



**TABLE 1**  
**RECOMMENDED LOCATIONS FOR FOUNDATION INVESTIGATIONS**  
**HIGH FILLS AND EMBANKMENTS OVER SWAMPS**  
**PREFERRED ROUTE - SOUTH SIDE NEW ALIGNMENT**

STATIONS	PROPOSED WORKS
<b>Fill Area/Swamp Crossing Highway 17 (Mainline)</b>	
11+150 to 11+470	Embankment fill up to 6 m high, swamp area
11+600 to 11+820	Embankment fill up to 2 m high, swamp area
12+220 to 12+580	Embankment fill up to 6 m high, swamp area
12+780 to 12+970	Embankment fill up to 2 m high, swamp area
13+130 to 13+440	Embankment fill up to 6 m high, swamp area
14+100 to 14+280	Embankment fill up to 3 m high, swamp area
14+810 to 14+850	Embankment fill up to 2 m high, culvert, swamp area
14+990 to 15+050	Embankment fill up to 5 m high, culvert, swamp area
15+790 to 16+200	Embankment fill up to 2 m high, swamp area
16+840 to 17+960	Embankment fill up to 8 m high, culvert, swamp area
17+320 to 17+400	Embankment fill up to 5 m high
17+400 to 17+600	Embankment fill up to 4 m high, swamp area
<b>SMR 55 Extension</b>	
9+720 to 9+960	Embankment fill 4 to 12 m high
10+100 to 10+400	Embankment fill 4 to 13 m high
10+400 to 10+480	Embankment fill 17 m high, culvert, swamp area
10+480 to 10+520	Embankment fill 4 m high
10+900 to 11+320	Embankment fill 2 m high, swamp area

**NOTES:**

1. Chainages are approximate and may vary for eastbound and westbound mainlines to be confirmed/refined during detailed design.
2. Preliminary geotechnical subsurface investigation was carried out for Preferred Route. Details of subsurface strata are presented in a preliminary geotechnical report, PML Ref. 05TF59-G1.
3. Assumed embankment through the Fairbank Creek flood plain swamp will not be changed east of Sta. 17+600.
4. Conditions through Sta. 15+200 to 15+600 and Sta. 16+480 to 17+020 were not assessed in detail due to lack of permission to enter the properties.



**TABLE 2**  
**RECOMMENDED LOCATIONS FOR FOUNDATION INVESTIGATIONS**  
**STRUCTURES AND CULVERTS**  
**PREFERRED ROUTE - SOUTH SIDE NEW ALIGNMENT**

STATIONS	PROPOSED WORKS
<b>Highway 17 (Mainline)</b>	
12+460	Culvert at unnamed swamp
12+880	Culvert at unnamed swamp
13+150	Culvert at unnamed swamp
14+200	Culvert at water course
14+840	Culvert at water course
15+030	Culvert at water course
15+600	Den-Lou Road Underpass
16+700	SMR 55 Extension Underpass
16+900	Culvert at water course
<b>SMR 55 Extension</b>	
10+440	Culvert at water course

**NOTE:**

1. Chainages refer to Alternate Route 4 and SMR 55.
2. Chainages are approximate and may vary for eastbound and westbound mainlines to be confirmed/refined during Detail Design.



**TABLE F-1- SOFT GROUND/SWAMPS**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	SOFT GROUND/SWAMPS DEPTHS AND FAVOURABILITY						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			L1	F1	L2	F2	L3	F3		
			Depth Range ( 0 - 3m )		Depth Range ( 3 - 10m )		Depth Range ( >10 m )			
1	North Side New Alignment	A - B	910	5	390	3	600	1	3.33	A <sub>1</sub>
2	North Side Twinning	A - B	810	5	850	3	440	1	3.35	A <sub>2</sub>
3	South Side Twinning	A - B	100	5	1410	3	370	1	2.71	A <sub>3</sub>
4	South Side New Alignment	A - B	100	5	1190	3	1160	1	2.13	A <sub>4</sub>
1	North Side New Alignment	B - C	320	5	850	3	930	1	2.42	A <sub>5</sub>
4	South Side New Alignment	B - C	1020	5	0	3	440	1	3.79	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	1290	5	0	3	540	1	3.82	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C	330	5	2150	3	2380	1	2.16	A <sub>8</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-2- GROUNDWATER CONDITIONS**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	GROUNDWATER DEPTHS AND FAVOURABILITY						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			L1	F1	L2	F2	L3	F3		
			Depth Range (>5m)		Depth Range (1 - 5m)		Depth Range (0 -1 m)			
1	North Side New Alignment	A - B	1320	5	1410	3	1690	1	<b>2.83</b>	A <sub>1</sub>
2	North Side Twinning	A - B	820	5	770	3	2100	1	<b>2.31</b>	A <sub>2</sub>
3	South Side Twinning	A - B	720	5	600	3	1880	1	<b>2.28</b>	A <sub>3</sub>
4	South Side New Alignment	A - B	1180	5	1290	3	2450	1	<b>2.48</b>	A <sub>4</sub>
1	North Side New Alignment	B - C	4280	5	3250	3	1550	1	<b>3.60</b>	A <sub>5</sub>
4	South Side New Alignment	B - C	900	5	6030	3	1460	1	<b>2.87</b>	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	1060	5	4750	3	2750	1	<b>2.61</b>	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C	10150	5	1830	3	4780	1	<b>3.64</b>	A <sub>8</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-3– STRUCTURE FOUNDATIONS**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	CONTEMPLATED STRUCTURE/INTERCHANGE SITE				WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			INTERCHANGE SITE		DEN-LOU/HWY 17(NEW) UNDERPASS			
			Type	F1	Type	F2		
1	North Side New Alignment	A - B	-	-	-	-	-	A <sub>1</sub>
2	North Side Twinning	A - B	-	-	-	-	-	A <sub>2</sub>
3	South Side Twinning	A - B	-	-	-	-	-	A <sub>3</sub>
4	South Side New Alignment	A - B	-	-	-	-	-	A <sub>4</sub>
1	North Side New Alignment	B - C	A	5	-	-	5.00	A <sub>5</sub>
4	South Side New Alignment	B - C	A	5	A	5	5.00	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	A	5	A	5	5.00	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C	B	3	-	-	3.00	A <sub>8</sub>

NOTE: Interchange at SMR 4 for Routes 1 and 6 and Interchange East of Den-Lou (Interchange Alternative 10, Alternative 4) for Routes 4 and 5 were considered for foundation assessment.

A: Shallow Foundation/Integral Abutments, F = 5

B: Deep Foundation, F = 3

Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-4- EMBANKMENT SETTLEMENT**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	SUBSOIL TYPE AND FAVOURABILITY FACTOR						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			Less than 3m Deep		3-10m Deep		Deeper than 10 m			
			L1	L2	L3	L4	L5	L6		
			Silty (F1=5)	Clayey (F2 =4)	Silty (F3=4)	Clayey (F4 =3)	Silty (F5=2)	Clayey (F6 =1)		
1	North Side New Alignment	A - B	80	910	-	390	-	600	<b>2.93</b>	A <sub>1</sub>
2	North Side Twinning	A - B	190	810	-	850	-	440	<b>3.14</b>	A <sub>2</sub>
3	South Side Twinning	A - B	420	100	-	1410	-	370	<b>3.09</b>	A <sub>3</sub>
4	South Side New Alignment	A - B	990	100	-	1190	-	1160	<b>2.93</b>	A <sub>4</sub>
1	North Side New Alignment	B - C	1700	310	-	850	-	930	<b>3.49</b>	A <sub>5</sub>
4	South Side New Alignment	B - C	1050	1020	4310	0	-	440	<b>3.96</b>	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	2650	1290	2500	0	-	540	<b>4.15</b>	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C	250	330	-	2150	-	2380	<b>2.23</b>	A <sub>8</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-5- EMBANKMENT STABILITY**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	EMBANKMENT REQUIRING SPECIAL OR CONVENTIONAL DESIGN				WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			L1	L2	L3	L4		
			Conventional Embankment (F1 = 5)	Embankment Requiring Subexcavation (F2 = 3)	Embankment Requiring Toe-Stabilizing Berms (F3 = 2)	Embankment Requiring pre-loading/ Wick Drains (F4 = 1)		
1	North Side New Alignment	A - B	2520	1300	-	600	<b>3.87</b>	A <sub>1</sub>
2	North Side Twinning	A - B	1600	1650	-	450	<b>3.62</b>	A <sub>2</sub>
3	South Side Twinning	A - B	1320	1510	-	370	<b>3.59</b>	A <sub>3</sub>
4	South Side New Alignment	A - B	2500	1260	-	1160	<b>3.54</b>	A <sub>4</sub>
1	North Side New Alignment	B - C	7020	1170	-	930	<b>4.34</b>	A <sub>5</sub>
4	South Side New Alignment	B - C	6930	1020	-	440	<b>4.55</b>	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	6730	1290	-	540	<b>4.45</b>	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C	11900	2480	-	2380	<b>4.66</b>	A <sub>8</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-6- CONSTRUCTION FEASIBILITY**

ALTERNATE ROUTES		ALTERNATE ROUTE SUBSECTION	EMBANKMENT REQUIRING SPECIAL CONSTRUCTION						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
			No of Structure Foundations		No of Major Culvert Foundations		No. of Major Swamps			
			S1	S1	C1	C2	L1	L2		
			Convent. (F1=5)	Special. (F2=1)	Convent. (F1=5)	Special. (F2=1)	Convent. (F1=5)	Special. (F2=1)		
1	North Side New Alignment	A - B			3			2	<b>4.42</b>	A <sub>1</sub>
2	North Side Twinning	A - B			3			2	<b>4.42</b>	A <sub>2</sub>
3	South Side Twinning	A - B			3			3	<b>4.75</b>	A <sub>3</sub>
4	South Side New Alignment	A - B			3		1	3	<b>6.42</b>	A <sub>4</sub>
1	North Side New Alignment	B - C	1		2	1		2	<b>5.92</b>	A <sub>5</sub>
4	South Side New Alignment	B - C	2		4				<b>10.00</b>	A <sub>6</sub>
5	South Side New Alignment (Southerly Route)	B - C	2		4				<b>10.00</b>	A <sub>7</sub>
6	North Side New Alignment (Northerly Route)	A - C		1	3	1	2	1	<b>8.17</b>	A <sub>8</sub>

Special Designation Applied to Following Conditions

A - Foundations with piers in water or deep foundations

B - Culverts in Lakes

C - Embankments through deep (> 10 m) swamps

(Only the ratio of conventional length to the length considered for ranking).

Enter weighted favourability value A<sub>i</sub> in Table F-7.



**TABLE F-7 – SCORING OF FOUNDATION CRITERIA**

EVALUATION CRITERIA			SOFT GROUND/ SWAMPS		GW CONDITIONS		STRUCTURE FOUNDATIONS		EMBANKMENT SETTLEMENT		EMBANKMENT STABILITY		COSTUCTION FEASIBILTY		NORMALIZED SCORE
TABLE NO			F1		F2		F3		F4		F5		F6		
IMPACT WEIGHT			0.25		0.10		0.15		0.25		0.10		0.15		
ALTERNATE ROUTES			Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni	
1	North Side New Alignment	A - B	3.33	0.99	2.83	1.00			2.93	0.94	3.87	1.00	4.42	0.69	<b>3.93</b>
2	North Side Twinning	A - B	3.35	1.00	2.31	0.81			3.14	1.00	3.62	0.94	4.42	0.69	<b>3.89</b>
3	South Side Twinning	A - B	2.71	0.81	2.28	0.80			3.09	0.98	3.59	0.93	4.75	0.74	<b>3.66</b>
4	South Side New Alignment	A - B	2.13	0.64	2.48	0.88			2.93	0.93	3.54	0.92	6.42	1.00	<b>3.61</b>
1	North Side New Alignment	B - C	2.42	0.63	3.60	0.99	5.00	1.00	3.49	0.84	4.34	0.93	5.92	0.59	<b>4.00</b>
4	South Side New Alignment	B - C	3.79	0.99	2.87	0.79	5.00	1.00	3.96	0.95	4.55	0.98	10.00	1.00	<b>4.82</b>
5	South Side New Alignment (Southerly Route)	B - C	3.82	1.00	2.61	0.72	5.00	1.00	4.15	1.00	4.45	0.96	10.00	1.00	<b>4.84</b>
6	North Side New Alignment (Northerly Route)	A - C	2.16	0.56	3.64	1.00	3.00	0.60	2.23	0.54	4.66	1.00	8.17	0.82	<b>3.44</b>

NOTES:

Ai - Weighted Favourability Value  
 Ni - Normalized Favourability Value



**TABLE F-7A – FINAL SCORING OF FOUNDATION CRITERIA**

ALTERNATE ROUTE DESCRIPTION		ROUTE SUBSECTION	NORMALIZED SCORE	FINAL SCORE	RANKING
1-1	A - B : Route 1 North Side New Alignment	1 A - B	3.93	3.96	5
	B - C : Route 1 North Side New Alignment	1 B - C	4.00		
2-1	A - B : Route 2 North Side Twinning	2 A - B	3.89	3.94	5
	B - C : Route 1 North Side New Alignment	1 B - C	4.00		
3-4	A - B : Route 3 South Side Twinning	3 A - B	3.66	4.24	1
	B - C : Route 4 South Side New Alignment	4 B - C	4.82		
3-5	A - B : Route 3 South Side Twinning	3 A - B	3.66	4.25	1
	B - C : Route 5 South Side New Alignment (Southerly Route)	5 B - C	4.84		
4-4	A - B : Route 4:South Side New Alignment	4 A - B	3.61	4.21	1
	B - C : Route 4 South Side New Alignment	4 B - C	4.82		
4-5	A - B : Route 4 South Side New Alignment	4 A - B	3.61	4.22	1
	B - C : Route 5 South Side New Alignment (Southerly Route)	5 B - C	4.84		
6	A - C : Route 6 North Side New Alignment (Notherly Route)	6 A - C	3.44	3.44	7



**TABLE S -1 – SOFT GROUND/SWAMPS**

INTERCHANGE ALTERNATIVES		SOFT GROUND/SWAMPS DEPTHS AND FAVOURABILITY						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		L1	F1	L2	F2	L3	F3		
		Depth Range ( 0 - 3m )		Depth Range ( 3 - 10m )		Depth Range ( >10 m )			
6	Interchange West of Den-Lou Road	1370	5	210	3	0	1	<b>4.73</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	460	5	0	3	0	1	<b>5.00</b>	A <sub>2</sub>
11	Interchange at SMR 3	500	5	0	3	200	1	<b>3.86</b>	A <sub>3</sub>
13	Interchange East of SMR 3	500	5	2140	3	600	1	<b>2.94</b>	A <sub>4</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table S-7.



**TABLE S-2 – GROUNDWATER CONDITIONS**

INTERCHANGE ALTERNATIVES		GROUNDWATER DEPTHS AND FAVOURABILITY						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		L1	F1	L2	F2	L3	F3		
		Depth Range (>5m)		Depth Range (1 - 5m)		Depth Range (0 - 1 m)			
6	Interchange West of Den-Lou Road	0	5	6040	3	2280	1	<b>2.45</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	2110	5	3110	3	1320	1	<b>3.24</b>	A <sub>2</sub>
11	Interchange at SMR 3	2950	5	2100	3	1150	1	<b>3.58</b>	A <sub>3</sub>
13	Interchange East of SMR 3	4620	5	1985	3	3240	1	<b>3.28</b>	A <sub>4</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table S-7.



**TABLE S-3 – STRUCTURE FOUNDATIONS**

INTERCHANGE ALTERNATIVES		CONTEMPLATED STRUCTURE/INTERCHANGE SITE										WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		INTERCHANGE SITE		DEN-LOU ROAD/HWY 17(NEW) UNDERPASS		SMR 55 EXTENSION/ HWY 17 (EXISTING) UNDERPASS		SMR 55 EXTENSION OVERHEAD AT HCR		FAIRBANK CREEK BRIDGE			
		Type	F1	Type	F2	Type	F3	Type	F4	Type	F4		
6	Interchange West of Den-Lou Road	A	5	-	-	A	5	-	-	-	-	<b>5.00</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	A	5	A	5	-	-	-	-	-	-	<b>5.00</b>	A <sub>2</sub>
11	Interchange at SMR 3	A*	5	-	-	A	5	B	3	-	-	<b>4.33</b>	A <sub>3</sub>
13	Interchange East of SMR 3	A	5	-	-	-	-	A	5	B	3	<b>4.33</b>	A <sub>4</sub>

NOTE:

A: Shallow Foundation/Integral Abutments, F = 5

B: Deep Foundation, F = 3

\* Possible Widening of the Structure

Enter weighted favourability value A<sub>i</sub> in Table S-7.



**TABLE S-4 – EMBANKMENT SETTLEMENT**

INTERCHANGE ALTERNATIVES		SUBSOIL TYPE AND FAVOURABILITY FACTOR						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		Less than 3m Deep		3m to 10m Deep		Deeper than 10m			
		L1	L2	L3	L4	L5	L6		
		Silty (F1=5)	Clayey (F2 =4)	Silty (F3=4)	Clayey (F4 =3)	Silty (F5=2)	Clayey (F6 =1)		
6	Interchange West of Den-Lou Road	6740	1370		210			<b>4.78</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	3750	460					<b>4.89</b>	A <sub>2</sub>
11	Interchange at SMR 3	2350	500				200	<b>4.57</b>	A <sub>3</sub>
13	Interchange East of SMR 3	1985	500		2140		600	<b>3.63</b>	A <sub>4</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table S-7.



**TABLE S-5- EMBANKMENT STABILITY**

INTERCHANGE ALTERNATIVES		CONVENTIONAL OR SPECIAL DESIGN REQUIREMENTS				WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		L1	L2	L3	L4		
		Conventional Embankment (F1 = 5)	Embankment Requiring Subexcavation (F2 = 3)	Embankment Requiring Toe-Stabilizing Berms (F3 = 2)	Embankment Requiring pre-loading/ Wick Drains(F4 = 1)		
6	Interchange West of Den-Lou Road	6740	1580			<b>4.62</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	6060	460			<b>4.86</b>	A <sub>2</sub>
11	Interchange at SMR 3	5500	500		200	<b>4.71</b>	A <sub>3</sub>
13	Interchange East of SMR 3	6605	2540		600	<b>4.23</b>	A <sub>4</sub>

NOTE: Enter weighted favourability value A<sub>i</sub> in Table S-7.



**TABLE S-6 – CONSTRUCTION FEASIBILITY**

INTERCHANGE ALTERNATIVES		STRUCTURE/EMBANKMENT REQUIRING SPECIAL CONSTRUCTION						WEIGHTED FAVOURABILITY VALUE(A <sub>i</sub> )	
		No of Structure Foundations		No of Major Culvert Foundations		Deep Swamps L(m)			
		S1 Convent. (F1=5)	S1 Special. (F2=1)	C1 Convent. (F1=5)	C2 Special. (F2=1)	L1 Convent. (F1=5)	L2 Special. (F2=1)		
6	Interchange West of Den-Lou Road	2	-	-	-	-	-	<b>5.00</b>	A <sub>1</sub>
10	Interchange East of Den-Lou Road	2	-	-	1	-	-	<b>3.67</b>	A <sub>2</sub>
11	Interchange at SMR 3	2	1	-	-	-	200	<b>3.00</b>	A <sub>3</sub>
13	Interchange East of SMR 3	2	1	1	-	-	700	<b>3.40</b>	A <sub>4</sub>

Special Designation Applied to Following Conditions

- Foundations with piers in water or deep foundations other than integral abutments
- Culverts in Lakes
- Embankments through deep (> 10 m) swamps

Enter weighted favourability value A<sub>i</sub> in Table S-7.



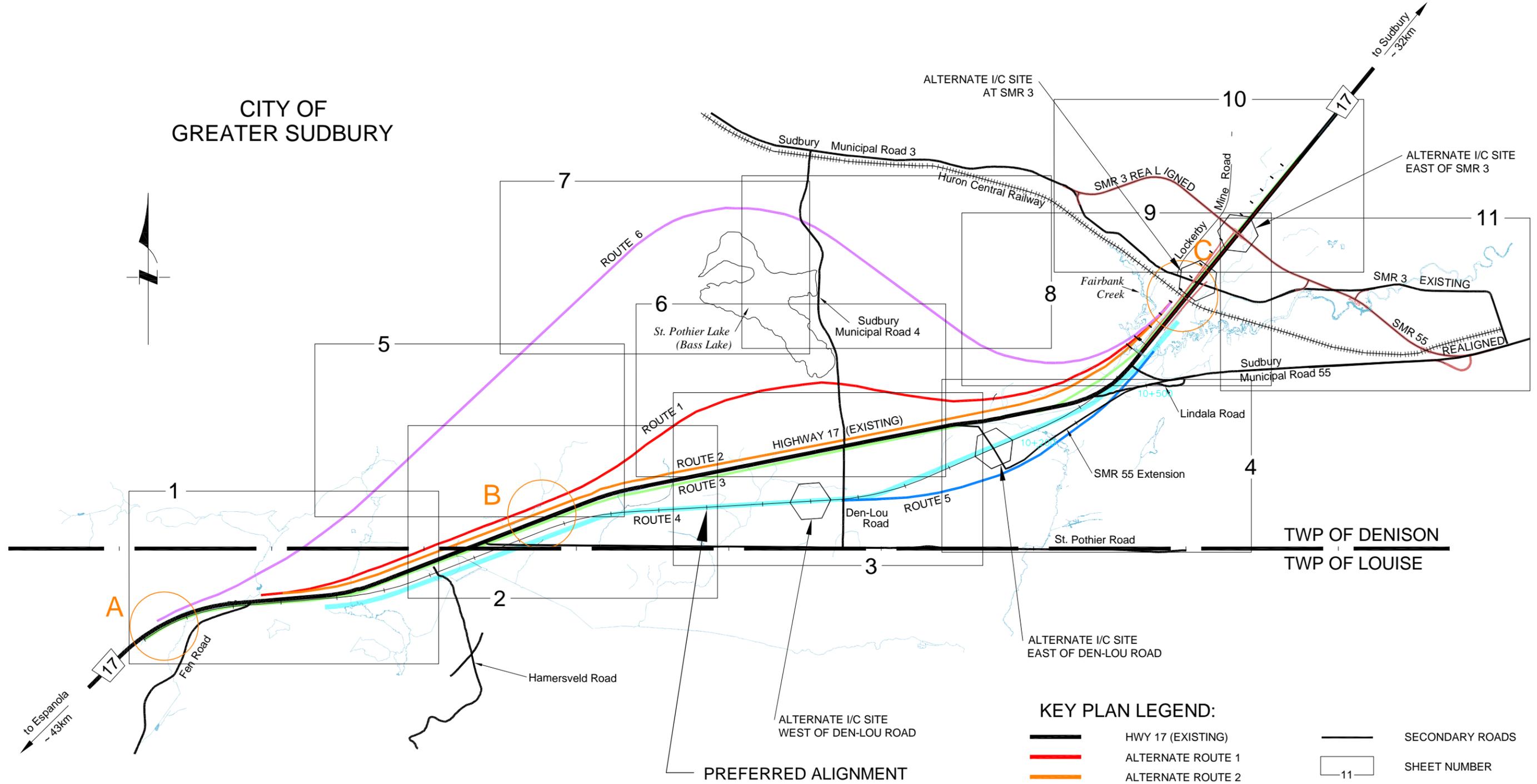
**TABLE S-7 – SCORING OF FOUNDATION CRITERIA**

EVALUATION CRITERIA		SOFT GROUND/ SWAMPS		GW CONDITIONS		STRUCTURE FOUNDATIONS		EMBANKMENT SETTLEMENT		EMBANKMENT STABILITY		CONSTRUCTION FEASIBILITY		NORMALIZED SCORE	NORMALIZED RANKING
TABLE NO		S1		S2		S3		S4		S5		S6			
IMPACT WEIGHT		0.25		0.10		0.15		0.25		0.10		0.15			
INTERCHANGE ALTERNATIVE		Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni	Ai	Ni		
6	Interchange West of Den-Lou Road	4.73	0.95	2.45	0.68	5.00	1.00	4.78	0.98	4.62	0.95	5.00	1.00	<b>4.72</b>	1
10	Interchange East of Den-Lou Road	5.00	1.00	3.24	0.91	5.00	1.00	4.89	1.00	4.86	1.00	3.67	0.73	<b>4.75</b>	1
11	Interchange at SMR 3	3.86	0.77	3.58	1.00	4.33	0.87	4.57	0.94	4.71	0.97	3.00	0.60	<b>4.22</b>	3
13	Interchange East of SMR 3	2.94	0.59	3.28	0.92	4.33	0.87	3.63	0.74	4.23	0.87	3.40	0.68	<b>3.71</b>	4

NOTES:

Ai - Weighted Favourability Value  
 Ni - Normalized Favourability Value

CITY OF GREATER SUDBURY



**KEY PLAN LEGEND:**

	HWY 17 (EXISTING)		SECONDARY ROADS
	ALTERNATE ROUTE 1		SHEET NUMBER
	ALTERNATE ROUTE 2		ASSESSMENT NODE
	ALTERNATE ROUTE 3		PROPOSED LOCATIONS OF INTERCHANGES
	ALTERNATE ROUTE 4		
	ALTERNATE ROUTE 5		
	ALTERNATE ROUTE 6		
	EASTERN INTERCHANGE 13		



**KEY PLAN**  
 PRELIMINARY DESIGN SERVICES  
**HIGHWAY 17 FROM 20.5 km WEST OF  
 HIGHWAY 144 EASTERLY FOR 6.5 km**  
 TOWN OF WALDEN, ONTARIO



**HIGHWAY 17**  
 Highway 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00

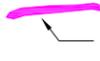


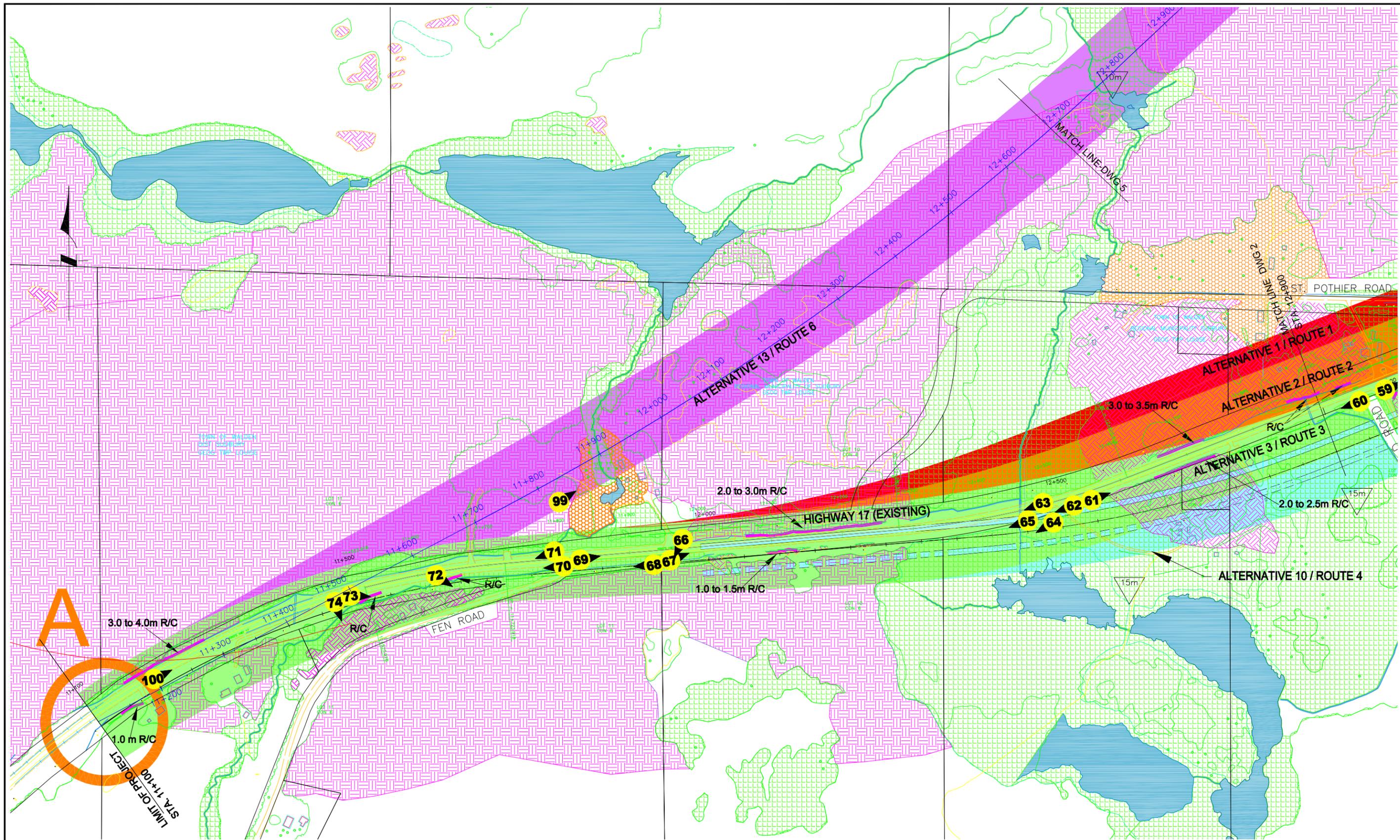
## NOTES:

1. BEDROCK CUTS AND OUTCROPS SHOWN ON PLANS ARE BASED ON EXISTING CONSTRUCTION DATA, SITE RECONNAISSANCE AND AERIAL PHOTOGRAPHS. THE SYMBOLS ON THE PLANS INDICATE THE LOCAL PRESENCE OF THE BEDROCK UNIT AND DO NOT REPRESENT THE FULL EXTENT OF EACH ROCK OUTCROP.
2. THE EXTENT OF SWAMPS, WATER BODIES AND FILL AREAS IS AS INTERPRETED FROM SITE RECONNAISSANCE AND AERIAL PHOTOGRAPHS. THE AREAL EXTENTS SHOWN ON THE PLANS REPRESENT ESTIMATES ONLY AND ACTUAL AREAS MAY VARY FROM THOSE SHOWN.
3. ESTIMATED DEPTH TO COMPETENT GROUND AND OR BEDROCK IN SWAMPS IS BASED ON GEOLOGICAL EVIDENCE, DESKTOP LITERATURE SEARCH DATA AND LIMITED SITE RECONNAISSANCE INFORMATION.
4. THE GEOLOGIC UNIT SYMBOLS SHOWN ON THE PLANS REPRODUCE THOSE SHOWN ON GEOLOGIC MAPPING OF THE AREA AND ARE ONLY A GENERAL REPRESENTATION OF BEDROCK AND SOIL UNITS.
5. THE PLANS ARE AN ENCLOSURE TO THE ROUTE SELECTION STUDY PREPARED BY PETO MACCALLUM LTD. THE DATA ON THESE PLANS MUST BE READ IN CONJUNCTION WITH THE REPORT.
6. THE DETAIL SHOWN ON THE PLAN IS CONSIDERED APPROPRIATE FOR ROUTE SELECTION PURPOSES. WHEN THE PREFERRED ROUTE HAS BEEN SELECTED, A SUBSURFACE INVESTIGATION SHOULD BE UNDERTAKEN TO DELINEATE THE STRATIGRAPHIC CONDITIONS ON A SITE SPECIFIC BASIS FOR PRELIMINARY AND DETAILED DESIGN PURPOSES.
7. THE CHAINAGES SHOWN ON THE DRAWINGS ARE APPROXIMATE.

