

APPENDIX 'A'

GEOTECHNICAL REPORT

LEGEND



TEST HOLE

GPS COORDINATES OF TEST HOLES			
TEST HOLE No.	UTM	14U	
TH1	5526254	0633443	

TEST HOLE No.	OFFSET OF TEST HOLES
TH1	0.9 m NORTHWEST OF EAST CURB



OSBORNE STREET (NORTHBOUND)

OSBORNE STREET (SOUTHBOUND)

DONALD STREET (SOUTHWEST BOUND)

CORYDON AVENUE (EASTBOUND)

CORYDON AVENUE (EASTBOUND)

~97.30 M

PEMBINA HIGHWAY (NORTHBOUND)

PEMBINA HIGHWAY (SOUTHBOUND)

TH1

57.10 M FROM NORTHEAST CORNER OF JESSIE STREET

NO.	DATE	ISSUE / REVISION
0	MAR. 2016	report

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Winnipeg, MB R2J 0K4
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ENG-TECH
Consulting Limited

ENG. STAMP:

PEGM
Certificate of Authorization
ENG-TECH Consulting Limited
No. 2475 Expiry: April 30, 2016

CLIENT:
MMM GROUP LTD.

PROJECT:
PEMBINA HIGHWAY PAVEMENT REHABILITATION CORING WINNIPEG, MANITOBA

DWG DESCRIPTION:
TEST HOLE LOCATION PLAN

SCALE:

NTS

DRAWN BY:

TDR

DATE: MARCH 2016

FILE NO.: 16-113-02

CLIENT DWGFIG. No.:

ENG-TECH DWGFIG. No.:

