

APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'A' – GEOTECHNICAL REPORT

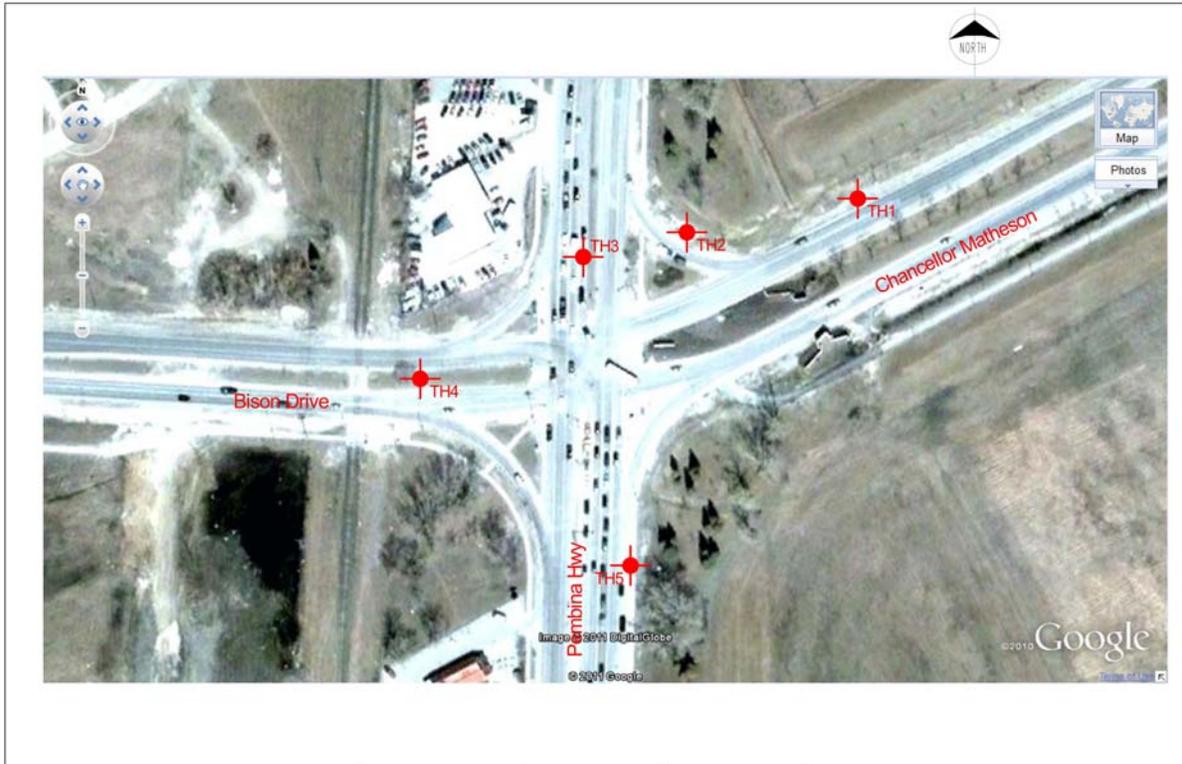
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The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.

Geotechnical Report for Bison Drive and Pembina Highway (April 2011)

Test Hole Locations



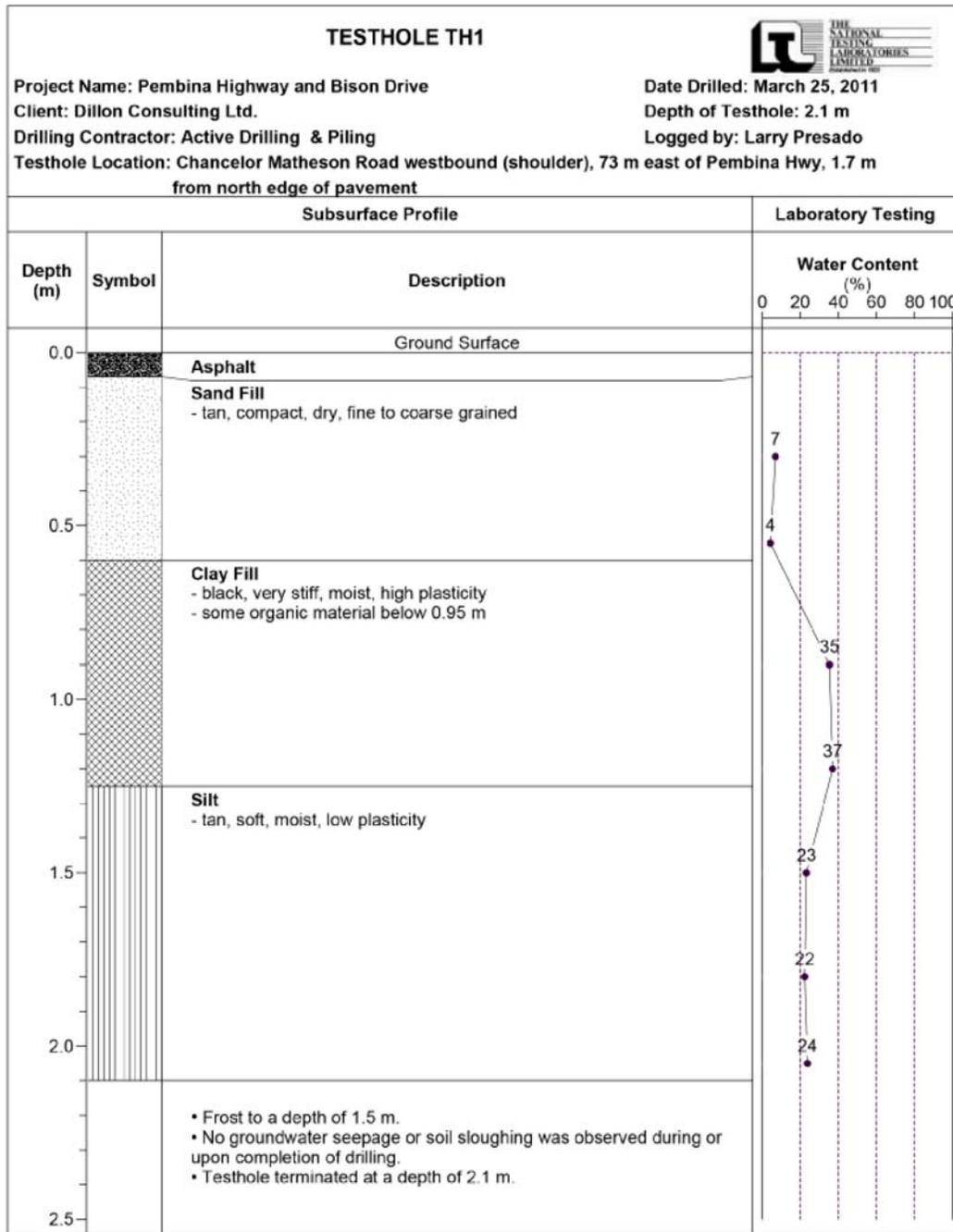
 THE NATIONAL TESTING LABORATORIES LIMITED <i>Established in 1923</i>	Project No. DIL-1103	Drawn by: GL	Figure: 1	Testhole Location Plan 2011 City of Winnipeg Street Renewal Program Pembina Highway and Bison Drive Winnipeg, Manitoba
	Date: April 8, 2011	Reviewed by: DF	Scale: NTS	

