APPENDIX 'A'

GEOTECHNICAL REPORT

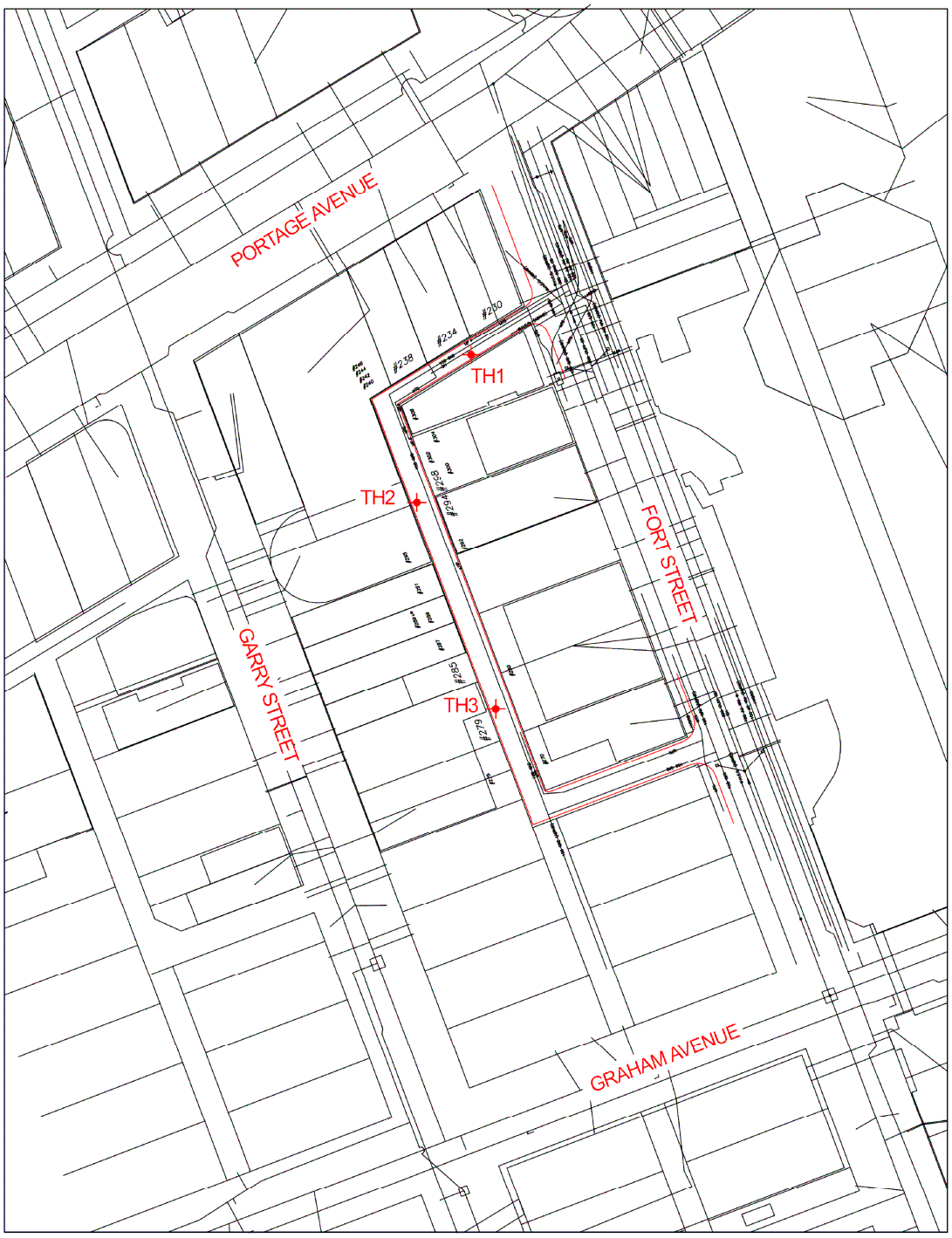
APPENDIX 'A' - GEOTECHNICAL REPORT

TABLE OF CONTENTS

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 Fort Street West Alley

Test Hole Locations



THE NATIONAL TESTING LABORATORIES LIMITED
Established in 1923

Testhole Location Plan
Fort Garry Alley, Portage Ave. to Graham Ave.
City of Winnipeg 2009 Alley Renewal Program

Project No.: KGS-863	Drawn by: KK	Figure: 1
Date: Feb. 25, 2009	Reviewed by: DF	Scale: NTS

Fort Garry Alley
Graham Avenue to Portage Avenue
City of Winnipeg 2009 Alley Renewal Program

