. No. 06TF033A dated September 18, 2008, GEOCREC No. 41I-222). The recommended preloading and surcharging periods and magnitude of settlement of the embankment surface for swamp crossings should be referred to the attached Tables 1, 3 and 7. No changes have been made to the previously submitted Tables 2, 4, 5 and 6.



This technical memorandum was prepared by Mr. Grigory Degil, MSc, PhD, P.Eng. and Mr. C.M.P. Nascimento, P.Eng., Senior Project Engineer. Mr. B. R. Gray, MEng, P.Eng., MTO Designated Principal Contact, conducted an independent review of the document.

We trust that the foregoing is sufficient for your present requirements.

Sincerely

Peto MacCallum Ltd.



Grigory Degil, MSc, PhD, P.Eng.
Senior Engineer



Carlos M.P. Nascimento, P.Eng.
Senior Project Engineer



Brian R. Gray, MEng, P.Eng
MTO Designated Principal Contact

GD/CN/BRG:nb-mi/nk

Enclosure(s):

Table 1 – Summary of Subsoil Conditions and Recommended Treatment
Table 3 – Settlement of Embankment Surface
Table 7 – Post-Construction Settlement Checks

Distribution:

3 cc + 1 digital copy: MRC for distribution to MTO, Project Manager
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TABLE 1

SUMMARY OF SUBSOIL CONDITIONS AND RECOMMENDED TREATMENT

PML SWAMP No.	LOCATION	ADDITIONAL FILL HEIGHT, m	DEPTH TO COMPETENT SOIL, m	SOIL BELOW EXCAVATION BASE	DEPTH TO PROBABLE BEDROCK, m	EXCAVATION PROCEDURE	RECOMMENDED TREATMENT
HIGHWAY 69 MAINLINE							
101	Sta. 12+740 to 12+800 Township of Delamere	-1.0 (cut) – -0.5 (cut) (NBL) -1.0 (cut) – 1.5 (SBL)	0.0 – 3.2	Very loose to dense sand extending to shallow bedrock	0.0 – 3.7 (El. 199.3 – 205.3)	Earth excavation	Preloading without removal of compressible soil
102	Sta. 11+490 to 11+550 (SBL) Sta. 11+650 to 12+000 (SBL)	0.0 – 2.5	0.0 – 7.0	Compact to dense sandy soils extending to bedrock	0.0 – 7.0 (El. 194.0 – 206.6)	Earth excavation	Full excavation of compressible soil
	Sta. 11+550 to 11+650 (SBL) Township of Delamere						Excavation to maximum 5 m depth at the median or to shallower competent soil
103	Sta. 11+290 to 11+350 (NBL) Sta. 11+650 to 11+690 (NBL)	-0.5 (cut) – 0.5	0.0 – 8.5	Loose to dense sandy soils extending to bedrock	0.0 – 8.8 (El. 192.8 – 206.9)	Earth excavation	Full excavation of compressible soil
	Sta. 11+350 to 11+650 (NBL) Township of Delamere						Pavement rehabilitation and partial excavation for platform widening on left per OPSD-203.020
104	Sta. 10+850 to 11+150 (NBL)	-1.5 (cut) – 0.0 (NBL)	0.0 – 7.8	Bedrock / probable bedrock	0.0 – 7.8 (El. 199.1 – 208.1)	Earth excavation	NBL – Pavement rehabilitation. Extend to Sta. 10+800
	Sta. 10+850 to 11+150 (SBL) Township of Delamere	0.5 – 4.0 (SBL)					SBL – Full excavation of compressible soil
105	Sta. 10+300 to 10+500 Township of Delamere	-1.0 (cut) – 0.0 (NBL) -0.5 (cut) – 3.5 (SBL)	0.4 – 7.4	Very loose to dense sand extending to bedrock	0.4 – 9.0 (El. 197.0 – 208.5)	Earth excavation	Full excavation of compressible soil