Summary of Core Samples

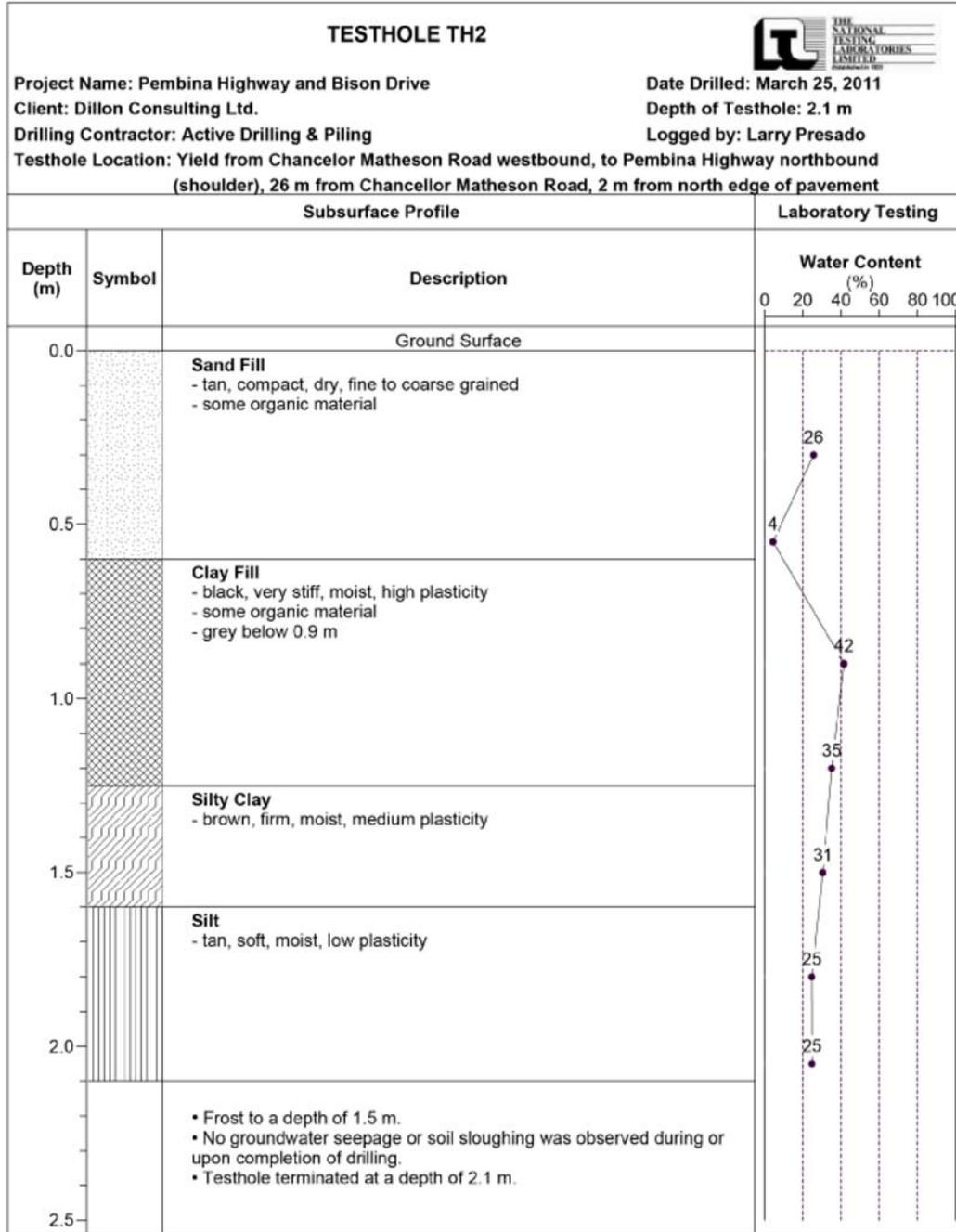
PEMBINA HIGHWAY AND BISON DRIVE
 GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	Chancellor Matheson Road westbound (shoulder) 73 m east of Pembina Highway 1.7 m from north edge of pavement	Asphalt	70	Sand	550	-	-	-	-	-	-	-	-	-	-
TH2	Yield from Chancellor Matheson Road westbound to Pembina Highway northbound (shoulder) 26 m from Chancellor Matheson Road 2 m from north edge of pavement	-	-	Sand	600	-	-	-	-	-	-	-	-	-	-
TH3	Pembina Highway southbound turning lane on to Chancellor Matheson Road eastbound 18 m north of Pembina Highway 1.5 m west from the median curb	Asphalt/Concrete	170/215	Crushed Limestone	225	Silty Clay	0.9	29	1.7	6.3	34.3	57.7	58	18	40
TH4	Bison Drive median 43 m west of Pembina Highway 1.5 m south from the median curb of westbound Bison Drive	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TH5	Pembina Highway northbound turning lane on to Chancellor Matheson Road eastbound 43 m south of Chancellor Matheson Road 2 m west of curb	Asphalt/Concrete	75/175	Sand	1300	Sand	0.6	9	18.5	69.4	8.2	3.9	non plastic		

