

METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No 2007-3043

WP No 64-00-00

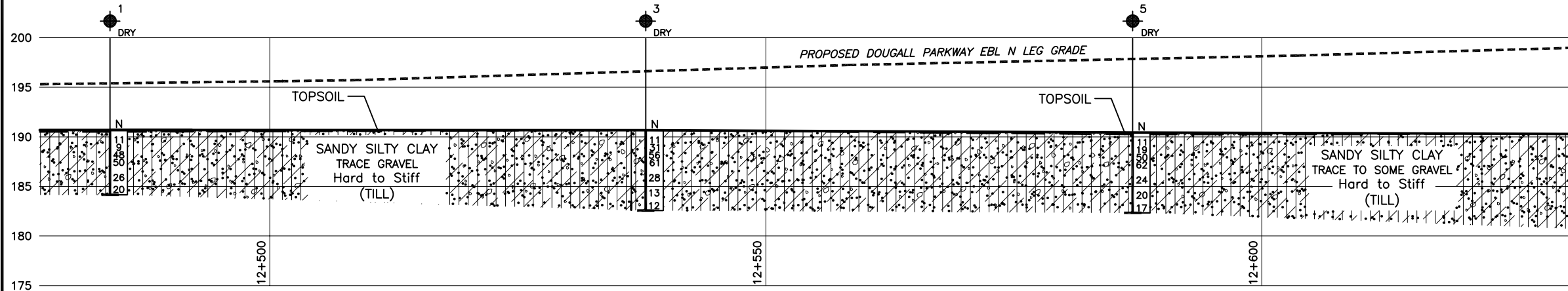
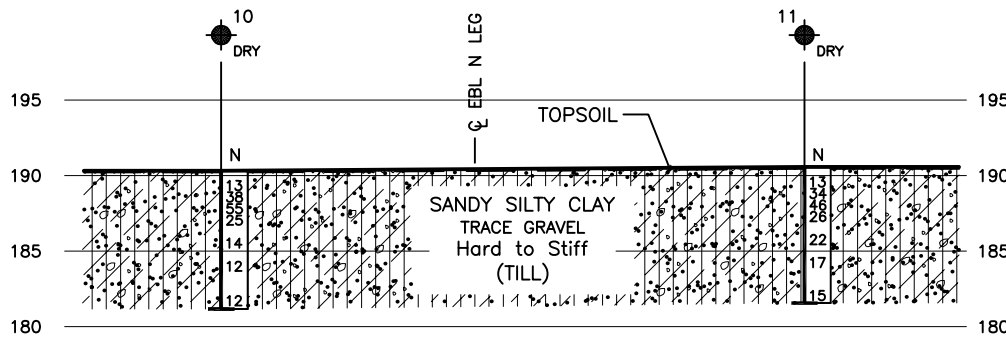
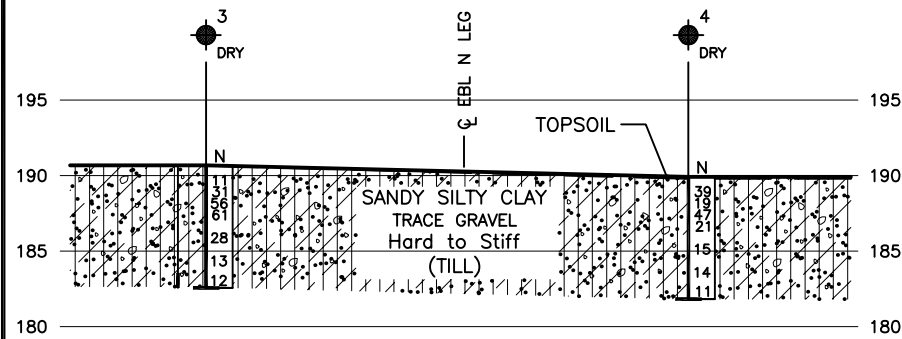
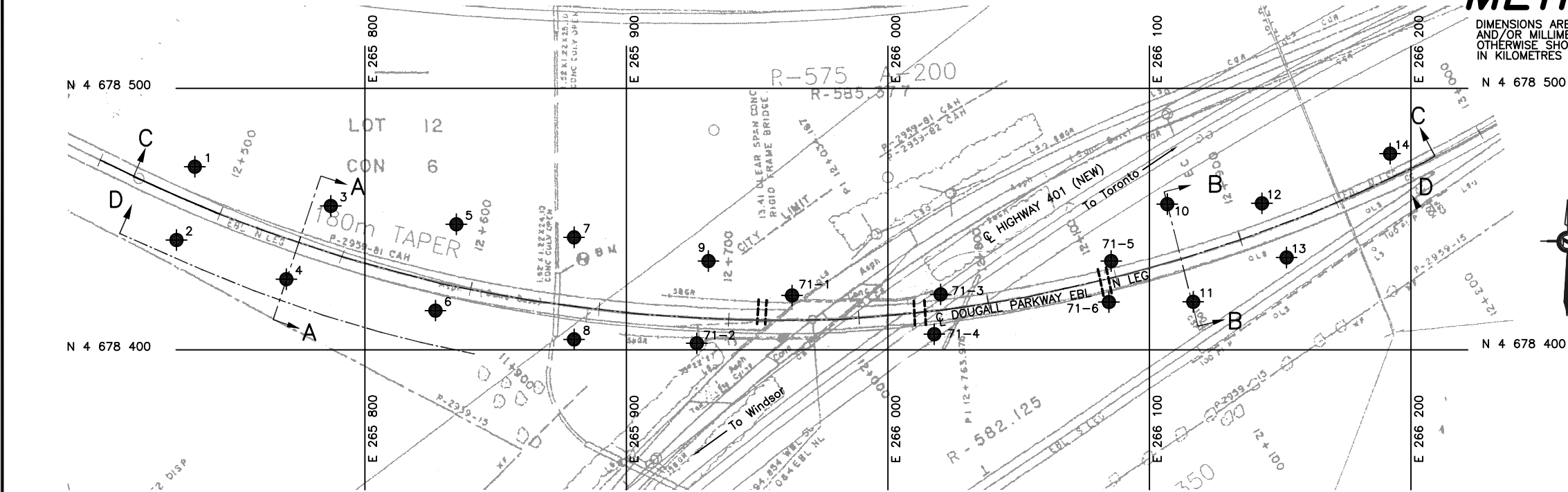
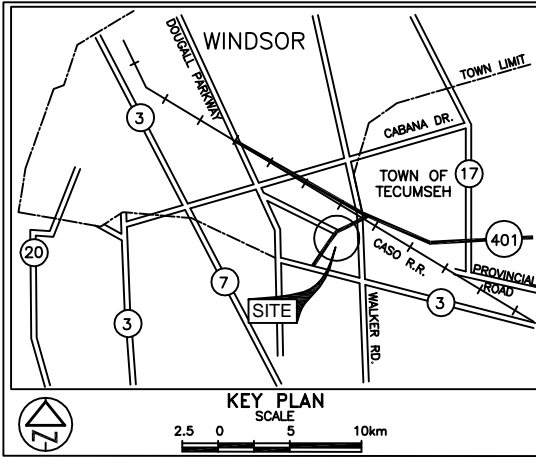
HIGHWAY 401
EMBANKMENT ON EBL
NORTH LEG AT DOUGALL PARKWAY
BOREHOLE LOCATIONS & SOIL STRATA