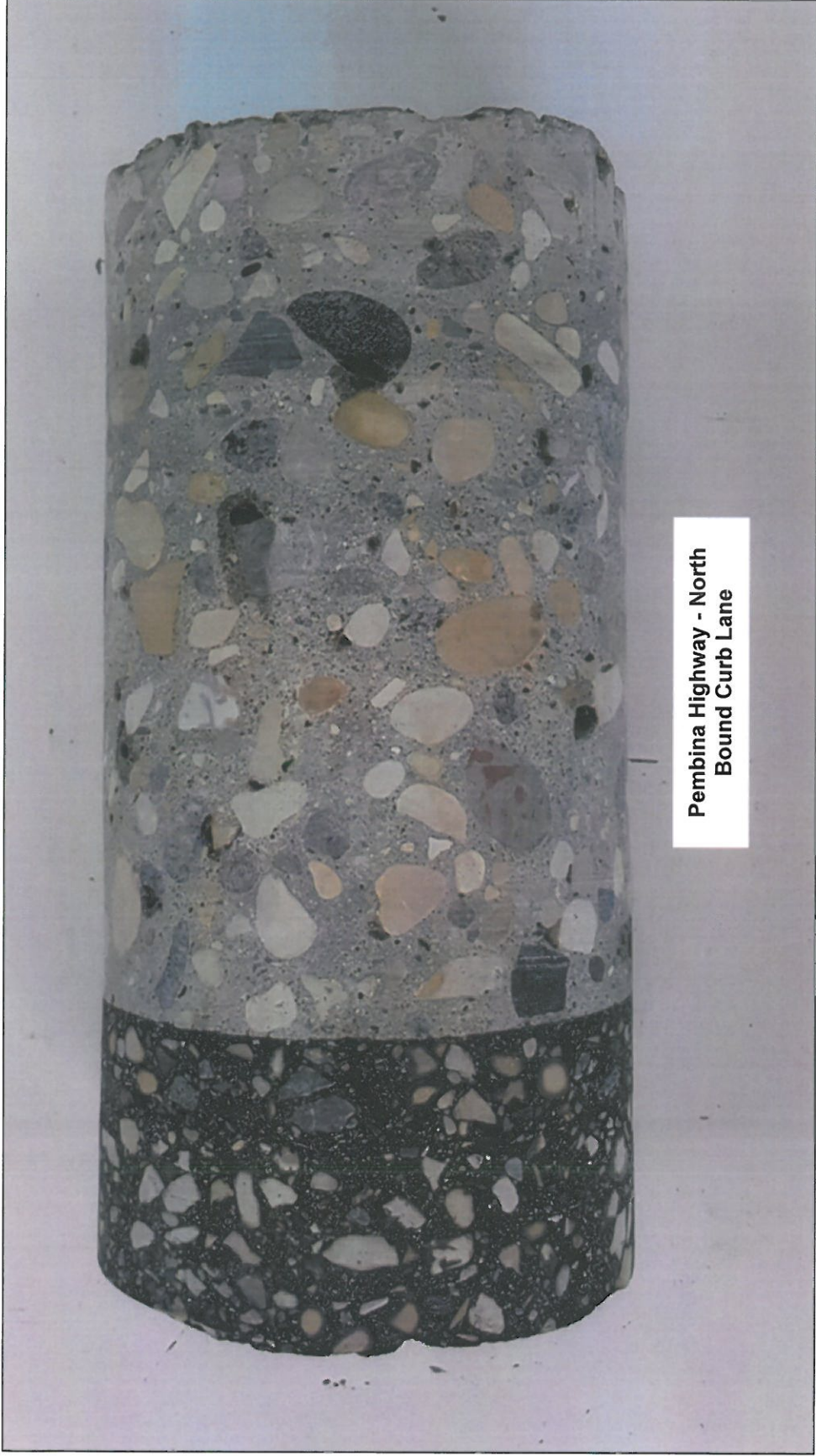
1 OF 1

**Table 1
Summary of Pavement Structure**

Pembina Highway from Jessie Street to Osborne Street, Winnipeg, Manitoba

Test Hole Number	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits							
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index					
1	Pembina Highway	Asphalt	78	Crushed Granular	150	Clay	0.1	27.6												
							0.4	30.4												
		Concrete	241				0.7	24.8							31	16	15			
							1.0	23.5	0.0	6.9	74.8	18.3								
							1.3	23.9												
							1.6	26.8												
						Clay	1.9	37.9												