Summary of Core Samples

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		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	Eastbound lane, 2 m west of the property line between 230 and 234 Portage Avenue	Asphalt / Concrete	106 / 120	Granular Base/ Granular and clay fill	74 / 460	Clay	0.9	34	0	4.0	28.5	67.5	86	22	64
TH2	Southbound lane, at the property line between 298 and 294 Fort Street	Asphalt / Concrete	70 / 119	Granular and clay fill	420	-	-	-	-	-	-	-	-	-	-
TH3	Southbound lane, 8 m south of the property line between 285 and 279 Garry Street	Concrete	146	Granular and clay fill	310	-	-	-	-	-	-	-	-	-	-

Test Hole #1 for Fort Street West Alley

TESTHOLE TH1

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Fort Garry Alley, Portage Ave. to Graham Ave.
Testhole Location: Eastbound lane, 2 m west of the property line of 230 / 234 Portage Avenue

Date Drilled: January 30, 2008
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Granular Base	33				
		Fill - grey, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	35				
0.5							
		Clay - black, stiff, moist, high plasticity, with layers of silt below 1.1 m	34	0	4.0	28.5	67.5
1.0			34				
		Silt - tan, firm, moist, low plasticity	19				
1.5							
		Clay - brown, stiff, moist, high plasticity, with layers of silt	32				
2.0			38				
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drilling • Testhole was terminated at 2.1m					
2.5							

Test Hole #2 for Fort Street West Alley

TESTHOLE TH2

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Fort Garry Alley, Portage Ave. to Graham Ave.
Testhole Location: Southbound lane, In line with property line of 298 / 294 Fort St.

Date Drilled: January 30, 2008
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - mixture of sand and clay, trace fine gravel	
0.5			19
		Clay - black, stiff, moist, high plasticity, with layers of silt to 1.1 m - grey below 1.2 m	28
1.0			39
1.5			38
		Silt - tan, firm, moist, low plasticity	22
2.0			23
		• Frost present to a depth of 1.7 m • No water seepage was observed during or upon completion of drilling • Sloughing was observed below 1.8 m upon completion of drilling • Testhole was terminated at 2.1m	
2.5			

Test Hole #3 for Fort Street West Alley

TESTHOLE TH3

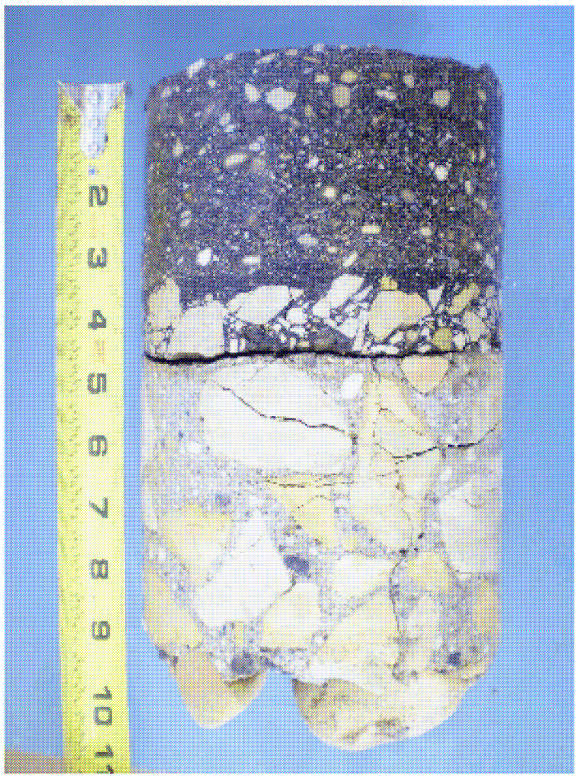
THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Fort Garry Alley, Portage Ave. to Graham Ave.
Testhole Location: Southbound lane, 8 m south of the property line of 285 / 279 Garry St.

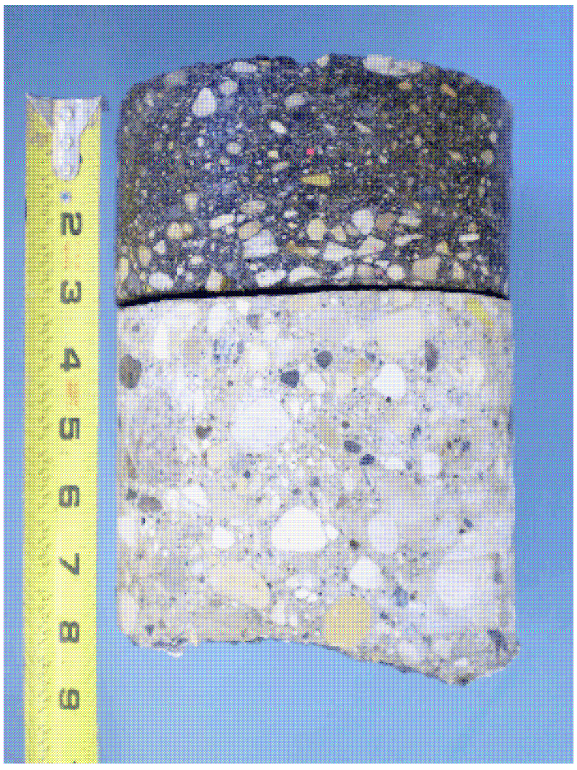
Date Drilled: January 30, 2008
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill - mixture of sand and black silty clay, trace fine gravel	33
0.5		**Clay** - black, stiff, moist, high plasticity, trace organics and rootlets to 0.5 m - grey, with layers of silt below 1.1 m	46
1.0			42
			34
1.5		**Silt** - tan, firm, moist, low plasticity	19
		Clay - brown, stiff, moist, high plasticity	35
2.0			39
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drilling • Testhole was terminated at 2.1m	
2.5			