SHEET

244

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



(Legend Continued)

BH No	ELEVATION	EBL-N LEG STA.	o/s CL
10	190.32	12+877	21.6m Lt.
11	190.56	12+876	17.0m Rt.
12	190.49	12+912	10.1m Lt.
13	191.11	12+914	12.6m Rt.
14	190.56	12+967	8.5m Lt.
71-1	191.00	12+725	9.5m Lt.
71-2	191.38	12+688	9.8m Rt.
71-3	191.47	12+782	6.0m Lt.
71-4	191.46	12+778	8.9m Rt.
71-5	190.49	12+850	6.3m Lt.
71-6	191.65	12+845	8.8m Rt.

LEGEND

	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Jan - Mar 2002
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

(Legend Continues)

BH No	ELEVATION	EBL-N LEG STA.	o/s CL
1	190.70	12+484	13.0m Lt.
2	189.74	12+489	15.5m Rt.
3	190.67	12+539	17.1m Lt.
4	189.92	12+532	14.8m Rt.
5	190.44	12+589	23.5m Lt.
6	190.05	12+589	10.5m Rt.
7	190.28	12+637	26.1m Lt.
8	190.73	12+642	12.5m Rt.
9	190.48	12+691	21.9m Lt.

NOTE -
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

NOTES:

- REFER TO DRAWING 1-2 FOR SECTION C-C CONTINUED AND DRAWING 1-3 FOR SECTION D-D.
- SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLES FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTIONS
SCALE



REF No Survey Plan 2001 Site # 6-71, entitled
Proposed Bridge Site at Tunnel Diversion and
Highway 401 and Plan, undated, untitled,
Provided by Planning and Design Section, MTO.