**Table 1
Summary of Pavement Structure**

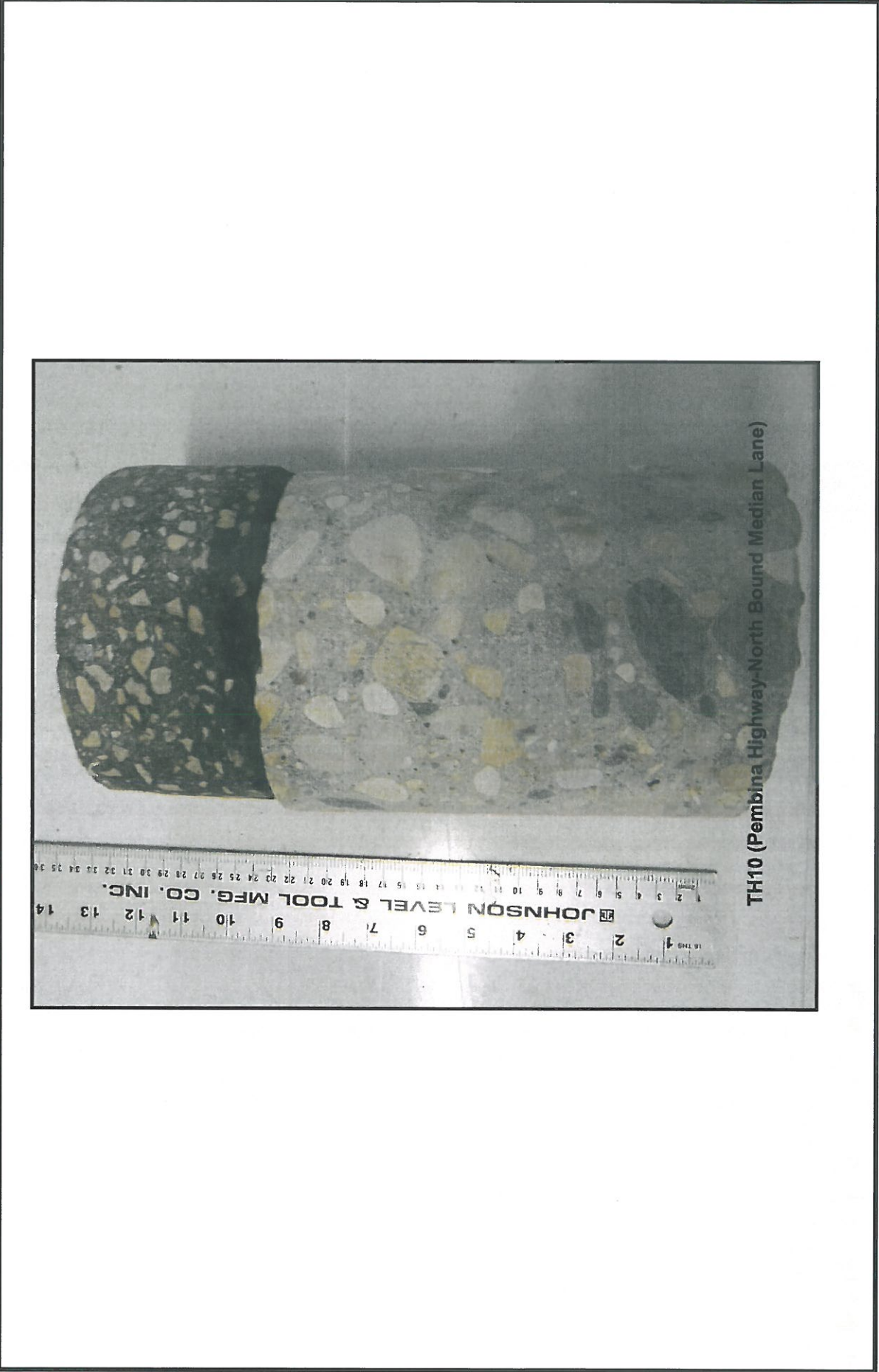
File No.: 16-113-02

Pembina Highway between Jessie and Osborne Streets

Page 1 of 1

Test Hole Number	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits					
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index			
10	Pembina Highway	Asphalt	80	Crushed Granular	203	Crushed Granular	0.1	9.6										
							0.4	32.2										
		Concrete	192			Silty Clay	0.7	28.5						42	17	25		
							1.0	32.3	0.0	2.1	26.0	71.9						
						Clay	1.3	23.1										
							1.6	23.7										
			1.9	26.2														



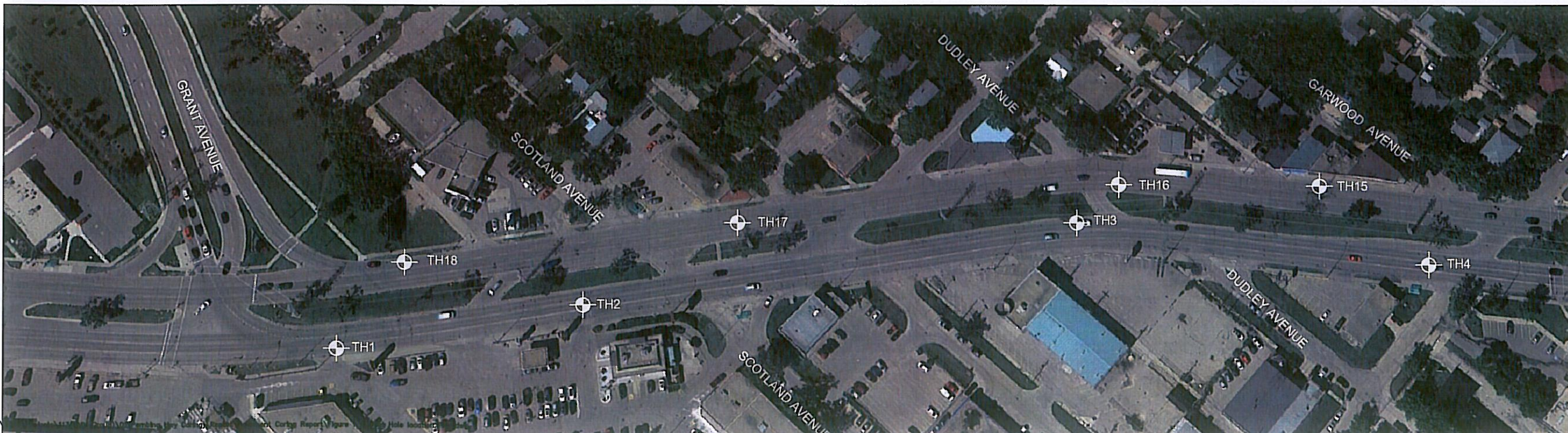


TEST HOLE No.	OFFSET OF TEST HOLES
TH1	32.60 m North of Northeast corner of Grant Avenue, 3.67 m West of East Curb of Northbound Pembina Highway
TH2	120.21 m North of Northeast corner of Grant Avenue, 8.32 m West of East Curb of Northbound Pembina Highway. 36.92 m south, 8.32 m west of southwest corner Scotland Avenue.
TH3	74.82 m North, 13.81 m West of East Curb of southwest corner of Lorette Avenue. 24.47 m south, 11.97 m west of southwest corner Dudley Avenue.
TH4	61.19 m North, 6.93 m West of East Curb of southwest corner of Dudley Avenue. 7.39 m south, 7.54 m west of southwest corner Daly Street (North).
TH5	25.31 m North, 7.33 m West of East Curb of southwest corner of Garwood Avenue. 81.76 m south, 6.32 m west of southwest corner Fleet Avenue.
TH6	23.19 m North, 2.84 m West of East Curb of southwest corner of Fleet Avenue. 63.09 m south, 2.40 m west of southwest corner Fleet Avenue.
TH7	51.89 m North, 9.83 m West of East Curb of southwest corner of Fleet Avenue. 38.63 m south, 8.42 m west of southwest corner Fleet Avenue.
TH8	95.49 m North, 5.99 m West of East Curb of southwest corner of Warsaw Avenue. 21.95 m south, 5.42 m west of southwest corner Jessie Street .