## LEGEND:

- ALTERNATE ROUTE
-  ROUTE 1 (NORTH SIDE NEW ALIGNMENT)
  -  ROUTE 2 (NORTH SIDE TWINNING)
  -  ROUTE 3 (SOUTH SIDE TWINNING)
  -  ROUTE 4 (SOUTH SIDE NEW ALIGNMENT)
  -  ROUTE 5 (SOUTH SIDE NEW ALIGNMENT)  
(SOUTHERLY ROUTE)
  -  ROUTE 6 (NORTH SIDE NEW ALIGNMENT)  
(NORTHERLY ROUTE)

-  **ROCK CUT (R/C)**  
4.5m R/C ROCK CUT HEIGHT FROM RECORDS
-  **BEDROCK OUTCROP (R O/C)**
-  **OUTWASH PLAIN DEPOSITS  
(SILTS AND SILTY SANDS)**
-  **SWAMP AREA**
-  **ANTICIPATED DEPTH TO  
COMPETENT MATERIAL/BEDROCK**
-  **WATER BODY**
-  **FILL AREA**
-  **PHOTOGRAPH NUMBER  
(ARROW SHOWS DIRECTION OF VIEW)**



STA. 11+100 TO 12+900 (HIGHWAY 17 STUDY CORRIDOR)

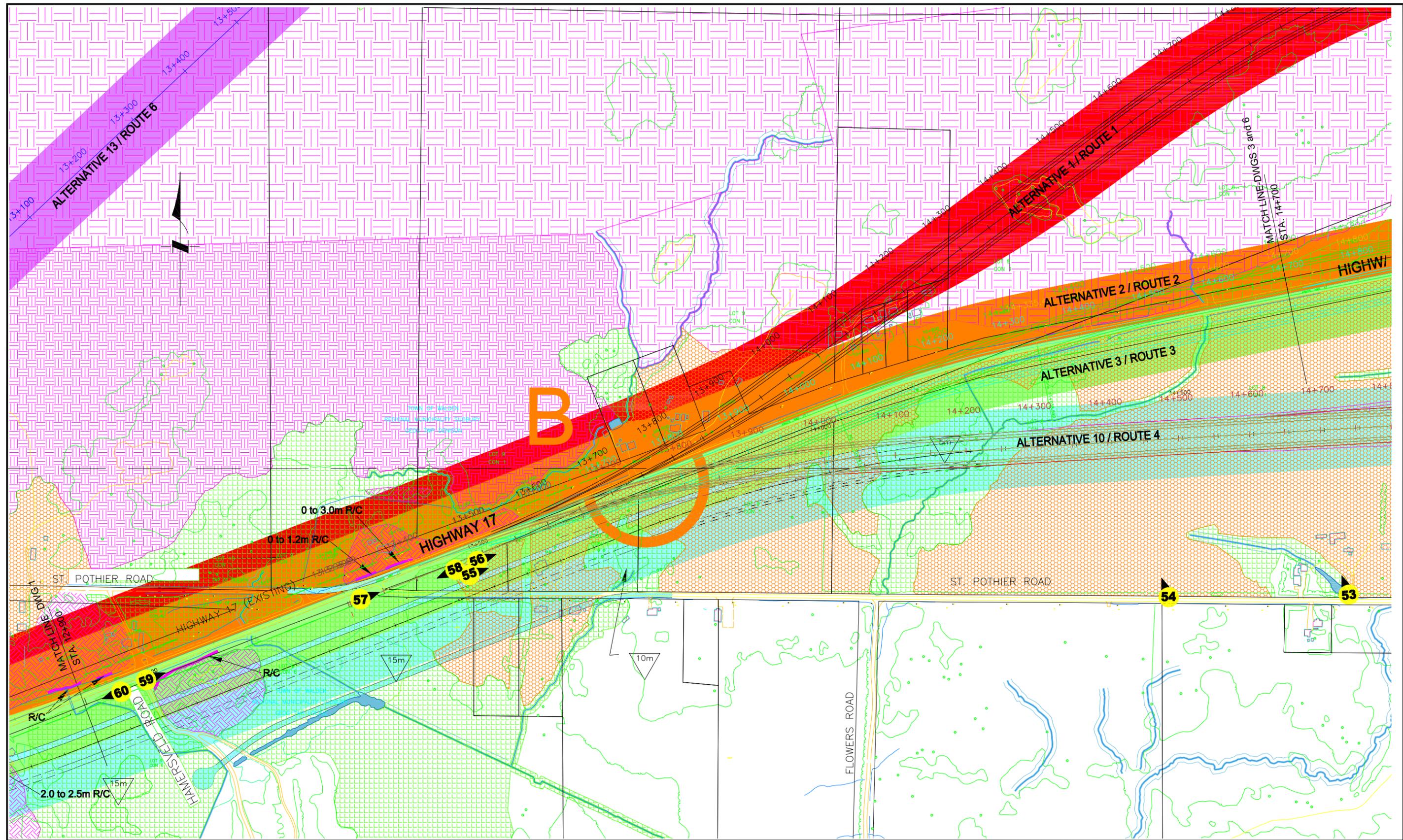
METRIC



HIGHWAY 17  
 HIGHWAY 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00

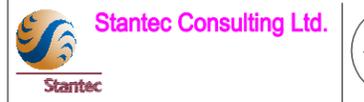


SHEET  
 1



STA. 12+900 TO 14+700 (HIGHWAY 17 STUDY CORRIDOR)

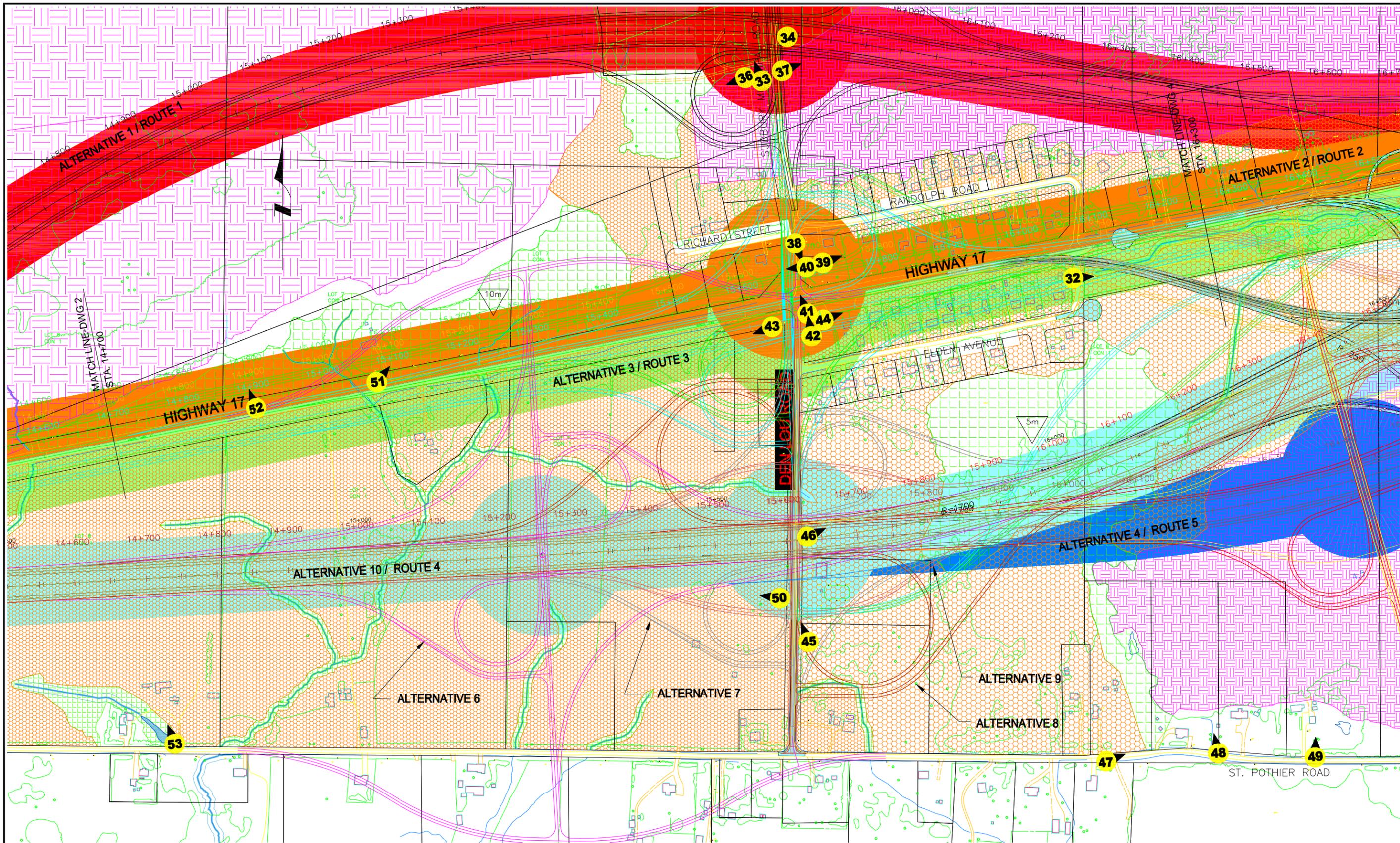
METRIC



HIGHWAY 17  
HIGHWAY 17 Four Laning From 20.5 km  
West of Highway 144, Easterly for 6.5 km  
G.W.P. 156 - 98 - 00

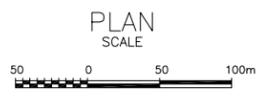


SHEET  
2



STA. 14+700 TO 16+300 (HIGHWAY 17 STUDY CORRIDOR)

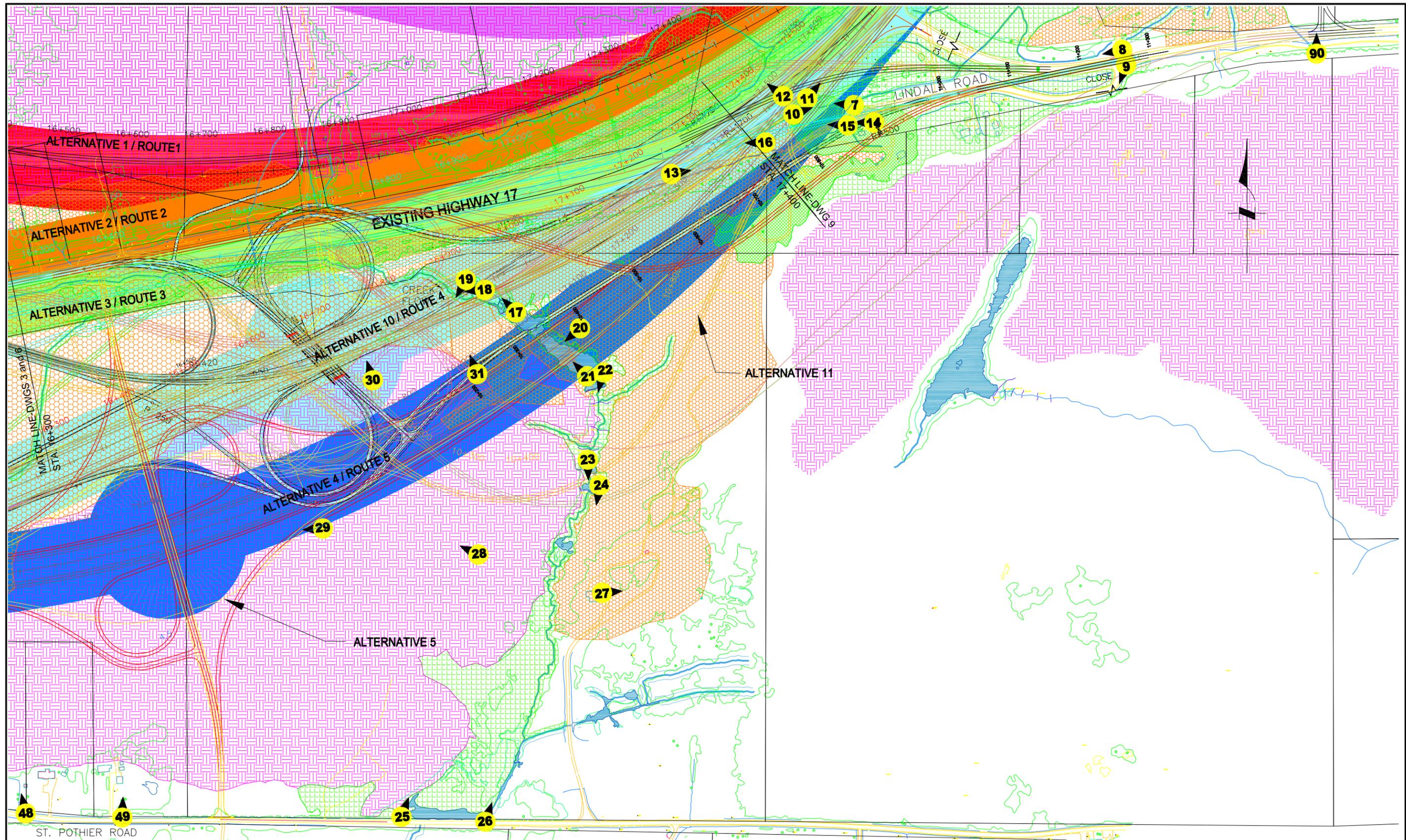
METRIC



HIGHWAY 17  
HIGHWAY 17 Four Laning From 20.5 km  
West of Highway 144, Easterly for 6.5 km  
G.W.P. 156 - 98 - 00



SHEET  
3



STA. 16+300 TO 17+400 (HIGHWAY 17 STUDY CORRIDOR)



METRIC

Ministry of  
Transportation  
Ontario

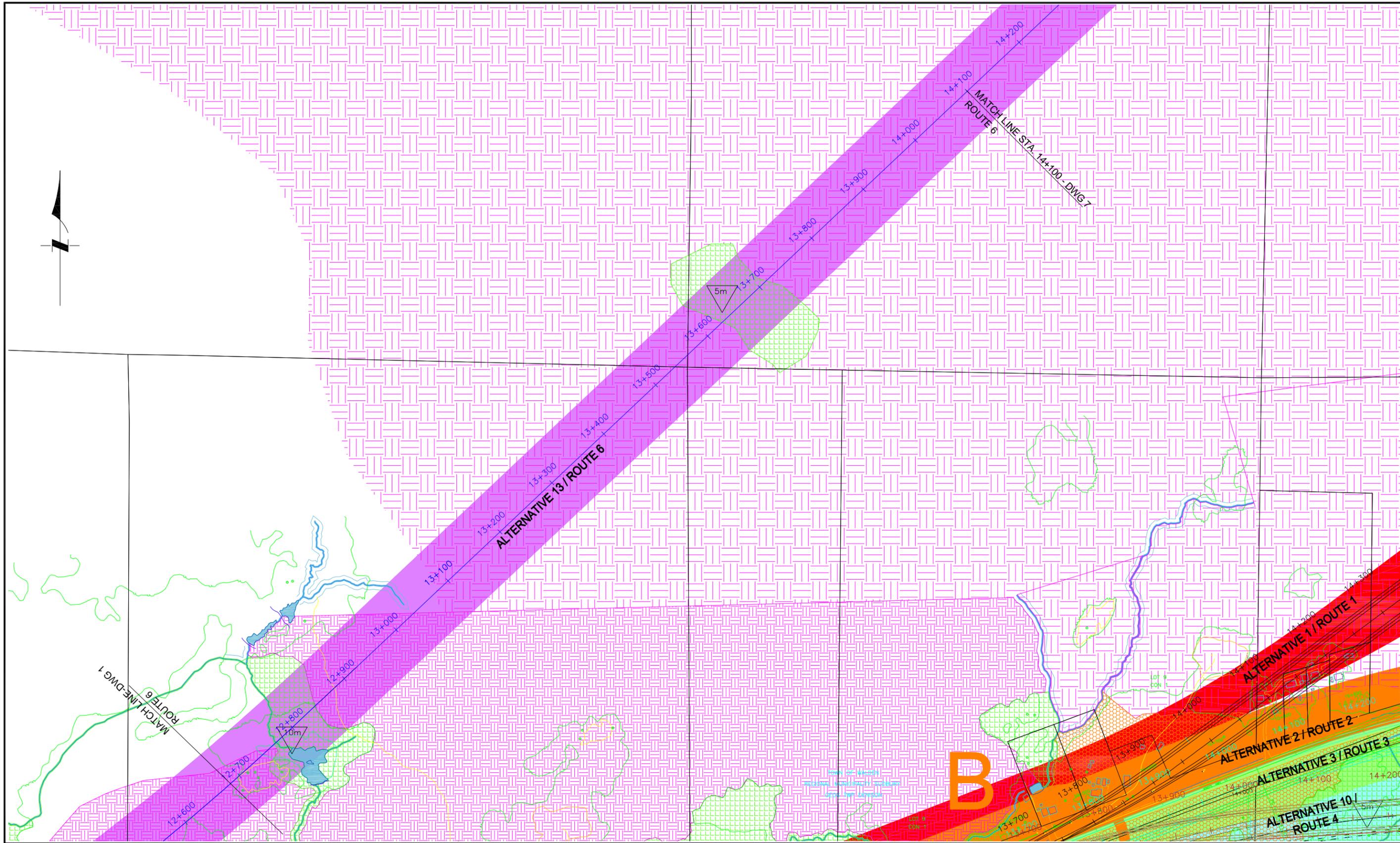
**PML** **Peto MacCallum Ltd.**  
CONSULTING ENGINEERS

**Stantec Consulting Ltd.**  
Stantec

**HIGHWAY 17**  
HIGHWAY 17 Four Laning From 20.5 km  
West of Highway 144, Easterly for 6.5 km  
G.W.P. 156 - 98 - 00

7

SHEET  
4



STA. 12+700 TO 14+100 (ROUTE 6 CORRIDOR)

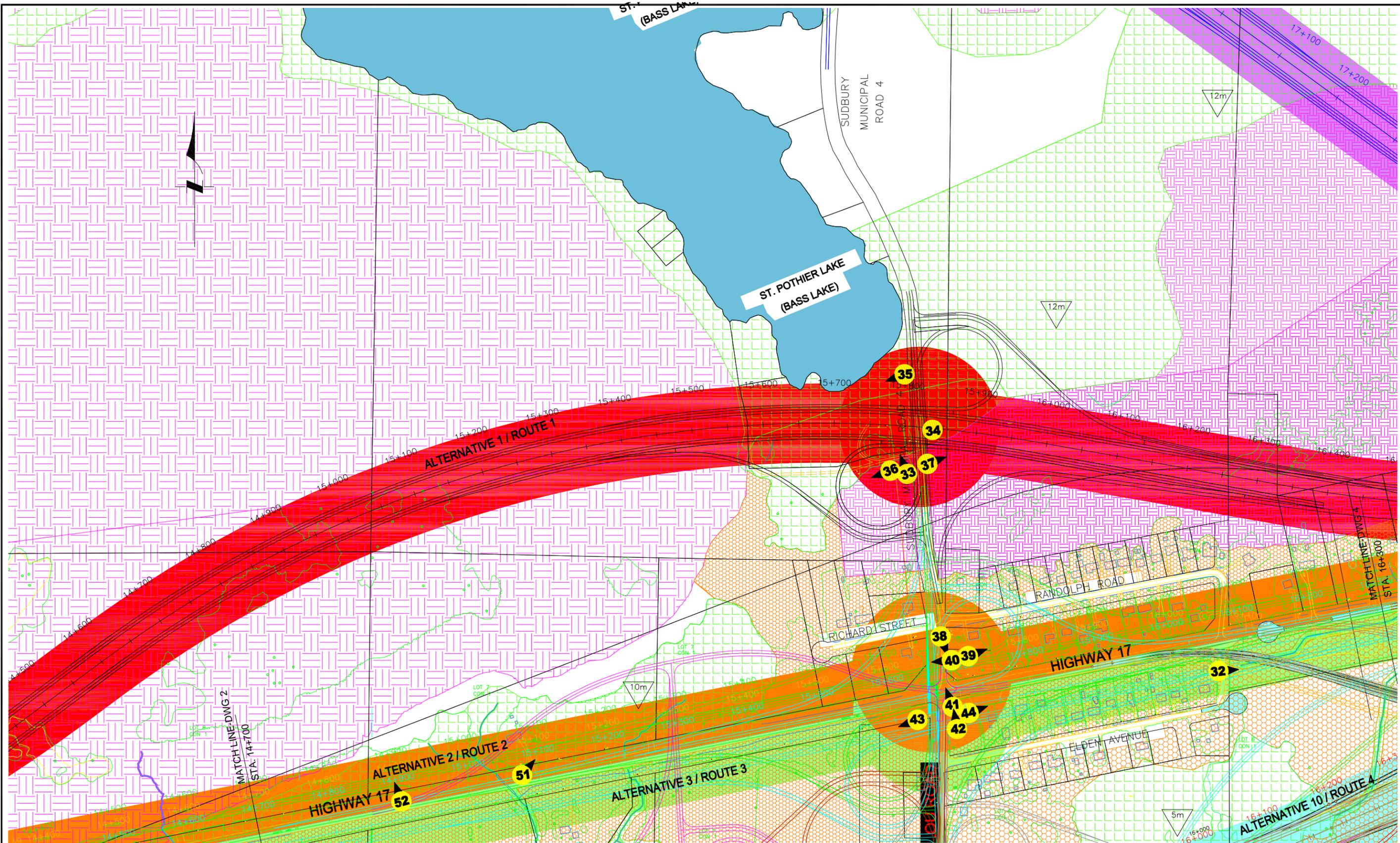
METRIC



HIGHWAY 17  
 HIGHWAY 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00



SHEET  
 5



STA. 14+700 TO 16+300 (HIGHWAY 17 STUDY CORRIDOR)

METRIC




 Ministry of Transportation  
 Ontario

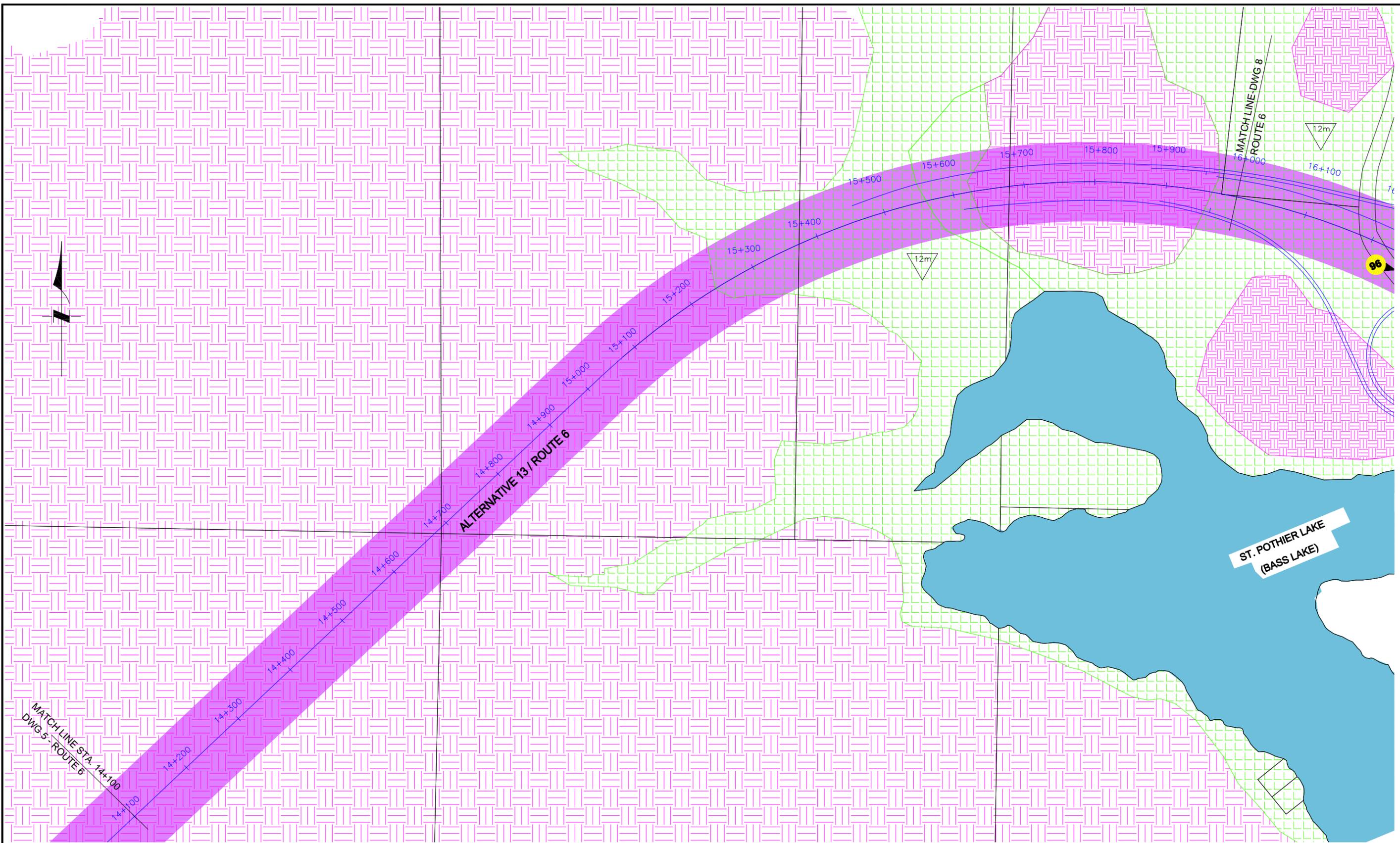

**Peto MacCallum Ltd.**  
 CONSULTING ENGINEERS


**Stantec Consulting Ltd.**

**HIGHWAY 17**  
 HIGHWAY 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00

  
**7**

SHEET  
**6**



STA. 14+100 TO 16+000 (ROUTE 6 CORRIDOR)

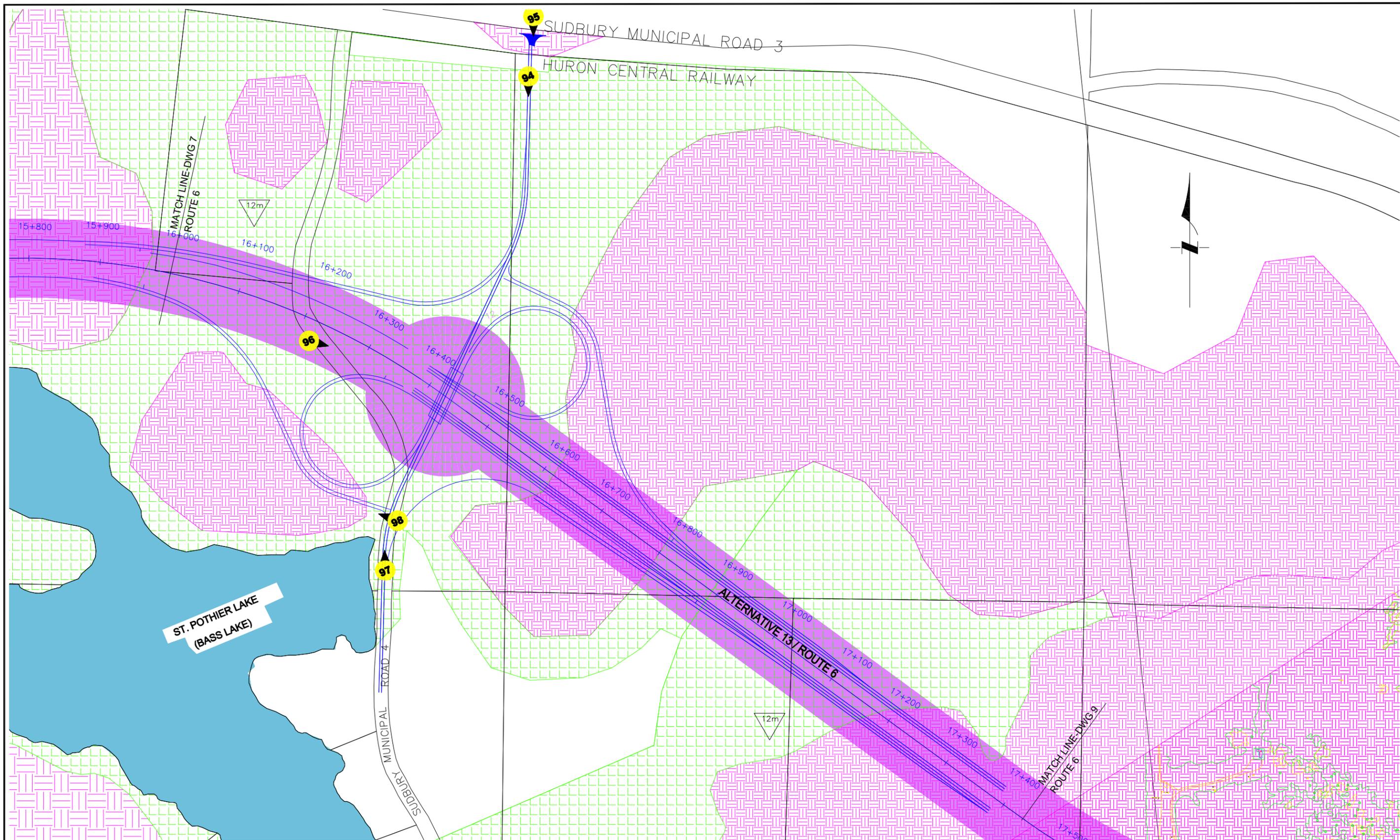
METRIC



HIGHWAY 17  
 HIGHWAY 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00



SHEET  
 7



STA. 16+000 TO 17+400 (ROUTE 6 CORRIDOR)

METRIC



Ministry of  
Transportation  
Ontario



**Peto MacCallum Ltd.**  
CONSULTING ENGINEERS

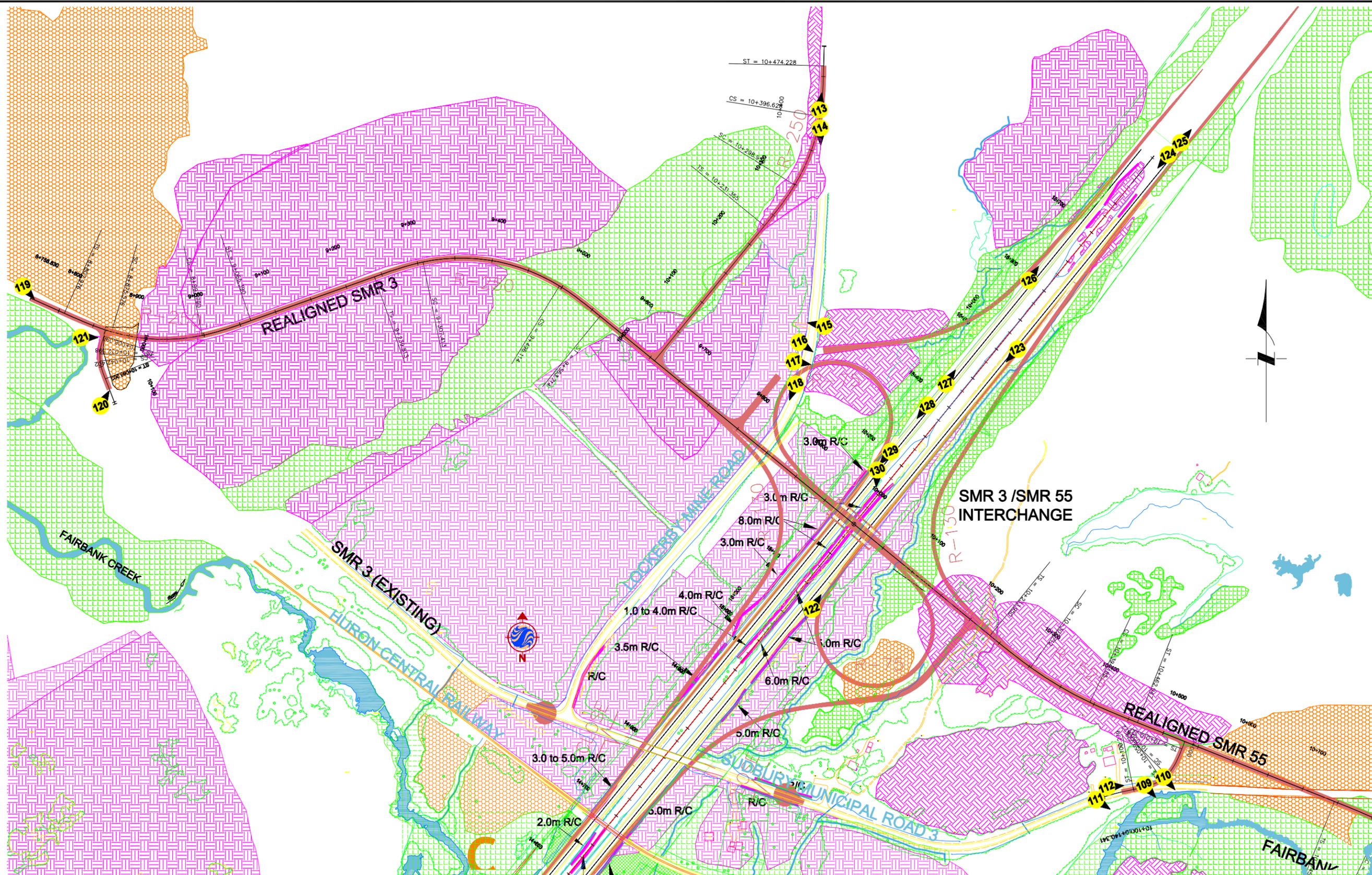
Stantec Consulting Ltd.  
Stantec

HIGHWAY 17  
HIGHWAY 17 Four Lining From 20.5 km  
West of Highway 144, Easterly for 6.5 km  
G.W.P. 156 - 98 - 00



SHEET  
8





SUBBURY MUNICIPAL ROAD 3 AND SUBBURY MUNICIPAL ROAD 55  
 REALIGNMENTS AND INTERCHANGE  
 (EASTERN INTERCHANGE ALTERNATIVE 13)



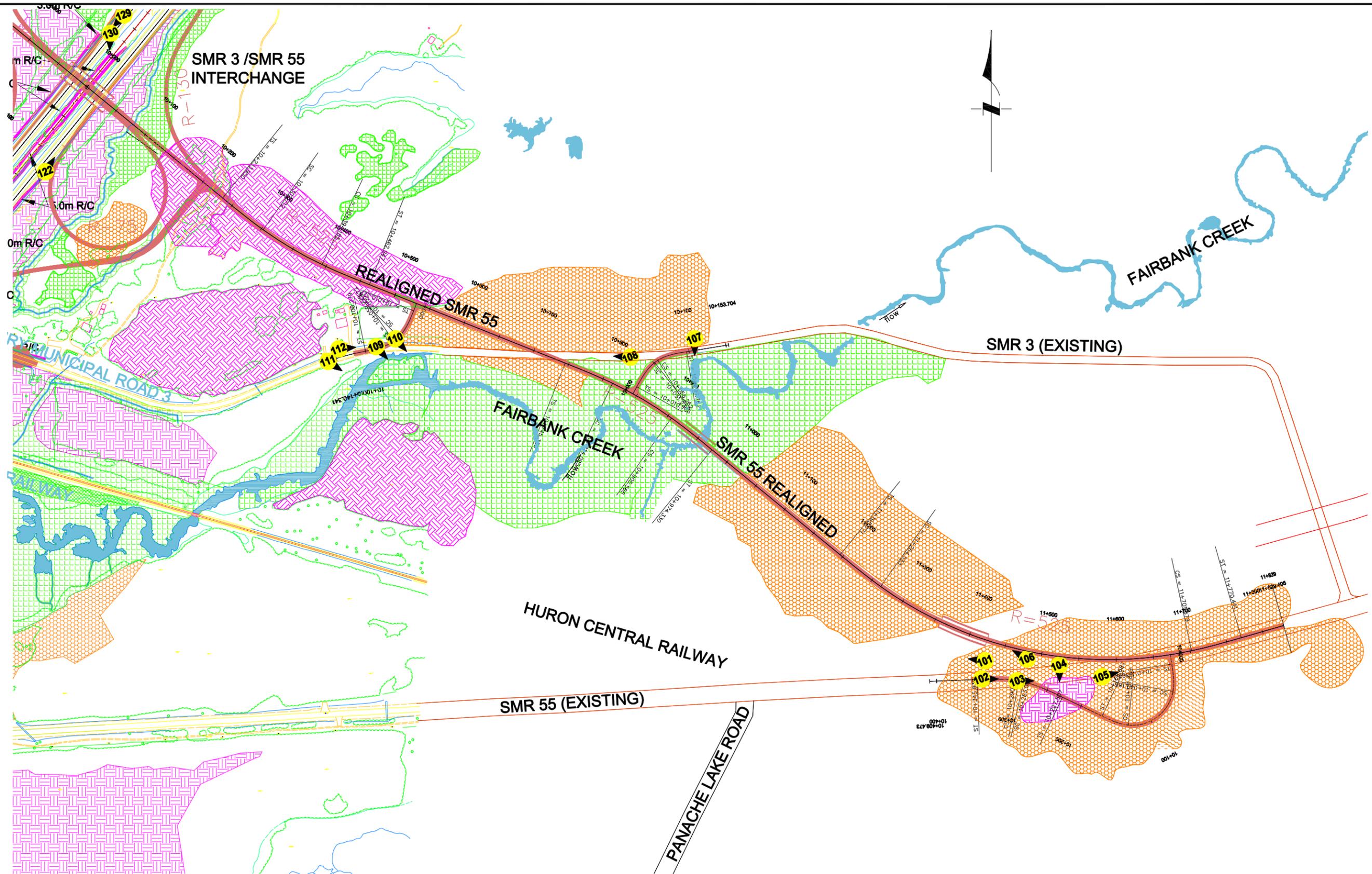
**METRIC**



HIGHWAY 17  
 HIGHWAY 17 Four Laning From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.V.P. 156 - 98 - 00



SHEET  
 10



**METRIC**

HIGHWAY 17  
 SUDBURY MUNICIPAL ROAD 55 REALIGNMENT  
 (EASTERN INTERCHANGE ALTERNATIVE 13)



HIGHWAY 17  
 HIGHWAY 17 Four Lining From 20.5 km  
 West of Highway 144, Easterly for 6.5 km  
 G.W.P. 156 - 98 - 00



SHEET  
 11



## **APPENDIX A**

### List of Reference Documents



## APPENDIX A

### LIST OF REFERENCE DOCUMENTS

HIGHWAY 17 FROM 20.5 KM WEST OF HIGHWAY 144  
EASTERLY FOR 6.5 KM  
TOWN OF WALDEN, ONTARIO  
PURCHASE ORDER NO. 5004-E-0037  
GWP NO. 156-98-00

#### A. Geological Maps

- Bedrock geology of the Panache Lake Area (East Part) Districts of Sudbury and Manitoulin, Preliminary Map P. 669 Geological Series, from the Ontario Department of Mines, issued 1971, Scale: 1 inch to 1 mile.

#### B. Resource Documents

- Sudbury Mining Area, Sudbury District Map 2170, from the Ontario Department of Mines, published 1969, Scale 1:63,360 or 1 inch to 1 mile.
- Aggregate Resources Inventory Paper 140 and Map 1B West of Sudbury Regional Municipality of Sudbury and District of Sudbury from the Ontario Geological Survey, Ministry of Development and Mines, issued 1987.

#### C. MTO Reports

- Preliminary Foundation Investigation Report for the Feasibility Study of the Proposed Interchange at Highway 17 Line 'D' (4 lanes) and the Existing Highway 17, Township of Denison, Regional Municipality of Sudbury, WP No. 61-74-01, Geocres No. 411-96A (September 1976 noted on Margin).
- Preliminary Foundation Investigation report for the Fairbank Creek structures, Highway 17, Line 'D', District 17 (Sudbury) Township of Denison, Regional Municipality of Sudbury, WP 61-74-02 and 03, Site 46-298A & B, Geocres No. 411 92 (September 1976 noted on Margin).
- Preliminary Foundation Investigation Report for Proposed Improvements, West Junction of Highway 17 and Sudbury Regional Road 55, District 54, Sudbury, GWP 156-98-00 prepared by Shaheen & Peaker Limited, Ref. No. SPT1057 Geocres No. 411-155 dated May 2, 2002.
- Foundation Investigation Report for stability of Fill Slopes, Highway 17 Line 'D' Stations 240 to 270, District 17 (Sudbury), WP 61-74-01, Geocres No. 411096 dated 11 June 1975.