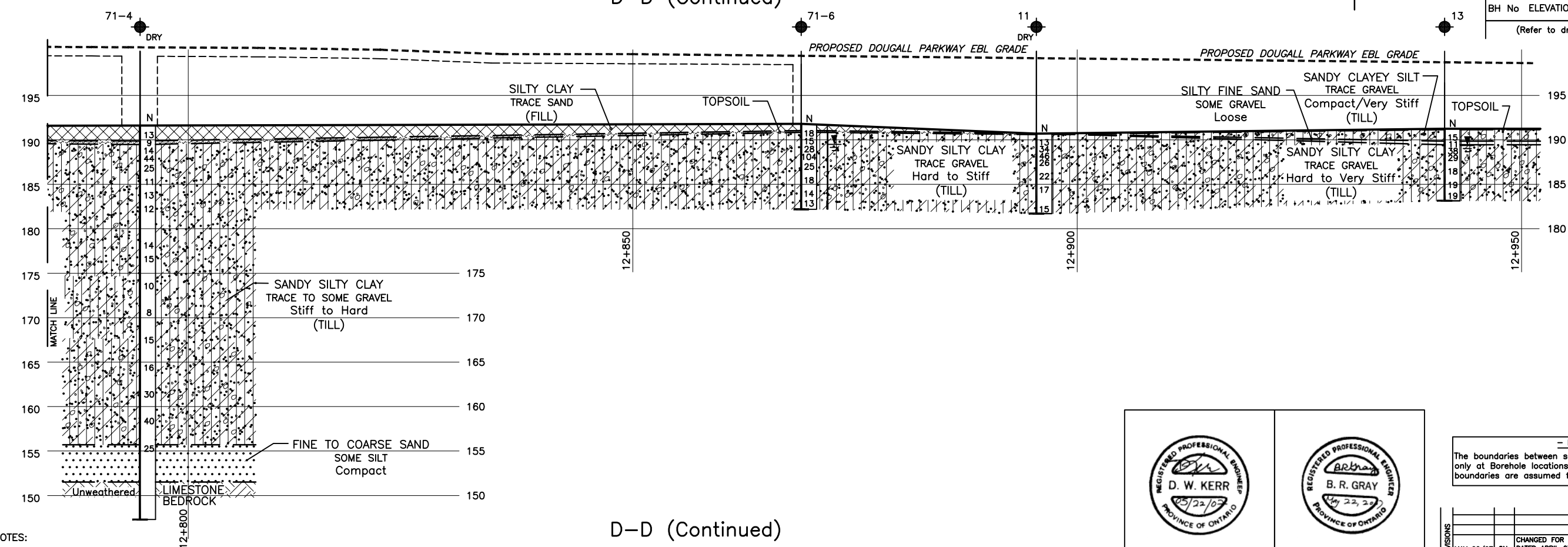
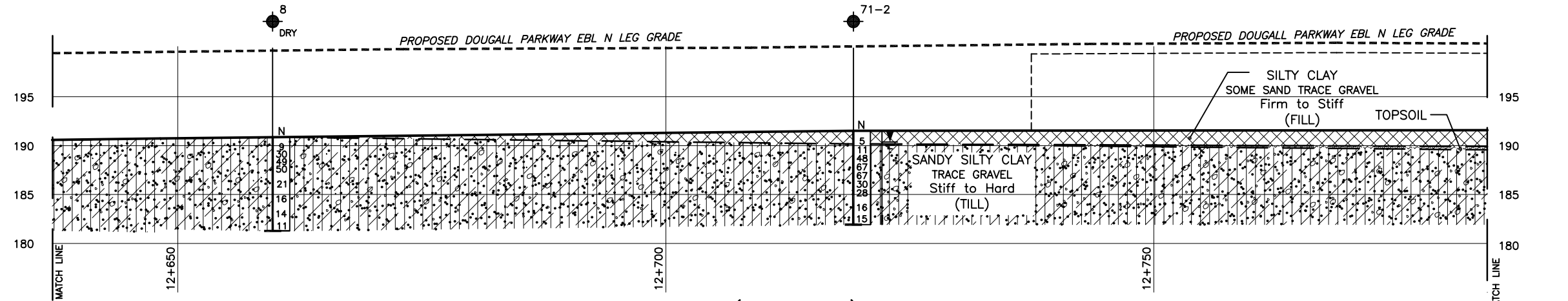
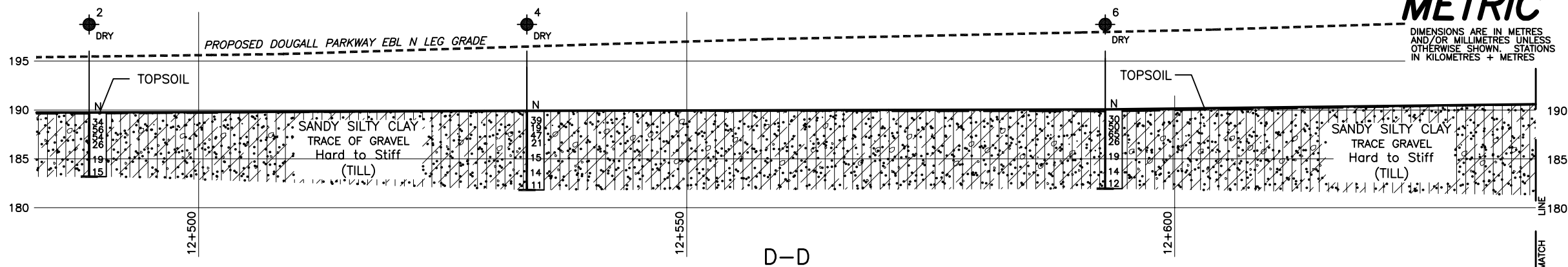