TEST HOLE No.	OFFSET OF TEST HOLES
TH11	66.34 m South, 10.88 m East of southeast corner of Corydon Avenue. 63 m North, 9.10 m West of Northeast corner of Jessie Avenue.
TH12	62.15 m South, 10.83 m East of Northeast corner of Jessie Avenue. 53.67 m North, 10.89 m East of Northeast corner Warsaw Avenue.
TH13	77.05 m South, 2.02 m East of southeast corner of Warsaw Avenue. 34.78 m North, 3.27 m west of southwest corner Mulvey Avenue.
TH14	80.08 m South, 11.99 m East of southeast corner of Mulvey Avenue. 27.09 m North, 11.07 m east of southeast corner Fleet Avenue.
TH15	41.41 m South, 3.10 m East of southeast corner of Garwood Avenue. 84.87 m North, 3.53 m east of southwest corner Dudley Avenue.
TH16	7.35m North, 13.74 m East southeast corner of Dudley Avenue.
TH17	16.12 m North, 7.69 m East of southeast corner of Lorette Avenue. 49.32 m south, 5.98 m west of southeast corner Scotland Avenue.
TH18	72.72 m South, 1.89 m East of southeast corner of Scotland Avenue. 60.72 m south, 2.14 m west of southeast corner Grant Avenue .



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APEGM
Certificate of Authorization
ENG-TECH Consulting Limited
No.2475 Expiry: April 30, 2017