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PML SWAMP No.	LOCATION	ADDITIONAL FILL HEIGHT, m	DEPTH TO COMPETENT SOIL, m	SOIL BELOW EXCAVATION BASE	DEPTH TO PROBABLE BEDROCK, m	EXCAVATION PROCEDURE	RECOMMENDED TREATMENT
HIGHWAY 69 MAINLINE							
106	Sta. 21+300 to 21+375 (NBL)	-0.5 (cut) – 0.5 (NBL)	0.0 – 11.9	Very loose to dense sand extending to bedrock	0.0 – 12.5 (El. 192.1 – 208.9)	Earth excavation	NBL – Full excavation of compressible soil. Extend to Sta. 21+260. Surcharging from Sta. 21+315 to 21+375
	Sta. 21+375 to 21+407 (NBL)	NBL – Excavation to maximum 5 m depth at the median or to shallower competent soil					
	Sta. 21+407 to 21+550 (NBL)	NBL – Pavement raise of 100 mm – no treatment required					
	Sta. 21+550 to 21+617 (NBL) Township of Bigwood	NBL – Pavement rehabilitation and partial excavation for speed change lane widening per OPSD-203.020					
	Sta. 21+300 to 21+375 (SBL) Sta. 21+485 to 21+540 (SBL) Township of Bigwood	-3.5 (cut) – 2.5 (SBL)					SBL – Full excavation of compressible soil
	Sta. 10+060 to 10+130 (SBL) Township of Delamere						
	Sta. 21+375 to 21+485 (SBL) Sta. 21+540 to 21+617 (SBL) Township of Bigwood						SBL – Excavation to maximum 5 m depth at the median or to shallower competent soil
	Sta. 10+000 to 10+060 (SBL) Township of Delamere						



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PML SWAMP No.	LOCATION	ADDITIONAL FILL HEIGHT, m	DEPTH TO COMPETENT SOIL, m	SOIL BELOW EXCAVATION BASE	DEPTH TO PROBABLE BEDROCK, m	EXCAVATION PROCEDURE	RECOMMENDED TREATMENT
107	Sta. 20+340 to 20+610 (NBL)	0.0 – 0.5	0.2 – 11.0	Loose to dense sandy soils extending to bedrock	0.2– 11.3 (El. 189.2 – 201.0)	Earth excavation	Pavement rehabilitation and partial excavation for platform widening on right per OPSD-203.020
	Sta. 20+610 to 20+700 (NBL) Township of Bigwood						Full excavation of compressible soil
108	Sta. 17+940 to 18+110 (NBL) Township of Bigwood	~0.0	0.0 – 10.4	Very loose to dense sandy soils extending to bedrock	0.0 – 11.1 (El. 185.8 – 198.6)	Not required	Pavement rehabilitation
109	Sta. 17+160 to 17+760 (NBL)	~0.0 (NBL)	0.0 – 10.8, locally 16.2	Very loose to very dense sandy soils, locally stiff clay, extending to bedrock	0.0 – 16.2 (El. 180.8 – 202.9)	Not required	NBL – Pavement rehabilitation
	Sta. 17+160 to 17+275 (SBL) Sta. 17+410 to 17+540 (SBL) Sta. 17+650 to 17+700 (SBL)	Earth excavation				SBL – Full excavation of compressible soil	
	Sta. 17+275 to 17+410 (SBL) Sta. 17+540 to 17+650 (SBL) Sta. 17+700 to 17+760 (SBL) Township of Bigwood					SBL – Excavation to maximum 5 m depth at the median or to shallower competent soil Extend to Sta. 17+830	
	Sta. 16+810 to 17+050 (SBL) Sta. 17+080 to 17+110 (SBL) 17+050 to 17+080 (SBL) Township of Bigwood					-2.0 (cut) – 5.5	0.0 – 5.5
SIDEROADS AND RAMPS							
111	Daoust Lake Access Road Sta. 11+560 to 11+800	0.0 – 4.0	0.0 – 3.7	Loose to compact sandy soils extending to shallow bedrock	0.0 – 4.0 (El. 197.5 – 207.7)	Earth excavation	Preloading without removal of compressible soil
112	N-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 9+900 to 10+180	2.0 – 8.5	1.4 – 8.8, locally up to 12.6	Very loose to compact sandy soils extending to bedrock	1.7 – 12.6 (El. 191.4 – 204.5)	Swamp excavation	Full excavation of compressible soil. Surcharging from Sta. 9+900 to 10+125