REVISIONS

DATE	BY	DESCRIPTION
MAY 22/07	CN	CHANGED FOR CONTRACT DOCUMENTS AS PER EMAIL
		DATED APRIL 27, 2007, FROM DILLON CONSULTING LIMITED

Geocres No. 40J2-43

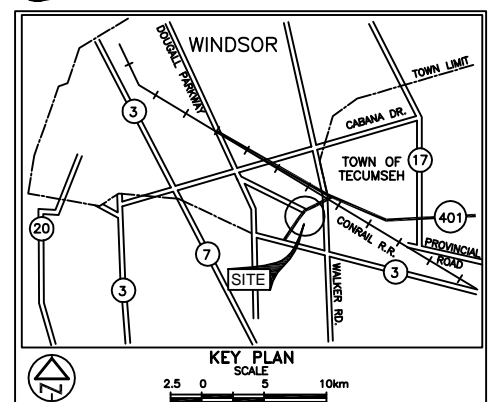
HWY No	401	DIST	31
SUBM'D	GD	CHECKED	MRA
DRAWN	MM	CHECKED	BRG
DATE	NOV 29, 2002	APPROVED	DWK
DWG	1-1		



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OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No 2007-3043
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HIGHWAY 401
EMBANKMENT ON EBL
NORTH LEG AT DOUGALL PARKWAY
BOREHOLE LOCATIONS & SOIL STRATA
SHEET
246

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
BH No	ELEVATION	CO-ORDINATES	
		NORTH	EAST
(Refer to drawing 1-1 for co-ordinates)			

- NOTES:
- REFER TO DRAWING 1-1 FOR PLAN AND SECTIONS A-A, B-B, C-C
DRAWING 1-2 FOR SECTION C-C.
 - SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER
TO RECORD OF BOREHOLES FOR DETAILED DESCRIPTION OF SUBSURFACE
CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE
5 2.5 0 5 10m



REF No Survey Plan 2001 Site # 6-71, entitled
Proposed Bridge Site at Tunnel Diversion and
Highway 401 and Plan, undated, untitled,
Provided by Planning and Design Section, MTO.

— NOTE —
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

REVISIONS			
DATE	BY	DESCRIPTION	
MAY 22/07	CN	CHANGED FOR CONTRACT DOCUMENTS AS PER EMAIL DATED APRIL 27, 2007 FROM DILLON CONSULTING LIMITED	
Geocres No. 40J2-43			
HWY No	401	DIST	31
SUBM'D	GD	CHECKED MRA	DATE NOV 29, 2002
DRAWN	MM	CHECKED BRG	APPROVED DWK
			DWG 1-3

RECORD OF BOREHOLE No 1

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+484, o/s 13.0m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 01, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		○
190.70	Ground Level						20	40	60	80	100	20	40	60						
0.00	Topsoil, silty clay																			
0.20	Dark Brown																			
	Sandy silty clay, trace of gravel		1	SS	11															
	Stiff Brown (Till)		2	SS	9															
	Hard		3	SS	48															
			4	SS	50															
	Very Stiff Grey		5	SS	26															
			6	SS	20															
184.15	End of Borehole																			
6.55	Borehole dry on completion of drilling																			
	Penetrometer Test																			