CLIENT:
MMM GROUP LIMITED

PROJECT:
**PEMBINA HIGHWAY CORING PROGRAM
WINNIPEG, MANITOBA**

DWG DESCRIPTION:
**TEST HOLE LOCATION PLAN -
PEMBINA HIGHWAY**

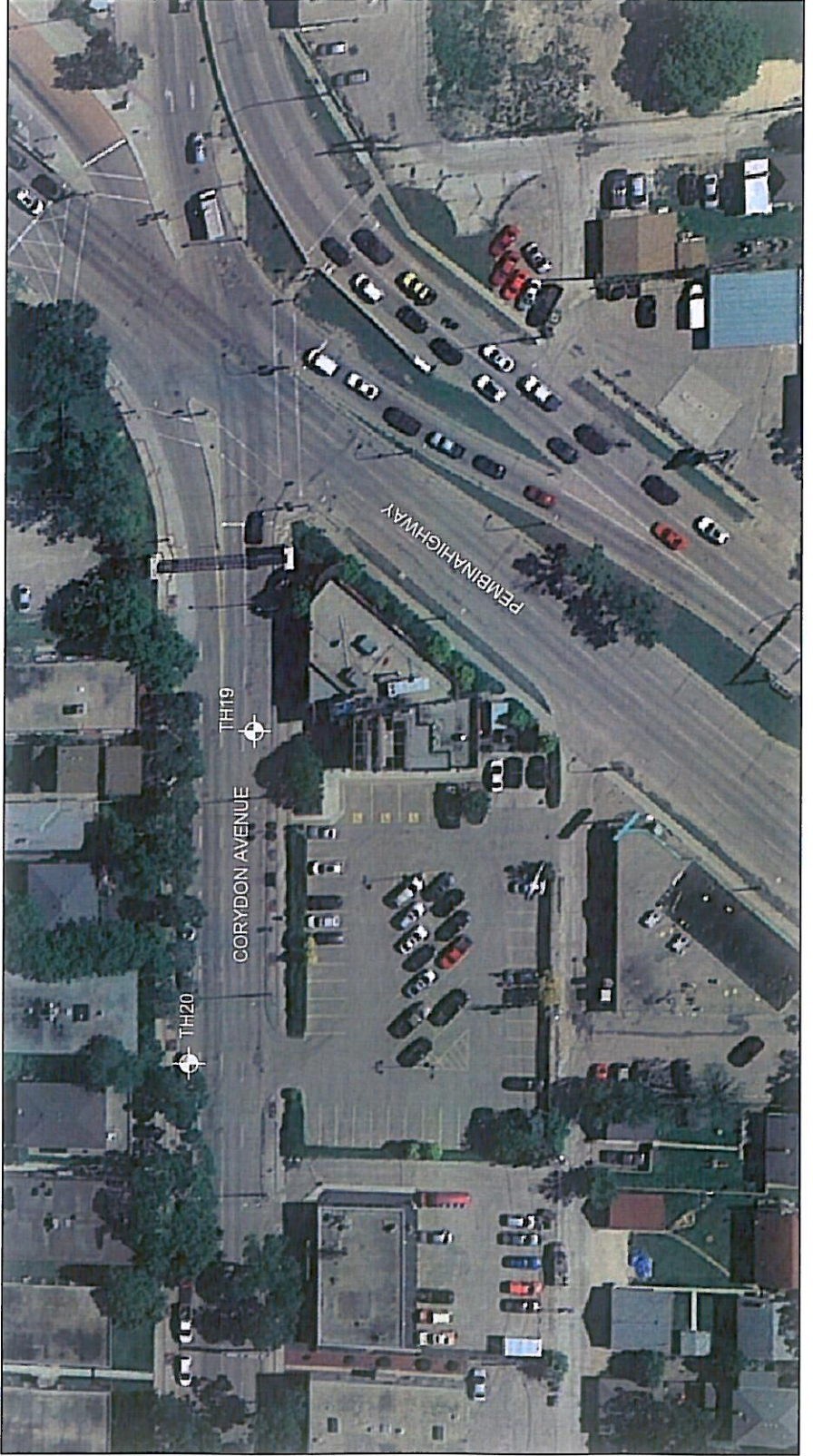
SCALE:
NTS

DRAWN BY: TDR	DATE: APRIL 2016
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FILE No.: 16-113-02	CLIENT DWG/FIG. No.:
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ENG-TECH DWG/FIG. No.: 1	NO.:
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TEST HOLE No.	OFFSET OF TEST HOLES
TH19	34.05 m West, 2.14 m North of southeast corner of Corydon Avenue.
TH20	93.40 m West, 2.24 m South of Northeast corner of Corydon Avenue.



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TEST HOLE

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PEMBINA HIGHWAY CORING PROGRAM
WINNIPEG, MANITOBA

DWG DESCRIPTION:
TEST HOLE LOCATION PLAN -
CORYDON AVENUE

SCALE:

NTS

DRAWN BY:

TDR

FILE NO.:

16-113-02

DATE:

APRIL 2016

CLIENT DWG/FIG. NO.:

ENG-TECH DWG/FIG. No.:

2

**Table 1
Summary of Pavement Structure**

Northbound Lanes on Pembina Highway from Grant Avenue to Osborne Street

Test Hole Number	Test Hole Location	Pavement Core Coordinates		Pavement Surface	
		UTM	14U	Type	Thickness (mm)
1	Northbound curb lane of Pembina Highway	55525275.888	633146.909	Asphalt	70
				Concrete	215
2	Northbound center lane of Pembina Highway	5525361.321	633177.106	Asphalt	45-50
				Concrete	190-200
3	Northbound median lane of Pembina Highway	5525545.000	633203.000	Asphalt	55-62
				Concrete	185
4	Northbound center lane of Pembina Highway	5525651.159	633257.430	Asphalt	62
				Concrete	205-210
5	Northbound median lane of Pembina Highway	552574.489	633304.715	Asphalt	35-37
				Concrete	172-175
6	Northbound curb lane of Pembina Highway	5525875.430	633355.964	Asphalt	37
				Concrete	210
7	Northbound median lane of Pembina Highway	5526015.350	633380.741	Asphalt	42
				Concrete	210
8	Northbound center lane of Pembina Highway	5526163.544	633419.009	Asphalt	50
				Concrete	190



**Table 2
Summary of Pavement Structure**

Southbound Lanes on Pembina Highway from Grant Avenue to Osborne Street

Test Hole Number	Test Hole Location	Pavement Core Coordinates		Pavement Surface	
		UTM	14U	Type	Thickness (mm)
11	Southbound median lane of Pembina Highway	5526218.284	633411.167	Asphalt	77
				Concrete	192
12	Southbound center lane of Pembina Highway	5526093.612	633383.407	Asphalt	110
				Concrete	241
13	Southbound curb lane of Pembina Highway	5525961.478	633345.553	Asphalt	50
				Concrete	150+
14	Southbound median lane of Pembina Highway	5525837.426	633317.696	Asphalt	60
				Concrete	200
15	Southbound curb lane of Pembina Highway	5525630.740	633219.066	Asphalt	96
				Concrete	150+
16	Southbound median lane of Pembina Highway	5525561.876	633212.913	Asphalt	92
				Concrete	195
17	Southbound center lane of Pembina Highway	5525423.197	633168.184	Asphalt	160
				Concrete	150-160
18	Southbound curb lane of Pembina Highway	5525304.529	633146.909	Asphalt	55
				Concrete	245



**Table 3
Summary of Pavement Structure**

Eastbound and Westbound Lanes on Corydon Avenue from Nassau Street to Osborne Street

Test Hole Number	Test Hole Location	Pavement Core Coordinates		Pavement Surface	
		UTM	14U	Type	Thickness (mm)
19	Eastbound curb lane of Corydon Avenue	5526271.790	633382.435	Asphalt	54
				Concrete	224
20	Westbound curb lane of Corydon Avenue	5526260.205	633334.258	Asphalt	49
				Concrete	223