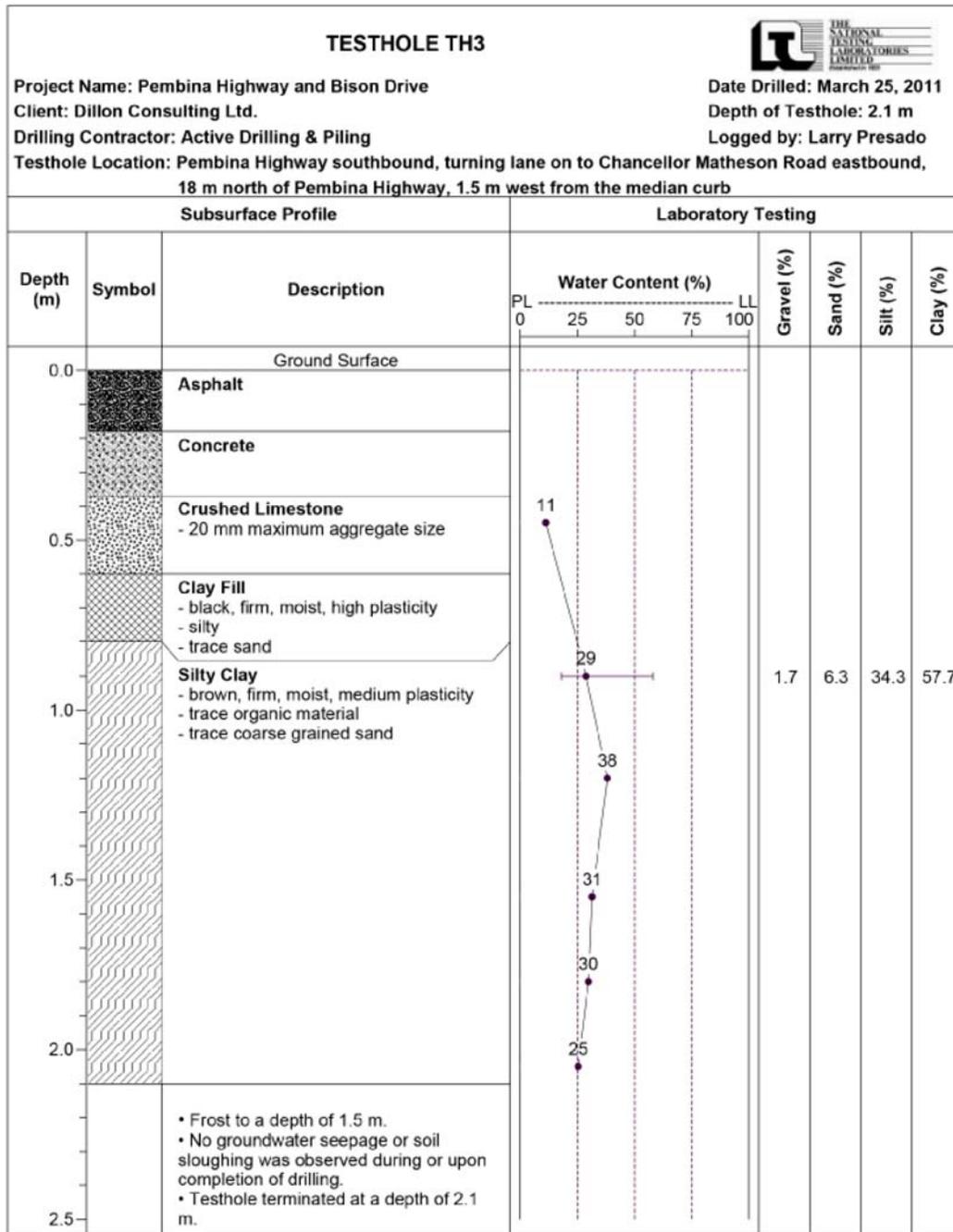
Test Hole Log for TH1-



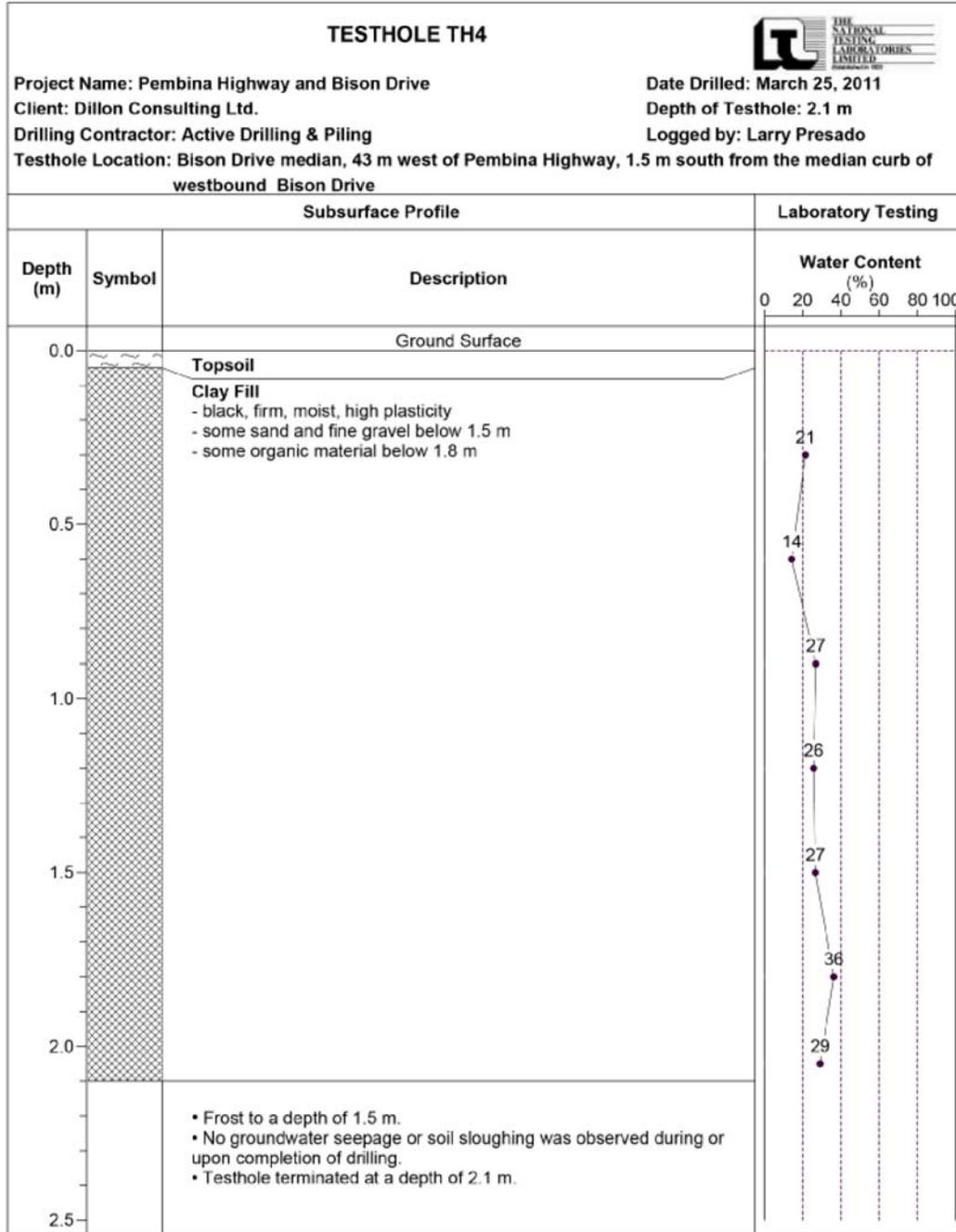
Test Hole Log for TH2-



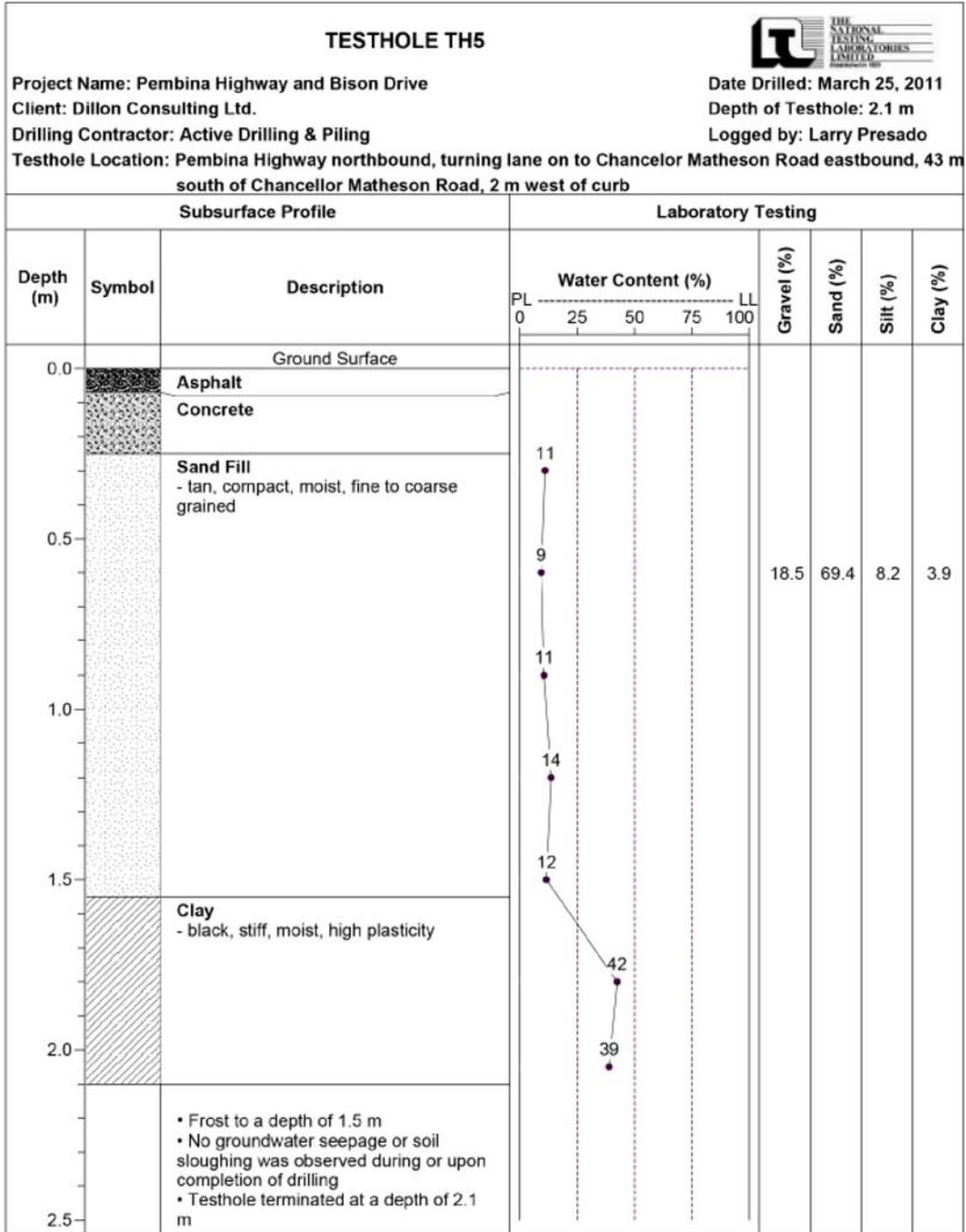
Test Hole Log for TH3-