TABLE 1

SUMMARY OF SUBSOIL CONDITIONS AND RECOMMENDED TREATMENT

PML SWAMP No.	LOCATION	ADDITIONAL FILL HEIGHT, m	DEPTH TO COMPETENT SOIL, m	SOIL BELOW EXCAVATION BASE	DEPTH TO PROBABLE BEDROCK, m	EXCAVATION PROCEDURE	RECOMMENDED TREATMENT
113	E/W-S Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+665 to 22+040	2.5 – 11.0	0.0 – 10.7, locally 12.7	Very loose to compact sand / sandy silt extending to bedrock	0.0 – 12.7 (El. 191.3 – 204.5)	Swamp excavation	Full excavation of compressible soil and surcharging
114	W-N Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+220 to 21+360 ----- Sta. 21+360 to 21+420	0.5 – 2.0	0.3 – 9.6	Loose to compact silty/sandy soils or probable bedrock	0.6 – 10.4 (El. 193.1 – 206.6)	Earth excavation	Full excavation of compressible soil ----- Partial excavation for widening of tie-in embankment
115	S-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+140 to 21+340	1.0 – 3.0	0.2 – 5.5	Compact silty/sandy soils or probable bedrock	0.4 – 5.5 (El. 199.0 – 205.4)	Earth excavation	Full excavation of compressible soil
116	Brazier Road (New) Sta. 9+580 to 9+980	10.0 – 12.0	0.0 – 12.2, locally 15.3	Loose to compact gravelly sand extending to bedrock	0.0 – 15.7 (El. 188.6 – 208.3)	Swamp excavation	Full excavation of compressible soil. Surcharging from Sta. 9+650 to 9+825 and from Sta. 9+925 to 9+960
117	Gauthier Road (New) Sta. 9+900 to 10+000	6.0 – 10.5	0.0 – 12.1, locally up to 13.4	Bedrock / probable bedrock	0.0 – 14.6 (El. 189.1 – 208.7)	Swamp excavation	Full excavation of compressible soil. Surcharging from Sta. 9+935 to 10+000
118	Gauthier Road (New) Sta. 9+500 to 9+650	0.0 – 1.5	0.2 – 5.0	Bedrock / probable bedrock	0.2 – 8.8 (El. 197.5 – 206.7)	Earth excavation	Preloading without removal of compressible soil

- NOTES:
1. Embankment fill height is based on the MRC profile (December 18, 2007 for the SBL and May 26, 2008 for the NBL).
 2. Depths to competent soil and probable bedrock are based on both borehole and dynamic cone penetration test data.
 3. Maximum excavation depth of 5 m in swamps 102, 106, 109 and 110 to extend from the CL median to 5 m westerly.
 4. Swamp excavation is expected where substantial thickness of peat and organic clay occurs.
 5. Recommendation of pavement rehabilitation assumes no centreline shift as well as adequacy of platform width.
 6. Estimated settlement and recommended duration of preloading/surcharging are given in Table 3.



TABLE 3
SETTLEMENT OF EMBANKMENT SURFACE
AS PER MTO MEMORANDUM “POST-CONSTRUCTION ROCK FILL SETTLEMENT AND GUIDELINES FOR ESTIMATING ROCK FILL QUANTITY” (APRIL 12, 2010)