- Engineering & Title Records for King's Highway 17 Geographic Township of Denison, Town of Walden Regional, Municipality of Sudbury, W.P. No. 192-92-00, 1997-06 survey and W.P. No. 110-88-00, 1991-12 survey.
- Engineering & Title Records for King's Highway 17, Geographic Township of Louise, Town of Walden, Regional Municipality of Sudbury, W.P. 192-92-00.

**D. Well Records (See Appendix B)**

- Water Well Records from the Drury Denison and Graham Townships (Denison) provided by the Ministry of Natural Resources on February 8, 2007 (62 wells).
- Water Well Records from the Louise Township provided by the Ministry of Natural Resources on February 8, 2007 (4 wells).

**E. Air Photo**

- Air photos from 1989, Roll 3 Flight 4612, Photos 159 to 163 and Roll 18, Flight 4613, Photos 132 to 137.
- Photo mosaic of oblique colored aerial photographs taken along the study corridor provided by Stantec Consulting Ltd.



## **APPENDIX B**

MOE Well Records

**WATER WELL RECORDS  
FROM THE DRURY DENISON AND GRAHAM TOWNSHIPS (DENISON)**

TABLE  
WATER WELL RECORDS

WELLS		KIND OF WATER							WATER USE, ETC.							
TOTAL	ENDING IN	FRESH	SALT	SULPH	MIN- ERAL	DRY HOLE	DOM. OR STOCK	IRRIG- ATION	INDUS- TRIAL	COMM- ERCIAL	MUNI- CIPAL	PUBLIC SUPPLY	COOL/ AIR COND	NOT USED	TEST HOLE	ABAN- DONED
62	OVER- BURDEN	52	0	0	0	4	55	0	0	0	0	2	0	1	1	5
	BED- ROCK															
		44														

- The location of these wells are either estimated from the centroid of the lot or they are uncertain

MUNICIPALITY CONCESSION ETC	LOT	UTM WELL NO	EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	STAT FOUND FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
DRURY DENISON & GRAHAM TOWNSHIP (DENISON)																
	01	007	59- 471321 08572 5135378		2005/07	7023	06	FR	0039	0031	0036	0005 1 :0	DO			---
																BRWN CLAY STNS 0008 BRWN SAND STNS 0015 GRVL 0039
CON	01	004	59- 473400 03683 5135500	870	1976/10	5210	06						DO			---
CON	01	004	59- 473200 04816 5135400	850	1983/09	5210				0015	0390	0000 3 :0	DO			SAND BLDR 0025 GREY GRNT 0215
CON	01	004	59- 473700 02613 5135800	850	1971/07	3613		DRY								CLAY 0020 SAND BLDR 0028 GREY GRNT 0390
CON	01	004	59- 473500 04819 5135500	850	1983/08	5210	06	FR	0185	0015	0225	0001 2 :0	DO			RED CLAY 0018
CON	01	006	59- 471590 02301 5135100	920	1969/12	5435	05	FR	0046	0037	0039	0004 3 :0	DO			SAND 0008 GREY GRNT 0225
CON	01	006	59- 471875 02584 5135250	900	1971/07	4507	05	FR	0038	0024	0030	0001 2 :0	DO			BRWN CLAY 0006 BRWN MSND CLAY 0023 BRWN MSND CSND GRVL 0025 BLUE ROCK 0047
CON	01	006	59- 471782 03212 5135384	900	1974/02	5210	06	FR	0058	0025	0030	0010 1 :0	DO			BRWN LOAM 0003 BRWN CLAY 0016 MSND 0028 GRVL BLDR 0034 GRVL 0038
CON	01	006	59- 471690 02166 5135120	900	1969/09	4507	05	FR	0048	0032	0075	0001 3 :0	DO			CLAY BLDR 0015 GREY GRNT 0065
CON	01	006	59- 471650 03726 5135350	900	1977/04	4817	06	FR	0078	0022	0022	0001 1 :0	DO			BRWN CLAY 0012 MSND 0018 HPAN 0019 BLUE ROCK 0083
CON	01	006	59- 471640 00886 5135220	900	1968/05	4507	02	FR	0041	0024	0030	0003 1 :0	DO			YLLW SAND CLAY 0072 GREY SAND GRVL 0078
CON	01	006	59- 471700 03728 5135450	900	1977/04	4817	06	FR	0082	0022	0022	0004 1 :0	DO			CLAY 0016 FSND 0030 GRVL 0041
CON	01	006	59- 471700 03729 5135400	900	1977/05	4817	06	DRY								YLLW CLAY SAND 0012 GREY ROCK 0086
CON	01	006	59- 471700 03730 5135350	900	1977/05	4817	06	FR	0094	0020	0020	0002 1 :0	DO			YLLW CLAY 0012 GREY ROCK 0170
CON	01	006	59- 471770 03731 5134990	890	1977/05	4817	06	FR	0096	0038	0038	0003 1 :0	DO			YLLW CLAY 0035 GREY ROCK 0100
CON	01	006	59- 471620- 00875 5134810	900	1956/06	3627	05	FR	0055	0029	0040	0006 4 :0	PS			YLLW CLAY SAND 0049 GREY ROCK 0100
CON	01	006	59- 471693 03588 5135095	900	1975/09	4862	02	FR	0037	0032			DO			CLAY GRVL 0017 GREY ROCK 0040 BRWN ROCK 0046 GREY ROCK 0054 BRWN ROCK 0059
CON	01	006	59- 471550 03846 5134950	900	1977/09	5210	06	FR	0086	0030	0095	0002 1 :30	DO			WHIT BLDR CLAY QSND 0038
CON	01	006	59- 471730 00890 5135200	900	1965/09	4507	02	FR	0047	0035	0035	0001 2 :0	DO	0044 03		SAND 0012 GREY GRNT 0095
CON	01	006	59- 471700 03854 5134990	900	1977/09	5210	06	FR	0105	0025	0115	0001 1 :0	DO			CLAY 0016 GRVL 0043 BLDR GRVL 0047
CON	01	006	59- 471570 00885 5135050	900	1967/11	4507	02	FR	0119	0035	0080	0001	DO			CLAY 0010 SAND 0044 GREY GRNT 0115
CON	01	006	59- 471580 00884 5135150	900	1967/07	4507	02	FR	0106	0038	0065	0001	DO			BRWN CLAY 0010 GRVL 0016 WHIT ROCK 0146
CON	01	006	59- 471510 00883 5134880	900	1965/07	4507	02	FR	0041	0028	0028	0060 1 :0	DO	0038 03		RED CLAY MSND 0022 BLDR 0025 BLUE ROCK 0116
CON	01	006	59- 472000 00882 5135280	890	1963/07	4507	02	FR	0038	0015	0020	0002 5 :0	DO			CLAY 0016 MSND CLAY 0036 GRVL 0041
CON	01	006	59- 471630- 00881 5135360	900	1961/06	4507	02	FR	0040	0038			NU			RED CLAY 0028 GRVL 0038
																RED CLAY 0040 FSND 0042

MUNICIPALITY CONCESSION ETC	LOT	UTM WELL NO	EASTING ELEV FEET	DATE	DRILLER	CSG DIA	KIND OF INS WATER	FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
CONTINUING... DRURY DENISON & GRAHAM TOWNSHIP (DENISON)																
CON	01 006	59- 00880	471830~ 5135350	900	1958/10 3624	02	FR	0127	0022							DO --- CLAY 0012 HPAN MSND CLAY 0020 GRVL 0022 GREN SLTE 0131 ---
CON	01 006	59- 00879	471880 5135470	900	1959/06 5511		DRY									PRDR 0131 GREY ROCK 0200 ---
CON	01 006	59- 00878	471680~ 5135220	900	1958/09 3624	02	FR	0045	0034							DO --- PRDG 0030 CLAY MSND GRVL 0045 GREN SLTE 0054 ---
CON	01 006	59- 00877	471570~ 5135090	900	1957/09 3624	03	FR	0037	0037							DO --- CLAY 0012 HPAN MSND GRVL 0037 GREN SLTE 0096 ---
CON	01 006	59- 00876	471840~ 5135250	900	1956/06 3627	05	FR	0043	0034	0036	0056	3 : 0				DO --- BRWN MSND 0012 GRVL 0045 ---
CON	01 006	59- 02107	471590 5135150	915	1969/05 3909	02	FR	0054	0023	0035	0002	3 : 0				DO --- BRWN CLAY 0023 HPAN 0054 ---
CON	01 006	59- 04658	471600 5135400	900	1981/10 5516	06	FR	0254	0018	0286	0006	2 : 0				DO --- GREY CLAY STNS SAND 0045 BLCK GRNT 0286 ---
CON	01 006	59- 07613	9999999~ 5135430		1998/06 5210	06	FR	0042	0020	0038	0003	1 : 0				DO --- SAND 0030 SAND GRVL 0042 ---
CON	01 006	59- 07326	471904~ 5135430		1996/08 1462	06										DO --- GREY CLAY 0010 SAND BLDR 0025 SAND 0034 GREY GRNT 0230 BLCK GRNT 0302 ---
CON	01 006	59- 07325	471904~ 5135430		1996/09 1462	06	FR	0210	0030		0001	4 : 0				DO --- GREY CLAY 0015 GREY SAND 0043 GREY GRNT 0200 BLCK GRNT 0282 ---
CON	01 006	59- 06232	471904~ 5135430		1990/09 1462	06	FR	0185	0015		0002	1 : 0				DO --- SAND CLAY BLDR 0029 GREY GRNT 0209 ---
CON	01 006	59- 05975	471904~ 5135430		1989/10 5210	06	FR	0170	0015	0185	0001	1 : 0				DO --- CLAY 0028 GREY GRNT 0185 ---
CON	01 006	59- 04981	472100 5135500	850	1984/10 5210	06	FR	0216		0010	0001	1 : 0				DO --- CLAY 0020 SAND 0045 GREY GRNT 0225 ---
CON	01 006	59- 04980	471500 5135400	800	1984/10 5210	06	FR	0188	0010	0205	0001	1 : 0				DO --- CLAY 0018 SAND 0039 GREY GRNT 0205 ---
CON	01 006	59- 04979	471500 5135700	800	1984/09 5210	06	FR	0050	0028	0125	0001	1 : 0				DO --- GRVL BLDR 0030 SAND 0035 SAND GRVL 0044 GREY GRNT 0125 ---
CON	01 006	59- 04817	471200 5135400	850	1983/09 5210	06	FR	0105	0015	0125	0001	1 : 0				DO --- CLAY 0015 QSND 0035 SAND GRVL 0052 GREY GRNT 0125 ---
CON	01 006	59- 04706	471900 5134800	850	1982/09 5210	06	FR	0082	0030	0105	0007	1 : 30				DO --- SAND GRVL 0009 GREY GRNT 0105 ---
CON	01 006	59- 03771	471850 5134980	890	1977/06 4817	06	FR	0033	0033	0033	0003	1 : 0				DO --- YLLW SAND CLAY 0026 GRVL 0038 ---
CON	01 006	59- 04694	472600 5135500	900	1982/10 5210	06	FR	0165	0025	0205	0001	2 : 0				DO --- LOAM 0003 CLAY 0012 SAND 0030 GREY GRNT 0205 ---
CON	01 006	59- 04445	471650 5135400	900	1981/05 5210	06	FR	0205	0022	0125	0001	4 : 0				DO --- GREY CLAY 0015 GREY FSND 0046 GREY GRNT DKCL 0290 ---
CON	01 006	59- 04189	471850 5134650	890	1979/09 5210	06	FR	0075	0020	0135	0001	1 : 0				DO --- CLAY 0008 GREY GRNT 0135 ---
CON	01 006	59- 04190	471500 5135190	900	1979/10 5210	06	FR	0045	0015	0055	0005	1 : 30				DO --- BRWN SAND 0038 GRVL 0045 GREY GRNT 0055 ---
CON	01 006	59- 04193	472100 5134650	800	1979/08 5210	06	FR	0105	FLW	0115	0001	1 : 30				DO --- SAND GRVL 0013 GREY GRNT 0115 ---
CON	01 006	59- 04194	471650 5135400	900	1979/11 5210	06	FR	0142	0020	0155	0001	1 : 0				DO --- SAND 0015 QSND 0030 CLAY 0047 GREY GRNT 0155 ---
CON	01 006	59- 04326	471600 5135050	850	1980/05 5210	06	FR	0100	0030	0105	0003	1 : 0				DO --- YLLW SAND 0005 GREY CLAY 0019 GREY GRNT 0105 ---
CON	01 006	59- 04657	471650 5135400	900	1981/10 5516	06			0014	0400	0001	2 : 0				DO --- GREY CLAY SAND STNS 0076 BLCK GRNT LYRD 0400

MUNICIPALITY CONCESSION ETC	UTM WELL EASTING LOT NO	ELEV ELEV NORTHING	DATE	DRILLER	CSG DIA	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
CONTINUING... DRURY DENISON & GRAHAM TOWNSHIP (DENISON)															
CON	01 006	59- 471950 04537 5135500	800	1981/11 5210	06	FR	0060	0015	0065	0005	4 :0	DO			---
															SAND 0010 SAND BLDR 0020 SAND GRVL 0028 GREY GRNT 0065
CON	01 006	59- 471600 04552 5135500	800	1981/09 5210	06	FR	0145	0020	0165	0001	1 :30	DO			---
															BRWN CLAY 0010 SAND 0028 GRVL 0032 GREY GRNT 0165
CON	01 006	59- 471550 04612 5135400	900	1982/05 5210	06	FR	0055	0020	0065	0010	1 :0	DO			---
CON	01 006	59- 471850 04310 5135500	850	1980/08 5210	06	FR	0050	0012	0065	0050	1 :0	DO			SAND GRVL 0045 GREY GRNT 0065
CON	01 007	59- 471180 03169 5135290	885	1973/11 3652	02	FR	0082	0030	0034	0003	3 :0	DO			---
CON	01 007	59- 470975 00887 5134650	920	1963/10 1721	02	DRY									PRDR 0032 STNS GRVL BLDR 0083
CON	01 007	59- 471093- 06585 5135438		1992/05 5210	06	FR	0055	0020	0045	0010	2 :0	DO			BRWN CLAY 0013 GREY ROCK 0173
CON	01 007	59- 471387 08691 5135363		2006/06 7023	06	FR	0064	0028	0030	0010	1 :	DO			CLAY 0015 QSND 0045 GRVL 0055
CON	01 007	59- 470800 03954 5136500	850	1978/06 3652	02	FR	0176	0022	0024	0002	1 :30	PS			BRWN CLAY 0012 GRVL PSND 0063
CON	01 008	59- 469950 04692 5135050	850	1982/10 5210	06	UK	0085	0015	0220	0000	1 :30	DO			---
CON	01 009	59- 469280 00889 5134700	850	1961/09 4817	02	UK	0223	0012	0055	0001	2 :0	DO			GREY CLAY 0008 GREY STNS 0193
															BRWN CLAY 0019 GREY GRNT 0220
															---
															GREY GRNT ROCK 0236

TABLE  
WATER WELL RECORDS

TOTAL WELLS DRILLED	WELLS ENDING IN			KIND OF WATER						WATER USE, ETC.						
	OVER- BURDEN	BED- ROCK	FRESH	SALT	SULPH	MIN- ERAL	DRY HOLE	DOM. OR STOCK	IRRIG- ATION	INDUS- TRIAL	COMM- ERCIAL	MUNI- CIPAL	PUBLIC SUPPLY	COOL/ AIR COND	NOT USED	TEST HOLE
4	0	4	4	0	0	0	0	3	0	0	1	0	0	0	0	0

- The location of these wells are either estimated from the centroid of the lot or they are uncertain

**WATER WELL RECORDS  
FROM THE LOUISE TOWNSHIP**

MUNICIPALITY	UTM	CONCESSION	WELL	EASTING	ELEV	DATE	DRILLER	INS	WATER	FEET	FEET	FEET	GPM	HR:MN	USE	DEPTH	LENGTH	DEPTHS	IN FEET	TO WHICH	FORMATIONS	EXTEND	
LOUISE TOWNSHIP																							
CON	06	009	59-	469137-		1990/07	5210	06	FR	0040	0015	0065	0020	1 : 0	DO								---
			06147	5133810																			CLAY 0010 GRNT 0065
CON	06	009	59-	468930	840	1970/08	4507	06	FR	0043	0000	0028	0003	2 : 0	CO								---
			02358	5134450																			GREY CLAY MSND 0037 MSND GRVL 0043 BLUE ROCK 0053
CON	06	010	59-	468700	850	1962/07	4507	02	FR	0118	0000	0060	0001	3 : 0	DO								---
			01282	5134360																			GREY CLAY 0021 FSND 0030 GRVL 0032 WHIT SLTE 0126
CON	06	011	59-	999999-		2000/10	1462	06	FR	0313	0020	0342	0010	1 :	DO								---
			07840	9999999																			GREY CLAY SAND 0020 GREY GRNT HARD 0280 BLCK GRNT QTZ 0342



## **APPENDIX C**

Site Reconnaissance Observations and

Site Photographs 1 to 130



## APPENDIX C

### SITE RECONNAISSANCE OBSERVATIONS AND SITE PHOTOGRAPHS

PML carried out Site Reconnaissance Surveys (SRS) of the existing alignment and adjacent lands within various alternate alignments/routes. The SRS consisted of a drive-by and walk-through of selected sections of Highway 17 and adjacent lands. The ground truth checks verified the surficial geology and drainage conditions inferred from the literature and map reviews as summarized below.

A total of eleven alternatives designated Alternatives 1 through 11 were initially investigated on May 1, 2006. Alternative Alignment 13 was added after the initial SRS and was surveyed in September 12, 2006. Stantec reduced these 12 Alternative Alignments to six Alternate Routes for final consideration and assessment. The following table provides the related numbering for each of the Alternative Alignments and Alternative Routes and should be referred when viewing the photographs.

INITIAL ALTERNATIVE ALIGNMENTS	FINAL ALTERNATE ROUTES
Alignment 1 – North Side New Alignment	Route 1 – North Side New Alignment
Alignment 2 – North Side Twinning	Route 2 – North Side Twinning
Alignment 3 – South Side Twinning	Route 3 – South Side Twinning
Alignment 4 – South Side New Alignment, Parclo A I/C east of Den-Lou Road	Route 5 – South Side New Alignment (Southerly Route)
Alignment 5 – South Side New Alignment, Diamond I/C east of Den-Lou Road	–
Alignment 6 – Middle New Alignment, I/C west of Den-Lou Road	–
Alignment 7 – Middle New Alignment, Parclo A I/C on Den-Lou Road	–
Alignment 8 – Middle New Alignment, Parclo B I/C on Den-Lou Road	–
Alignment 9 – Middle New Alignment, Diamond I/C on Den-Lou Road	–
Alignment 10 – Middle New Alignment, Parclo A I/C across from Microwave Tower	Route 4 – South Side New Alignment (*)
Alignment 11 – Middle New Alignment with Button Hook and Parclo A I/C	–
Alignment 13 – North Side New Alignment (Northerly Route)	Route 6 – North Side New Alignment (Northerly Route)

Notes: Alignment 12 not provided

(\*) With realigned SMR 55 connection



The photographs were numbered from east to west to reflect the most likely direction of the construction of the Highway 17 improvements and future four-laning programs.

As indicated previously, the new SMR 55 / SMR 3 realignment and associated interchange photographs were added to this report (photographs 101 to 130). The SRS was carried out on December 6, 2007.

**A. East Project Limits to Huron Central Railway Overhead (Photographs 1 and 2)**

- The terrain consists of bedrock outcrops.
- The existing Highway 17 was cut into the bedrock. The Sudbury Municipal Road (SMR) 3 underpass and Huron Central Railway (HCR) overhead cross over the highway.

**B. From HCR to SMR 55 Area (Photographs 3 to 16 and 93)**

- An extensive open water swamp was found within the Fairbank Creek floodplain (Photographs 3 to 6). Depths to competent soil vary across swamp (up to 19 m noted on the photographs).
- A culvert over 3 m span crossed the Highway 17 from north to south (Photographs 4, 5 and 93).
- The swamp was locally covered by the road embankments of the existing and previous Highway 17, Lindala Road and SMR 55 (Photographs 7, 10 to 16).
- Prominent bedrock outcrops occurred north of the SMR 55 intersection (Photograph 8) and south of the Lindala Road / SMR 55 intersection (Photograph 9).

**C. Crossing of Creek Floodplain West of SMR 55 Area (Photographs 17 to 27)**

- A floodplain of variable width was encountered west of the existing SMR 55 intersection (Photographs 17 to 24).
- Exposed bedrock was found along the west of the creek bed and rising steeply on a westerly direction (Photographs 18 and 19).
- An extensive network of beaver dams restrict water flow along the creek (Photographs 20 to 24).
- Earth (silts, clayey silts) occur along the creek floodplain rising above the creek bed (Photographs 20, 23 and 27).
- Open water swamps occurred where the creek meets with St. Pothier Road (Photographs 25 and 26).



**D. West of Creek (Rocha's Property) to Den-Lou Road (Photographs 28 to 32, 47, 48 and 49)**

- Massive rock outcrops were found west of the creek on M. Rocha's property and extending northerly (Photographs 28 to 31, 48 and 49).
- South of existing Highway 17 and to the west of the rock outcrops, flat terrain containing outwash deposits and wetland was encountered - southeast of Elden Avenue (Photograph 32).
- Bedrock outcrops and rolling terrain noted on St. Pothier Road (Photograph 47).

**E. SMR 4 and Den-Lou Road (Photographs 33 to 46 and 50)**

- St. Pothier Lake (Bass Lake) and associated SMR 4 embankment was noted (Photographs 33 and 34).
- Low rock outcrops and shallow soil cover were noted to the south of the lake on both sides and beyond of the SMR 4 alignment (Photographs 35 to 37).
- A prominent rock ridge was noted beyond the west margin of the lake (Photographs 35 and 36).
- Extensive flat earth terrain noted in the area of the intersection of the existing Highway 17 and SMR 4/Den-Lou Road. Bedrock in the area is at 12 to 15 m depths based on water well records (Photographs 38 to 46).
- Open flat to rolling terrain noted at Den-Lou Road and to the east (Photographs 45 and 46) and west (Photograph 50). Tree lines demark location of possible creeks and swamp areas (Photograph 50).

**F. Den-Lou Road to St. Pothier Road / Highway 17 Intersection (Photographs 51 to 58)**

- Wetlands are present north of existing Highway 17 with a massive rock ridge (also noted previously beyond Bass Lake) in the distance (Photographs 51 and 52).
- Small water courses with potential associated wetlands and flat terrain inferred outwash deposits of silts/sandy silts occur between Highway 17 and St. Pothier Road (Photographs 53, 54 and 56).
- Rock outcrops and swampy terrain are present at/near the intersection of Highway 17 and St. Pothier Road (Photographs 55, 57 and 58).

**G. St. Pothier Road to West of Fen Road (Photographs 59 to 74)**

- Prominent rock outcrops partially cut for the existing Highway 17 embankment construction were noted along this alignment (Photographs 59 to 63, 65 to 73).
- Swamp areas with open water were noted between the outcrops (Photographs 60, 62 to 64, 68, 69 and 74).
- Estimated height of embankment through swamps is 2 to 5 m (Photographs 60, 63 and 70).



**H. SMR 3 and Lockerby Mine Road Areas Near Highway 17 (Photographs 75 to 89)**

- Extensive rock outcrops and rock cuts were noted along Highway 17 at the SMR 3 underpass (Photographs 75 to 82 and 89) and along/near the Lockerby Mine Road (Photographs 83 to 88).
- Treed terrain beyond roadways indicated presence of soil cover beyond the visible bedrock (Photographs 83 to 89).

**I. SMR 55 and Fairbank Creek Areas South of Highway 17 (Photographs 90 to 93)**

- Potentially shallow soil cover over bedrock noted beyond the east shoulder of SMR 55 (Photograph 90).
- Beyond potential shallow bedrock, the estimated 150 m wide floodplain of the Fairbank Creek was noted towards the east (SMR 3 and HCR embankments) (Photographs 91 and 92) with competent soil estimated at 10 to 12 m depth.

**J. SMR 3 / SMR 4 Intersection Area North of Bass Lake (Photographs 94 to 98)**

- Bedrock outcrops bordering extensive swamp lands were found on the south side of the HCR (Photographs 94 to 96).
- Bedrock outcrops border the existing SMR 4 with forested areas beyond indicating potentially variable soil cover thickness (Photographs 97 and 98).

**K. Area North of Highway 17 West of Fen Road (Photographs 99 and 100)**

- Massive rock ridge noted in the distance and in foreground north of Highway 17 (Photographs 99 and 100).
- Treed terrain and farm field indicated the presence of local deep soil cover over the bedrock (Photographs 99 and 100).

**L. SMR 55 and Area south of Huron Central Railway (Photographs 101 to 106)**

- Extensive low-lying terrain occurs north of the existing SMR 55 (Photographs 101 and 106).
- Bedrock outcrops were noted on the south ditch of the SMR 55 (Photographs 102 and 103).
- Treed terrain indicated the presence of soils covering the bedrock (Photographs 102, 104 and 105).
- Estimated height of embankment for possible Huron Central Railway (HCR) overhead is over 8 m (Photograph 106).



**M. Area of SMR 3 (Existing) / SMR 55 (Realigned) (Photographs 107 to 112)**

- Extensive Fairbank Creek flood plain was noted south of SMR 3 and possible creek crossing structure site (Photographs 107, 109, 110 and 111).
- Sloping farm field and treed terrain indicated the presence of local deep soil cover over the bedrock. To the north and west, beyond the farmland, rock ridges were noted. (Photographs 108 and 112).

**N. Realigned SMR 55 / SMR 3 and Lockerby Mine Road Areas Near Highway 17 (Photographs 113 to 118 and 122 to 130)**

- Shallow bedrock / bedrock outcrops were noted along Lockerby Mine Road proposed E-N/S Ramp and S-W Ramp (Photographs 113, 115 to 118).
- Swamp areas were present north of the existing and realigned Lockerby Mine Road (Photograph 114).
- Rock cuts and shallow bedrock were noted at the proposed Realigned SMR 3 / SMR 55 I/C underpass. It is noted that the grade of Highway 17 WBL is at a higher level than the EBL (Photographs 122 and 123).
- Low-lying swampy areas were found south and north of Highway 17 and to the east of the possible underpass site (Photographs 125, 127 and 130).

**O. Area of Realigned SMR 3 and Existing SMR 3 (Photographs 119 to 121)**

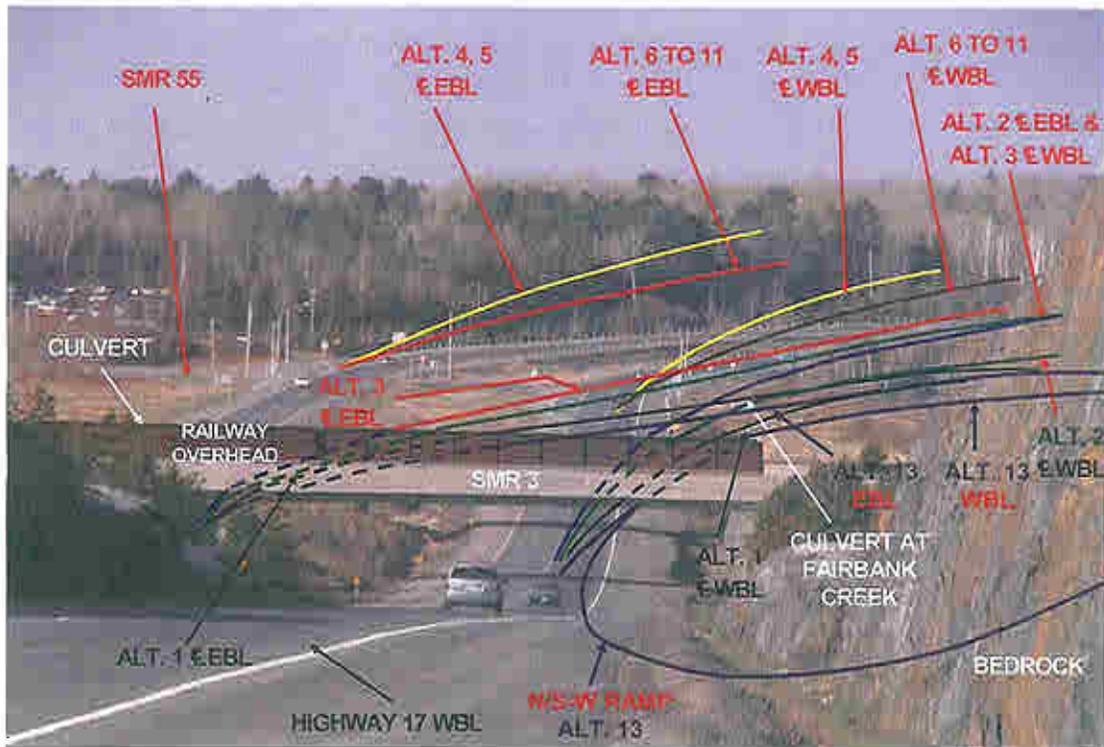
- The Fairbank Creek flood plain was noted south of SMR 3 (Photographs 119 and 120)
- Farmland and treed terrain indicated soil cover over bedrock north of SMR 3 (Photographs 119 to 121).
- Extensive rock ridge area was present beyond visible treed terrain (Photograph 119).



**Photograph 1 VIEW:** Highway 17 looking west from north shoulder of WBL about 350 m east of railway overhead. (Limit of project). Note 6 m high rock cut, low laying terrain beyond in Fairbank Creek floodplain. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



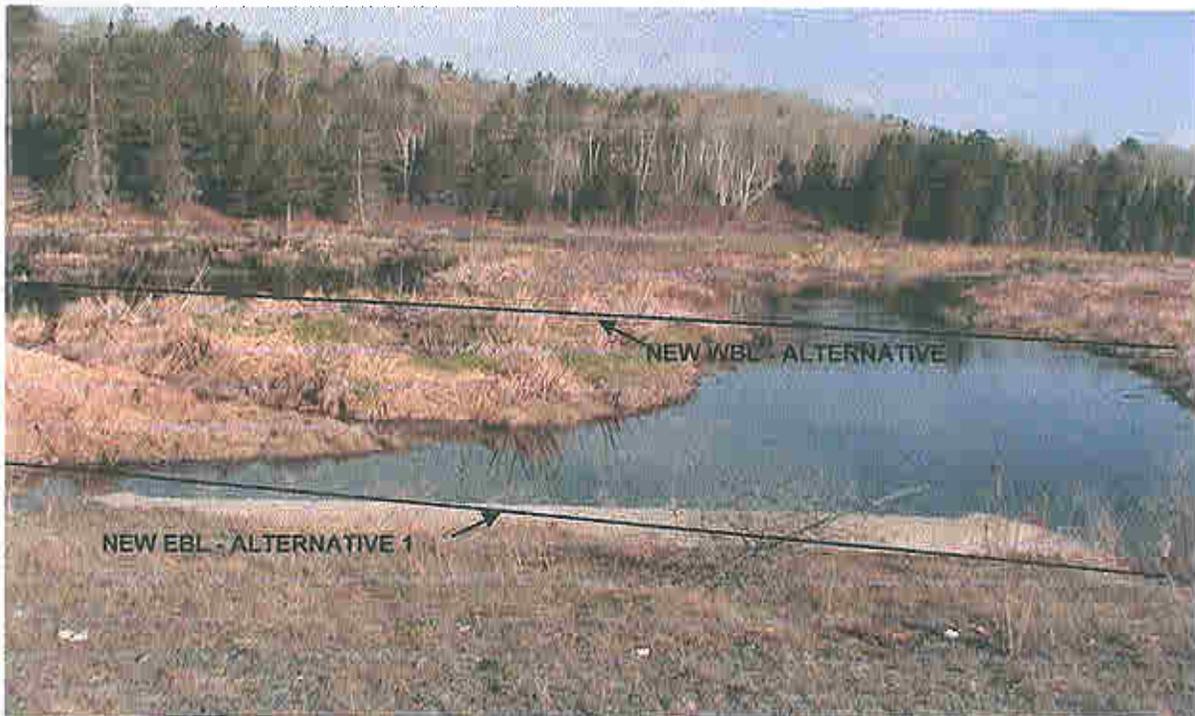
**Photograph 2 ZOOM VIEW** (Revised October 2006): Looking westerly at Highway 17 from 350 m east of railway overhead to intersection with SMR 55. Eastern sections of alignment alternatives 1 to 11 are shown across Fairbank Creek floodplain. (May 1, 2006).



**Photograph 3** VIEW: Highway 17 Sta. 17+700 (Alt. 1). Looking westerly from north shoulder of westbound lanes. Note ditch and swamp beyond embankment. Alternatives 2 and 3 (not shown) are located between Alternative 1 and existing Highway WBL. Depth to bedrock is over 24 m, about 15 m to firm bottom in Fairbank Creek floodplain. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 4** VIEW: Highway 17 Sta. 17+750 (Alt. 1). Looking north across top of Fairbank Creek culvert. Note open water and swamp. Depth to firm bottom is about 15 m, Artesian conditions exist. (May 1, 2006)

GWP156-98-00

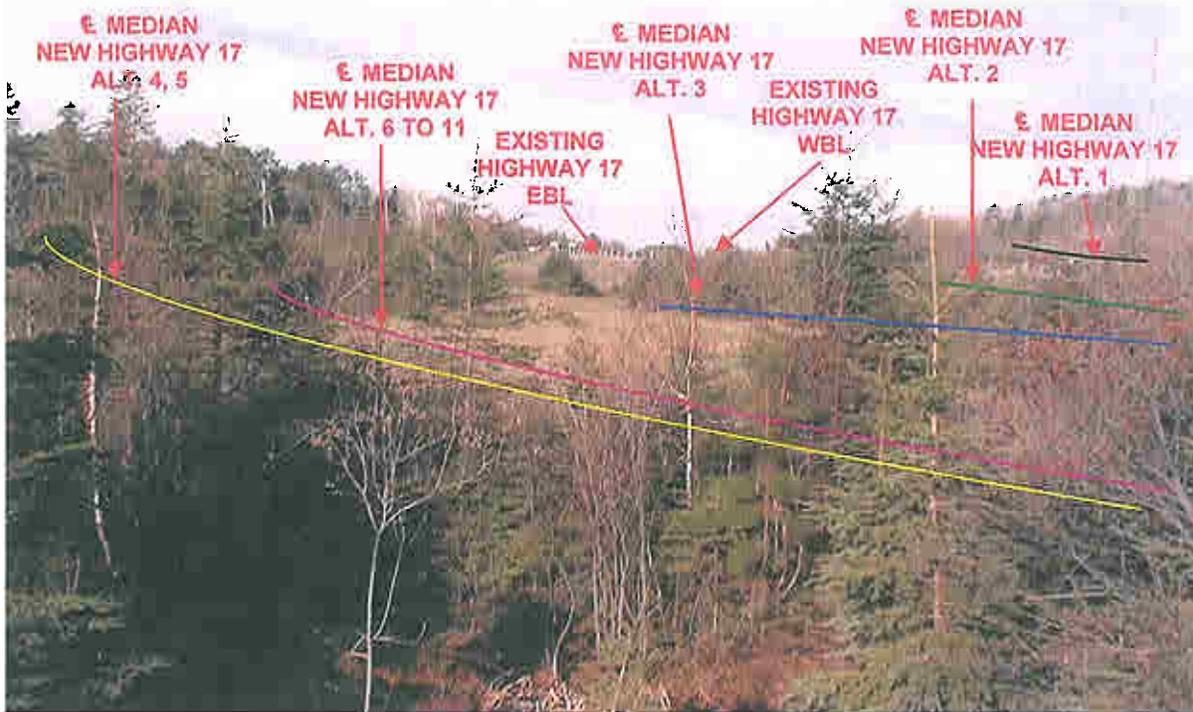
Peto MacCallum Ltd.