Test Hole Log for TH4-



Test Hole Log for TH5-



Pavement Core Photos



Core sample from Testhole TH1



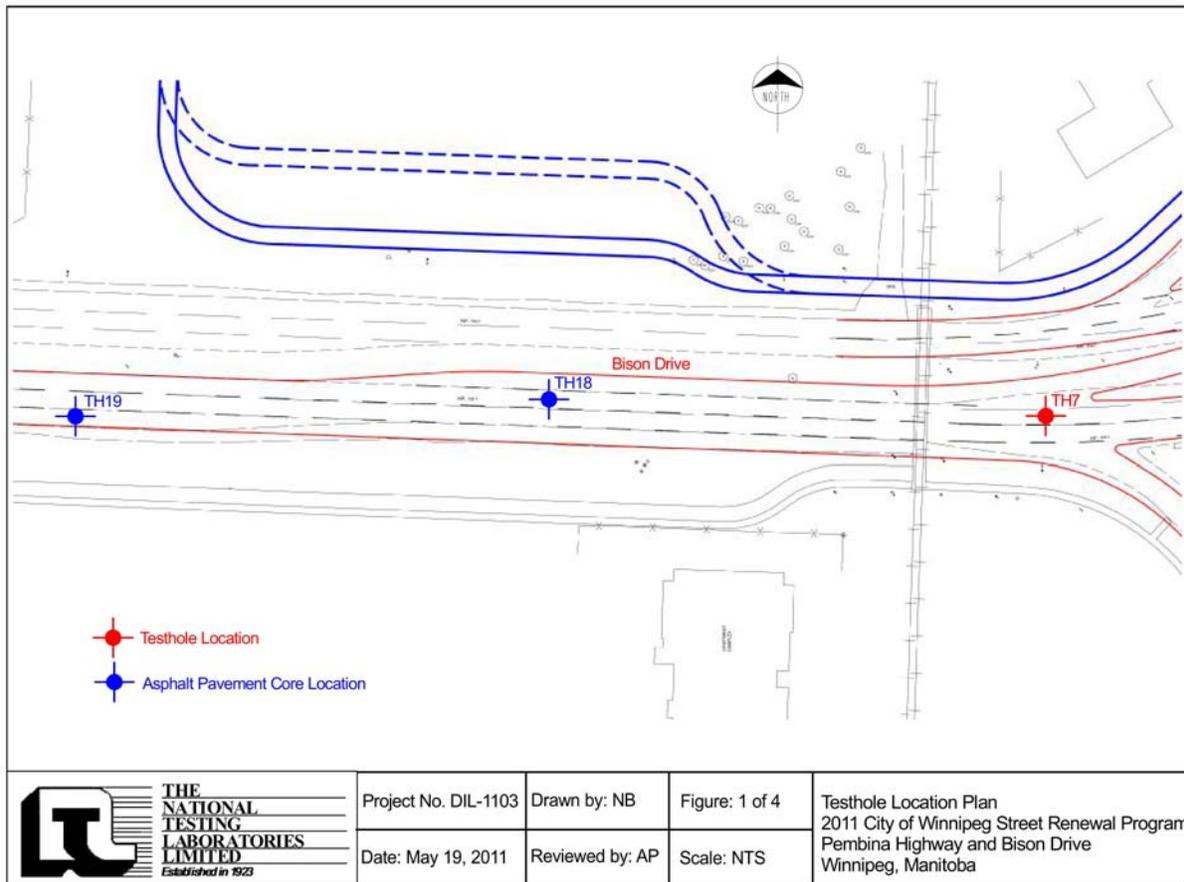
Core sample from Testhole TH3