SWAMP No.	RECOMMENDED TREATMENT OPTION (1)	RANGE OF FILL HEIGHT (m)	ESTIMATED MAXIMUM SETTLEMENT (mm)						REMAINING SETTLEMENT (mm)		MINIMUM RECOMMENDED DURATION OF PRELOADING / SURCHARGING PERIOD (months)
			PRIMARY CONSOLIDATION OF COHESIVE SOILS	TOTAL ROCKFILL SETTLEMENT (2)		TOTAL	DURING FIRST 6 MONTHS FOLLOWING FILL PLACEMENT	DURING FIRST 12 MONTHS FOLLOWING FILL PLACEMENT			
				COMPACTED	DUMPED				AFTER 6 MONTHS	AFTER 12 MONTHS	
HIGHWAY 69 MAINLINE											
101 Sta. 12+740 to 12+800 (NBL) Sta. 12+740 to 12+800 (SBL) Township of Delamere	Preloading without removal of compressible soil	-1.0 (cut) – -0.5 (cut)	0	10	0	10	5 – 10	10	0 – 5	0	Not required
		-1.0 (cut) – 1.5	120	10	5	135	120	130	15	5	6
102 Sta. 11+490 to 11+550 (SBL) Sta. 11+650 to 12+000 (SBL) Sta. 11+550 to 11+650 (SBL) Township of Delamere	Full excavation of compressible soil	0.0 – 2.5	0	15	120	135	105	120	30	15	6
	Excavation to maximum 5 m depth		50	15	60	125	100	110	25	15	6
103 Sta. 11+290 to 11+350 (NBL) Sta. 11+650 to 11+690 (NBL) Sta. 11+350 to 11+650 (NBL) Township of Delamere	Full excavation of compressible soil	-0.5 (cut) – 0.5	0	5	145	150	115	130	35	20	6
	Pavement rehabilitation and partial excavation for platform widening on left (OPSD-203.020)		No settlement (only pavement rehabilitation required)								
104 Sta. 10+850 to 11+150 (NBL) Sta. 10+850 to 11+150 (SBL) Township of Delamere	Pavement rehabilitation. Extend to Sta. 10+800	No settlement (only pavement rehabilitation required)									Not required
	Full excavation of compressible soil	-1.5 (cut) – 4.0	0	25	95	120	90	105	30	15	6
105 Sta. 10+300 to 10+500 Township of Delamere	Full excavation of compressible soil	-1.0(cut) – 3.5	0	20	95	115	90	100	25	15	6

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SWAMP No.	RECOMMENDED TREATMENT OPTION (1)	RANGE OF FILL HEIGHT (m)	ESTIMATED MAXIMUM SETTLEMENT (mm)						REMAINING SETTLEMENT (mm)		MINIMUM RECOMMENDED DURATION OF PRELOADING / SURCHARGING PERIOD (months)	
			PRIMARY CONSOLIDATION OF COHESIVE SOILS	TOTAL ROCKFILL SETTLEMENT (2)		TOTAL	DURING FIRST 6 MONTHS FOLLOWING FILL PLACEMENT	DURING FIRST 12 MONTHS FOLLOWING FILL PLACEMENT				
				COMPACTED	DUMPED				AFTER 6 MONTHS	AFTER 12 MONTHS		
106 Sta. 21+300 to 21+375 (NBL) Sta. 21+300 to 21+375 (SBL) Sta. 21+485 to 21+540 (SBL) Township of Bigwood ----- Sta. 10+060 to 10+130 (SBL) Township of Delamere	Full excavation of compressible soil. NBL – Extend to Sta. 21+260	-0.5 (cut) – 0.5 (NBL) -3.5 (cut) – 2.5 (SBL)	0	5 – 15	260	265 – 275	215 – 225	240 – 250	50	25	6 (surcharging from Sta. 21+315 to 21+375 (NBL); preloading elsewhere)	
Sta. 21+375 to 21+407 (NBL) Sta. 21+375 to 21+485 (SBL) Sta. 21+540 to 21+617 (SBL) Township of Bigwood ----- Sta. 10+000 to 10+060 (SBL) Township of Delamere	Excavation to maximum 5 m depth		70	5 – 15	60	135 – 145	90 – 100	115 – 125	45	20	6	
Sta. 21+550 to 21+617 (NBL) Township of Bigwood	NBL – Pavement rehabilitation and partial excavation for speed change lane widening (OPSD-203.020)		Negligible or No settlement (only pavement rehabilitation required)									12 (Note 4)
Sta. 21+407 to 21+550 (NBL)	NBL – Pavement rehabilitation		Max. 100 mm	Negligible or No settlement (only pavement rehabilitation required)								
107 Sta. 20+340 to 20+610 (NBL) ----- Sta. 20+610 to 20+700 (NBL) Township of Bigwood	Pavement rehabilitation and partial excavation for platform widening on right (OPSD-203.020) ----- Full excavation of compressible soil	0.0 – 0.5	Negligible or No settlement (only pavement rehabilitation required)									12 (Note 4)
			0	5	240	245	200	220	45	25	6	
108 Sta. 17+940 to 18+110 (NBL) Township of Biawood	Pavement rehabilitation	Negligible or No settlement (only pavement rehabilitation required)									Not required	