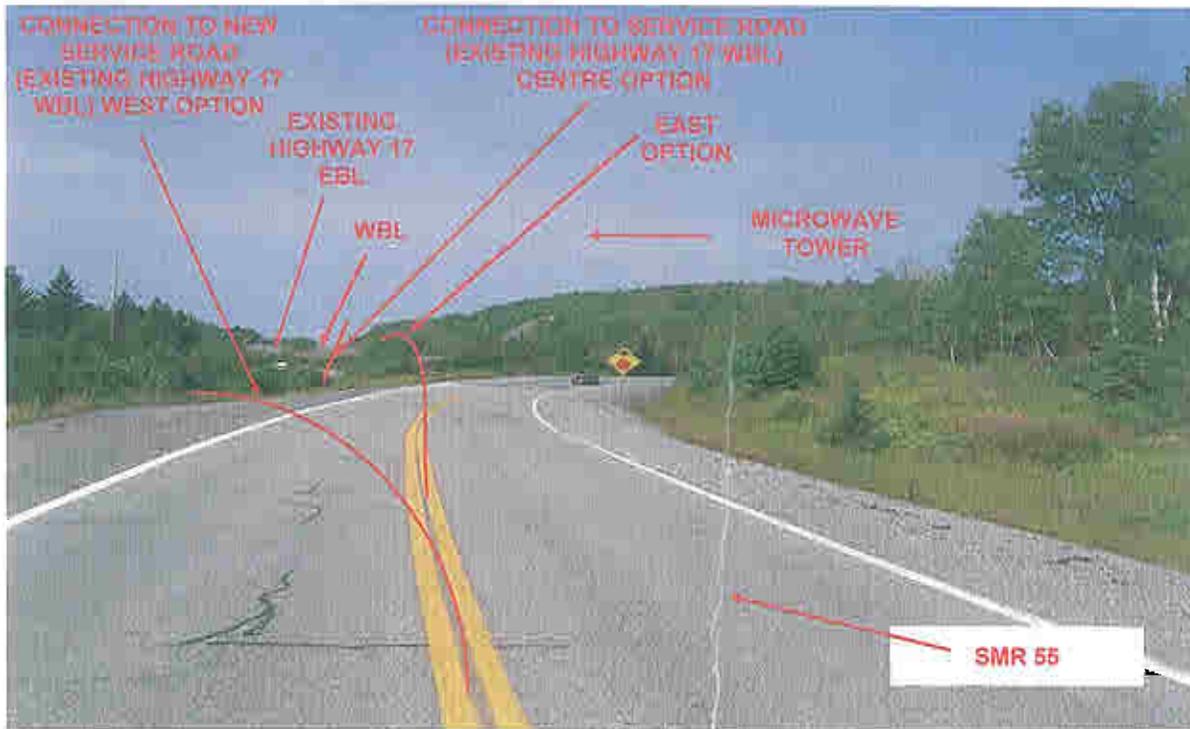
**Photograph 5 VIEW:** Looking west along Alternative 1 of Highway 17 (Sta. 17+750) along top of Fairbank Creek culvert. Note open water and swamp. Depth to firm bottom 15 m in foreground, 12 m at tree line. (May 1, 2006)



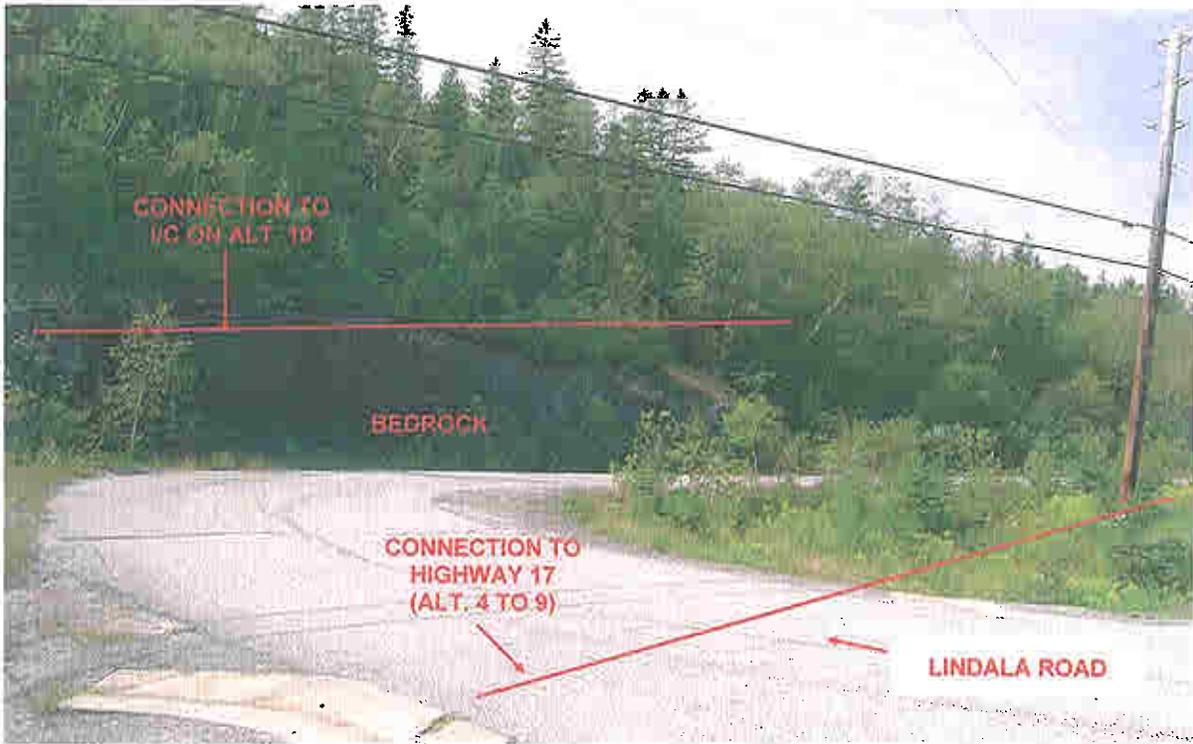
**Photograph 6 VIEW:** Looking south to Fairbank Creek across top of culvert from south shoulder of existing Highway 17 EBL. Depth to firm bottom in Fairbank Creek is about 19 m. (May 1, 2006)



**Photograph 7 VIEW:** Looking westerly from end of Lindala Road at alternative alignments. Ground to the right of photograph is swamp. Depth to firm bottom is about 14 m below the embankment. (May 1, 2006)



**Photograph 8 VIEW:** Looking north along Sudbury Municipal Road 55 about 350 m south of Highway 17 intersection. Bedrock outcrop visible in centre of photograph. (August 2005)



**Photograph 9** VIEW: Looking south along Lindala Road at shoulder south of Sudbury Municipal Road 55. Bedrock cut (6 m) readily visible at road bend. (August 2005)

GWP156-98-00

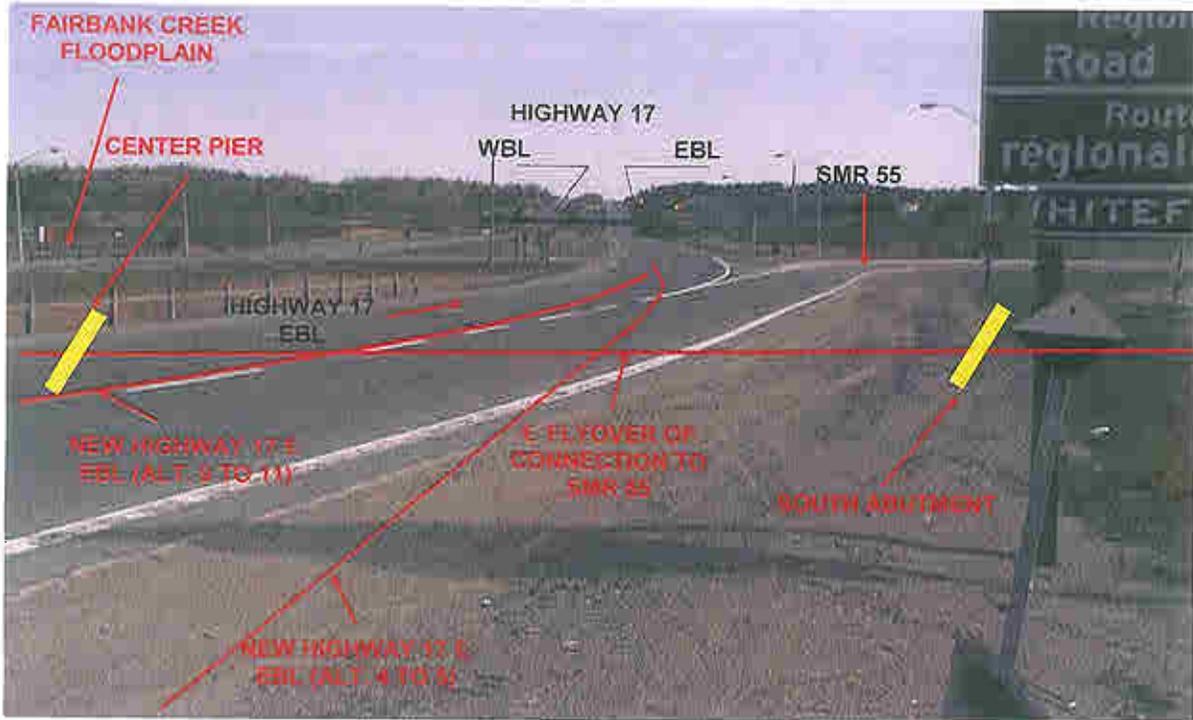
Peto MacCallum Ltd.



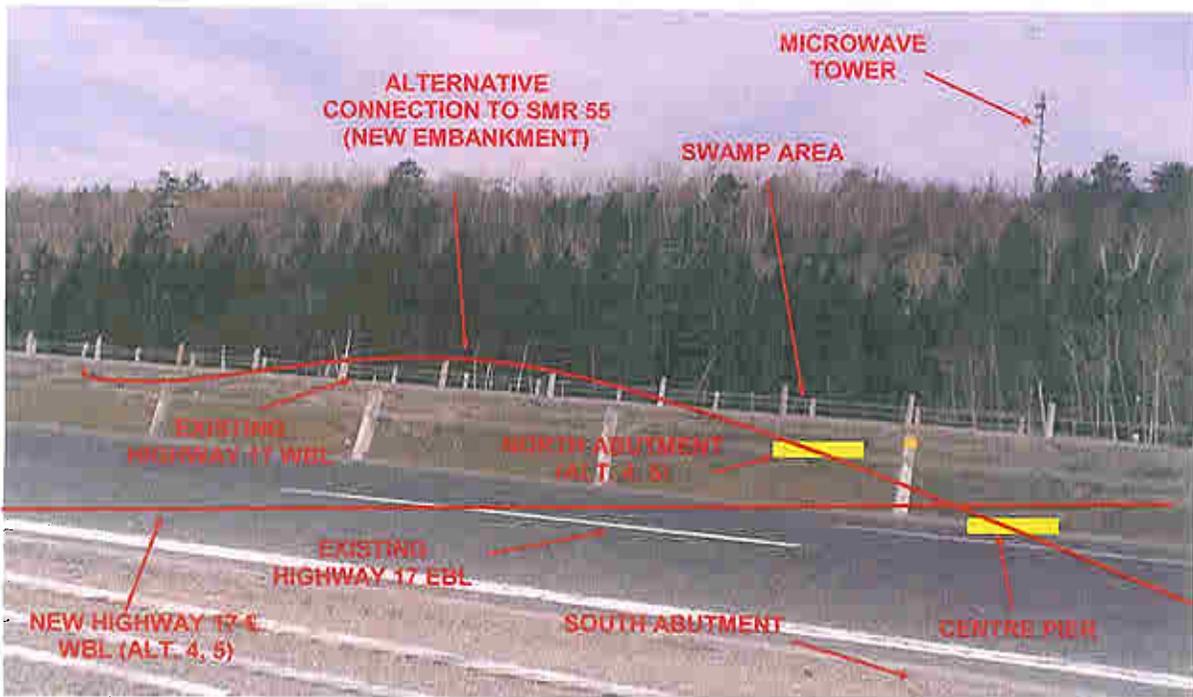
**Photograph 10** VIEW: Looking southerly along alignment of alternative connection to SMR 55. Embankment on wet swamp between Highway 17 eastbound embankment in foreground and SMR 55 in background. Depth to firm bottom is about 14 to 17 m. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 11** VIEW: Looking east at intersection of SMR 55 centre pier and south abutment of connecting flyover structure (about Sta. 17+550 - Alt. 4). Depth to bedrock about 30 m. Railway overhead in background across existing Highway 17 at east project limit. (May 1, 2006).



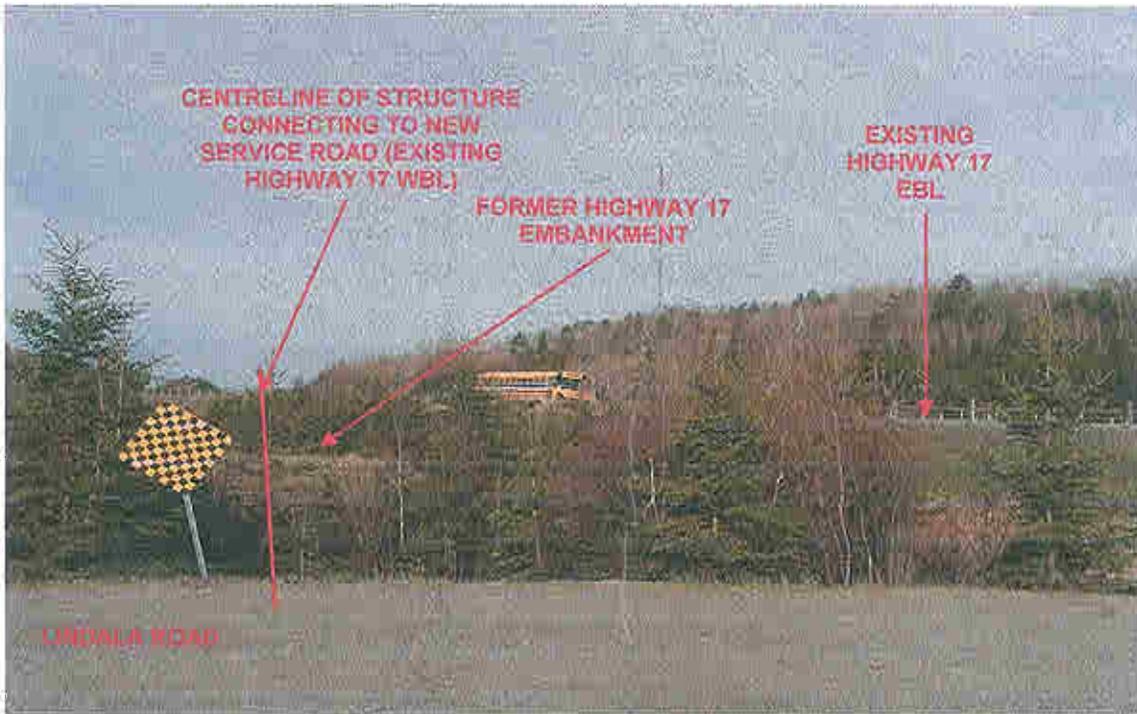
**Photograph 12** VIEW: Looking northerly from south shoulder of Highway 17 EBL (Sta. 17+550 Alt. 4). Embankment and structure alignment (East Option) are applicable to Alternatives 4 to 9. North abutment located north of WBL for Alternatives 6 to 9. Note alignment through swamp north of WBL. Depth to firm bottom 12 to 15 m. Depth to bedrock 20 to 24 m. (May 1, 2006).



**Photograph 13 VIEW:** Looking southeasterly at Lindala Road from shoulder of Highway 17 EBL. Alignment of centreline for alternative connection using flyover. Former Highway 17 embankment in foreground right. Depth to bedrock over 19 m. Applicable to Alternatives 4 to 9. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd



**Photograph 14 VIEW:** Looking west from end of Lindala Road. Bus travelling on EBL of Highway 17. New structure alternative to connect New Service Road (existing Highway 17 WBL) to Lindala Road. Applicable to Alternatives 4 to 9. Old Highway 17 constructed on swamp lands. Depth to bedrock over 19 m. Depth to firm bottom 14 to 17 m. (May 1, 2006)

GWP156-98-00

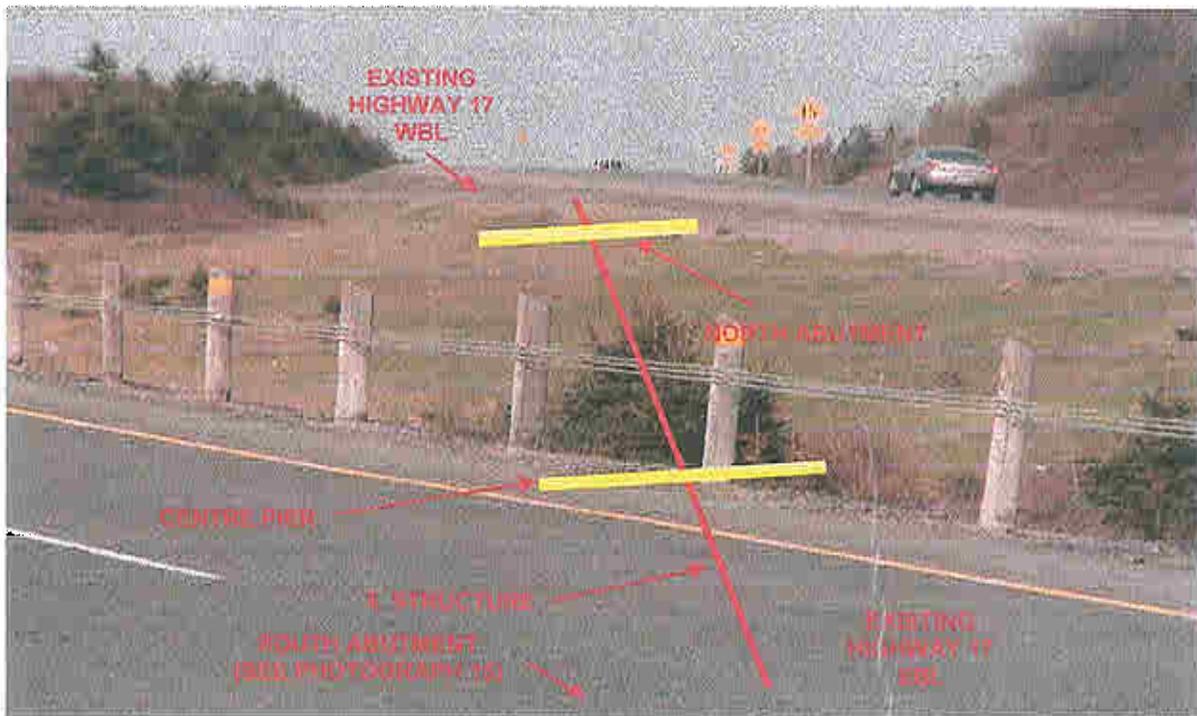
Peto MacCallum Ltd



**Photograph 15 VIEW:** At end of Lindala Road looking westerly from west end of Lindala Road along centreline of alternative flyover structure to connect to new Service Road (existing Highway 17 WBL). Applicable to Alternatives 4 to 9. Depth to rock is over 19 m. Depth to firm bottom 14 to 17 m. Foreground is former Highway 17 embankment. (May 1, 2006)

GWP156-98-00

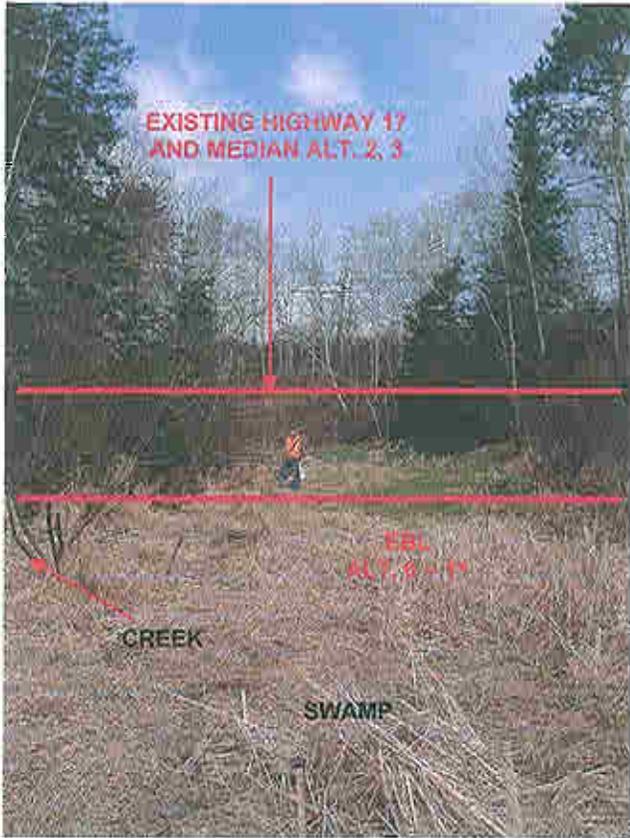
Peto MacCallum Ltd.



**Photograph 16 VIEW:** Looking westerly at Highway 17 about Sta. 17+250 (Alt. 6). Alternative structure for connection from New Service Road (Highway 17 WBL) to Lindala Road (Alternatives 4 to 9). Depth to bedrock over 19 m. (May 1, 2006)

GWP156-98-00

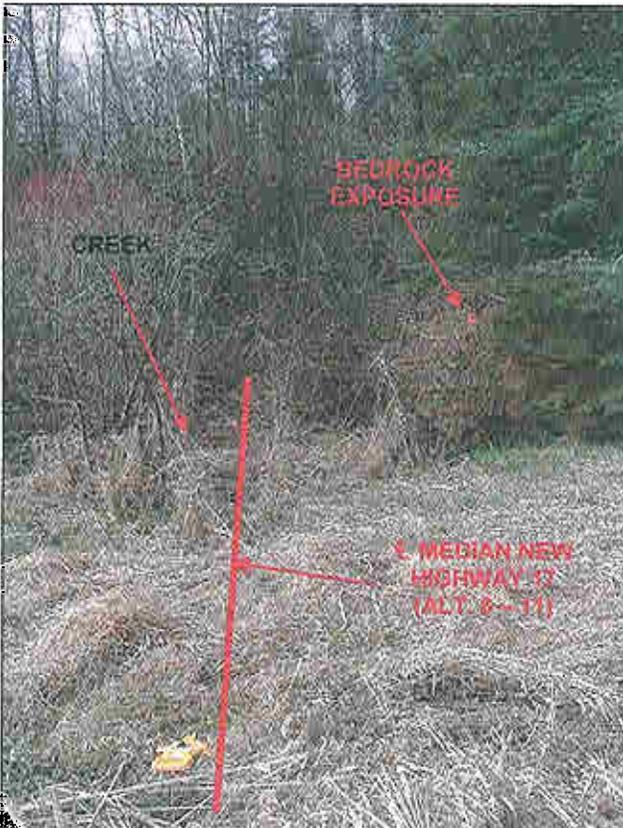
Peto MacCallum Ltd.



**Photograph 17 VIEW:** Looking north from swamp in creek valley at station 16+920 through Rocha's property Denison Con. 1, Lot 5, PCL 6778, 716 St. Pothier Road. C. Nascimento standing on New Highway 17 EBL of Alt. 6 to 11. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 18 VIEW:** Looking westerly across valley of creek in Rocha's property. Potential culvert required at about Sta. 16+900 for New Highway 17 (Alt. 6 to 9) or Sta. 16+880 (Alt. 10 and 11). Rock exposure in creek bank is marked with red cap. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 19 VIEW:** Looking west at rock exposure in creek through Rocha's property. Potential culvert location is at about Sta. 16+900 (Alt. 6 to 9) and Sta. 16+880 (Alt. 10 and 11) for New Highway 17. Wet area of crossing is about 20 to 30 m wide. (May 1, 2006)

GWP156-88-00

Peto MacCallum Ltd.



**Photograph 20 VIEW:** Looking west along new Highway 17 alignment of Alt. 4 and 5 (Sta. 17+020) through pond of beaver dam on Rocha's property. Side slopes of ponded water consist of clayey silt. B.R. Gray standing on centreline median. Potential culverts required through 30 to 40 m wide crossing. (May 1, 2006)

GWP156-98-00

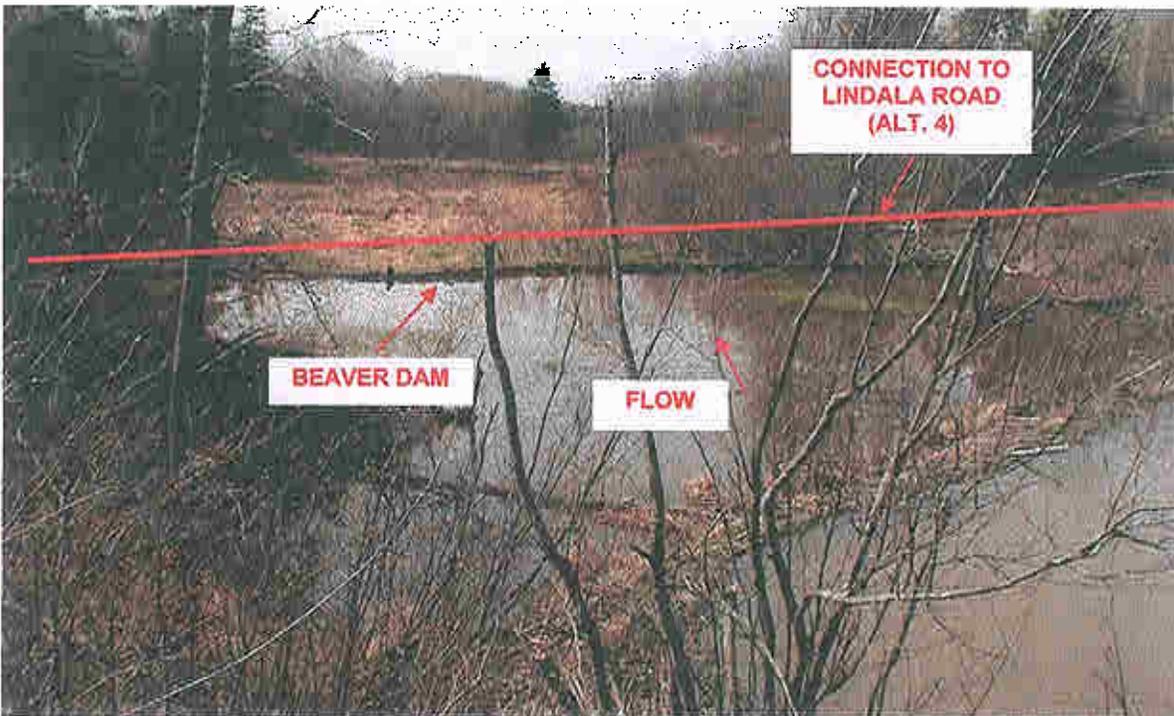
Peto MacCallum Ltd.



**Photograph 21** VIEW: Looking northerly across beaver dams on creek through Rocha's property. Potential culvert required at about Sta. 17+020 (Alt. 4 and 5) New Highway 17. Pond created by beaver dam is about 30 to 40 m across. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 22** VIEW: Looking south across pond of beaver dam immediately north of potential connecting road from St. Pothier Road to Lindala Road, approximately south of Sta. 17+050 (Alt. 4). Swamp crossing is about 40 m wide, culvert required. (May 1, 2006)

GWP156-98-00

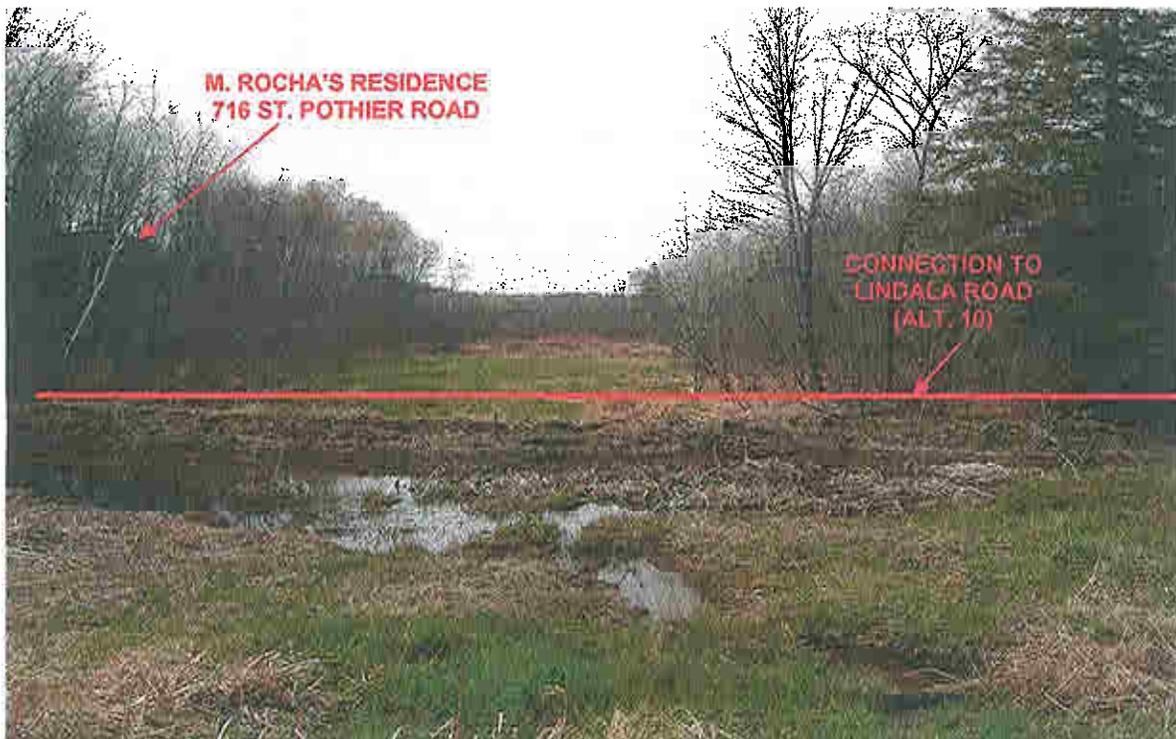
Peto MacCallum Ltd.



**Photograph 23** VIEW: Looking south at connecting roads to Lindala Road for Alternatives 10 and 11 through swamp and creek of Rocha's land. Swamp is about 40 m wide. Culverts are required. (May 1, 2006)

GWP156-98-00

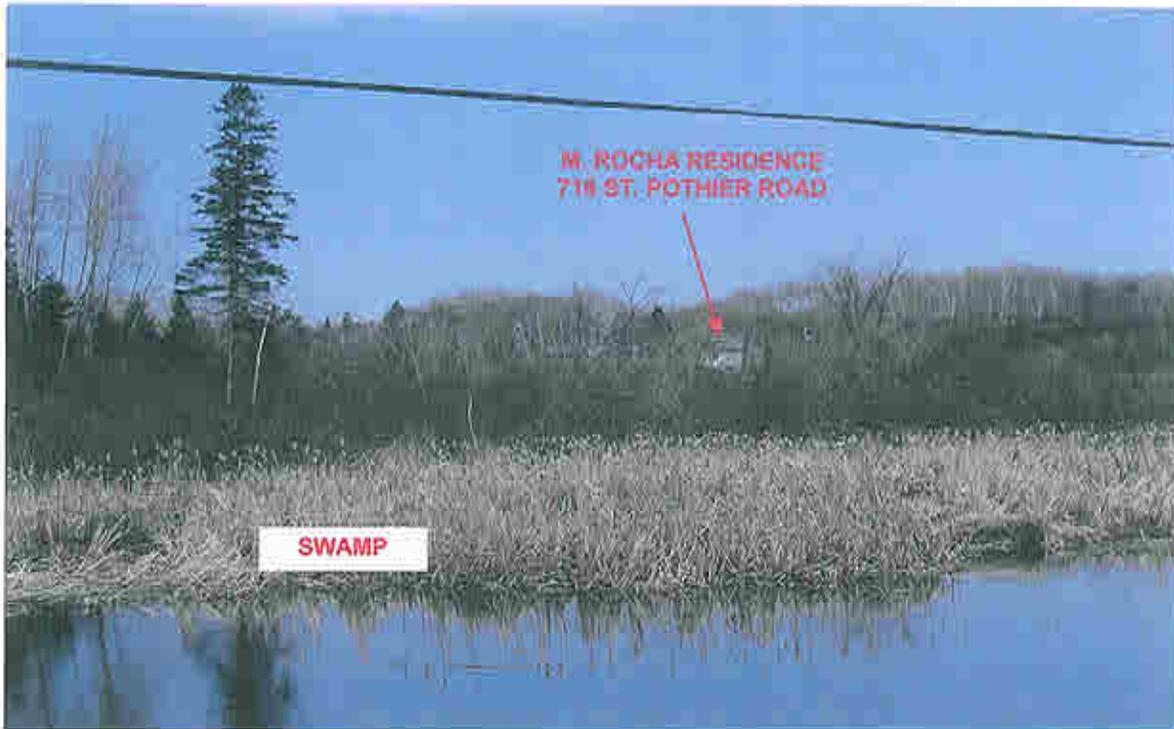
Peto MacCallum Ltd.



**Photograph 24** VIEW: Looking south at connecting road to Lindala Road for Alt. 10 New Highway 17. Embankment through swamp will require a culvert. (May 1, 2006)

GWP156-98-00

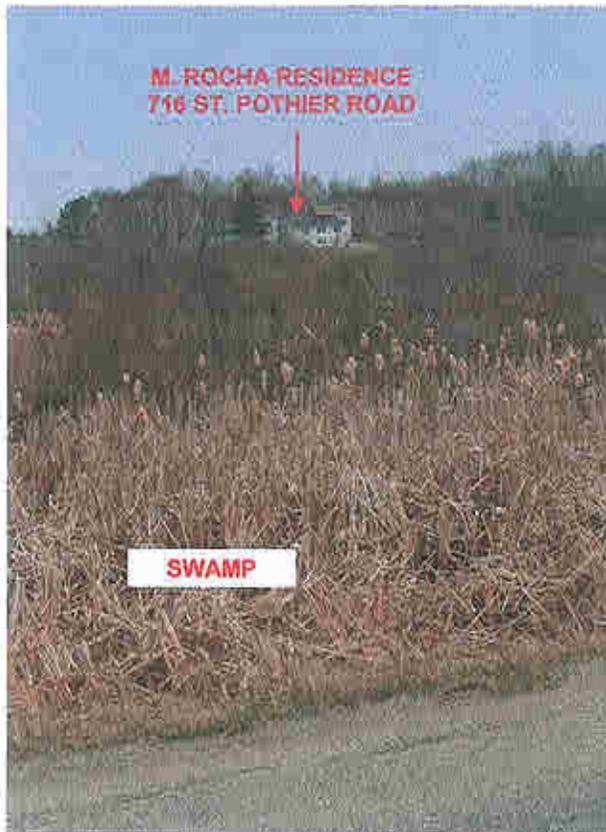
Peto MacCallum Ltd.