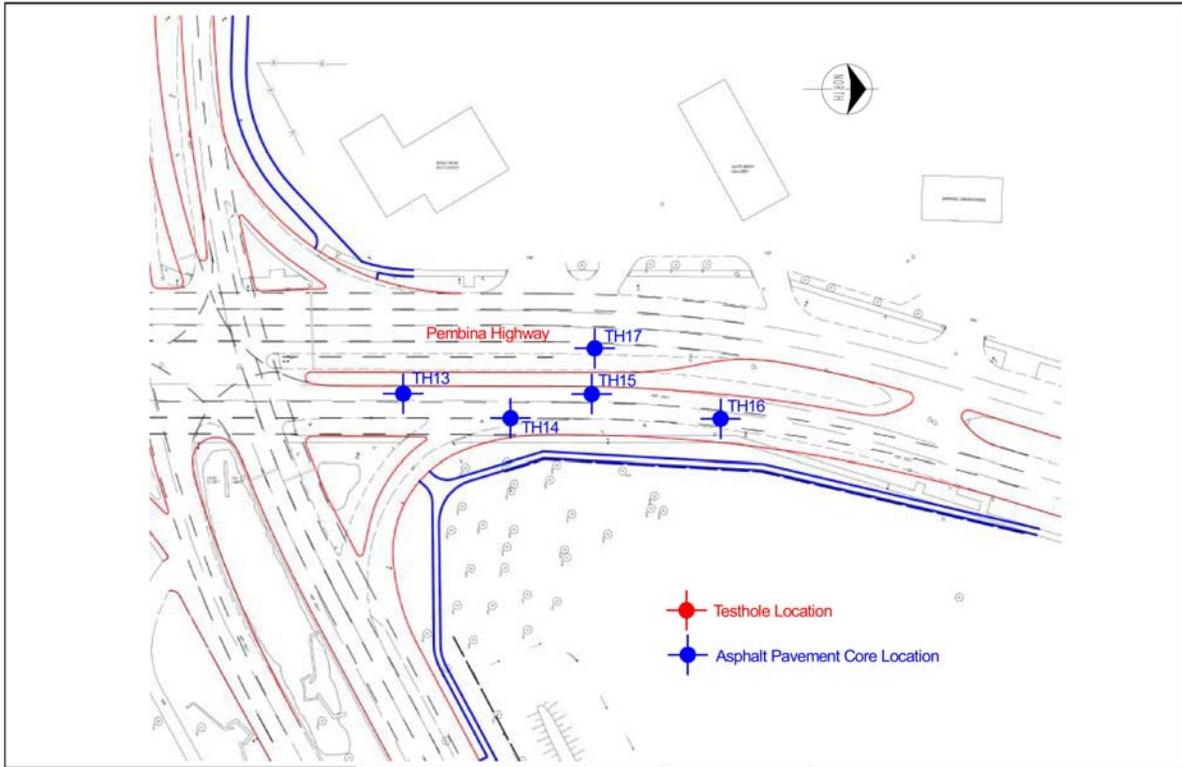


Core sample from Testhole TH5

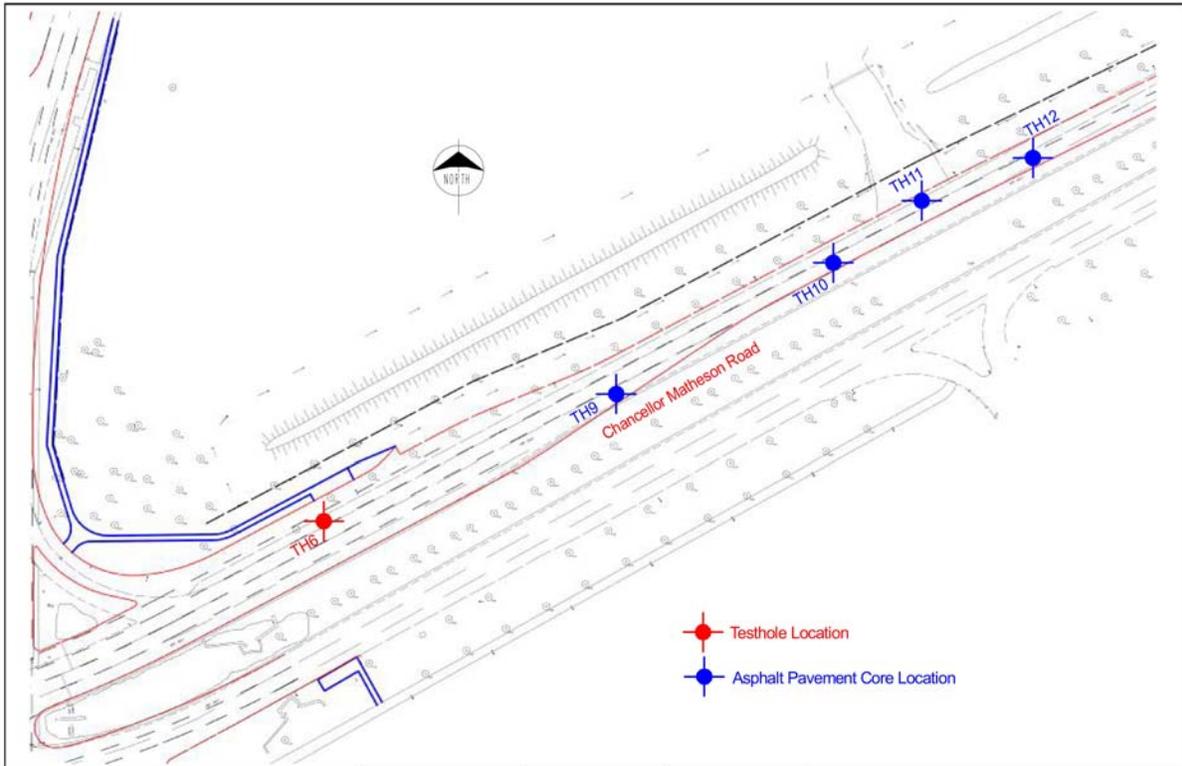
Geotechnical Report for Bison Drive and Pembina Highway (May 2011)