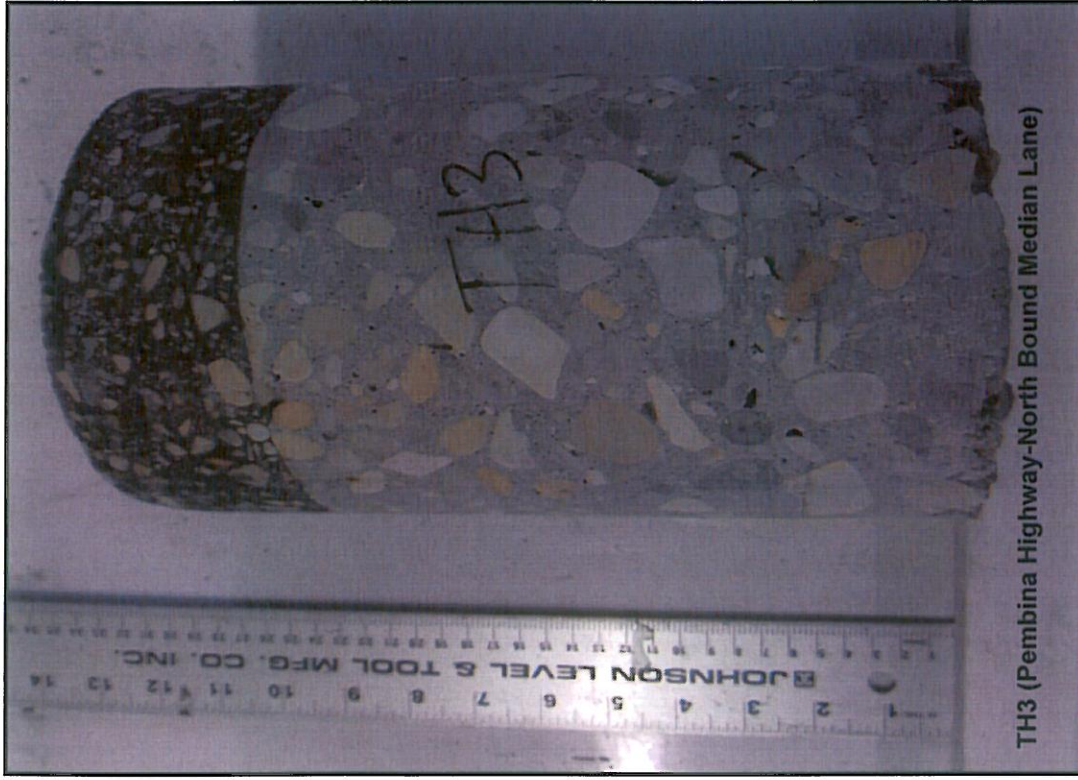




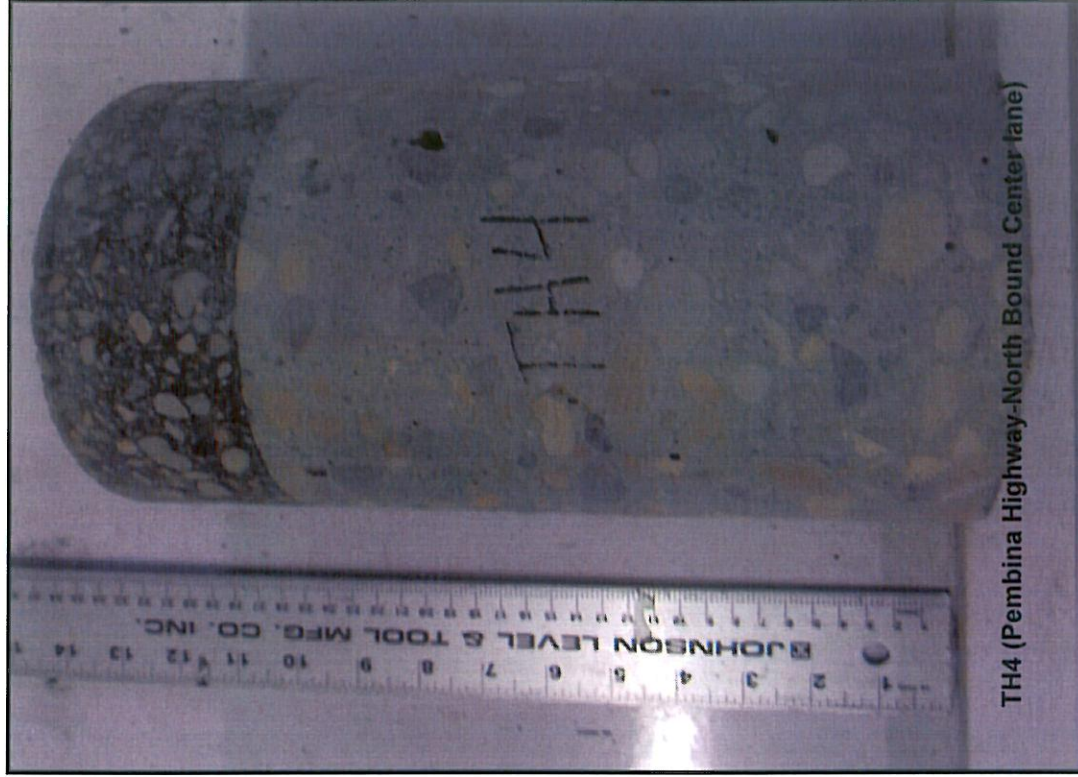
TH1 (Pembina Highway-North Bound Curb Lane)