**Photograph 25** VIEW: Looking north from eastbound St. Pothier Road at about 1100 m east of Den/Lou Road. Possible new connection of Sudbury Municipal Road 55, just west of swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 26** VIEW: Looking north from north shoulder St. Pothier Road about 1250 m east of Den/Lou Road. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 27 VIEW:** Looking east at exposed 2 m overburden slope at rear of M. Rocha residence, 716 St. Pothier Road. Soil profile comprised upper 1 m of reddish brown fine sandy silt over dense grey silt. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 28 VIEW:** Typical outcrops/ridges west section, Rocha property, Denison Con. 1, Lot 5, PCL 6778, 716 St. Pothier Road. (May 1, 2006)

GWP156-98-00

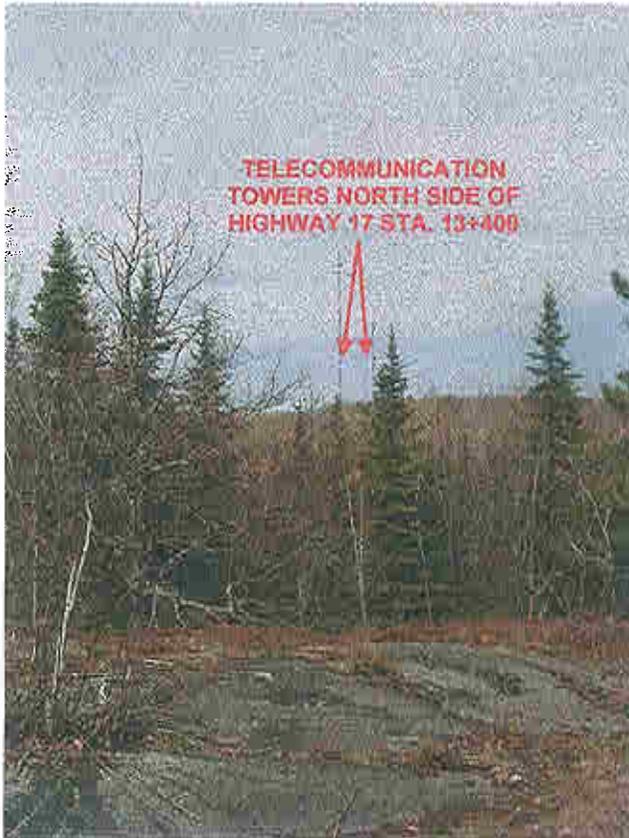
Peto MacCallum Ltd.



**Photograph 29** VIEW: Typical outcrops/ridges west section, M. Rocha property, Denison Con. 1, Lot 5, PCL 6778, 716 St. Pothier Road. (May 1, 2006)

GWP156-98-00

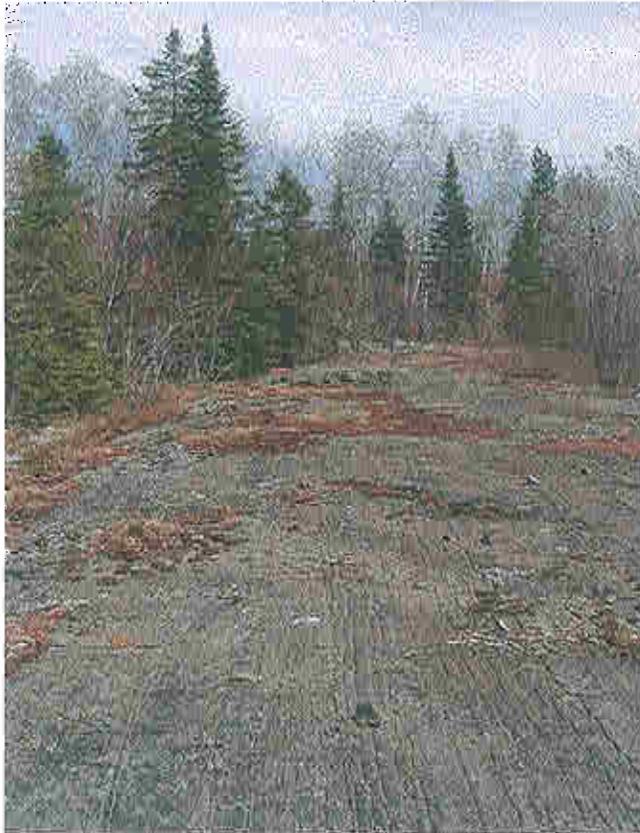
Peto MacCallum Ltd.



**Photograph 30** VIEW: Typical outcrops/ridges west section, M. Rocha property, Denison Con. 1, Lot 5, PCL 6778, 716 St. Pothier Road. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 31** VIEW: Typical outcrops/ridges west section, M. Rocha property, Denison Con. 1, Lot 5, PCL 6778, 716 St. Pothier Road. Note striation of rock surface from glacial action. (May 1, 2006)

GWP156-98-00

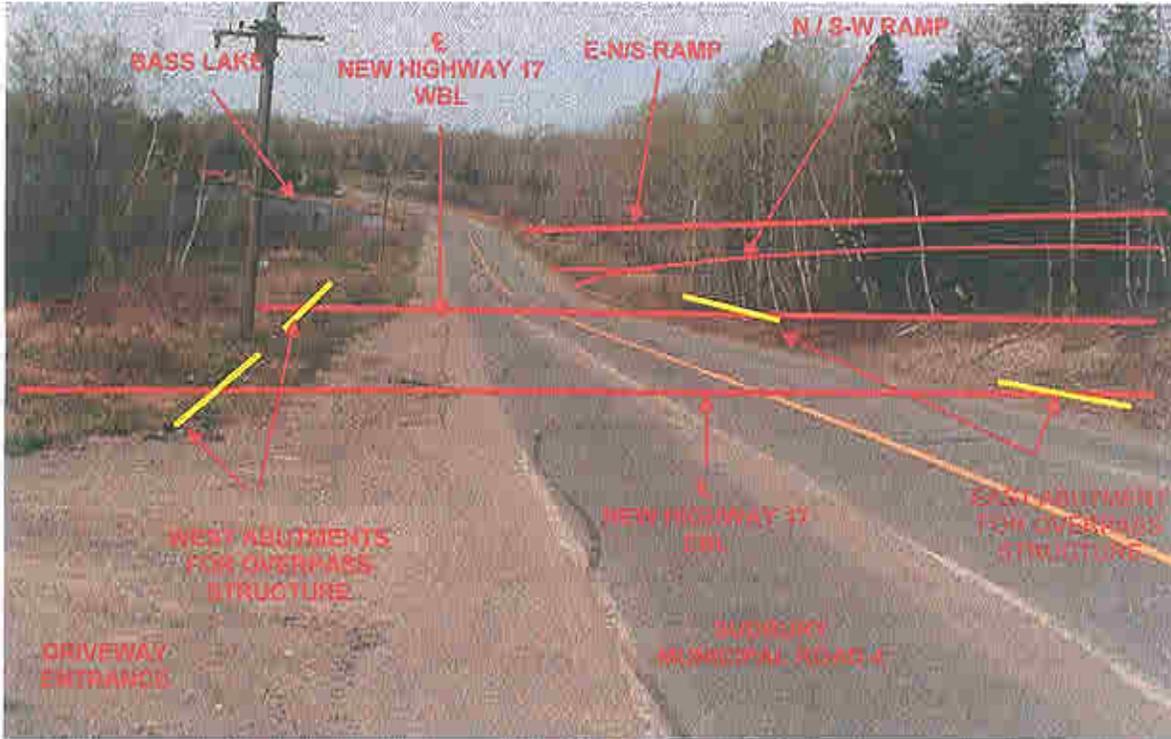
Peto MacCallum Ltd.



**Photograph 32** VIEW: Looking southeast from roadway to cul-de-sac off Elden Avenue south of Highway 17. New Highway 17 EBL centreline (Alt 3) to left of photograph. Tie-in for Alt. 10 to centre right. Alignment for Alt. 9 to 11 in distance right. Flat open field to rolling terrain at bush line. Massive rock outcrop on M. Rocha property in distance. (August 2005)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 33 VIEW:** Looking north from west shoulder of Sudbury Municipal Road 4 (SMR 4) about 350 m north of Highway 17. Alternative 1 New Highway 17 north alignment. Bass Lake on west side SMR 4 in distance. (May 1, 2006)

GWP156-98-00

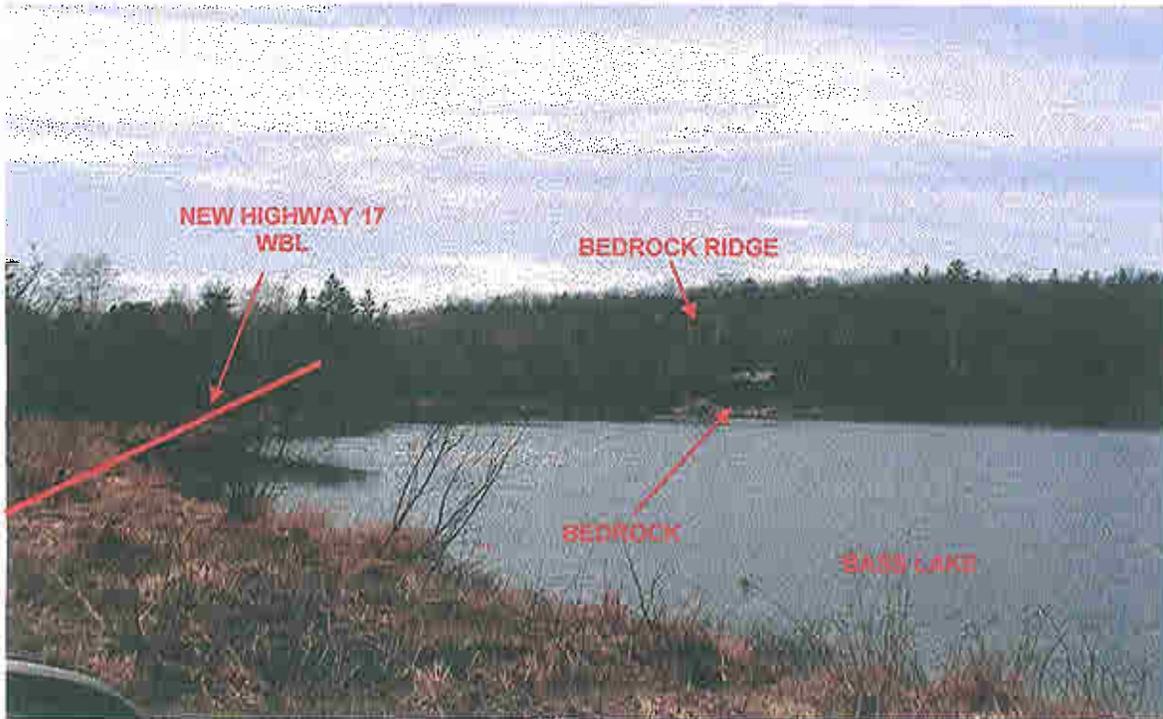
Peto MacCallum Ltd.



**Photograph 34 VIEW:** Looking north from east shoulder of SMR 4 about 450 m north of existing Highway 17. Alternative 1 – New Highway 17 north alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 35 VIEW:** Looking west across Bass Lake from west shoulder of SMR 4 about 500 m north of existing Highway 17. Alternative 1 – New Highway 17 north alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 36 VIEW:** Looking west from west shoulder of SMR 4 about 350 m north of Highway 17. Bedrock outcrop in foreground. Rock ridge in the distance. Alternative 1 – New Highway 17 north alignment. (May 1, 2006)

GWP156-98-00

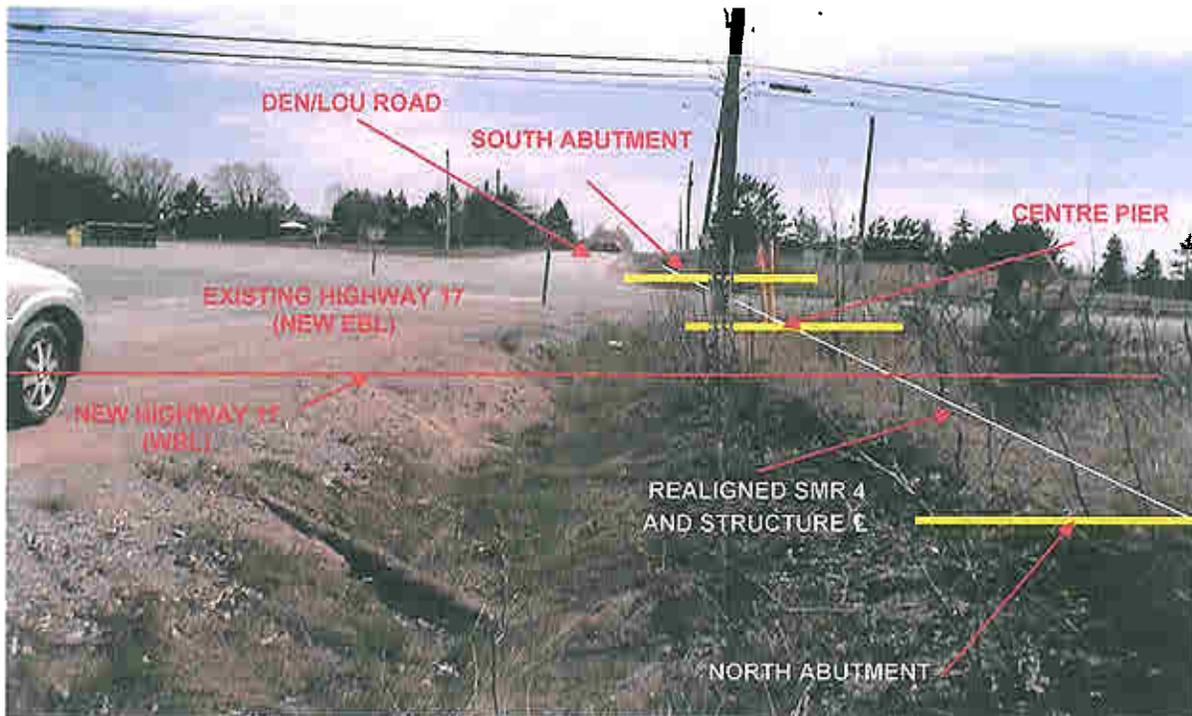
Peto MacCallum Ltd.



**Photograph 37** VIEW: Looking east from west shoulder of SMR 4 about 350 m north of Highway 17. Rock ridge behind tree line. Alternative 1: New Highway 17 north alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 38** VIEW: Looking south from west ditch of SMR 4 about 50 m north of Highway 17. Alternative 2 – New Highway 17 Twinning North. Bedrock at 12 to 15 m at new structure. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 39** VIEW: Looking east from east shoulder of SMR 4 about 20 m north of Highway 17. Alternative 2: New Highway 17 Twinning North. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 40** VIEW: Looking west along north ditch line of existing Highway 17 from east shoulder of SMR 4. Alternative 2 – New Highway 17 Twinning North. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 41** VIEW: Looking north from west shoulder of Den/Lou Road about 10 m south of Highway 17. Depth to rock at new structure is about 12 to 15 m. Alternative 2 – New Highway 17 Twinning North. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 42** VIEW: Looking north from east shoulder of Den/Lou Road about 30 m south of Highway 17. Depth to rock about 12 to 15 m. Alternative 3 – New Highway 17 Twinning South Alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 43** VIEW: Looking west from west side of Den/Lou Road along south ditch line Highway 17. Alternative 3 – New Highway 17 Twinning south alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 44** VIEW: Looking east from west shoulder Den/Lou Road about 15 m south of Highway 17. Alternative 3 – New Highway 17 Twinning south alignment. (May 1, 2006)

GWP156-98-00

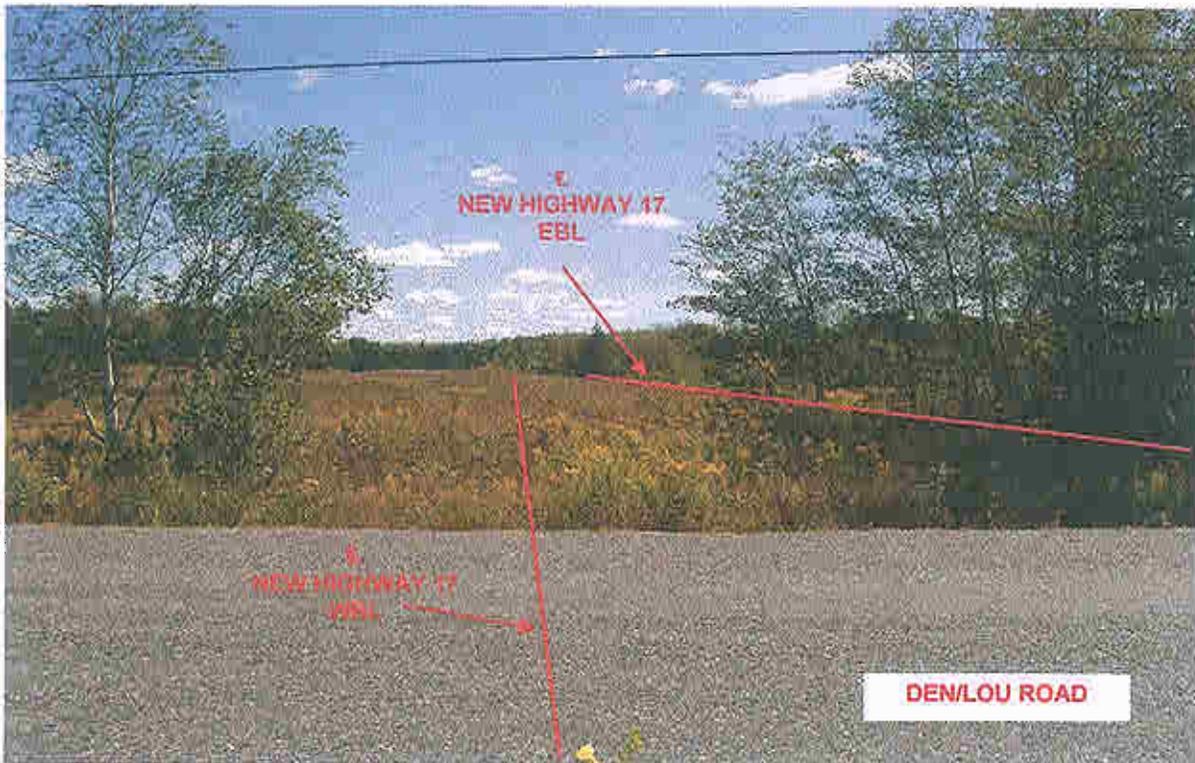
Peto MacCallum Ltd.



**Photograph 45 VIEW:** Looking north from east shoulder of Den/Lou Road in front of West Walden Library at foundation areas for interchange underpass. New Highway 17 Alternatives 7, 8 and 9 south alignment. (May 1, 2006)

GWP156-98-00

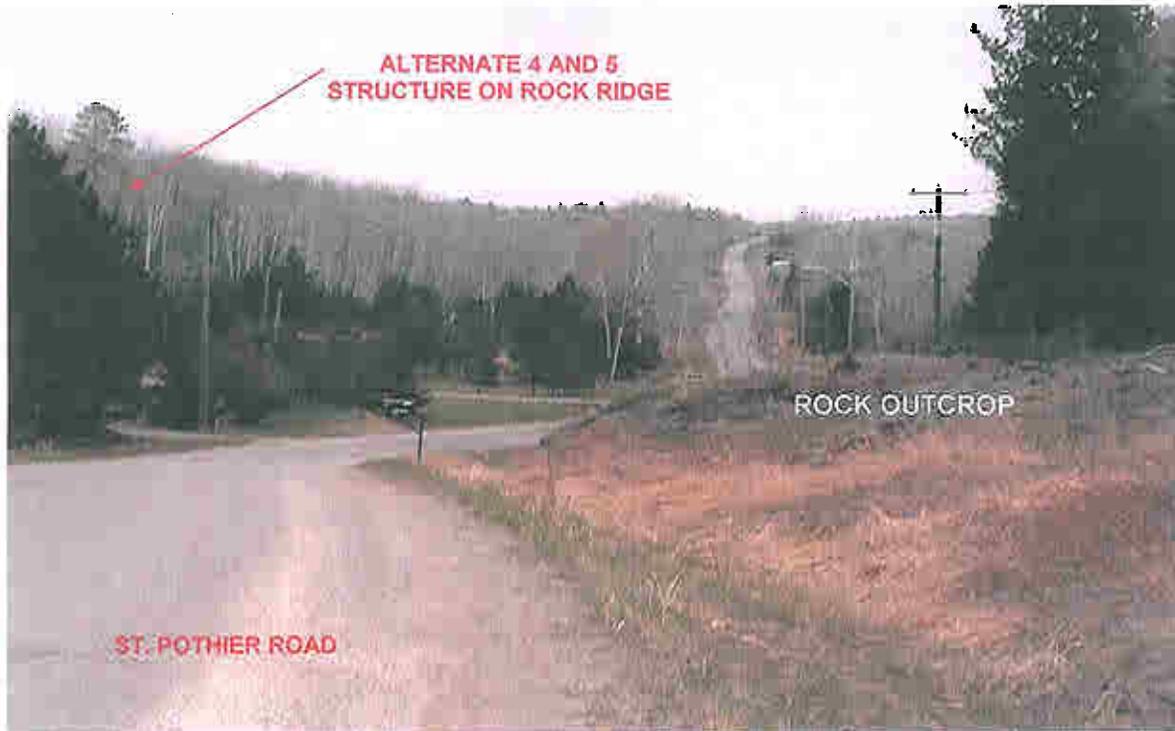
Peto MacCallum Ltd.



**Photograph 46 VIEW:** Looking east from west shoulder of Den/Lou Road along proposed extension of Highway 17. Flat open field to rolling terrain at bush line. (August 2005)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 47** VIEW: Looking east from south shoulder of St. Pothier Road about 450 m east of Den/Lou Road. Bedrock outcrop on south side of road. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 48** VIEW: Looking north from south shoulder of St. Pothier Road about 630 m east of Den/Lou Road. Massive +10 m bedrock ridge exposed beyond residence at 550 St. Pothier Road. (May 1, 2006)

GWP156-98-00

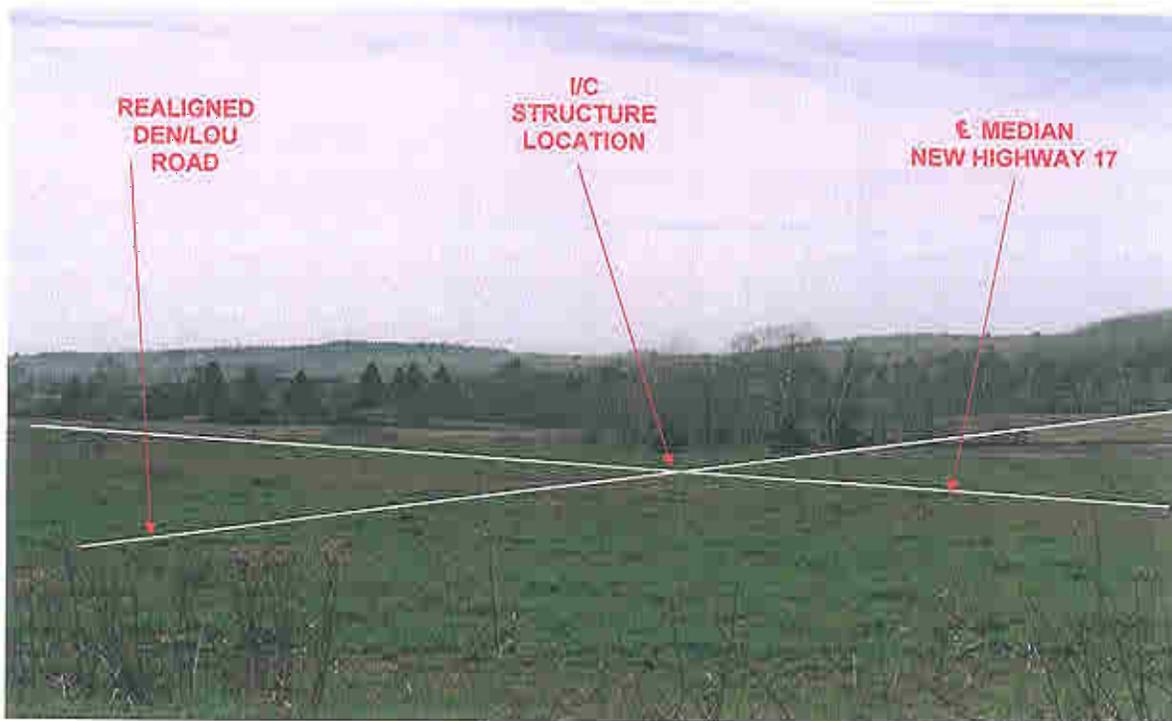
Peto MacCallum Ltd.



**Photograph 49** VIEW: Looking north from south shoulder of St. Pothier Road about 720 m east of Den/Lou Road. Massive +10 m bedrock ridge exposed beyond residence at 564 St. Pothier Road. (May 1, 2006)

GWP156-98-00

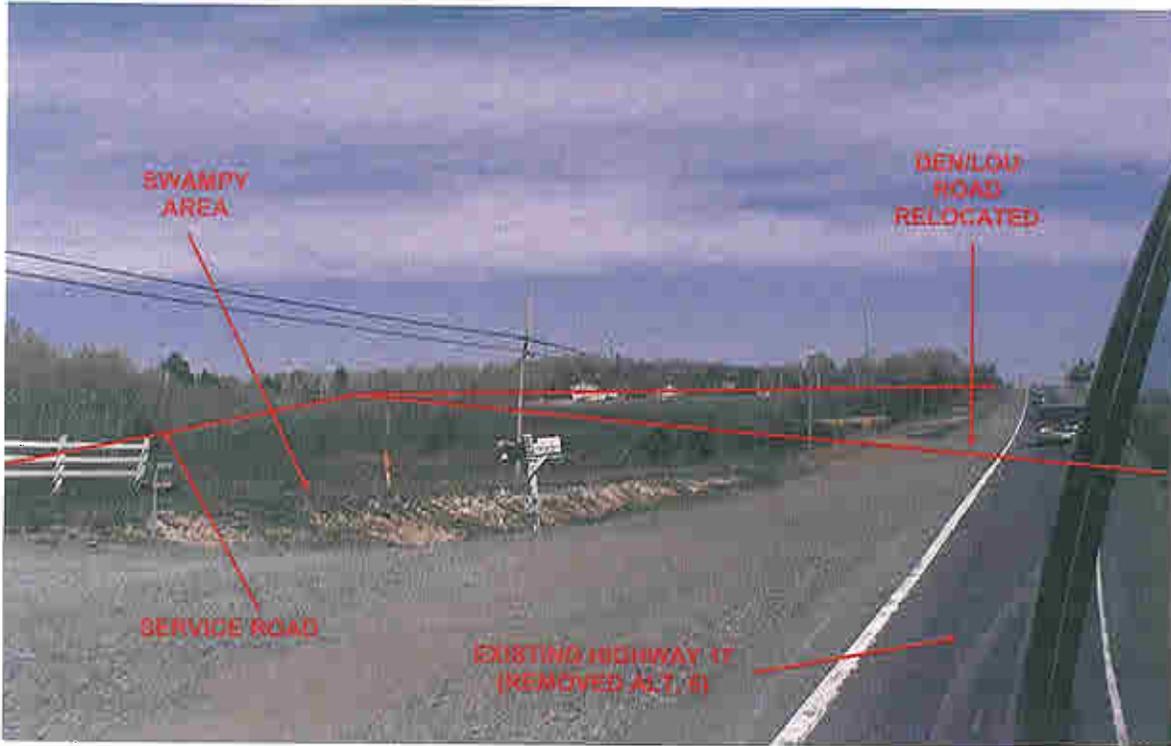
Peto MacCallum Ltd.



**Photograph 50** VIEW: Looking west from west shoulder of Den/Lou Road to new Parclo A I/C at 350m in distance at tree line. (Alternative 6) Depth of rock at new structure 9 to 12m (May 1, 2006)

GWP156-98-00

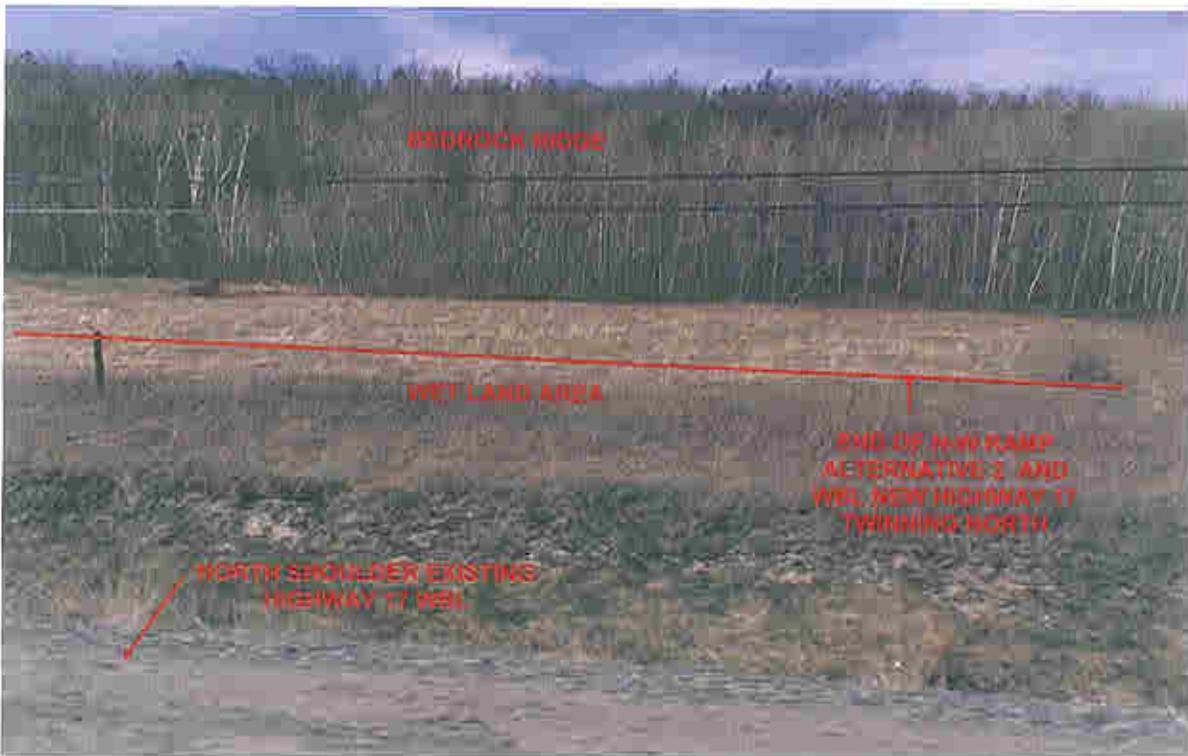
Peto MacCallum Ltd.



**Photograph 51** VIEW: Looking east from existing Highway 17 WBL at about station 15+100. Alternative 6 – Parclo A I/C 350 m west of Den/Lou Road. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 52** VIEW: Looking north from Highway 17 WBL at about station 14+700. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 53** VIEW: Looking north from north side of St. Pothier Road at about station 14+750. Alternatives 4 to 11 New Highway 17 south alignment. (May 1, 2006)

GWP156-98-00

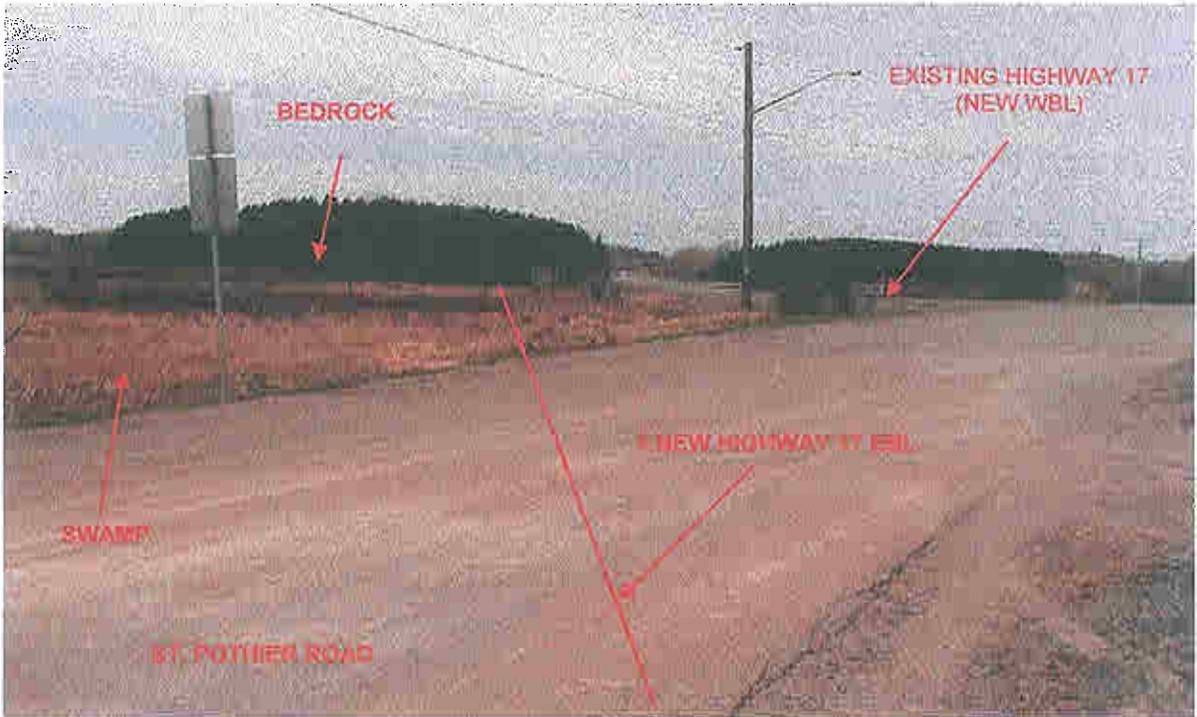
Peto MacCallum Ltd.



**Photograph 54** VIEW: Looking north from south side of St. Pothier Road at about station 14+500. Alternatives 4 to 11 New Highway 17 south alignment. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 55 VIEW:** Looking west from east shoulder of St. Pothier Road about 30 m south of intersection with Highway 17. New Highway 17 twinning to south across swamp and bedrock area. (May 1, 2006)

GWP156-98-00

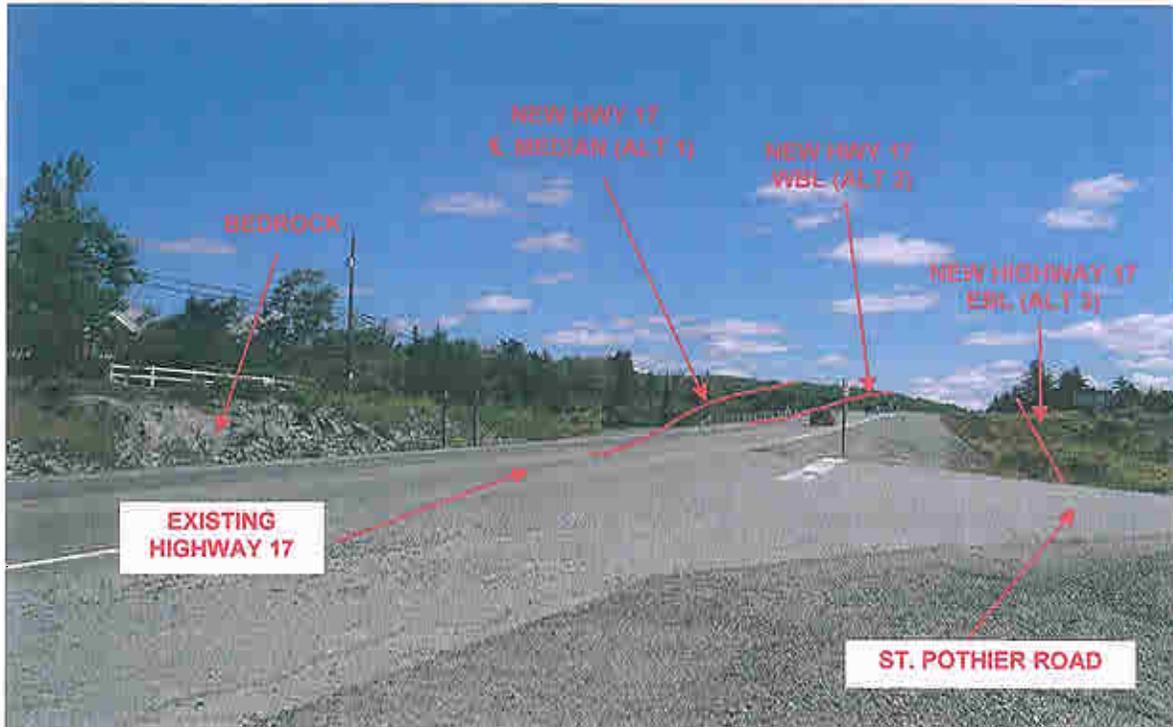
Peto MacCallum Ltd.