Test Hole Locations

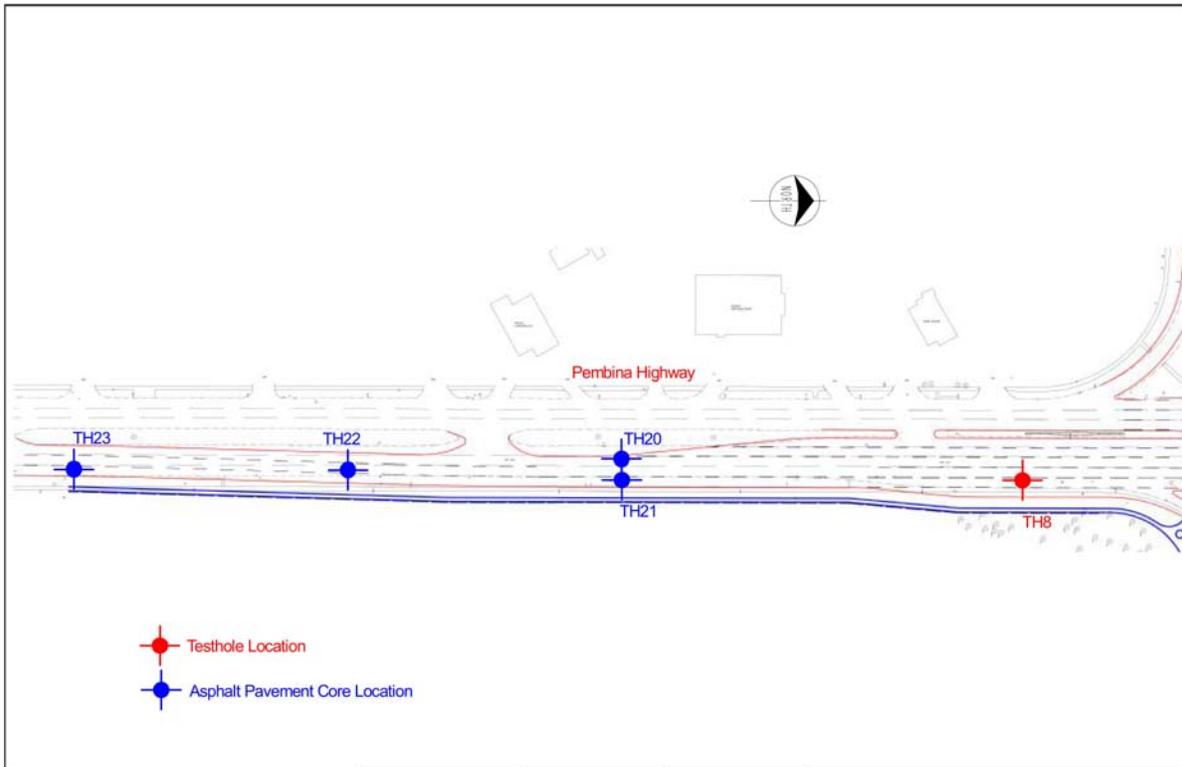




 <p>THE NATIONAL TESTING LABORATORIES LIMITED <small>Established in 1923</small></p>	Project No. DIL-1103	Drawn by: NB	Figure: 2 of 4	Testhole Location Plan 2011 City of Winnipeg Street Renewal Program Pembina Highway and Bison Drive Winnipeg, Manitoba
	Date: May 19, 2011	Reviewed by: AP	Scale: NTS	



 THE NATIONAL TESTING LABORATORIES LIMITED <small>Established in 1923</small>	Project No. DIL-1103	Drawn by: NB	Figure: 3 of 4	Testhole Location Plan 2011 City of Winnipeg Street Renewal Program Pembina Highway and Bison Drive Winnipeg, Manitoba
	Date: May 19, 2011	Reviewed by: AP	Scale: NTS	



 <p>THE NATIONAL TESTING LABORATORIES LIMITED <small>Established in 1923</small></p>	Project No. DIL-1103	Drawn by: NB	Figure: 4 of 4	Testhole Location Plan 2011 City of Winnipeg Street Renewal Program Pembina Highway and Bison Drive Winnipeg, Manitoba
	Date: May 19, 2011	Reviewed by: AP	Scale: NTS	