Pavement Core Photos



Testhole TH1



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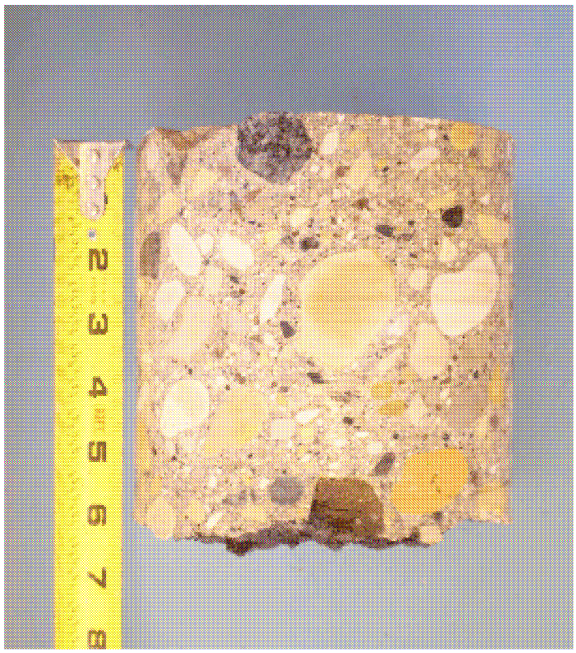
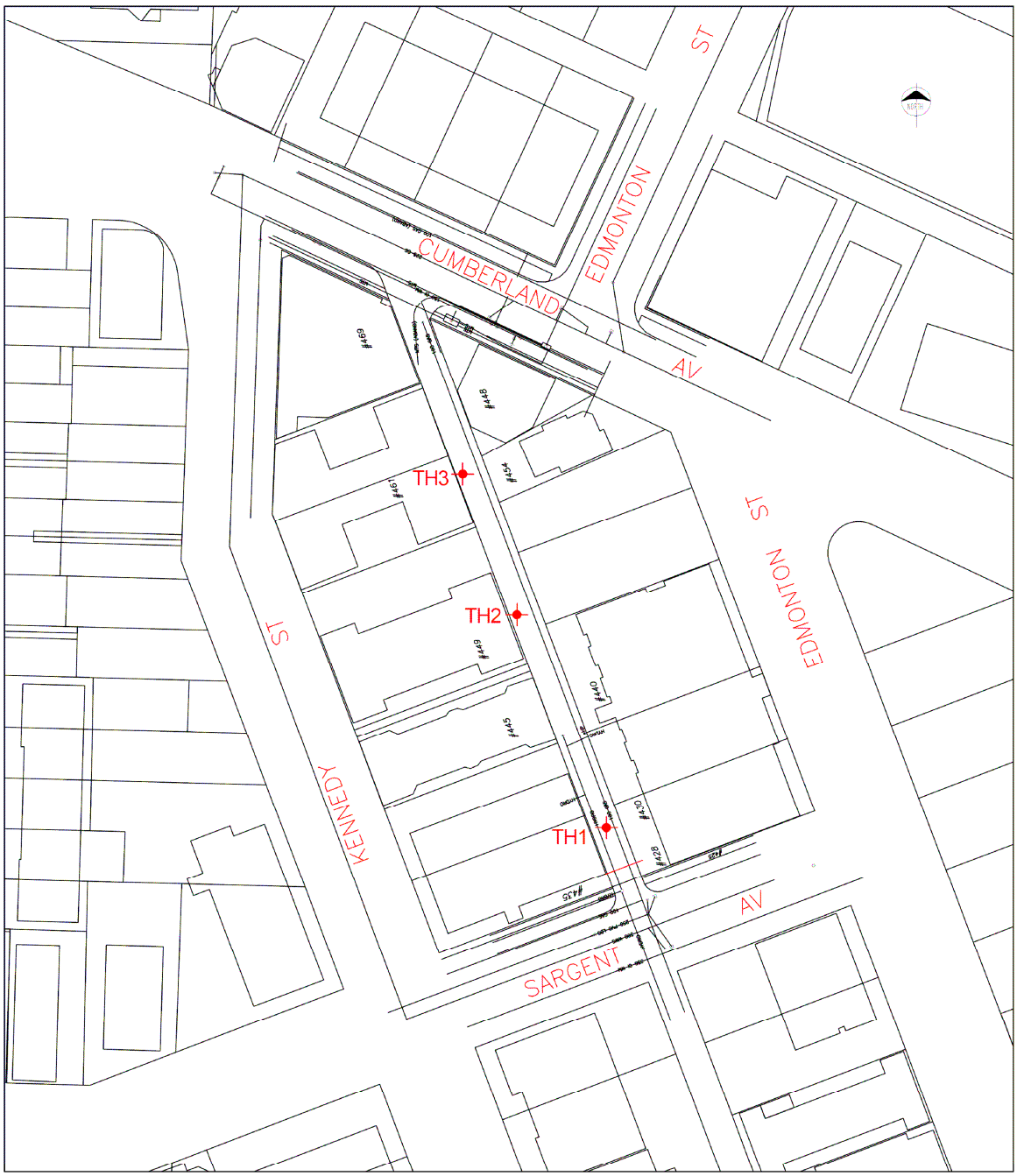