**Photograph 56 VIEW:** Looking east from east shoulder of St. Pothier Road about 40 m south of intersection with Highway 17. New Highway 17 twinning to south across glacialustrine plain. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 57** VIEW: Looking east from south shoulder of Highway 17, just west of St. Pothier Road intersection. Bedrock exposure (1.2 to 3 m) on north (left) side of Highway 17, Sta. 13+360 Denison Township. Private residence (7090) in mid photograph, left. (August 2005)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 58** VIEW: Close up Photograph 55. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 59 VIEW:** Looking east from east shoulder of Hamersveld Road about 10 m south of Highway 17. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)



**Photograph 60 VIEW:** Looking west from east shoulder of Hamersveld Road about 10 m south of Highway 17. New Highway 17 twinning to south across swamp to bedrock ridge. (May 1, 2006)



**Photograph 61** VIEW: Looking east from south shoulder of Highway 17 about 350 m west of Hamersveld Road. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd



**Photograph 62** VIEW: Looking west from south shoulder of Highway 17 about 350 m west of Hamersveld Road. New Highway 17 twinning to south across 300 m wide deep swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd



**Photograph 63 VIEW:** Looking west of driveway at 7139 Highway 17 about 500 m west of Hamersveld Road. New Highway 17 twinning to south across 300 m wide deep swamp area. (May 1, 2006)

GWP158-98-00

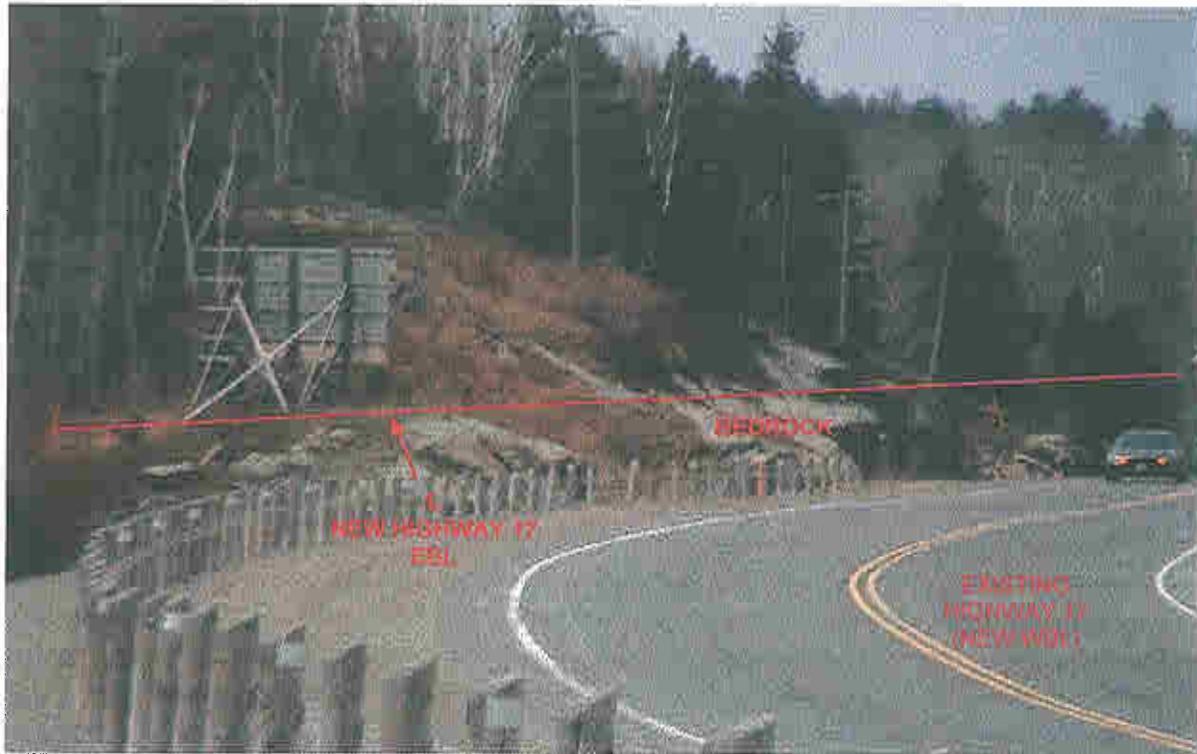
Peto MacCallum Ltd.



**Photograph 64 VIEW:** Looking south of driveway at 7139 Highway 17 about 500 m west of Hamersveld Road. New Highway 17 twinning to south across 300 m wide open water deep swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd



**Photograph 65 ZOOM VIEW:** Looking west from south shoulder of Highway 17 about 500 m east of Fen Road. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)

GWP156-98-00

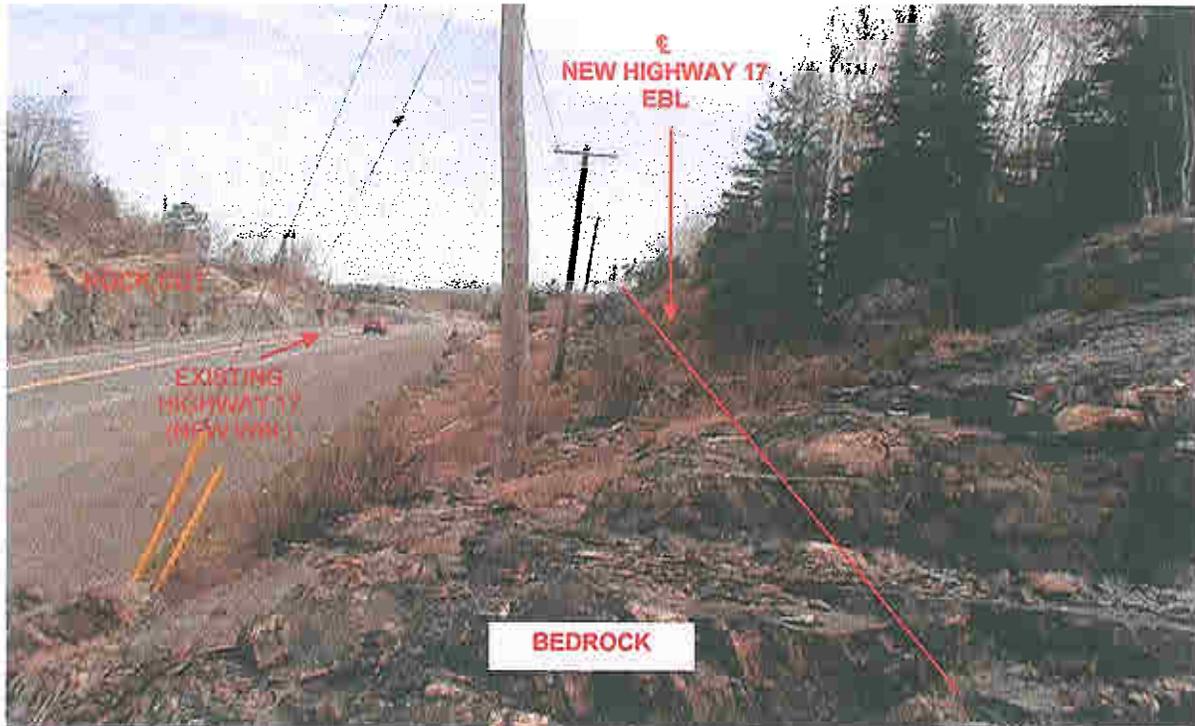
Peto MacCallum Ltd



**Photograph 66 VIEW:** Looking south from north shoulder of Highway 17 about 200 m east of Fen Road. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)

GWP156-98-00

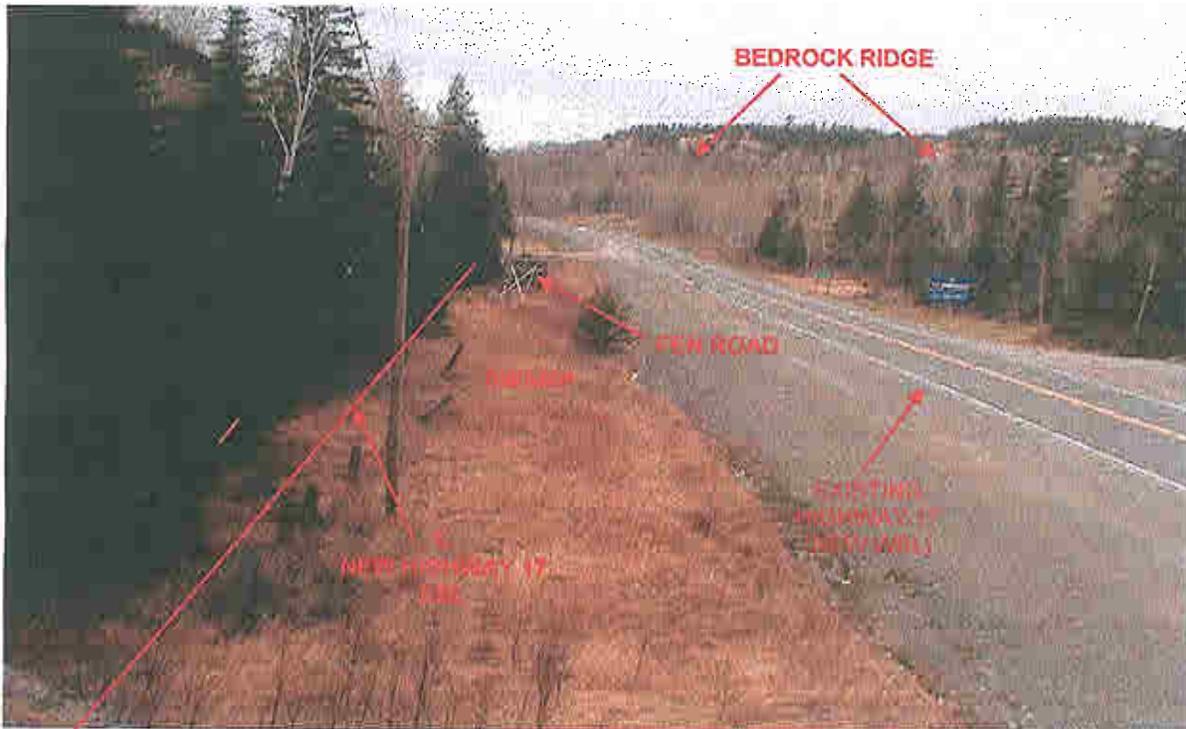
Peto MacCallum Ltd



**Photograph 67 VIEW:** Looking east from south side of existing Highway 17 R.O.W. along extensive bedrock ridge at 200 m east of Fen Road. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)

GWP156-98-00

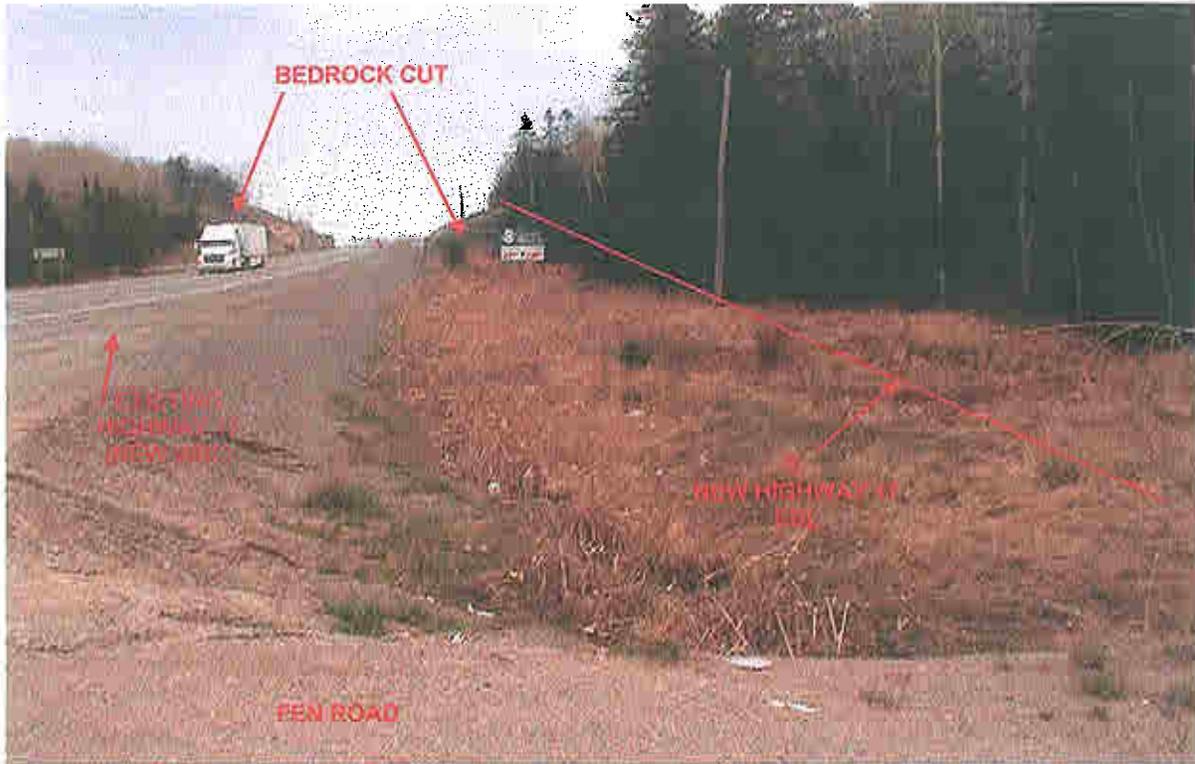
Peto MacCallum Ltd



**Photograph 68 VIEW:** Looking west from bedrock ridge on south side of existing Highway 17 about 200 m east of Fen Road New Highway 17 twinning to south across swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd



**Photograph 69 VIEW:** Looking east from east shoulder of Fen Road about 10 m south of Highway 17. New Highway 17 twinning to south across swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 70 VIEW:** Looking west from east shoulder of Fen Road about 10 m south of Highway 17. New Highway 17 twinning to south across swamp area. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 71 ZOOM VIEW:** Looking west from south shoulder Highway 17 about 150m west of Fen Road at west project limits. New Highway 17 twinning to south across swamp area and through bedrock ridge. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 72 VIEW:** Looking south from EBL of Highway 17 about 250 m west of Fen Road at west project limits. New Highway 17 twinning to south (or transition) through bedrock ridge. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 73 VIEW:** Looking east from south shoulder of Highway 17 about 300 m west of Fen Road near west project limits. New Highway 17 twinning to south through bedrock ridge. (May 1, 2006)

GWP156-98-00

Peto MacCallum Ltd.



**Photograph 74 VIEW:** Looking south west from EBL of Highway 17 about 300 m west of Fen Road near west project limits. New Highway 17 twinning to south across swamp area. (May 1, 2006)

GWP156-98-00

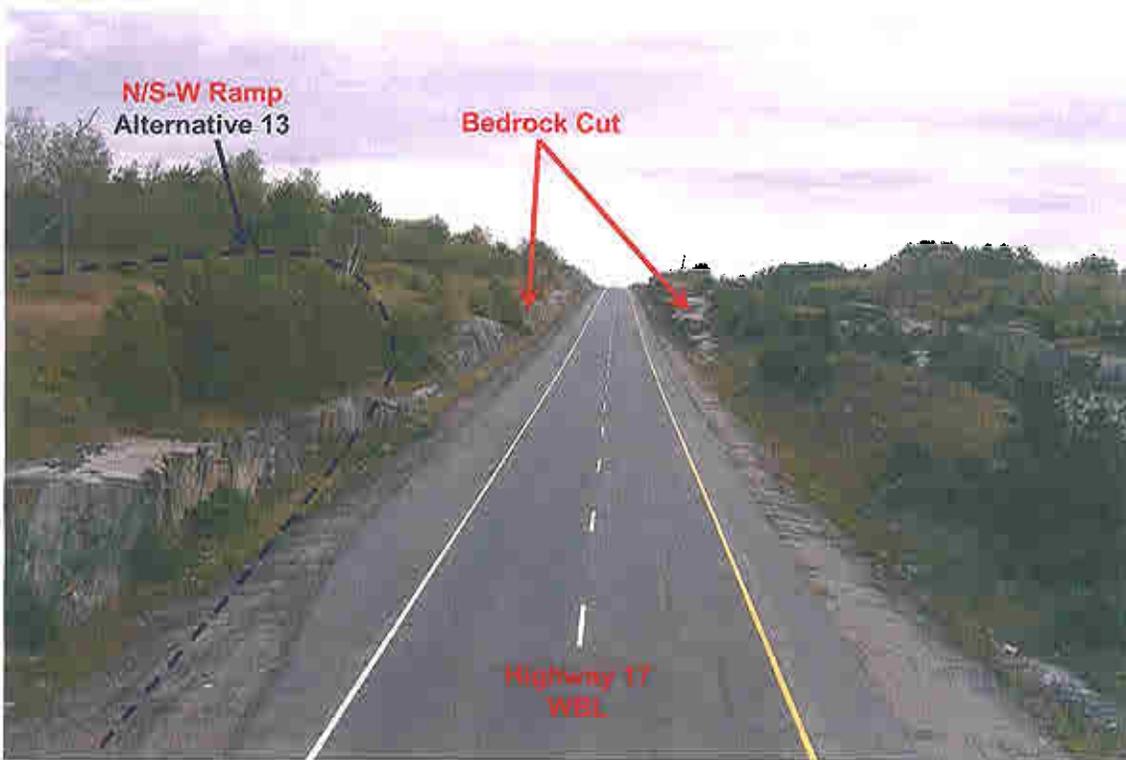
Peto MacCallum Ltd.



**Photograph 75** VIEW: Looking north along centreline SMR 3 about 10 m south of south abutment of Highway 17 underpass. (September 12, 2006)



**Photograph 76** VIEW: Looking east from east side of existing SMR 3 structure at about Sta.19+040 along existing Highway 17 EB mainline. (September 12, 2006)



**Photograph 77** VIEW: Looking east from east side of existing SMR 3 structure at about Sta.19+040 along existing Highway 17 WB mainline. (September 12, 2006)



**Photograph 78** VIEW: Looking south along centreline SMR 3 about 10 m north of north abutment of Highway 17 underpass. (September 12, 2006)



**Photograph 79** VIEW: Looking south from north side of Highway 17 at about Sta. 19+060, some 20 m east of SMR 3 underpass structure at south abutment founded on bedrock. (September 12, 2006)



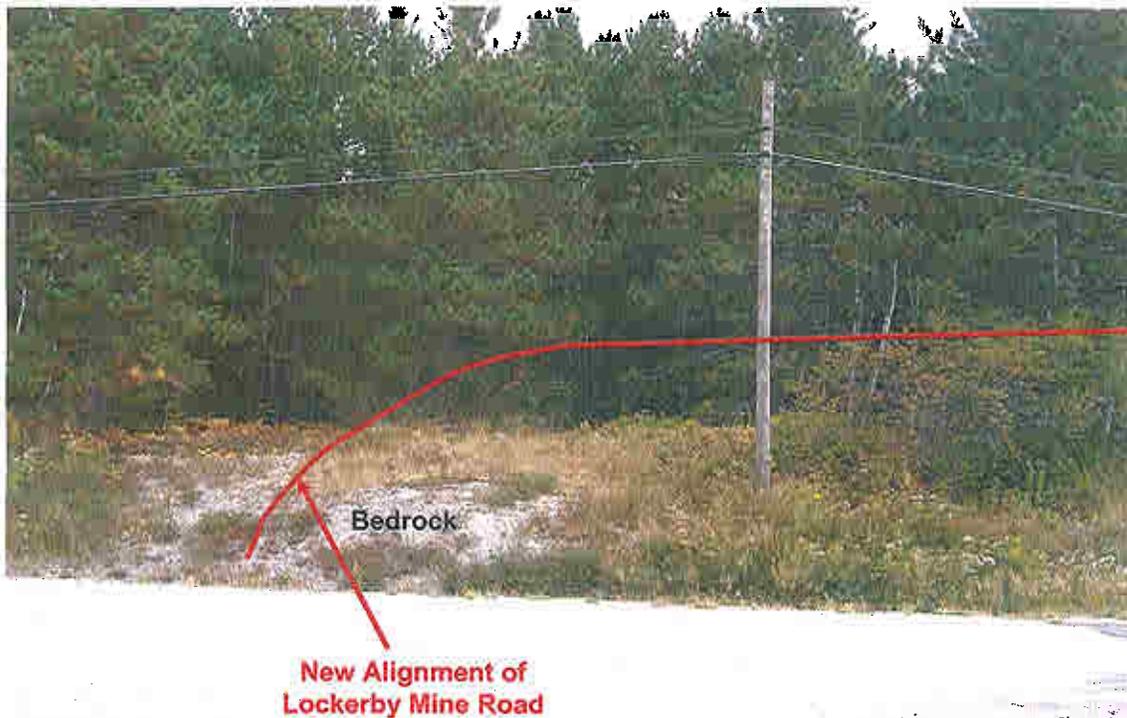
**Photograph 80** VIEW: Looking west from west side of existing SMR 3 structure at about Sta. 19+030 along existing Highway 17 EB mainline at Huron Central Railway structure. (September 12, 2006)



**Photograph 81** VIEW: Looking west from north rock cut beyond ditch line of WB Highway 17 at about Sta. 19+060, some 20 m east of SMR 3 north abutment. (September 12, 2006)



**Photograph 82** VIEW: Looking west from west side of existing SMR 3 structure at about Sta. 19+030 along existing Highway 17 WB mainline at Huron Central Railway structure. (September 12, 2006)



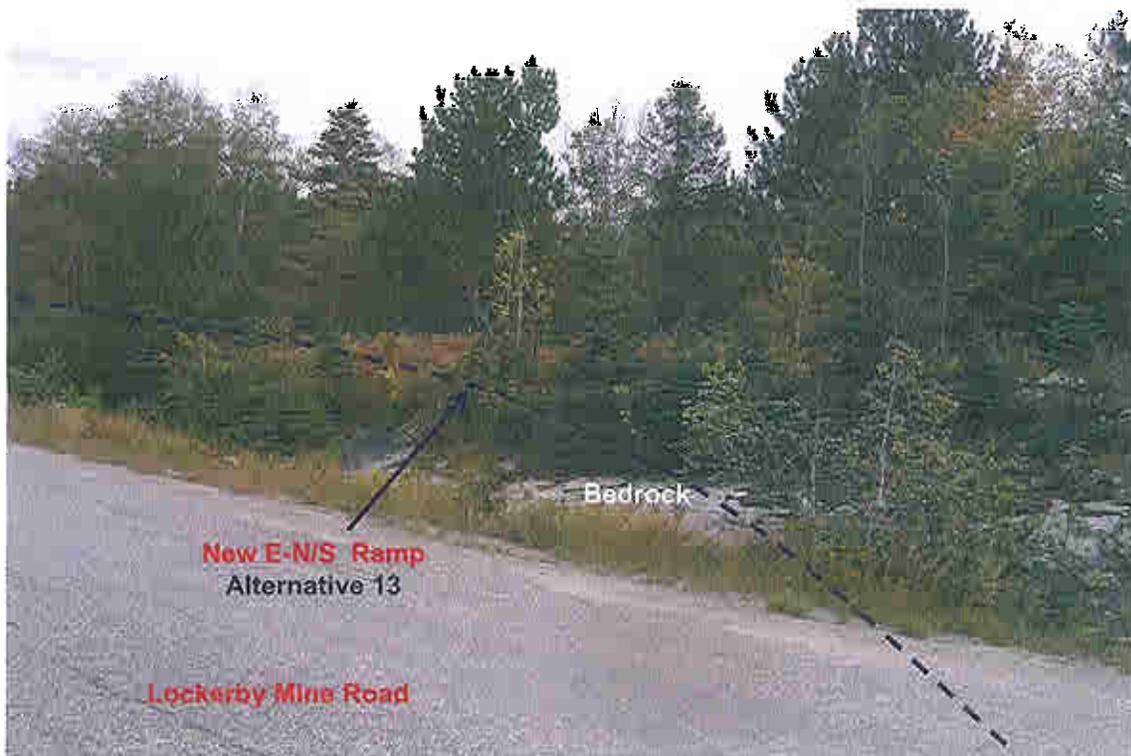
**Photograph 83** VIEW: Looking east from west side of SMR 3 about 100 m north of Lockerby Mine Road showing typical shallow bedrock terrain conditions. (September 12, 2006)



**Photograph 84** VIEW: Looking south from west shoulder of SMR 3 about 100 m north of Lockerby Mine Road. (September 12, 2006)



**Photograph 85** VIEW: Looking west from north shoulder of Lockerby Mine Road about 140 m east of SMR 3. (September 12, 2006)



**Photograph 86** VIEW: Looking northwest from south shoulder of Lockerby Mine Road about 200 m east of SMR 3. (September 12, 2006)



**Photograph 87** VIEW: Looking southeast from north shoulder of Lockerby Mine Road about 200 m east of SMR 3. Shallow bedrock terrain in bush area across road. (September 12, 2006)



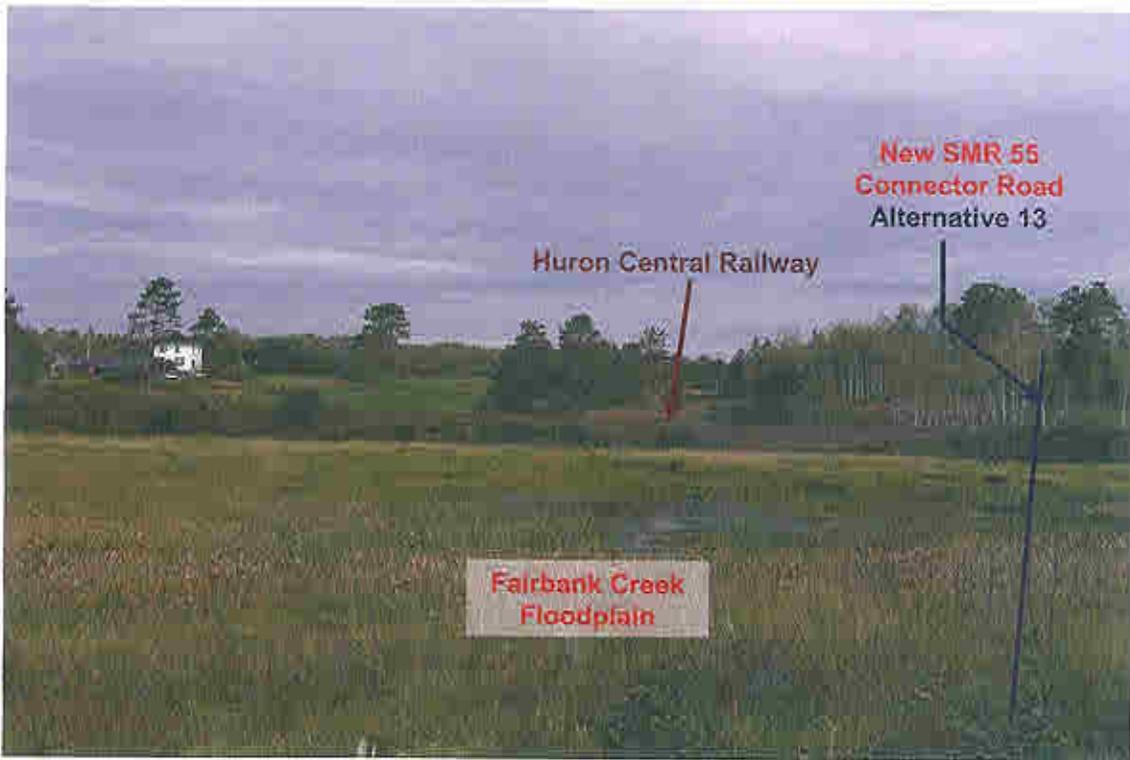
**Photograph 88** VIEW: Looking northwest from south shoulder of Lockerby Mine Road about 300 m east of SMR 3. (September 12, 2006)



**Photograph 89** VIEW: Looking east from west shoulder of SMR 3 about 230 m south of Highway 17 underpass structure. (September 12, 2006)



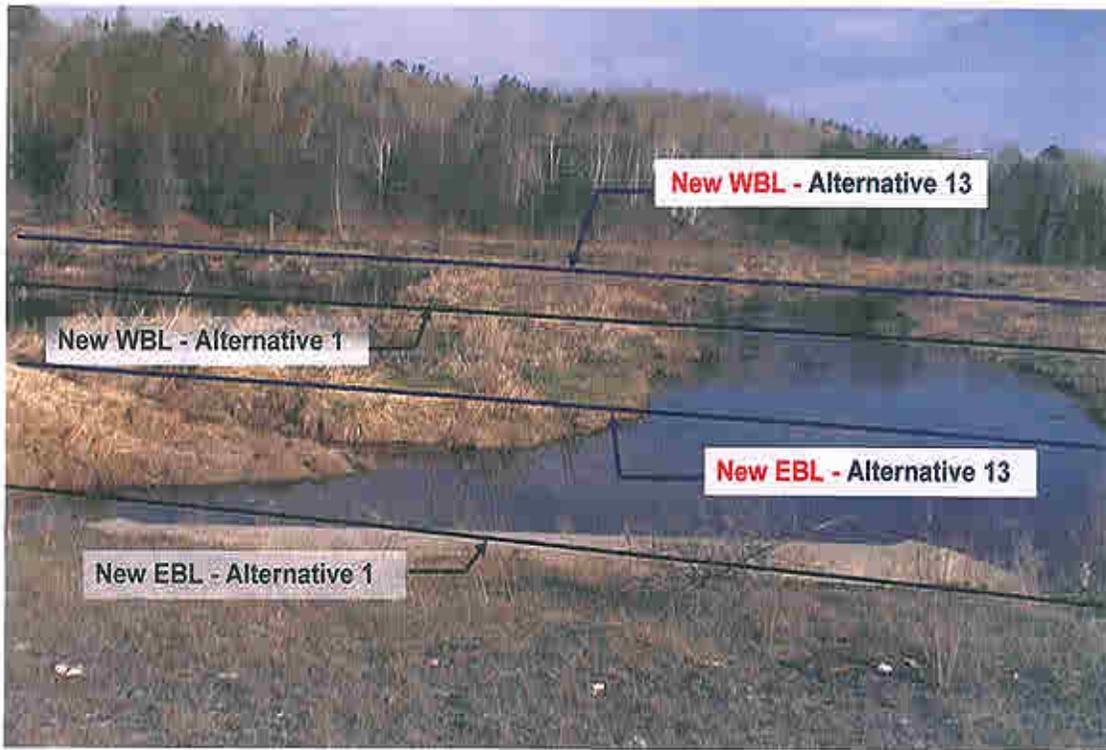
**Photograph 90** VIEW: Looking east from west side of SMR 55 at about 300 m south of SMR 55 intersection with Lindala Road. (September 12, 2006)



**Photograph 91** VIEW: Looking northeast across Fairbank Creek Floodplain about 150 m east of SMR 55. Estimated depth 10 to 12 m to "firm bottom". (September 12, 2006)



**Photograph 92** VIEW: Looking east across Fairbank Creek Floodplain about 150 m east of SMR 55. Estimated depth 10 to 12 m to "firm bottom". (September 12, 2006)



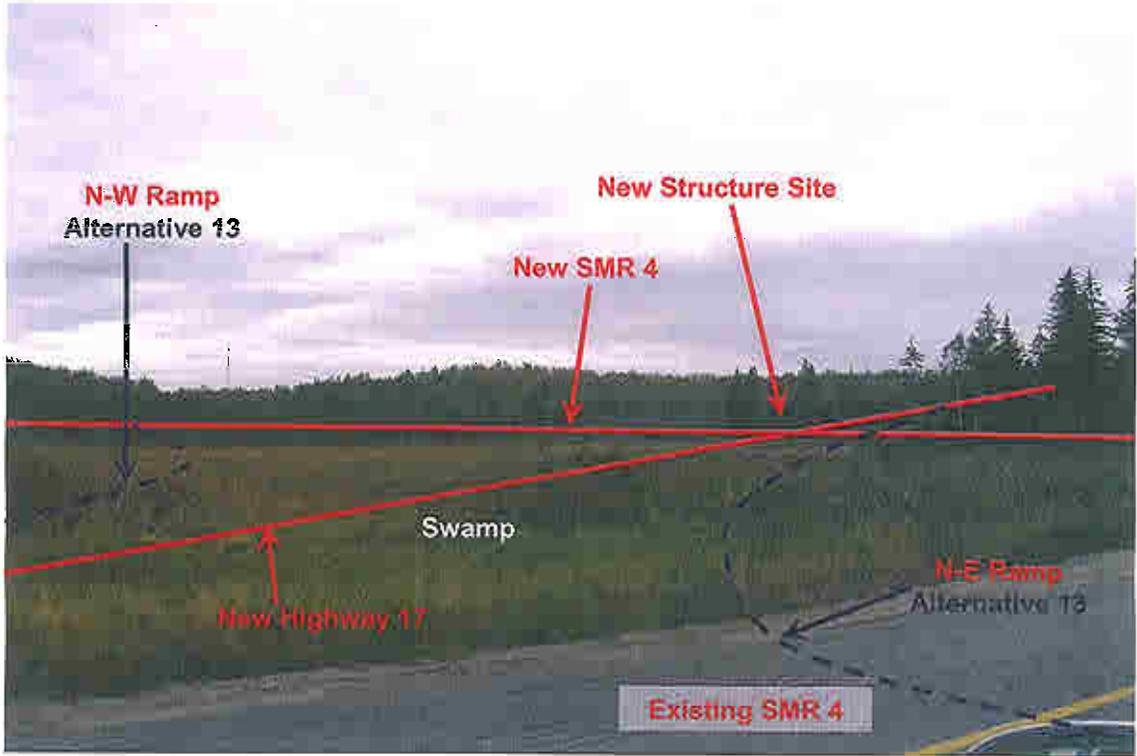
**Photograph 93** VIEW: Highway 17 Sta. 17+750 (Alt. 1). Looking north across top of Fairbank Creek culvert. Note open water and swamp. Depth to firm bottom is about 15 m. Artesian conditions exist. (May 1, 2006)



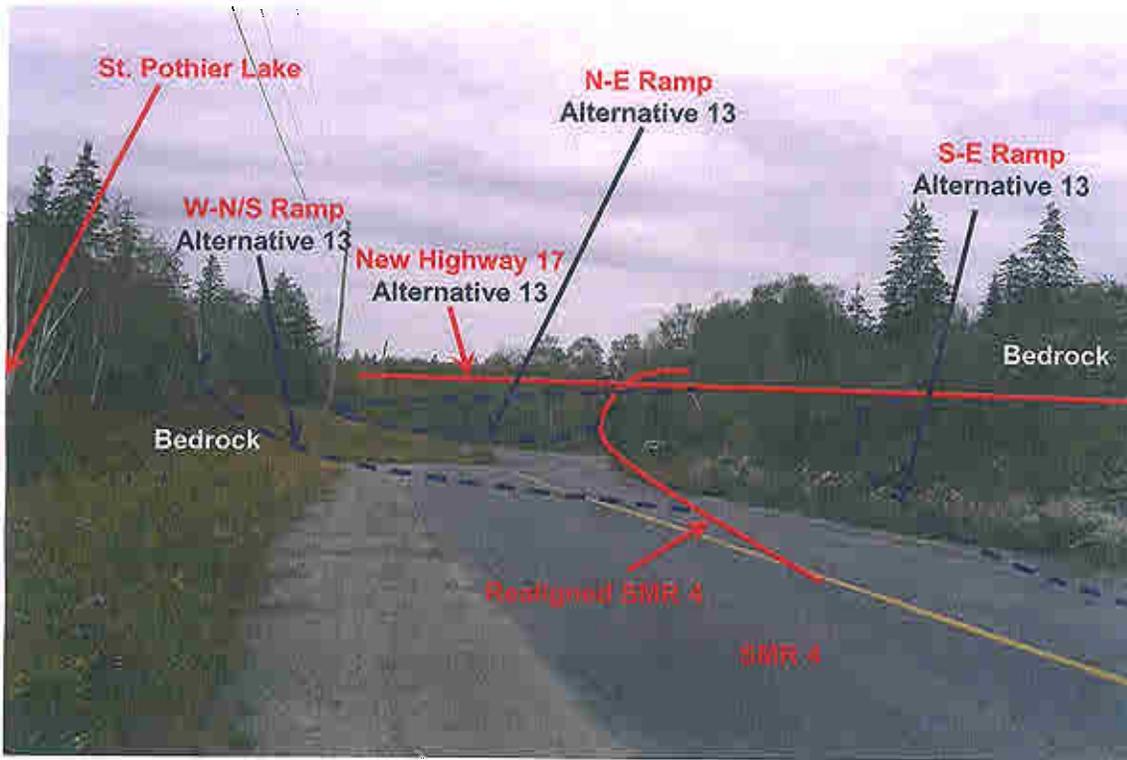
**Photograph 94** VIEW: Looking south from bedrock outcrop on south side of Huron Central Railway about 250 m east of existing SMR 3/SMR 4 intersection. (September 12, 2006)