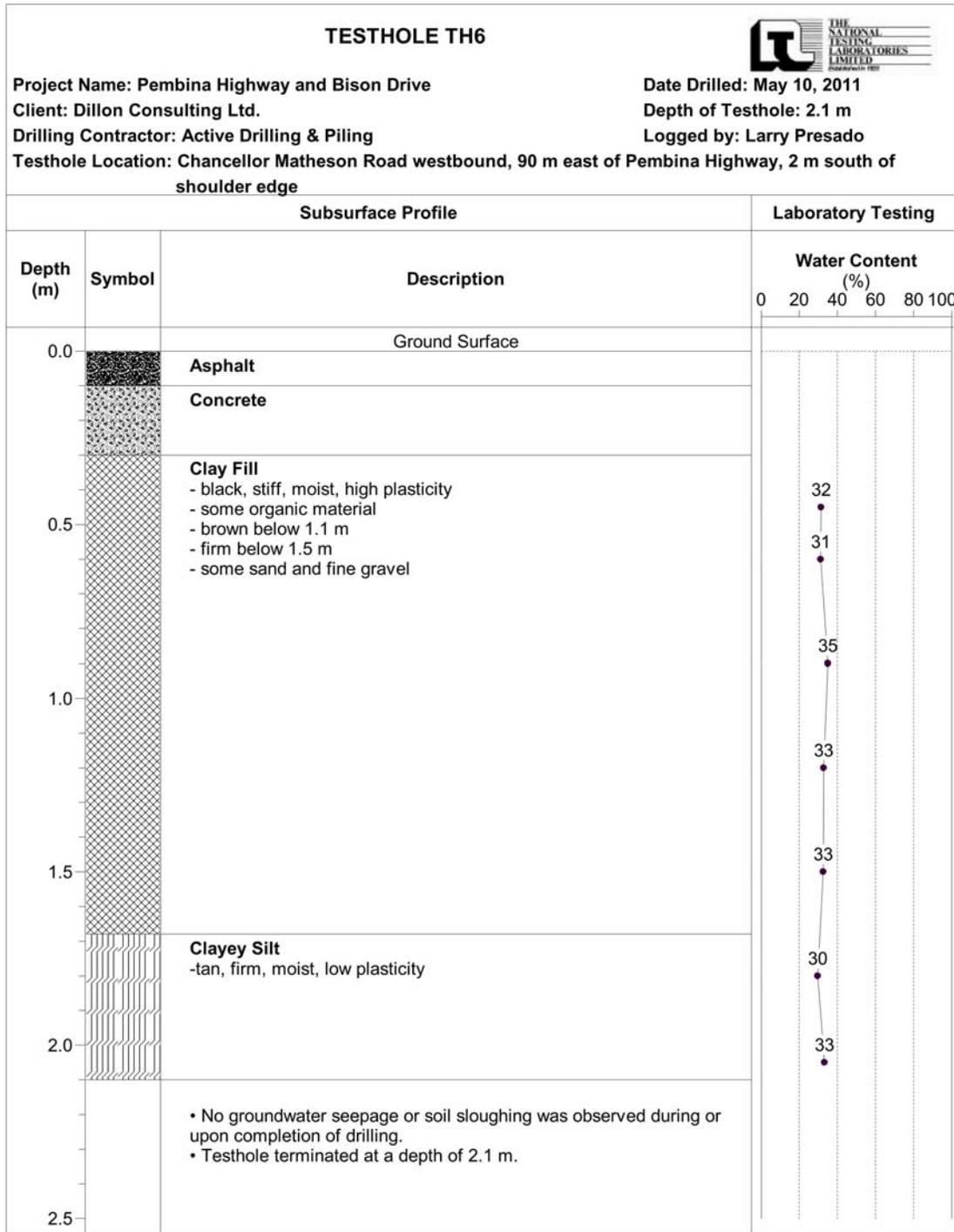
Summary of Core Samples

PEMBINA HIGHWAY AND BISON DRIVE GEOTECHNICAL INVESTIGATION

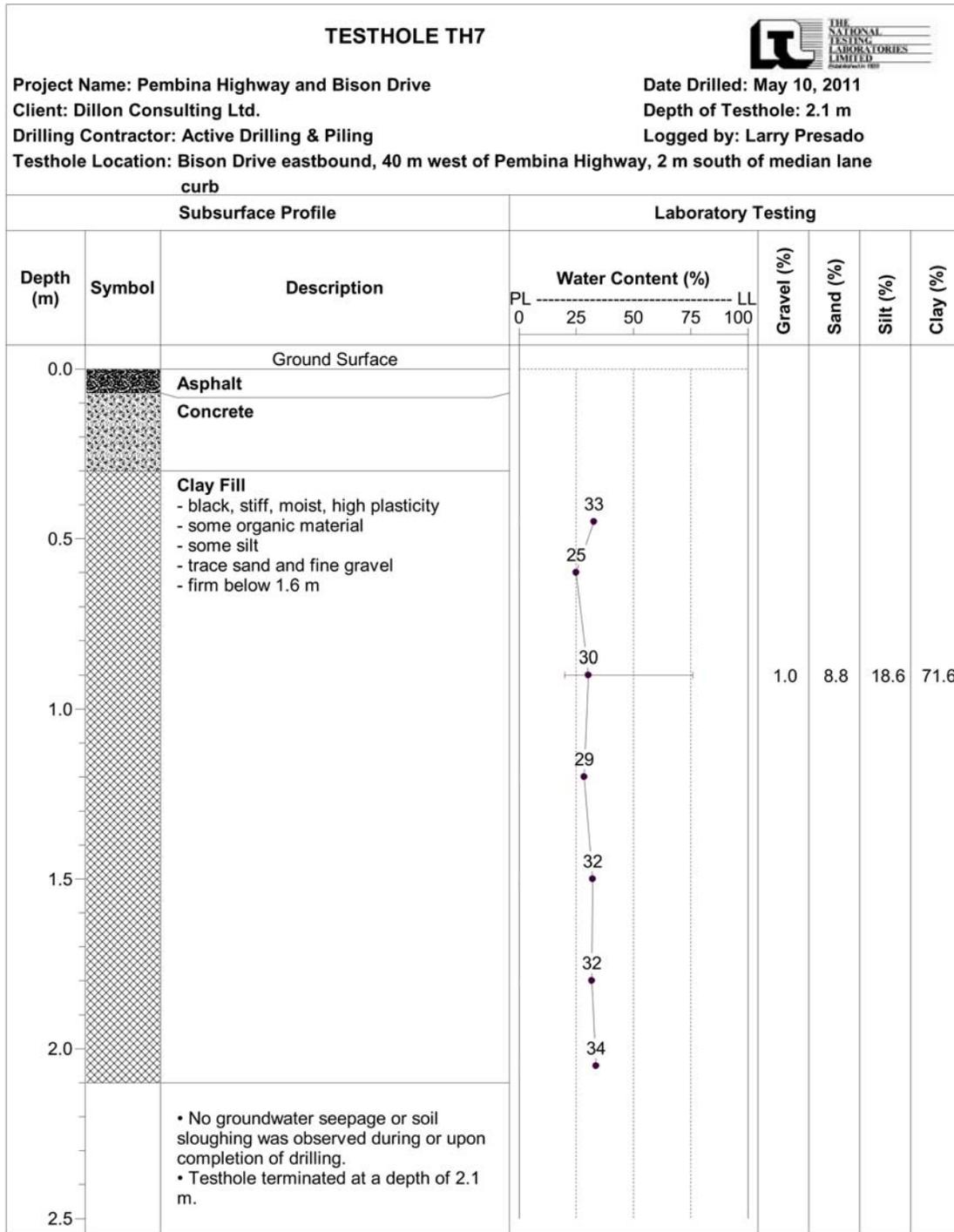
Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits			
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index	
TH6	Chancellor Matheson Road westbound, 90 m east of Pembina Highway, 2 m south of shoulder edge	Asphalt/Concrete	95/210	Clay Fill	-	-	-	-	-	-	-	-	-	-	-	-
TH7	Bison Drive eastbound, 40 m west of Pembina Highway, 2 m south of median lane curb	Asphalt/Concrete	70/205	Clay Fill	-	Clay Fill	0.9 m	30.38	1.0	8.8	18.6	71.6	76	20	56	
TH8	Pembina Highway northbound, 52 m south of Chancellor Matheson Road, 6 m west of outside lane curb	Asphalt/Concrete	70/235	Sand Fill	-	-	-	-	-	-	-	-	-	-	-	-
TH9	Chancellor Matheson Road westbound, 180 m east of Pembina Highway, 2 m north of median lane curb	Asphalt	110	-	-	-	-	-	-	-	-	-	-	-	-	-
TH10	Chancellor Matheson Road westbound, 250 m east of Pembina Highway, 2 m north of median lane curb	Asphalt	120	-	-	-	-	-	-	-	-	-	-	-	-	-
TH11	Chancellor Matheson Road westbound, 280 m east of Pembina Highway, 1 m north of shoulder edge	Asphalt	95	-	-	-	-	-	-	-	-	-	-	-	-	-
TH12	Chancellor Matheson Road westbound, 310 m east of Pembina Highway, 2 m north of median lane curb	Asphalt	95	-	-	-	-	-	-	-	-	-	-	-	-	-
TH13	Pembina Highway northbound, 30 m north of Chancellor Matheson Road, 2 m east of median lane curb	Asphalt	80	-	-	-	-	-	-	-	-	-	-	-	-	-
TH14	Pembina Highway northbound, 50 m north of Chancellor Matheson Road, 2 m west of outside lane curb	Asphalt	85	-	-	-	-	-	-	-	-	-	-	-	-	-
TH15	Pembina Highway northbound, 75 m north of Chancellor Matheson Road, 2 m east of median lane curb	Asphalt	80	-	-	-	-	-	-	-	-	-	-	-	-	-
TH16	Pembina Highway northbound, 100 m north of Chancellor Matheson Road, 5 m west of outside lane curb	Asphalt	70	-	-	-	-	-	-	-	-	-	-	-	-	-
TH17	Pembina Highway southbound, 75 m north of Chancellor Matheson Road, 6 m west of median lane curb	Asphalt	125	-	-	-	-	-	-	-	-	-	-	-	-	-
TH18	Bison Drive eastbound, 80 m west of Canadian National Railway railroad track, 6 m south of median lane curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-	-
TH19	Bison Drive eastbound, 170 m west of Canadian National Railway railroad track, 1 m from north edge of pavement	Asphalt	100	-	-	-	-	-	-	-	-	-	-	-	-	-
TH20	Pembina Highway northbound, 232 m south of Chancellor Matheson Road, 2 m east of median lane curb	Asphalt	45	-	-	-	-	-	-	-	-	-	-	-	-	-
TH21	Pembina Highway northbound, 232 m south of Chancellor Matheson Road, 5 m west of outside lane curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-	-
TH22	Pembina Highway northbound, 301 m south of Chancellor Matheson Road, 6 m west of outside lane curb	Asphalt	75	-	-	-	-	-	-	-	-	-	-	-	-	-
TH23	Pembina Highway northbound, 401 m south of Chancellor Matheson Road, 5 m west of outside lane curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: Testholes TH9 to TH23 were cored only through asphalt to top of concrete.