RECORD OF BOREHOLE No 2

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+489, o/s 15.5m Rt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 04, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
189.74	Ground Level							20	40	60	80	100								
0.00	Topsoil, silty clay																			
0.12	Dark Brown																			
	Sandy silty clay, trace of gravel		1	SS	34		189							○						
	Hard Brown (Till)		2	SS	56		188							○						
			3	SS	54		187							○						
	Very Stiff Grey		4	SS	26		186							○						
			5	SS	19		185							○						
			6	SS	15		184													
183.19	End of Borehole													○						
6.55	Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 3

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers
DATUM Geodetic DATE February 01, 2002
ORIGINATED BY MR
COMPILED BY GD
CHECKED BY MRA

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		20	40	60	80	100	W _p	w	W _L		
190.67	Ground Level															
0.00	Sandy silty clay, trace of gravel															
	Stiff Brown (Till)		1	SS	11											
	Hard		2	SS	31											
			3	SS	56											
			4	SS	61											
	Very Stiff Grey		5	SS	28											
	Stiff		6	SS	13											
			7	SS	12											
182.57	End of Borehole															
8.10	Groundwater level not established due to piezometer destruction															
	Penetrometer Test															
	Borehole Backfill Legend:															
	Native Backfill															
	Bentonite Seal															
	Filter Gravel															
	Slotted Pipe															

RECORD OF BOREHOLE No 4

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+532, o/s 14.8m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 04, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL					
189.92	Ground Level																
0.00	Topsoil, silty clay																
0.12	Dark Brown																
	Sandy silty clay, trace of gravel		1	SS	39		189										
	Hard Brown (Till)		2	SS	19*		188									* Bouncing on cobble	
			3	SS	47		187									1 30 42 27	
	Very Stiff Grey		4	SS	21		186										
			5	SS	15		185										
			6	SS	14		184										
			7	SS	11		183										
181.82	End of Borehole						182										
8.10																	
	Borehole dry on completion of drilling																
	■ Penetrometer Test																

RECORD OF BOREHOLE No 5

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+589, o/s 23.5m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 11, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
190.44	Ground Level						20	40	60	80	100	WATER CONTENT (%)					
0.00	Topsoil, silty clay						20	40	60	80	100	20	40	60			
0.20	Dark Brown																
	Sandy silty clay, trace of gravel		1	SS	11												
	Stiff to Very Stiff Brown (Till)		2	SS	19												
	Hard		3	SS	50												
			4	SS	62												
	Very Stiff Grey		5	SS	24												
			6	SS	20												
			7	SS	17												
182.34	End of Borehole																
8.10																	
	Borehole dry on completion of drilling																
	■ Penetrometer Test																

RECORD OF BOREHOLE No 6

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+589, o/s 10.5m Rt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 04, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	WATER CONTENT (%)					
190.05	Ground Level						20	40	60	80	100						
0.00	Topsoil, silty clay																
0.20	Dark Brown																
	Sandy silty clay, trace of gravel		1	SS	30												
	Hard Brown (Till)		2	SS	50												
			3	SS	65												
	Very Stiff Grey		4	SS	26												
			5	SS	19												
	Stiff		6	SS	14												
			7	SS	12												
181.95	End of Borehole																
8.10	Borehole dry on completion of drilling																
	■ Penetrometer Test																

RECORD OF BOREHOLE No 7

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+637, o/s 26.1m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 02, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)					
190.28	Ground Level																
0.00	Sandy silty clay, some gravel Very Stiff																
	Brown (Till)		1	SS	16												
	Hard		2	SS	43												
			3	SS	60												
	Very Stiff		4	SS	26												
	Grey		5	SS	25												
			6	SS	18												
			7	SS	16												
	Stiff		8	SS	14												
180.68	End of Borehole	9	SS	10													
9.60	Borehole dry on completion of drilling																
	Penetrometer Test																

RECORD OF BOREHOLE No 8

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg ORIGINATED BY MR
 DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
 DATUM Geodetic DATE February 04, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)				
190.73 0.00	Ground Level						190										
	Sandy silty clay, trace of gravel																
	Stiff to Very Stiff																
	Brown (Till)		1	SS	9												
	Hard		2	SS	30												
			3	SS	49												
		4	SS	50													
	Very Stiff Grey																
		5	SS	21													
		6	SS	16													
	Stiff																
		7	SS	14													
		8	SS	11													
181.13 9.60	End of Borehole																
	Borehole dry on completion of drilling																
	■ Penetrometer Test																