**Photograph 95** VIEW: Looking south from north shoulder of SMR 3 about 250 m east of existing intersection with SMR 4. (September 12, 2006)



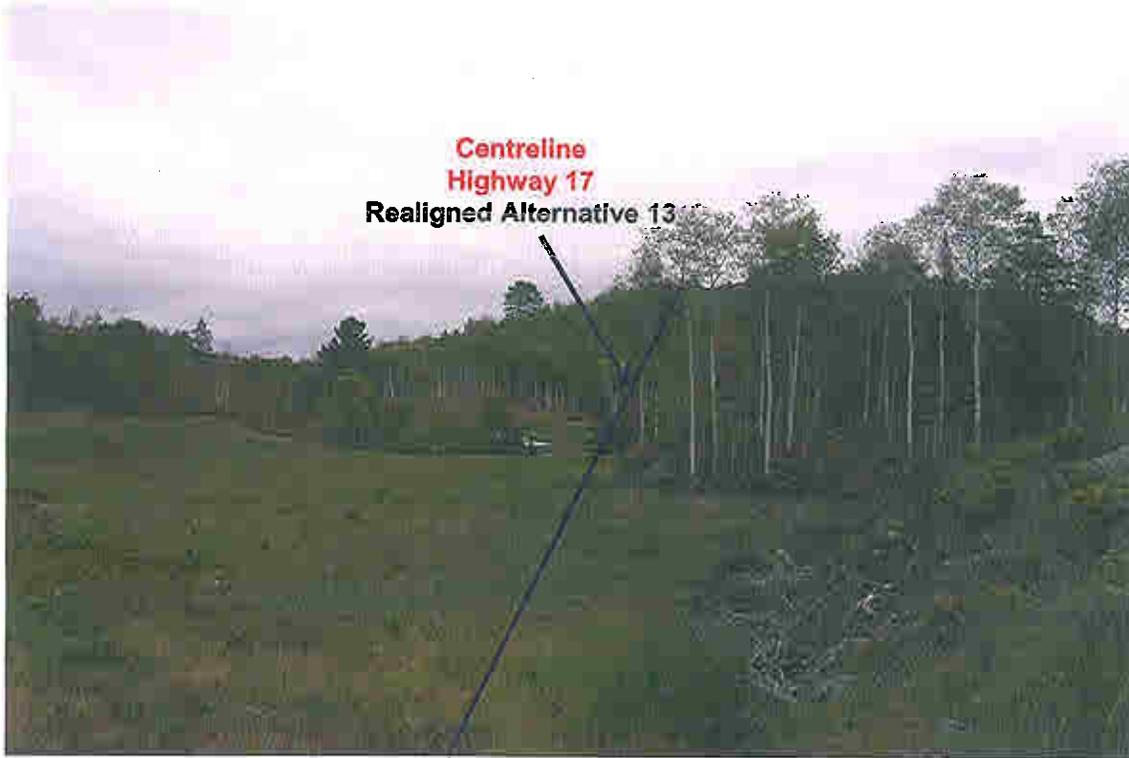
**Photograph 96** VIEW: Looking east from west shoulder SMR 4 about 500 m south of intersection with SMR 3 across major swamp area. (September 12, 2006)



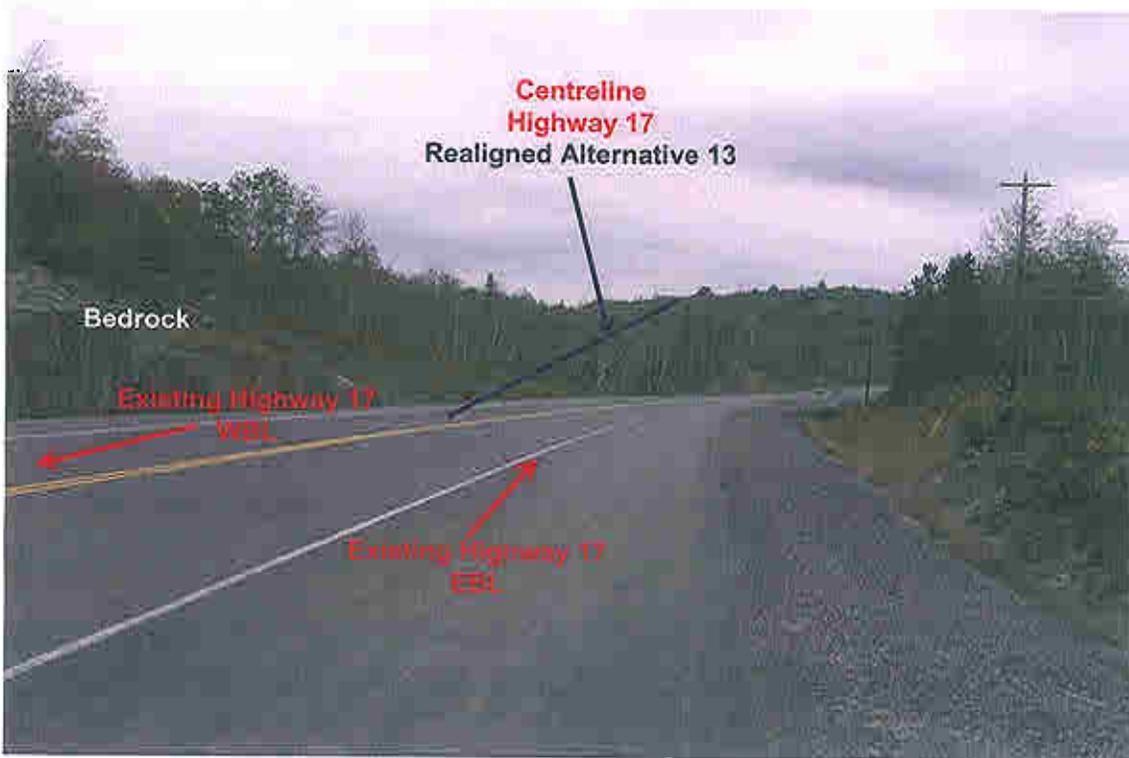
**Photograph 97** VIEW: Looking north from west shoulder of SMR 4 about 850 m south of intersection with SMR 3. Bedrock exposures visible at north end of Pothier Road abutting SMR 4. (September 12, 2006)



**Photograph 98** VIEW: Looking northwest from east shoulder of SMR 4 about 750 m south of intersection with SMR 3. (September 12, 2006)



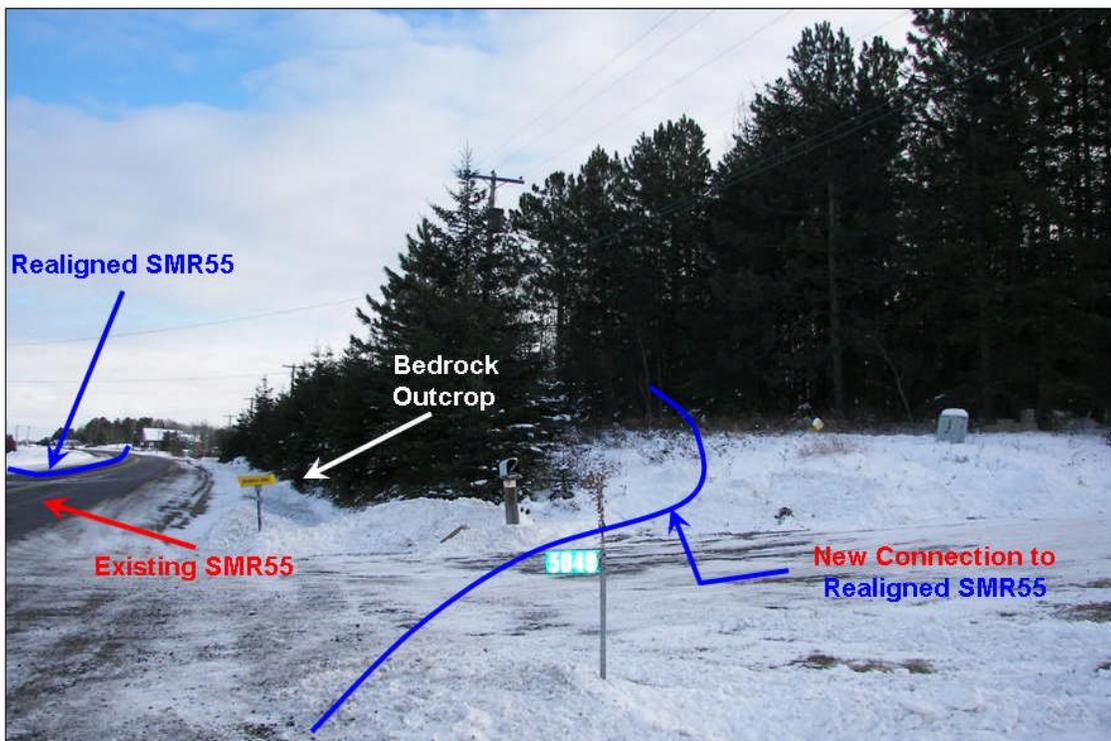
**Photograph 99** VIEW: Looking east from about Sta. 11+800 about 50 m north of Highway 17 across open farm field. (September 12, 2006)



**Photograph 100** VIEW: Looking east from south shoulder of Highway 17 at about Sta. 11+200, some 600 m west of Fen Road at tie-in with existing highway. (September 12, 2006)



**Photograph 101** VIEW: Looking west from north ditch line of SMR55 opposite Jim's Portable Toilets west driveway. Extensive low-lying wet lands on north (right) side of photograph. (Dec. 6, 2007)



**Photograph 102** VIEW: Looking east from south shoulder of SMR55 just west of 5049 driveway entrance. (Dec. 6, 2007)



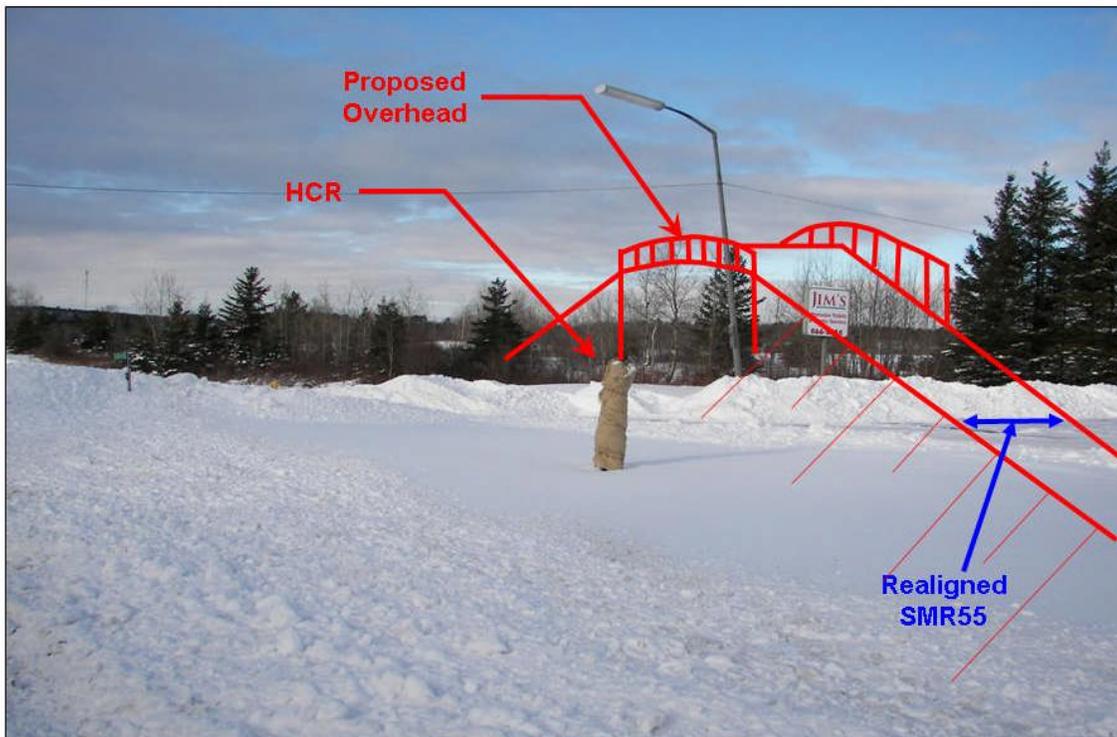
**Photograph 103** VIEW: Close up of bedrock in south ditch and slope of SMR55, about 150 m east of 5049 entrance driveway (Photograph 1). (Dec. 6, 2007)



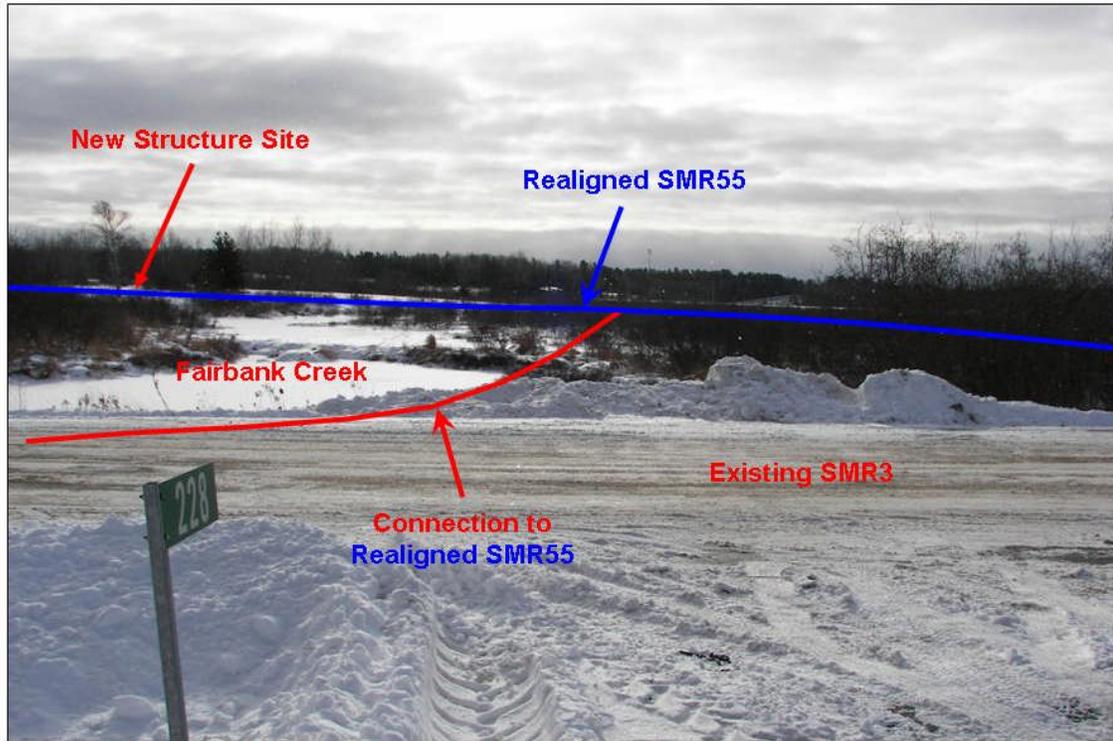
**Photograph 104** VIEW: Looking southwest from north shoulder of existing SMR55 at new connection from the Realigned SMR55 to the existing SMR55. (Dec. 6, 2007)



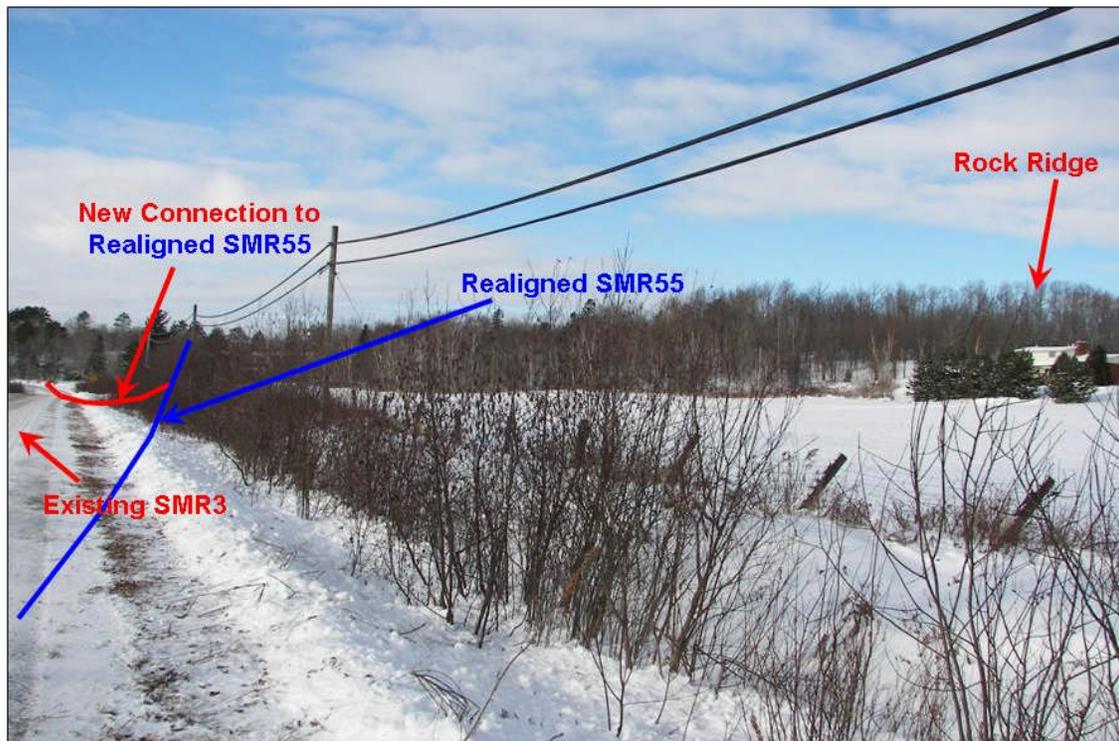
**Photograph 105** VIEW: Looking east from south shoulder of SMR55 at new intersection of Realigned SMR55 and connection with existing SMR55. Note commercial and residential structures of Whitefish visible in distance. (Dec. 6, 2007)



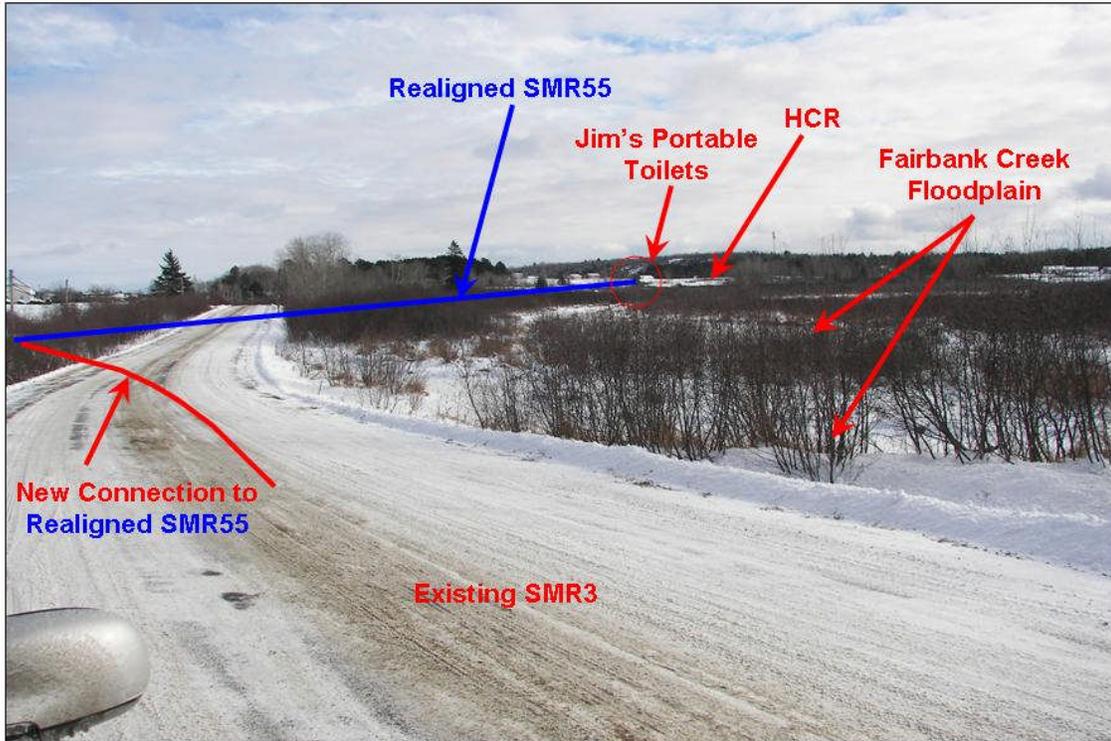
**Photograph 106** VIEW: Looking northwest from north side of SMR55 of commercial property No. 5040, Jim's Portable Toilets and Septic Services. High embankment (> 8 m) required to elevate the realigned SMR55 over HCR track. (Dec. 6, 2007)



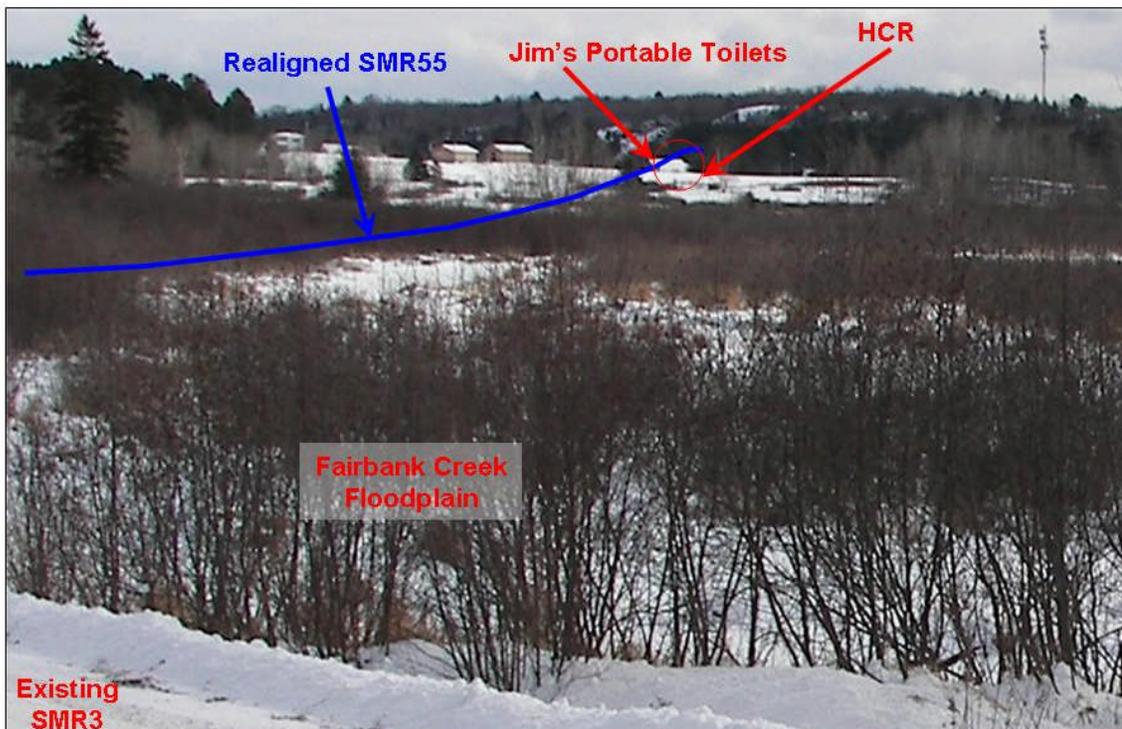
**Photograph 107** VIEW: Looking south from driveway of 228 SMR3 across existing Fairbank Creek at site of new structure. Extensive floodplain in midground past road. (Dec. 6, 2007)



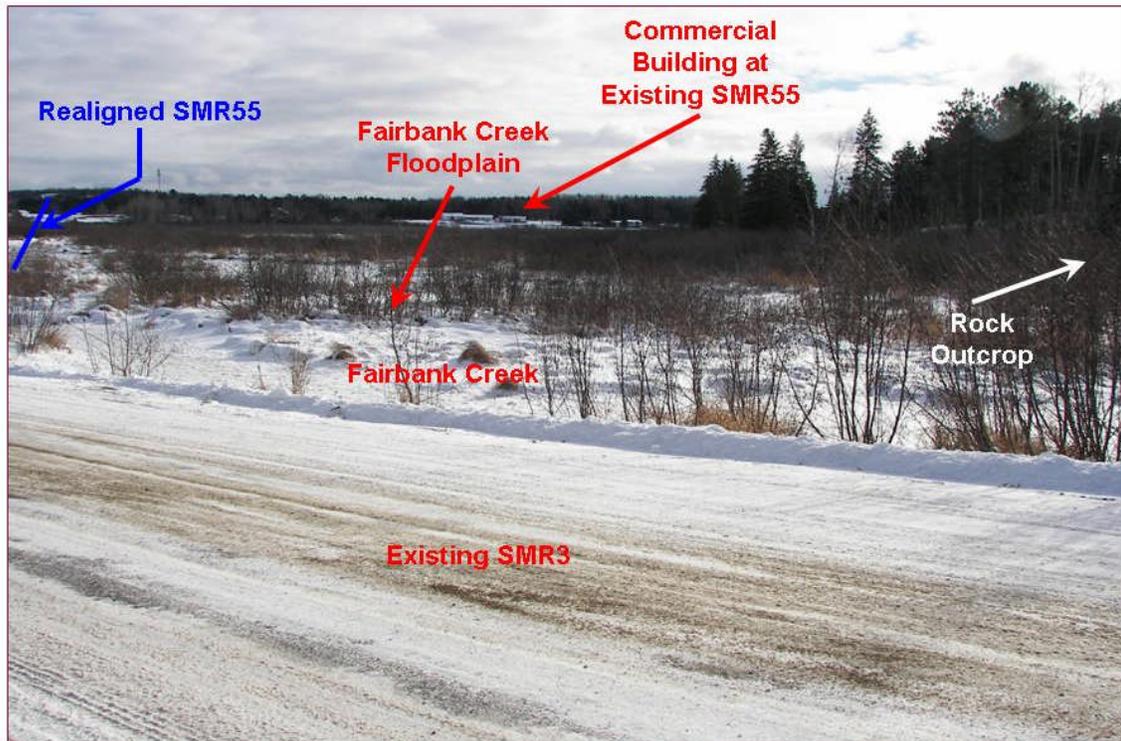
**Photograph 108** VIEW: Looking northwest from north shoulder of SMR3 at proposed crossing of existing SMR3 and realigned SMR55. Sloping farmland in foreground with bedrock outcrops in forested bush in distance. (Dec. 6, 2007)



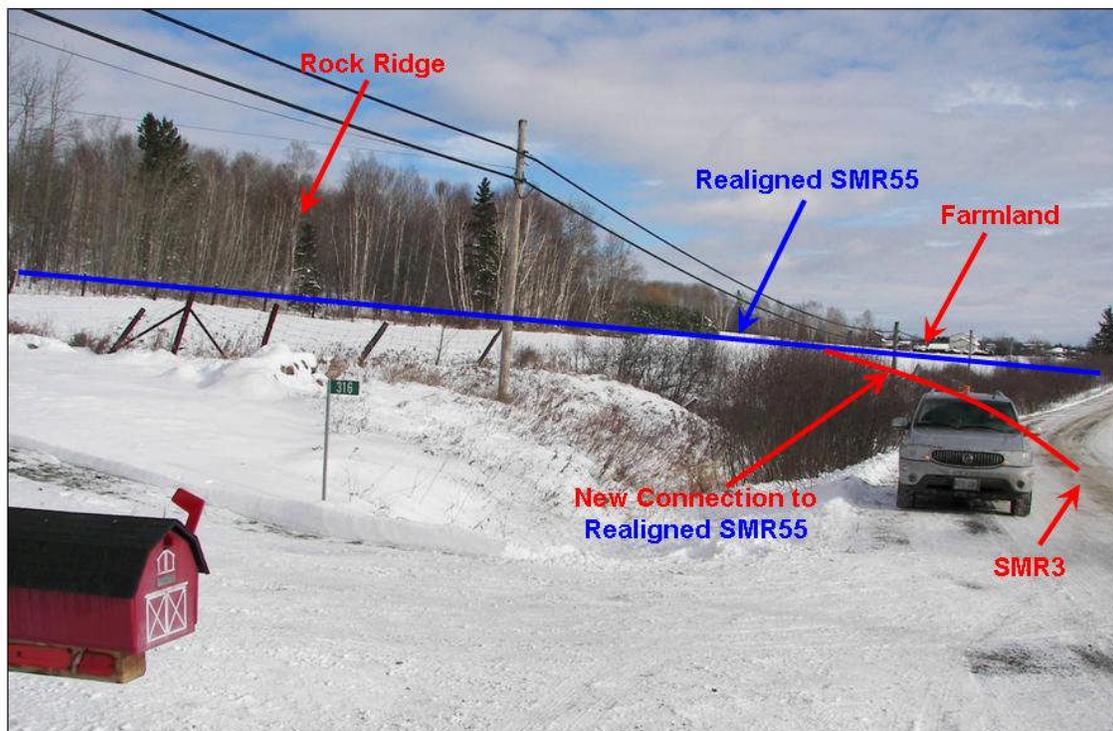
**Photograph 109** VIEW: Looking southeast from north shoulder of SMR3 about 300 m west of the crossing of the realigned SMR55 and the existing SMR3. The extensive Fairbank Creek floodplain is visible south of SMR3. (Dec. 6, 2007)



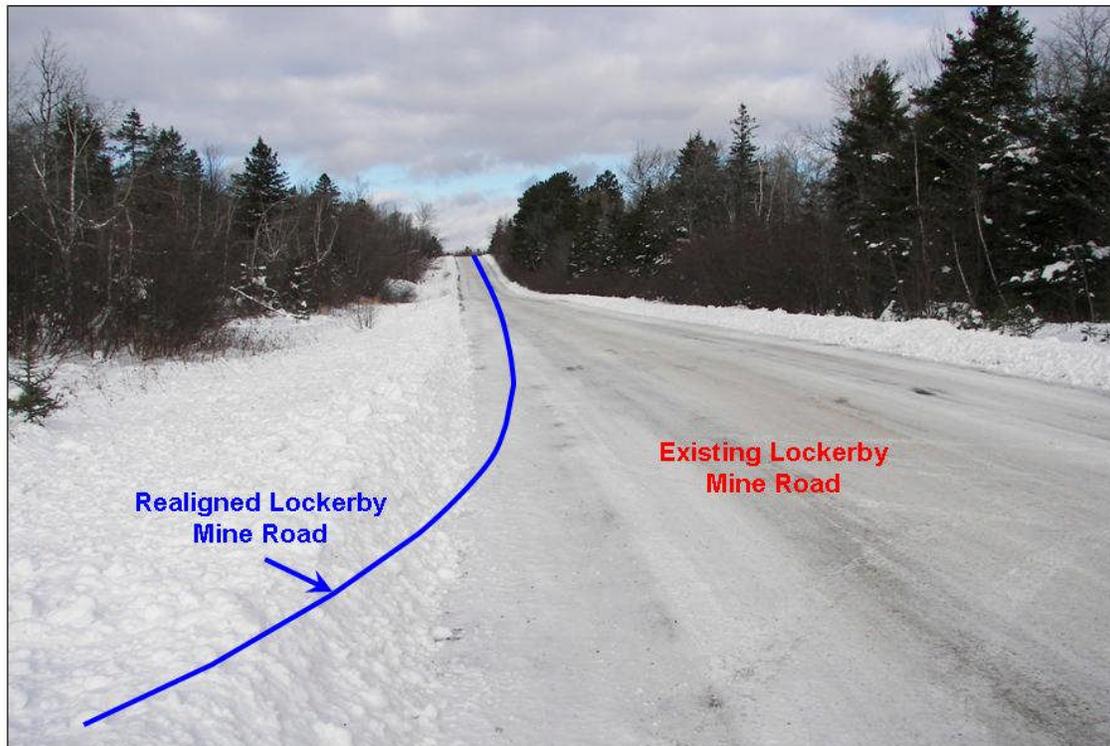
**Photograph 110** VIEW: Close up of photograph 109. Looking southeast from north shoulder of SMR3 about 300 m west of the crossing of the realigned SMR55 and the existing SMR3. The extensive Fairbank Creek floodplain is visible south of SMR3. (Dec. 6, 2007)



**Photograph 111 VIEW:** Looking southeast from north shoulder of SMR3 about 300 m west of the crossing of the realigned SMR55 and the existing SMR3. The extensive Fairbank Creek flood plain is visible south of SMR3. (Dec. 6, 2007)



**Photograph 112 VIEW:** Looking east from entrance to driveway to house #316. Realigned SMR55 traverses farmland and a rock ridge beyond the end of the driveway. (Dec. 6, 2007)



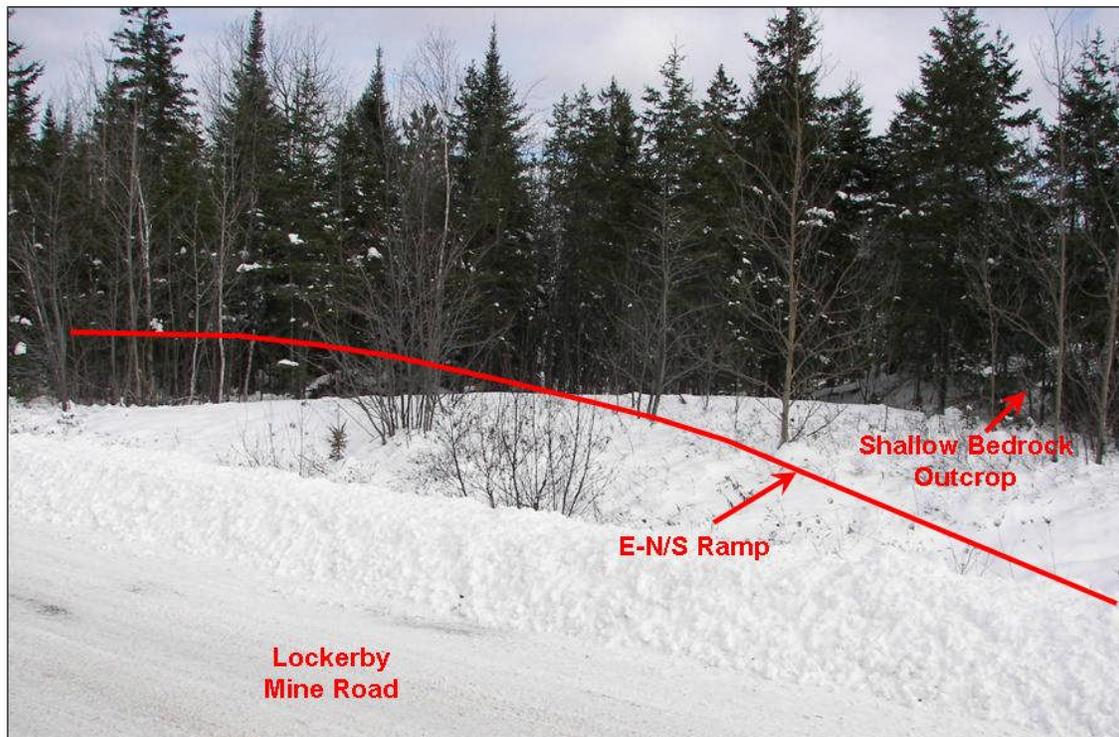
**Photograph 113** VIEW: Looking east from north shoulder of the Lockerby Mine Road about 900 m east of intersection with existing SMR3. Existing Lockerby Mine Road starts to swing to north to intersect realigned SMR3. Shallow bedrock in bush areas. (Dec. 6, 2007)