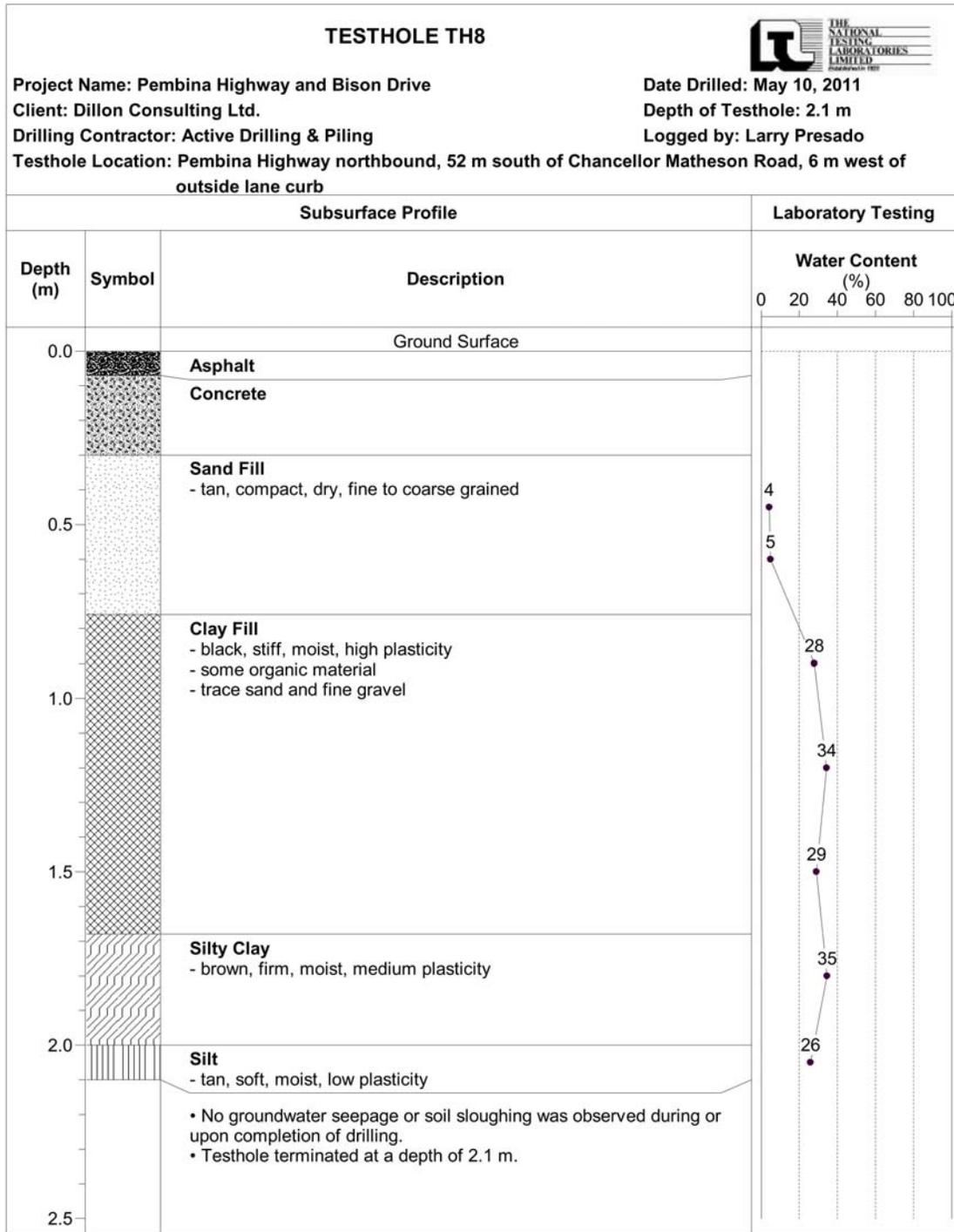
Test Hole Log for TH6



Test Hole Log for TH7



Test Hole Log for TH8



Pavement Core Photos



PEMBINA HIGHWAY AND BISON DRIVE



Core sample from Testhole TH6



Core sample from Testhole TH7



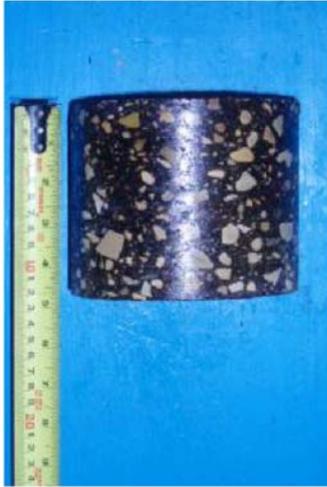
Core sample from Testhole TH8



Core sample from Testhole TH9



PEMBINA HIGHWAY AND BISON DRIVE



Core sample from Testhole TH10



Core sample from Testhole TH11



Core sample from Testhole TH12



Core sample from Testhole TH13



PEMBINA HIGHWAY AND BISON DRIVE



Core sample from Testhole TH14



Core sample from Testhole TH15



Core sample from Testhole TH16



Core sample from Testhole TH17



PEMBINA HIGHWAY AND BISON DRIVE



Core sample from Testhole TH18



Core sample from Testhole TH19



Core sample from Testhole TH20



Core sample from Testhole TH21



PEMBINA HIGHWAY AND BISON DRIVE



Core sample from Testhole TH22



Core sample from Testhole TH23