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 AS PER MTO MEMORANDUM “POST-CONSTRUCTION ROCK FILL SETTLEMENT AND GUIDELINES FOR ESTIMATING ROCK FILL QUANTITY” (APRIL 12, 2010)

SWAMP No.	RECOMMENDED TREATMENT OPTION (1)	RANGE OF FILL HEIGHT (m)	ESTIMATED MAXIMUM SETTLEMENT (mm)						REMAINING SETTLEMENT (mm)		MINIMUM RECOMMENDED DURATION OF PRELOADING / SURCHARGING PERIOD (months)
			PRIMARY CONSOLIDATION OF COHESIVE SOILS	TOTAL ROCKFILL SETTLEMENT (2)		TOTAL	DURING FIRST 6 MONTHS FOLLOWING FILL PLACEMENT	DURING FIRST 12 MONTHS FOLLOWING FILL PLACEMENT			
				COMPACTED	DUMPED				AFTER 6 MONTHS	AFTER 12 MONTHS	
109 Sta. 17+160 to 17+760 (NBL)	NBL – Pavement rehabilitation	No settlement (only pavement rehabilitation required)									Not required
Sta. 17+160 to 17+275 (SBL) Sta. 17+410 to 17+540 (SBL) Sta. 17+650 to 17+700 (SBL)	SBL – Full excavation of compressible soil	-1.0 (cut) – 4.5	0	25	165	190	150	165	40	25	6
Sta. 17+275 to 17+410 (SBL) Sta. 17+540 to 17+650 (SBL) Sta. 17+700 to 17+760 (SBL) Township of Bigwood	SBL – Excavation to maximum 5 m depth. Extend to Sta. 17+830		65	25	60	150	110	130	40	20	6
110 Sta. 16+810 to 17+050 (SBL) Sta. 17+080 to 17+110 (SBL)	Full excavation of compressible soil	-2.0 (cut) – 5.5	0	45	95	140	110	125	30	15	6
Sta. 17+050 to 17+080 (SBL) Township of Bigwood	Excavation to maximum 5 m depth		40	45	60	145	115	130	30	15	6
SIDEROADS AND RAMPS											
111 Daoust Lake Access Road Sta. 11+560 to 11+800	Preloading without removal of compressible soil	0.0 – 4.0	250	25	5	280	245	270	35	10	6
112 N-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 9+900 to 10+180	Full excavation of compressible soil	2.0 – 8.5	0	75	275	350	285	315	65 (Note 5)	35	6 (surcharging from Sta. 9+900 to 10+125; preloading elsewhere)
113 E/W-S Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+665 to 22+040	Full excavation of compressible soil	2.5 – 11.0	0	120	280	400	325	365	75 (Note 5)	35	6 (surcharging from Sta. 21+665 to 22+040)

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SWAMP No.	RECOMMENDED TREATMENT OPTION (1)	RANGE OF FILL HEIGHT (m)	ESTIMATED MAXIMUM SETTLEMENT (mm)						REMAINING SETTLEMENT (mm)		MINIMUM RECOMMENDED DURATION OF PRELOADING / SURCHARGING PERIOD (months)
			PRIMARY CONSOLIDATION OF COHESIVE SOILS	TOTAL ROCKFILL SETTLEMENT (2)		TOTAL	DURING FIRST 6 MONTHS FOLLOWING FILL PLACEMENT	DURING FIRST 12 MONTHS FOLLOWING FILL PLACEMENT			
				COMPACTED	DUMPED				AFTER 6 MONTHS	AFTER 12 MONTHS	
114 W-N Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+220 to 21+360 Sta. 21+360 to 21+420	Full excavation of compressible soil	0.5 – 2.0	0	10	150	160	125	140	35	20	6
	Partial excavation for widening of tie-in embankment		25	10	60	95	75	85	20	10	12 (Note 4)
115 S-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+140 to 21+340	Full excavation of compressible soil	1.0 – 3.0	0	15	95	110	85	95	25	15	6
116 Brazier Road (New) Sta. 9+580 to 9+980	Full excavation of compressible soil	10.0 – 12.0	0	135	335	470	380	425	90	45	12 (surcharging from Sta. 9+650 to 9+825 and from Sta. 9+925 to 9+960; preloading elsewhere)
117 Gauthier Road (New) Sta. 9+900 to 10+000	Full excavation of compressible soil	6.0 – 10.5	0	115	295	410	335	370	75 (Note 5)	40	6 (surcharging from Sta. 9+935 to 10+000; preloading elsewhere)
118 Gauthier Road (New) Sta. 9+500 to 9+650	Preloading without removal of compressible soil	0.0 – 1.5	150	10	5	165	135	160	30	5	6