RECORD OF BOREHOLE No 9

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+691, o/s 21.9m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 01, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
190.48	Ground Level																	
0.00	Topsoil, silty clay																	
0.20	Dark Brown																	
	Sandy silty clay, trace of gravel		1	SS	30		190											
	Hard Brown (Till)		2	SS	44		189											
			3	SS	40		188											
	Very Stiff Grey		4	SS	26		187											
			5	SS	29		186											
			6	SS	20		185											
			7	SS	19		184											
	Stiff	8	SS	12		183												
180.88		9	TW	PH		181												
9.60	End of Borehole																	
	Borehole dry on completion of drilling																	
	■ Penetrometer Test																	

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 11

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+876, o/s 17.0m Rt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 05, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL					
190.56	Ground Level						20	40	60	80	100						
0.00	Topsoil, silty clay																
0.10	Dark Brown																
	Sandy silty clay, trace of gravel		1	SS	13								○				
	Stiff to Hard Brown (Till)		2	SS	34								○				
			3	SS	46								○				
	Very Stiff Grey		4	SS	26								○				
			5	SS	22								○				
			6	SS	17								○				

RECORD OF BOREHOLE No 12

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+912, o/s 10.1m Lt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 11, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	WATER CONTENT (%)								
190.49 0.00	Ground Level						20	40	60	80	100									
	Sandy silty clay, trace of gravel																			
	Stiff Brown (Till)		1	SS	10															
	Hard — — — —		2	SS	47															
			3	SS	45															
	Very Stiff — — — —		4	SS	27															
	— — — — Grey		5	SS	17															
	Stiff — — — —		6	SS	13															

RECORD OF BOREHOLE No 13

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg Sta. 12+914, o/s 12.6m Rt. of CL ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
DATUM Geodetic DATE February 05, 2002 CHECKED BY MRA


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL					
191.11	Ground Level						20	40	60	80	100						
0.00 0.10	Topsoil, silty clay					V _u *	191									* No recovery	
	Dark Brown						190										
	Sandy clayey silt, trace of gravel		1	SS	15												
189.71	Compact/Very Stiff Rusty Brown (Till)																
1.40	Silty fine sand, some gravel		2	SS	11												
189.31	Loose						189										
1.80	Rusty Brown Saturated																
	Sandy silty clay, trace of gravel		3	SS	38												
	Very Stiff to Hard						188										
	Brown to Grey(at 2.55m) (Till)		4	SS	29												
						187											
			5	SS	18												
						186											
			6	SS	19*		185										
						184											
183.01			7	SS	19*												
8.10	End of Borehole																
	▽ Water level observed during drilling																

RECORD OF BOREHOLE No 14

1 of 1

METRIC

W.P. 64-00-00 LOCATION Dougall Parkway, EBL-N Leg ORIGINATED BY MR
 DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY GD
 DATUM Geodetic DATE February 12, 2002 CHECKED BY MRA

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
190.56 0.00	Ground Level						20	40	60	80	100						GR	SA	SI	CL
	Sandy silty clay, trace of gravel																			
	Very Stiff																			
	Brown (Till)		1	SS	16															
	Hard		2	SS	41															
			3	SS	68															
			4	SS	32															
	Grey																			
	Very Stiff																			

RECORD OF BOREHOLE No 71-1

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METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+725, o/s 9.5m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE January 28 to 30, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		W _p	W	W _L		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE					
191.00	Ground Level					*		20 40 60 80 100		20 40 60				GR SA SI CL
0.00	Silty clay, trace of sand, with bluish grey fissures Stiff													
	Brown		1	SS	8		190							
			2	SS	9		189							
188.90	Sandy silty clay, trace of gravel		3	SS	45		188							2 30 44 24
2.10	(Till)		4	SS	48		187							
	Hard Brown		5	SS	23		186							
	Very Stiff to Stiff		6	SS	19		185							
	Grey		7	SS	10		184							
			8	SS	16		183							
			9	SS	13		182							
			10	SS	9		181							
				FV			180							
			11	SS	11		179							
							178							
							177							
	Cont'd		12	SS	14									4 30 37 29

RECORD OF BOREHOLE No 71-1

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METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+725, o/s 9.5m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE January 28 to 30, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		w _p	w	w _L		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%)					
176.0								20 40 60 80 100						GR SA SI CL
	Very Stiff to Stiff Grey						175							
							174							
			13	SS	13		173							
							172							
							171							
			14	SS	12		170							
							169							
							168							
			15	SS	9		167							
							166							
	some gravel Very Stiff to Hard						165							
							164							
			16	SS	22		163							
							162							
161.00	Cont'd													