TH2 (Pembina Highway-North Bound Center Lane)



TH3 (Pembina Highway-North Bound Median Lane)



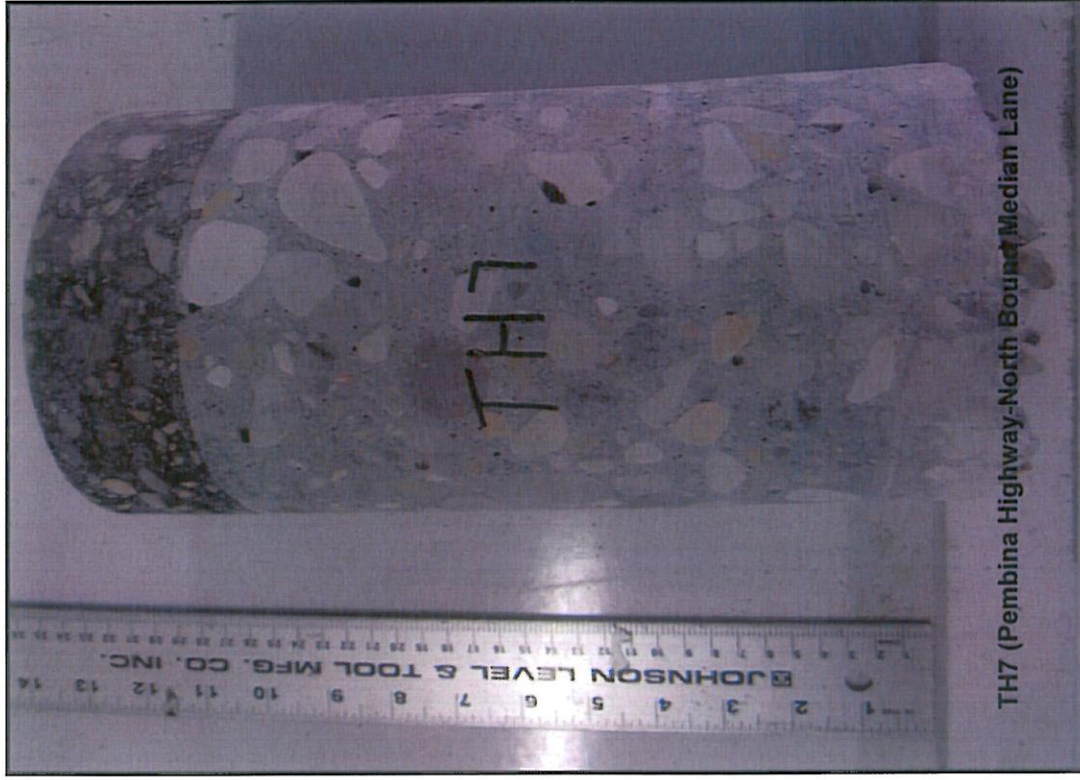
TH4 (Pembina Highway-North Bound Center lane)



TH5 (Pembina Highway-North Bound Median Lane)