- Notes:
- (1) Compressible soil in this table refers to cohesive soils remaining after removal of organic soil.
 - (2) Includes rockfill settlement above and below grade / water table.
 - (3) Settlement due to surcharging is based on a surcharge height of 2 m.
 - (4) Surcharge period of 12 months is required for all embankment widening sections.
 - (5) Maximum settlement in excess of 50 mm may be tolerated in view of lower speed limits on interchange ramps and sideroads.



TABLE 7
POST-CONSTRUCTION SETTLEMENT CHECKS
AS PER MTO MEMORANDUM "EMBANKMENT SETTLEMENT CRITERIA FOR DESIGN" (MARCH 2, 2010)

SWAMP NO.		MAXIMUM FILL HEIGHT (m)	RECOMMENDED SURCHARGE LOCATIONS	CRITICAL SECTION FOR MAX. TOTAL SETTLEMENT	TRANSITION TREATMENT		TRANSVERSE DIFFERENTIAL SETTLEMENT		LONGITUDINAL DIFFERENTIAL SETTLEMENT		REMARKS AND REVISIONS TO RECOMMENDATIONS IN TABLE 3
					SECTION	WITHIN CRITERIA?	CRITICAL SECTION	WITHIN CRITERIA?	CRITICAL SECTION	WITHIN CRITERIA?	
101 Sta. 12+740 to 12+800 Township of Delamere	NBL	-0.5 (cut)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No change in recommendations
	SBL	1.5		Sta. 12+762.5			Sta. 12+762.5	Yes	Sta. 12+740 to 12+762.5	Yes	
102 Sta. 11+490 to 11+650 Township of Delamere	SBL	2.5	N/A	Sta. 11+600	N/A	N/A	Sta. 11+775	Yes	Sta. 11+850 to 11+900	Yes	No change in recommendations
103 Sta. 11+290 to 11+690 Township of Delamere	NBL	0.5	N/A	Sta. 11+550	N/A	N/A	Sta. 11+525	Yes	Sta. 11+500 to 11+550	Yes	No change in recommendations
104 Sta. 10+850 to 11+150 Township of Delamere	NBL	0.0	N/A	Sta. 10+850	N/A	N/A	Sta. 10+875	Yes	Sta. 10+850 to 10+900	Yes	No change in recommendations
	SBL	4.0					Sta. 11+025 and 11+125	Yes			
105 Sta. 10+300 to 10+500 Township of Delamere	NBL	0.0	N/A	Sta. 10+350	N/A	N/A	Sta. 10+462.5	Yes	Sta. 10+325 to 10+350	Yes	No change in recommendations
	SBL	3.5									
106 Sta. 21+300 to 21+617 Township of Bigwood	NBL	0.5	Sta. 21+315 to 21+375	Sta. 21+350	N/A	N/A	Sta. 21+325	Yes	Sta. 21+363 to 21+400 and Sta. 10+050 to 10+100	Yes	No change in recommendations
Sta. 21+300 to 21+617 Township of Bigwood Sta. 10+000 to 10+130 Township of Delamere	SBL	2.5	N/A								
107 Sta. 20+340 to 20+700 Township of Bigwood	NBL	0.5	N/A	Sta. 20+450	N/A	N/A	Sta. 20+475 to 20+525	Yes	Sta. 20+450 to 20+500	Yes	No change in recommendations
108 Sta. 17+940 to 18+110 Township of Bigwood	NBL	~0.0	N/A								
109 Sta. 17+160 to 17+760 Township of Bigwood	NBL	~0.0	N/A	Sta. 17+700	N/A	N/A	Sta. 17+475	Yes	Sta. 17+200 to 17+250	Yes	No change in recommendations
	SBL	4.5									
110 Sta. 16+810 to 17+110 Township of Bigwood	SBL	5.5	N/A	Sta. 17+050	N/A	N/A	Sta. 17+075	Yes	Sta. 17+050 to 17+100	Yes	No change in recommendations