RECORD OF BOREHOLE No 71-1

3 of 4

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+725, o/s 9.5m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE January 28 to 30, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
161.00 30.00	Sandy silty clay, some gravel Very Stiff to Hard Grey (Till)		17	SS	35														
					18	SS	61												

RECORD OF BOREHOLE No 71-1

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METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE January 28 to 30, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L			
	Borehole dry on completion of drilling ■ Penetrometer Test																	

RECORD OF BOREHOLE No 71-2

1 of 1

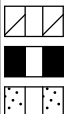
METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+688, o/s 9.8m Rt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY MRA
DATUM Geodetic DATE February 05, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		W _p	W	W _L		
191.38 0.00	Ground Level					*		20 40 60 80 100						GR SA SI CL
	Silty clay, some sand						191							
	Firm Brown					* →								
	(Fill)		1	SS	5									
190.03 1.35							190							
	Sandy silty clay, trace of gravel		2	SS	11									
	(Till)													
	Stiff to Hard		3	SS	48		189							
	Brown													
			4	SS	67		188							
			5	SS	67		187							
			6	SS	30		186							
	— — — — —													
	Grey													
			7	SS	28		185							
			8	SS	16		184							

■ Penetrometer Test
Piezometer Readings:
Date Depth (m)
Feb.07/02 6.00
Feb.14/02 3.55
Mar.05/02 1.40
Mar.28/02 1.05
May 06/02 0.85

Borehole Backfill
Legend:



Native Backfill

Bentonite Seal

Filter Sand

RECORD OF BOREHOLE No 71-3

1 of 1

METRIC

W.P. 64-00-02

LOCATION

Dougall Parkway, N-E Ramp
Sta. 12+782, o/s 6.0m Lt. of Lt. EP

ORIGINATED BY MR

DIST 31 HWY 401

BOREHOLE TYPE

Continuous Flight Solid and Hollow Stem Augers

COMPILED BY MRA

DATUM Geodetic

DATE _____

February 11, 2002

CHECKED BY DWK

[illegible]

RECORD OF BOREHOLE No 71-4

1 of 4

METRIC

W.P. 64-00-02

LOCATION

Dougall Parkway, N-E Ramp
Sta. 12+778, o/s 8.9m Rt. of Lt. EP

ORIGINATED BY MR

DIST 31 HWY 401

BOREHOLE TYPE

C.F.H.S.A., Mud Rotary & NQ Rock Coring

COMPILED BY MRA

DATUM Geodetic

DATE _____

February 05, 2002

CHECKED BY DWK

[illegible]

RECORD OF BOREHOLE No 71-4

2 of 4

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp
Sta. 12+778, o/s 8.9m Rt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 05, 2002 CHECKED BY DWK





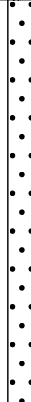

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
176.5			12	SS	15		20	40	60	80	100	20	40	60	GR SA SI CL
	Stiff Grey (Till) <														

RECORD OF BOREHOLE No 71-4

3 of 4

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+778, o/s 8.9m Rt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 05, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)													
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L															
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																						
161.46 30.00	Sandy silty clay, some gravel Hard Grey (Till)		17	SS	30	*	161					○																		
			18	SS	40		158																							
							157																							
							156																							
155.46 36.00	Sand, fine to coarse, some silt Compact Grey Saturated		19	SS	25*		155										* No recovery													
							154																							
							153																							
							152																							
151.36 40.10	Bedrock Unweathered, strong limestone Light Grey 75mm void at 40.96m 100mm void at 43.86m		20	RC	REC 95%		151										RQD=50%													
			21	RC	REC 95%		149										RQD=55%													
	Unweathered, shaley limestone Grey						148																							
147.16 44.30	End of Borehole																													
	Cont'd																													

RECORD OF BOREHOLE No 71-4

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METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 05, 2002 CHECKED BY DWK