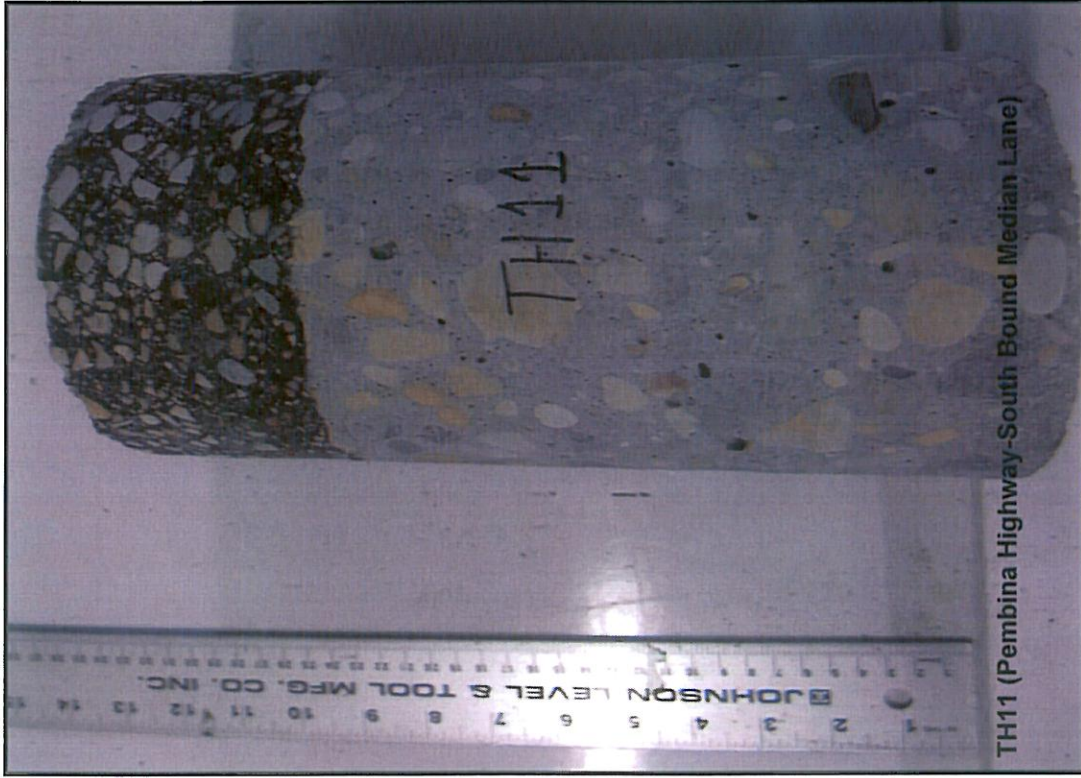
TH6 (Pembina Highway-North Bound Curb lane)



TH7 (Pembina Highway-North Bound Median Lane)



TH8 (Pembina Highway-North Bound Center lane)



TH11 (Pembina Highway-South Bound Median Lane)



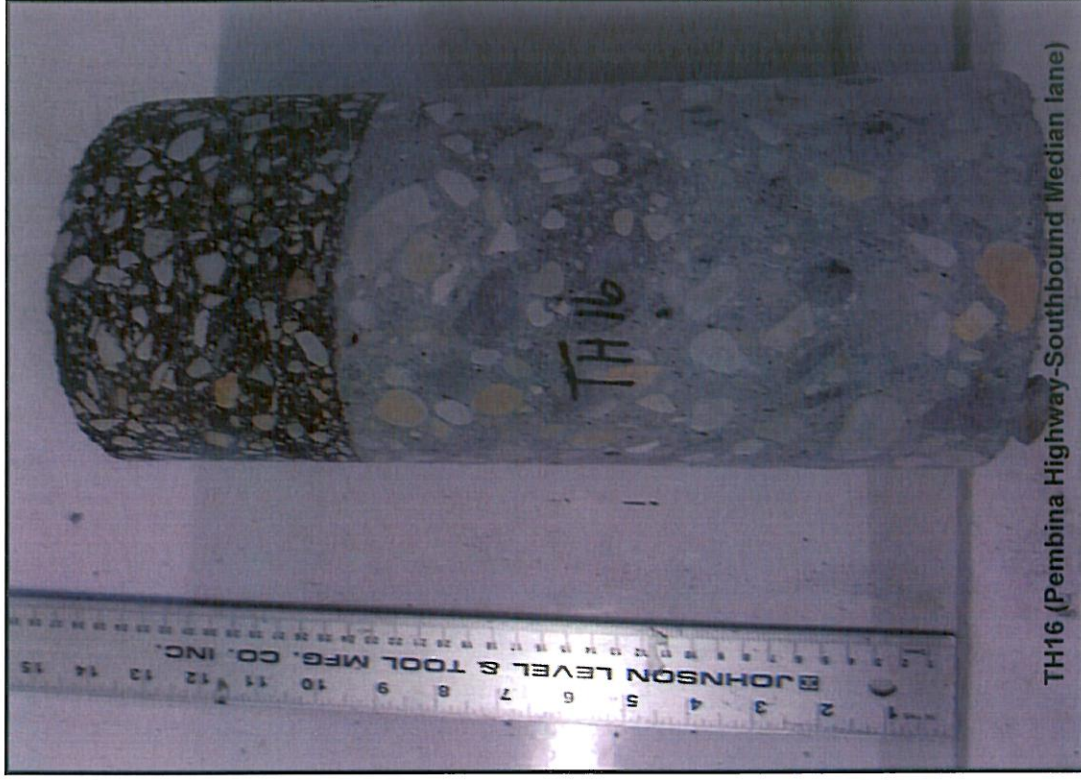
TH12 (Pembina Highway-Sound Bound Center Lane)



TH13 (Pembina Highway-Southbound Curb Lane)



TH14 (Pembina Highway-Southbound Median lane)





TH17 (Pembina Highway-Southbound Center Lane)



TH18 (Pembina Highway-Southbound Center lane)



TH19 (Corydon Avenue-Eastbound Curb Lane)



TH20 (Corydon Avenue-Westbound Curb lane)