TABLE 7
POST-CONSTRUCTION SETTLEMENT CHECKS
AS PER MTO MEMORANDUM “EMBANKMENT SETTLEMENT CRITERIA FOR DESIGN” (MARCH 2, 2010)

SWAMP NO.	MAXIMUM FILL HEIGHT (m)	RECOMMENDED SURCHARGE LOCATIONS	CRITICAL SECTION FOR MAX. TOTAL SETTLEMENT	TRANSITION TREATMENT		TRANSVERSE DIFFERENTIAL SETTLEMENT		LONGITUDINAL DIFFERENTIAL SETTLEMENT		REMARKS AND REVISIONS TO RECOMMENDATIONS IN TABLE 3
				SECTION	WITHIN CRITERIA?	CRITICAL SECTION	WITHIN CRITERIA?	CRITICAL SECTION	WITHIN CRITERIA?	
SIDEROADS AND RAMPS										
111 Daoust Lake Access Road Sta. 11+560 to 11+800	4.0	N/A	Sta. 11+610	N/A	N/A	Sta. 11+610 to 11+637.5	Yes	Sta. 11+600 to 11+635	Yes	No change in recommendations
112 N-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 9+900 to 10+180	8.5	Sta. 9+900 to 10+125	Sta. 9+925 to 9+950	N/A	N/A	Sta. 10+125	Yes	Sta. 10+150 to 10+175	Yes	No change in recommendations
113 E/W-S Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+665 to 22+040	11.0	Sta. 21+665 to 22+040	Sta. 21+900	N/A	N/A	Sta. 22+025 to 22+040	Yes	Sta. 21+800 to 21+900	Yes	No change in recommendations
114 W-N Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+220 to 21+420	2.0	N/A	Sta. 21+375	N/A	N/A	Sta. 21+337.5	Yes	Sta. 21+325 to 21+350	Yes	No change in recommendations
115 S-E/W Ramp of Hwy 69 / Hwy 64 Interchange Sta. 21+140 to 21+340	3.0	N/A	Sta. 21+312.5	N/A	N/A	Sta. 21+237.5	Yes	Sta. 21+225 to 21+250	Yes	No change in recommendations
116 Brazier Road (New) Sta. 9+580 to 9+980	12.0	Sta. 9+650 to 9+825 and Sta. 9+925 to 9+960	Sta. 9+750	West approach to Highway 64 structure (see table below)	Yes	Sta. 9+675 and 9+825	Yes	Sta. 9+800 to 9+850	Yes	No change in recommendations
117 Gauthier Road (New) Sta. 9+900 to 10+000	10.5	Sta. 9+935 to 10+000	Sta. 10+000	N/A	N/A	Sta. 9+962.5	Yes	Sta. 9+975 to 10+000	Yes	No change in recommendations
118 Gauthier Road (New) Sta. 9+500 to 9+650	1.5	N/A	Sta. 9+539.5	N/A	N/A	Sta. 9+539.5	Yes	Sta. 9+550 to 9+575	Yes	No change in recommendations

TRANSITIONS AT HIGHWAY 64 STRUCTURE					
STATION Hwy 64 / Brazier Road	SETTLEMENT REMAINING AFTER 12 MONTHS (mm)			CRITERIA FOR DIFFERENTIAL SETTLEMENT TO STRUCTURE (mm)	CRITERIA MET? (Y/N)
	CLAYEY SOILS	ROCKFILL	TOTAL		
9+885 (borehole 116-18)	0	5	5	75	Yes
9+910 (borehole 116-19)	0	5	5	50	Yes
9+940 (borehole H64-3)	0	24	24	25	Yes
9+960 (west abutment)	N/A	N/A	0	0	-
10+040 (east abutment)	N/A	N/A	0	0	-
10+060 (borehole H64-16)	0	19 (25)	19 (25)	25	Yes
10+090 (borehole PH64-2)	0	15 (20)	15 (20)	50	Yes
10+165 (borehole H64-7)	0	7 (10)	7 (10)	75	Yes

Note: Numbers in brackets represent estimated settlement remaining after 9 months.