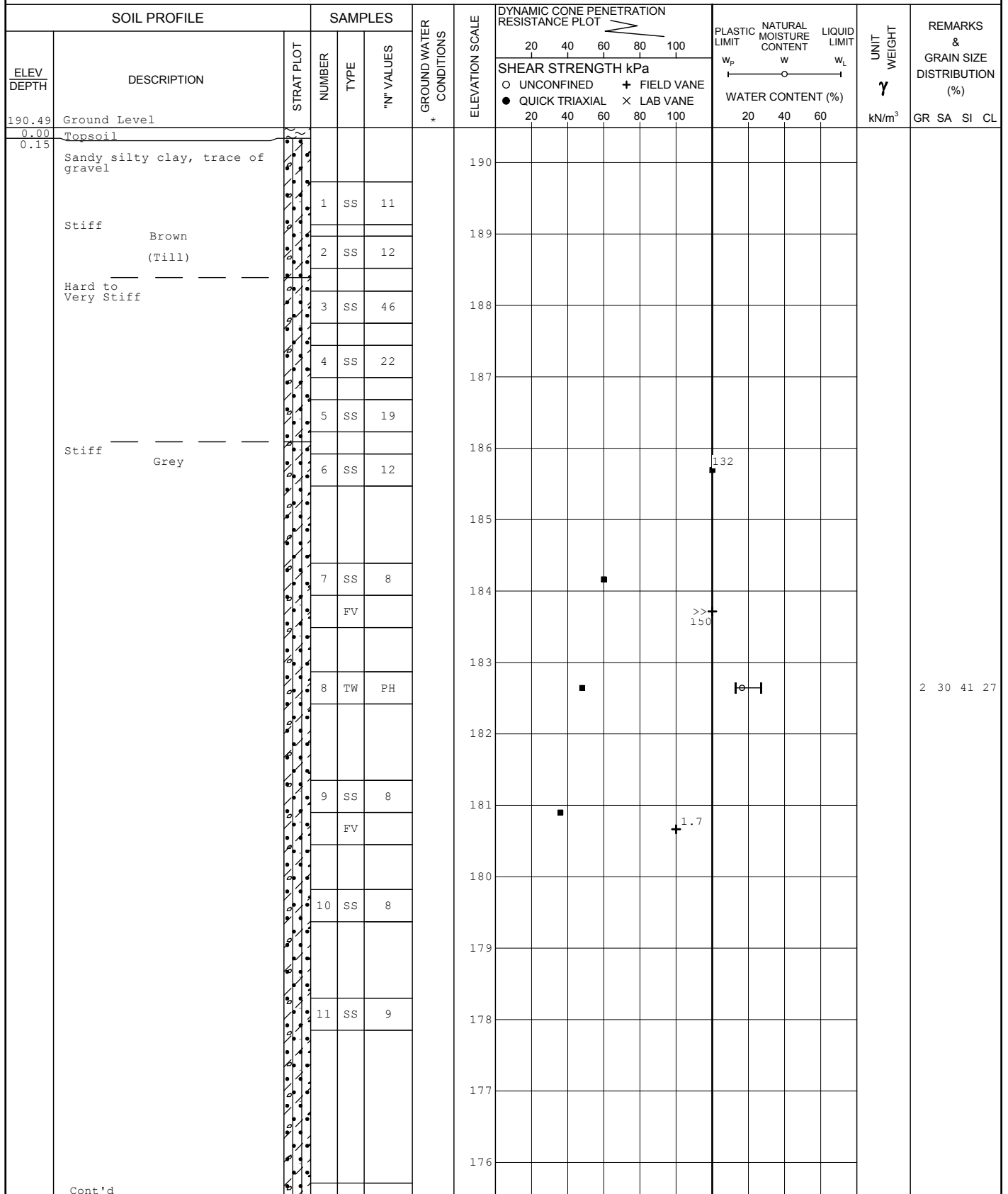
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
	Borehole dry on completion of drilling ■ Penetrometer Test																

RECORD OF BOREHOLE No 71-5

1 of 3

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+850, o/s 6.3m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 7, 8 and 11, 2002 CHECKED BY DWK



RECORD OF BOREHOLE No 71-5

2 of 3

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp
Sta. 12+850, o/s 6.3m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 7, 8 and 11, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)								
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)					GR	SA	SI	CL
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×					LAB VANE								
175.5			12	SS	11																				
Stiff to Very Stiff (Till)																									

* No
recovery

RECORD OF BOREHOLE No 71-5

3 of 3

METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+850, o/s 6.3m Lt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE C.F.H.S.A., Mud Rotary & NQ Rock Coring COMPILED BY MRA
DATUM Geodetic DATE February 7, 8 and 11, 2002 CHECKED BY DWK

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa				w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
160.49			17	SS	30		20	40	60	80	100		20	40	60	GR	SA	SI	CL
	(Till) <																		

RECORD OF BOREHOLE No 71-6

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METRIC

W.P. 64-00-02 LOCATION Dougall Parkway, N-E Ramp Sta. 12+845, o/s 8.8m Rt. of Lt. EP ORIGINATED BY MR
DIST 31 HWY 401 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY MRA
DATUM Geodetic DATE February 05, 2002 CHECKED BY DWK