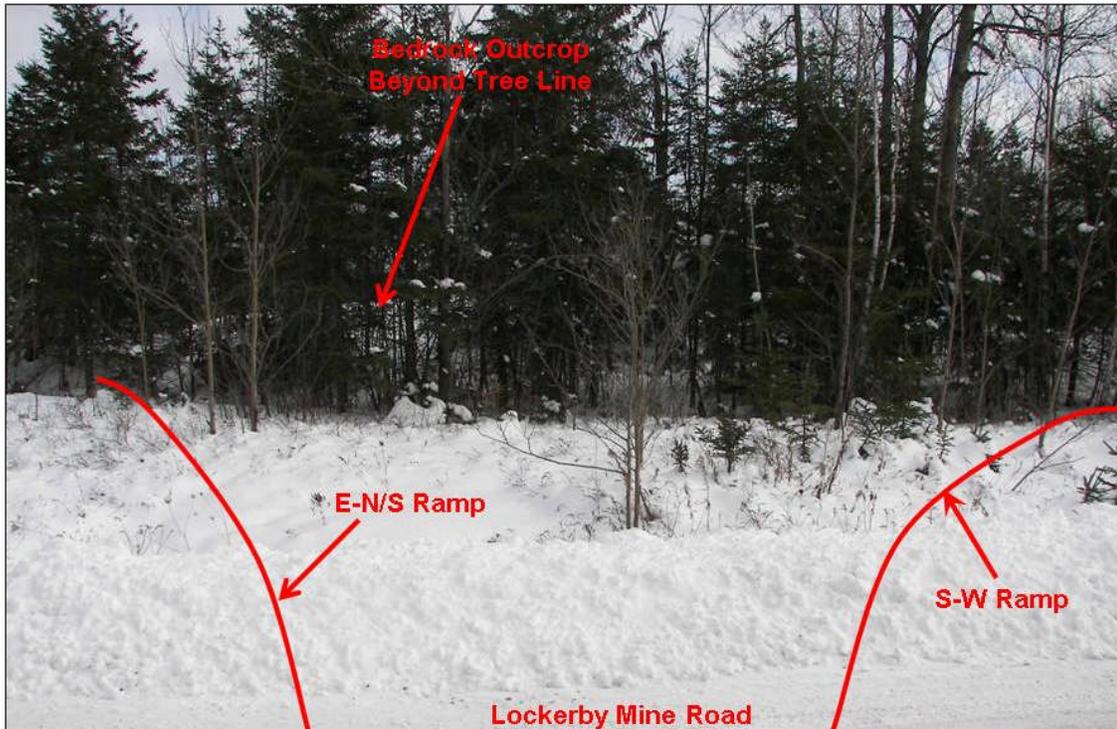
**Photograph 114** VIEW: Looking west from north shoulder of the Lockerby Mine Road about 900 m east of intersection with existing SMR3. Existing Lockerby Mine Road starts to swing to north to intersect realigned SMR3. Shallow bedrock in bush areas. Swamp area visible beyond tree line. (Dec. 6, 2007)



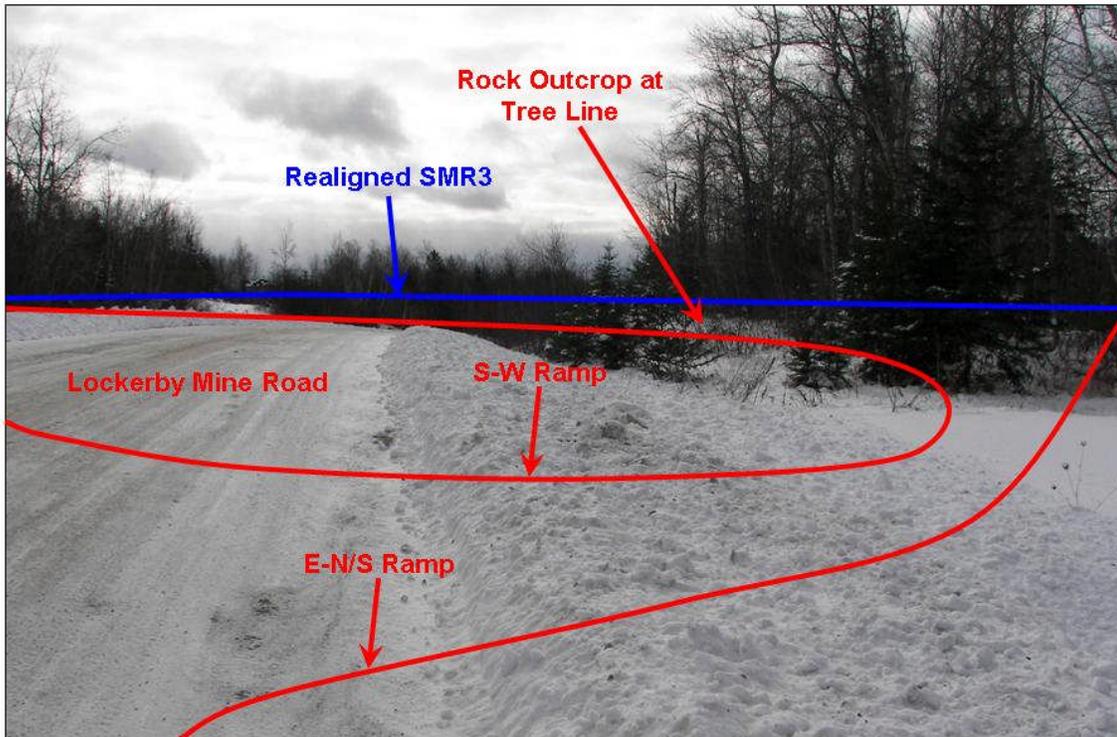
**Photograph 115** VIEW: Looking north from north shoulder of Lockerby Mine Road about 600 m east of intersection of existing SMR3. The Realigned SMR55 crosses the existing Lockerby Mine Road about 150 m to the west. The ground raises sharply to north. Shallow bedrock anticipated. Bedrock exposed in north ditch line at numerous locations to the west. (Dec. 6, 2007)



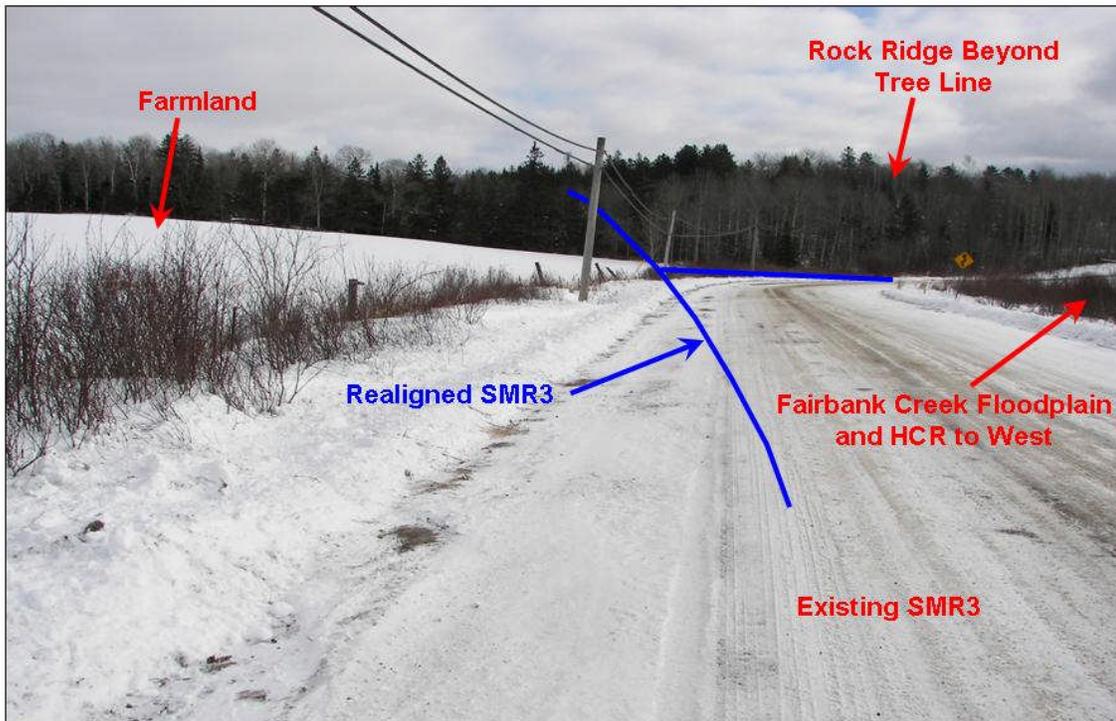
**Photograph 116** VIEW: Looking southeast from north shoulder of Lockerby Mine Road about 600 m east of existing SMR3. The E-N/S ramp crosses from a low area at the left of the photograph to a shallow bedrock outcrop near the tree line. (Dec. 6, 2007)



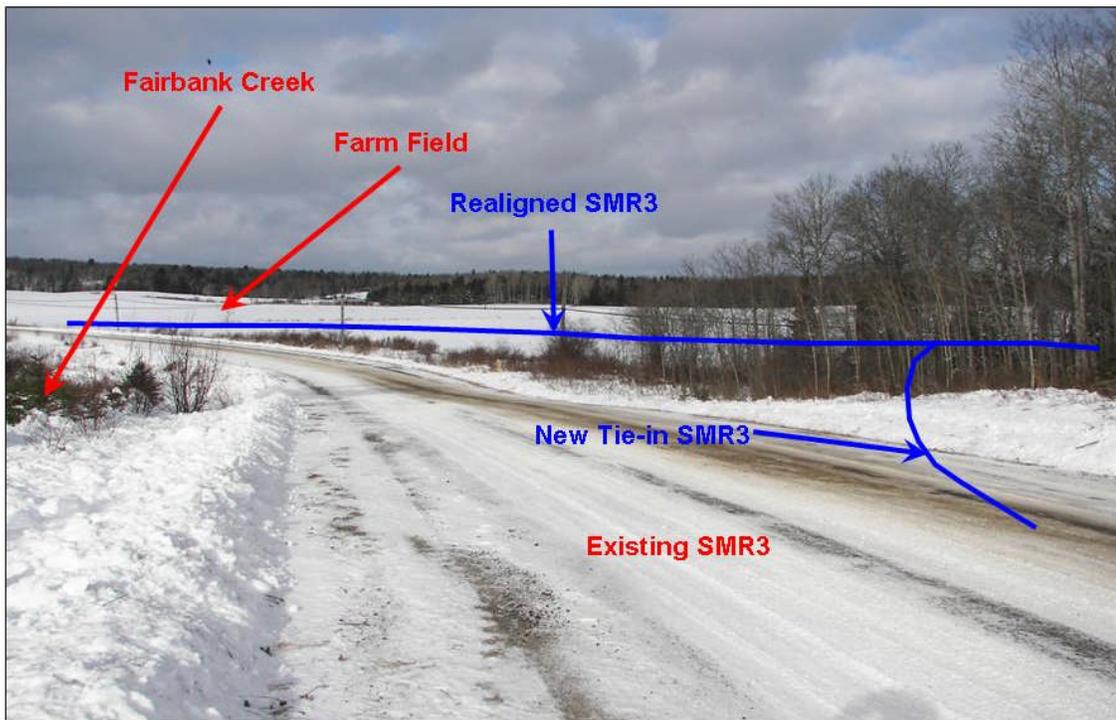
**Photograph 117** VIEW: Looking south from north shoulder of Lockerby Mine Road about 600 m east of existing SMR3. Highway 17 is about 130 m south of tree line in view. Sections of E-N/S and S-W ramps in view would cross bedrock outcrops visible immediately beyond the tree line. (Dec. 6, 2007)



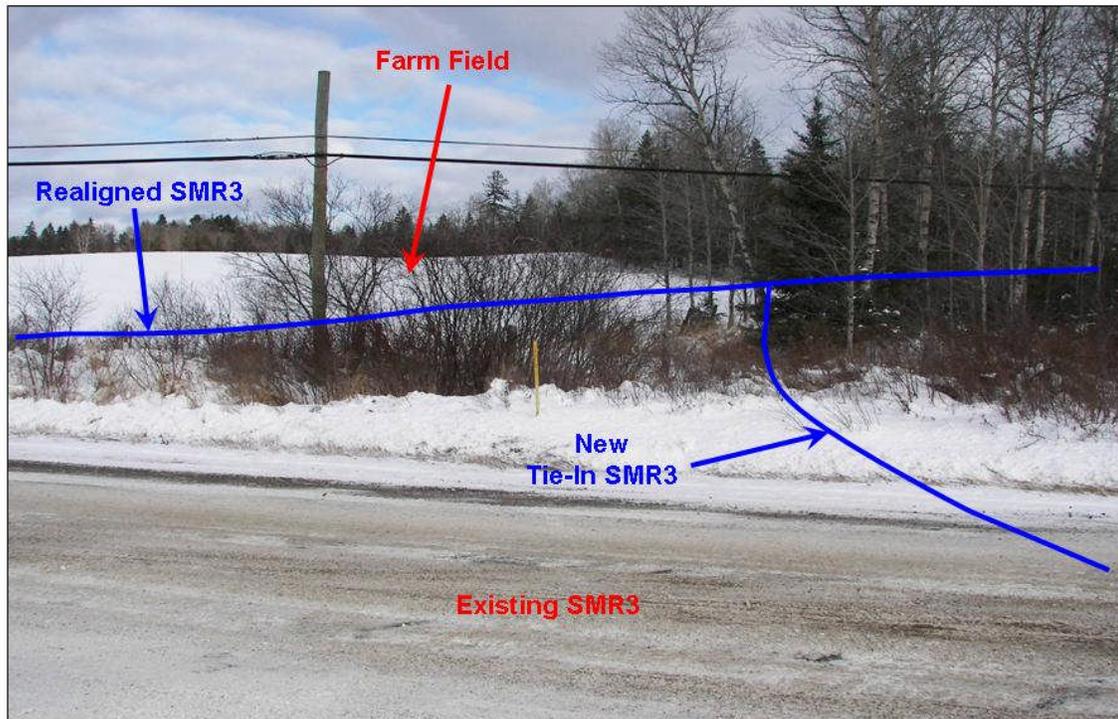
**Photograph 118** VIEW: Looking west from north shoulder of Lockerby Mine Road about 500 m east of existing SMR3. View of site for realigned SMR3, E-N/S and S-W ramp sections north of future SMR55 / SMR3 underpass. (Dec. 6, 2007)



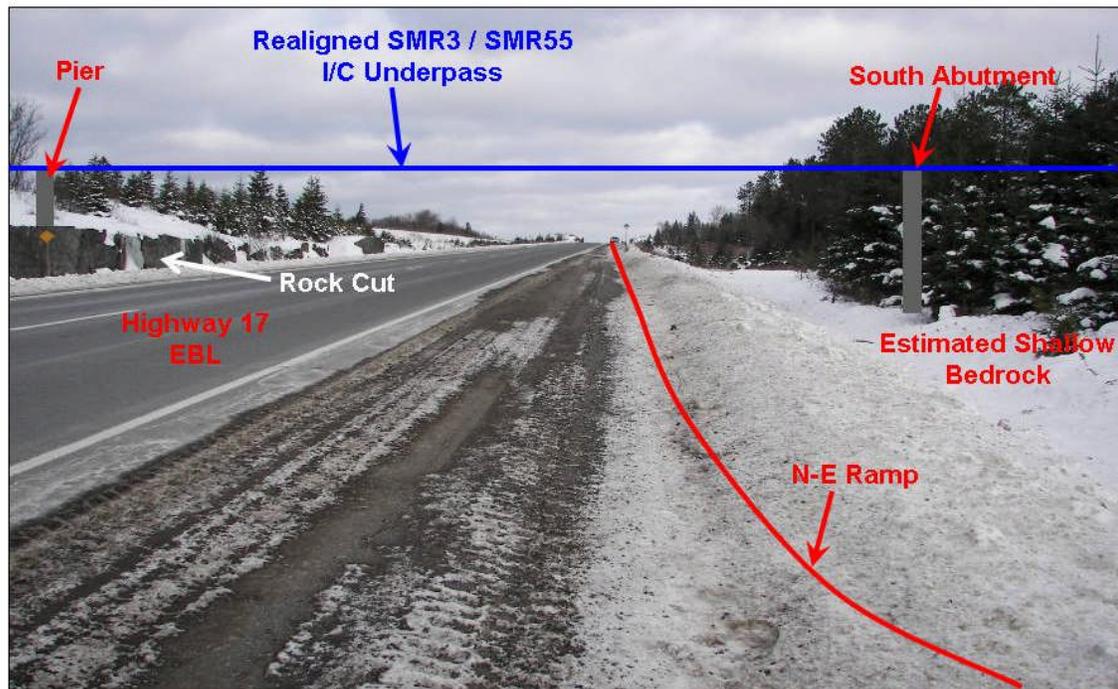
**Photograph 119** VIEW: Looking southeast from the east shoulder of SMR3 at the proposed northerly tie of the realigned SMR3 to the existing SMR3, about 1050 m north of the Hwy 17/SMR3 structure. Shallow bedrock with sand till veneer in bush area. (Dec. 6, 2007)



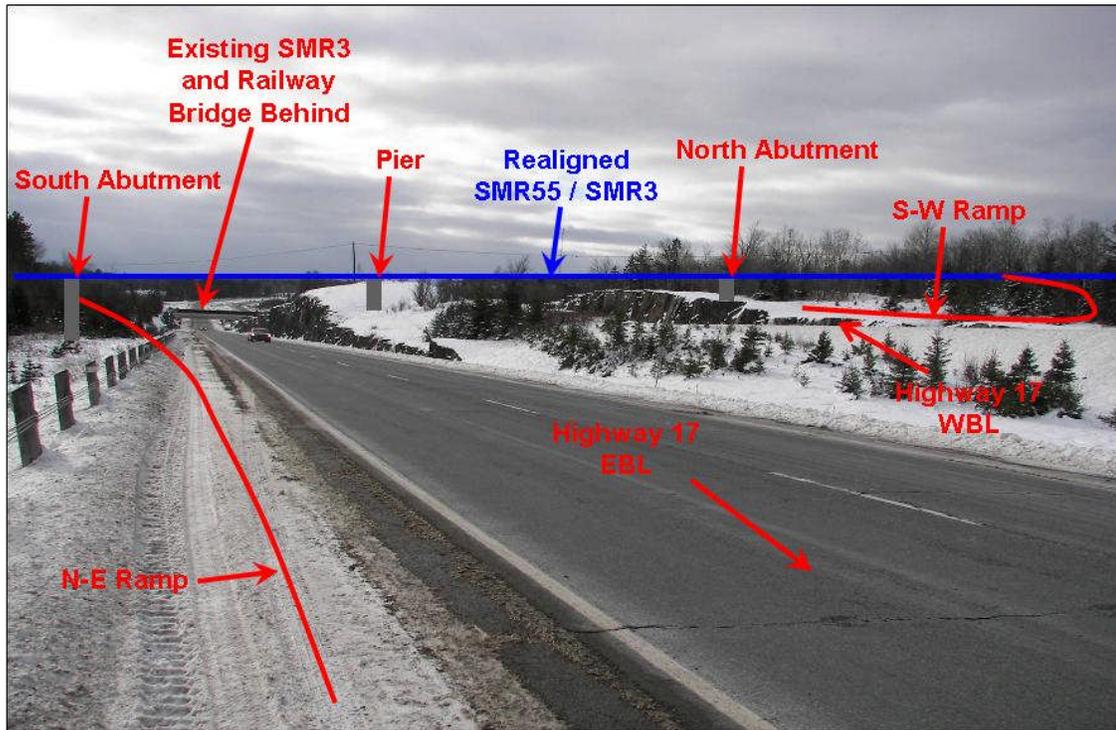
**Photograph 120** VIEW: Looking north from west shoulder of existing SMR3 at about the proposed tie-in to the Realigned SMR3, some 900 m north of the Hwy 17/SM3 structure. Fairbank Creek flood plain to west of SMR3. Farm field to north and flood plain beyond. (Dec. 6, 2007)



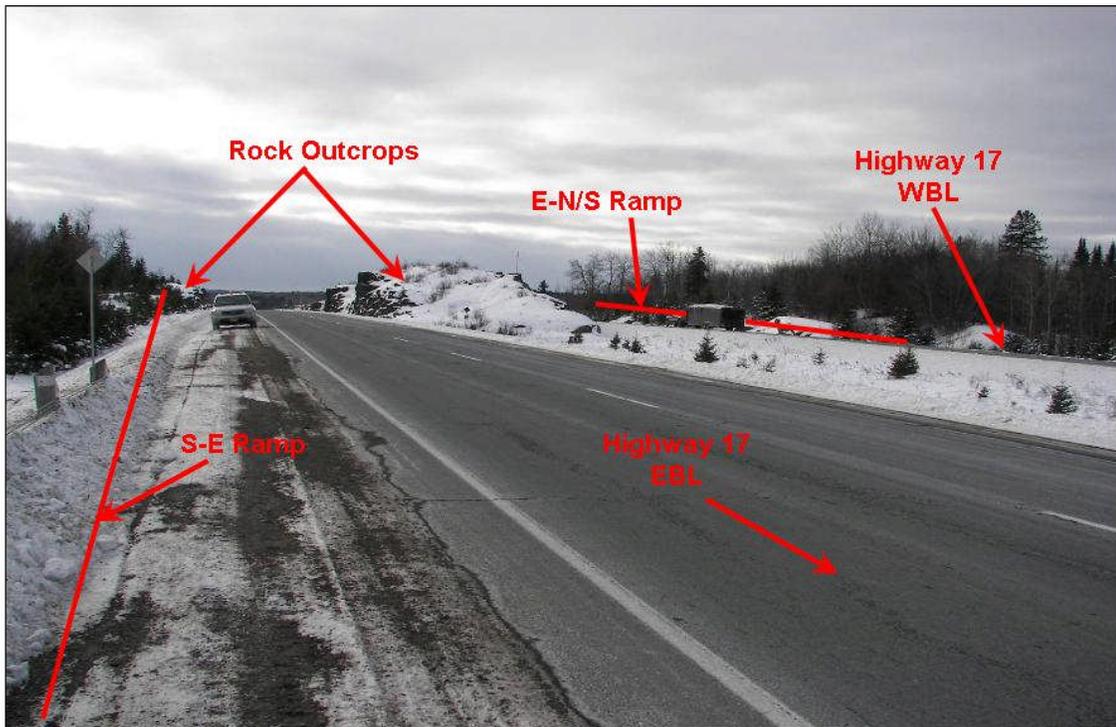
**Photograph 121** VIEW: Looking east from west shoulder of SMR3, about 950 m north of existing Hwy 17/SMR3 structure. Existing SMR3 section shown in photo will be abandoned with the tie-in and realigned SMR3. (Dec. 6, 2007)



**Photograph 122** VIEW: Looking east from south shoulder of Highway 17 EBL about 250 m east of existing SMR3 underpass at approximate location of new SMR3 / SMR55 I/C underpass. South span illustrated. Widening for N-E ramp required. Rock cut at north shoulder and shallow bedrock beyond south shoulder provide adequate bridge foundation conditions. (Dec. 6, 2007)



**Photograph 123** VIEW: Looking west from south shoulder of Highway 17 EBL about 700 m east of existing SMR3 underpass at approximate location of new SMR3/SMR55 I/C underpass. Widening for N-E ramp required. S-W ramp on rock cut under future north span. Note Highway 17 WBL at higher level than EBL. (Dec. 6, 2007)



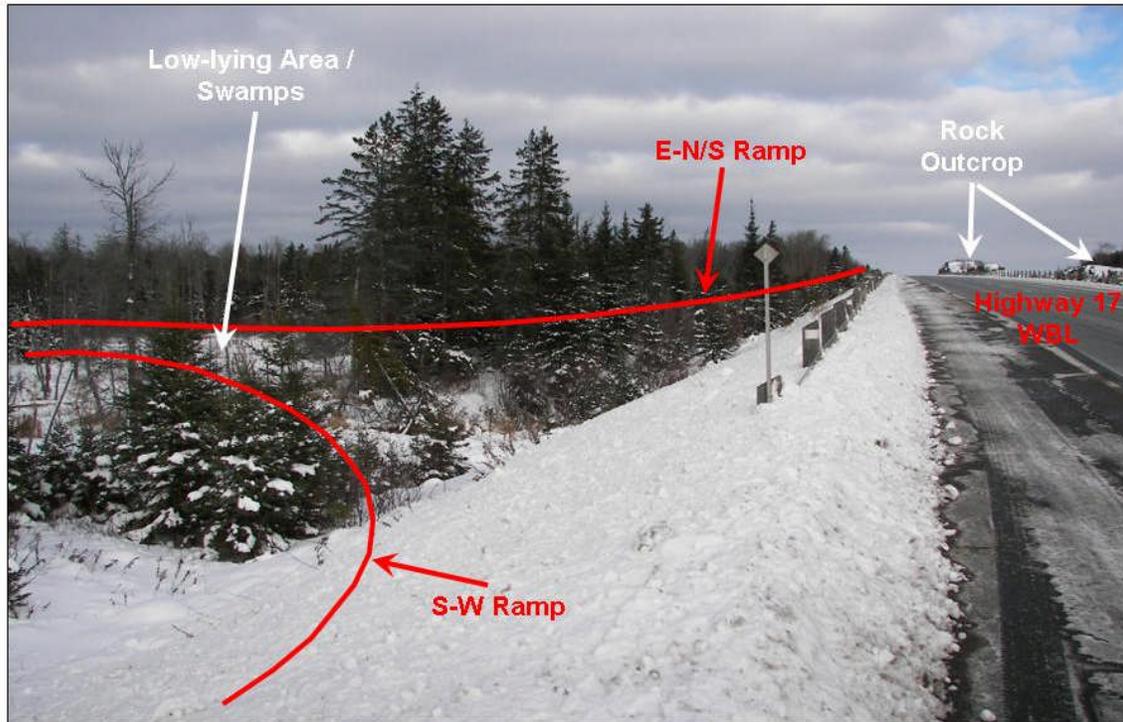
**Photograph 124** VIEW: Looking west from south shoulder of Highway 17 EBL about 1,050 m east of existing SMR 3 underpass. Widening for new S-E ramp to require a rock cut beyond the south shoulder. New E-N/S ramp to cross same rock outcrop on north shoulder. (Dec. 6, 2007)



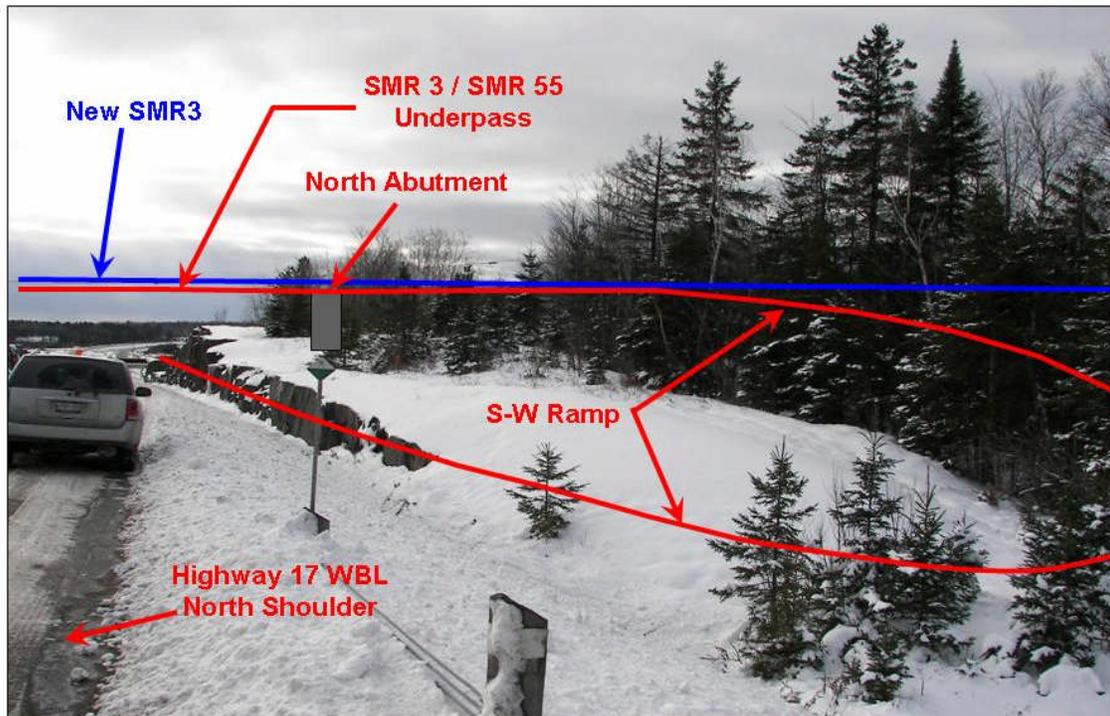
**Photograph 125** VIEW: Looking east from south shoulder of Highway 17 EBL about 1,050 m east of existing SMR3 underpass. Note low-lying swampy ground to the south where S-E ramp construction will require widening of the highway embankment. (Dec. 6, 2007)



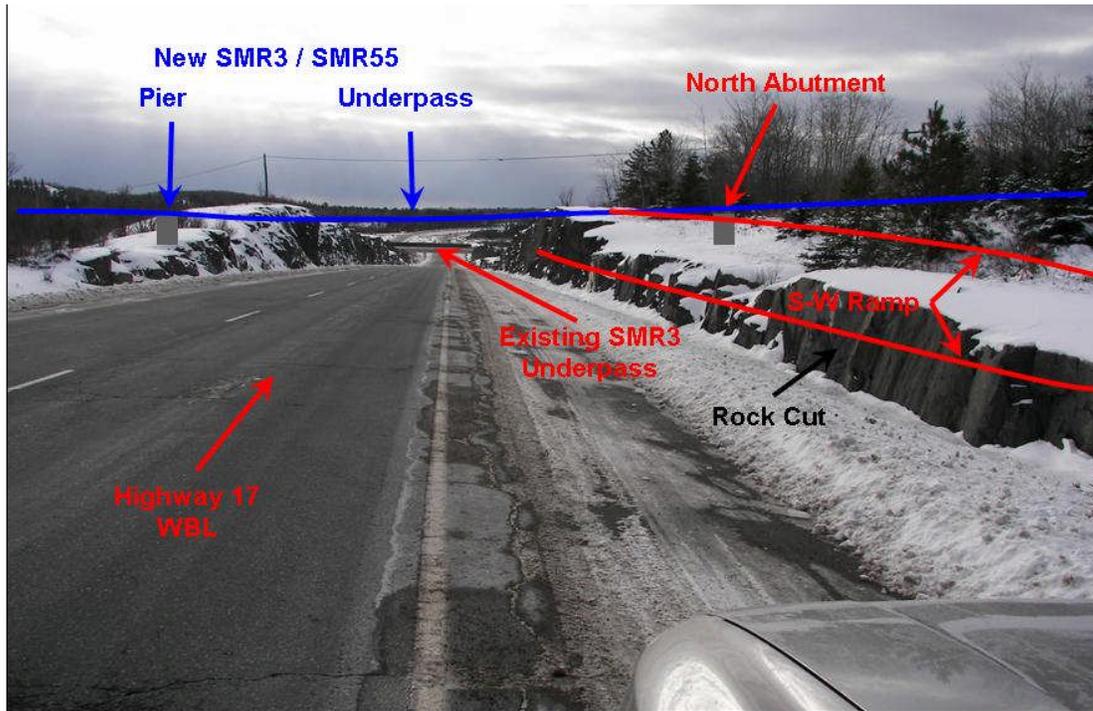
**Photograph 126** VIEW: Looking east from north shoulder of Highway 17 WBL about 800 m east of existing SMR3 underpass. New E-N/S ramp will cross a zone of shallow bedrock opposite existing rock cuts in the median. (Dec. 6, 2007)



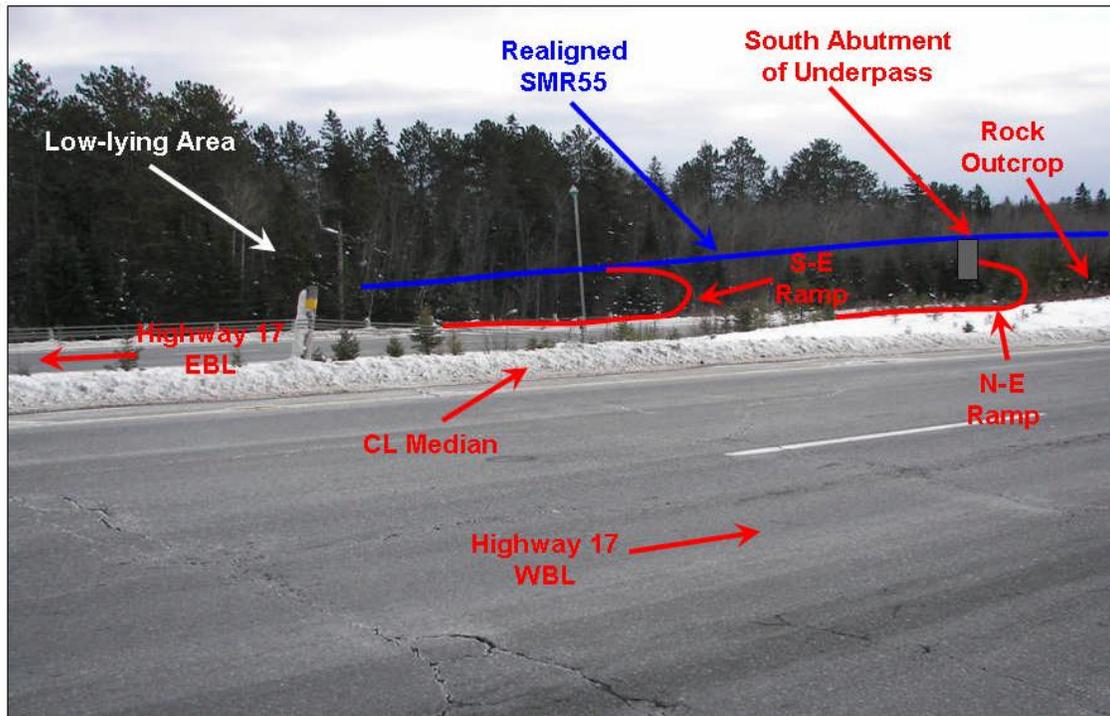
**Photograph 127** VIEW: Looking east from north shoulder of Highway 17 WBL about 600 m east of existing SMR3 Underpass. Rock outcrops illustrated in previous photograph are in the distance right of photograph. Foreground left show a low-lying swampy area where sections of the S-W Ramp area E-W/S Ramp will cross. (Dec. 6, 2007)



**Photograph 128** VIEW: Looking west from north shoulder of Highway 17 WBL about 600 m east of existing SMR3 Underpass. Rock outcrop on north side of highway will provide foundation for new north abutment and will be cut to allow tie-in for new S-W Ramp. (Dec. 6, 2007)



**Photograph 129** VIEW: Looking west from north shoulder of Highway 17 WBL about 580 m east of existing SMR3 Underpass. North abutment and pier to be founded on rock outcrops. The illustrated section of the S-W Ramp will require a rock cut at the north shoulder. (Dec. 6, 2007)



**Photograph 130** VIEW: Looking southwest across median of Highway 17 about 500 m east of existing SMR3 Underpass. Note Hwy 17 WBL higher grade than EBL. Sections of realigned SMR55 and of S-E Ramp will cross a low-lying area south of the bedrock outcrop located at the south abutment. (Dec. 6, 2007)