Testhole TH3

Geotechnical Report for Kennedy / Edmonton Alley

Test Hole Locations



THE NATIONAL TESTING LABORATORIES LIMITED
Established in 1923

Testhole Location Plan
Kennedy Edmonton Alley, Sargent Ave. to Cumberland Ave.
City of Winnipeg 2009 Alley Renewal Program

Project No.: KGS-863	Drawn by: KK	Figure: 1
Date: Feb. 25, 2009	Reviewed by: KK	Scale: NTS

Summary of Core Samples

Kennedy Edmonton Alley
Sargent Avenue to Cumberland Avenue
City of Winnipeg 2009 Alley Renewal Program

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		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	Centre of alley, 9 m north of the south property line of 435 Sargent Avenue	Asphalt / Concrete	30 / 155	Granular Base/ Clay Fill	15 / 300	-	-	-	-	-	-	-	-	-	-
TH2	Southbound lane, 12 m north of the property line between 449 and 445 Kennedy Street	Asphalt / Concrete	40 / 140	Granular Base/ Clay Fill	120 / 460	Clay	0.9	36	0	4.1	20.5	75.4	72	23	49
TH3	Southbound lane, 2.5 m south of the property line between 448 and 454 Cumberland Avenue	Asphalt / Concrete	38 / 212	Granular Base	50	Silt	1.2	26	0	1.8	70.7	27.5	28	19	9

Test Hole Log #1 for Kennedy / Edmonton Alley

TESTHOLE TH1

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Kennedy Edmonton Alley, Sargent Ave. to Cumberland Ave.
Testhole Location: Centre of alley, 9 m north of the south property line of 435 Sargent Ave.

Date Drilled: January 26, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Granular Base	
		Fill -black/brown, stiff, moist, high plasticity clay, with trace fine gravel	46
0.5		**Clay** -brown, stiff, moist, high plasticity with layers of silt below 0.8 m	34
			31
1.0		**Silt** -tan, firm, moist, low to intermediate plasticity, some clay	25
1.5			23
			23
2.0		**Clay** -brown, stiff, moist, high plasticity	41
		• Frost present to 1.5 m • No water seepage or sloughing observed during or upon completion of drilling • Testhole was terminated at 2.1 m	
2.5			

Test Hole Log #2 for Kennedy / Edomonton Alley

TESTHOLE TH2

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Kennedy Edmonton Alley, Sargent Ave. to Cumberland Ave.
Testhole Location: Southbound lane, 12 m north of property line of 449 / 445 Kennedy St.

Date Drilled: January 26, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Granular Base -20 mm maximum aggregate size					
		Fill -black, stiff, moist, high plasticity clay with trace fine gravel	25, 28				
0.5							
		Clay -grey, stiff, moist, high plasticity	36	0	4.1	20.5	75.4
1.0							
		Silt -tan, firm, moist, low to intermediate plasticity, with layers of clay to 1.4 m	34, 22				
1.5							
			23, 41				
2.0		**Clay** -brown, stiff, moist, high plasticity					
		• Frost present to 1.5 m • No water seepage or sloughing observed during or upon completion of drilling • Testhole was terminated at 2.1 m					
2.5							

Test Hole Log #3 for Kennedy / Edmonton Alley

TESTHOLE TH3

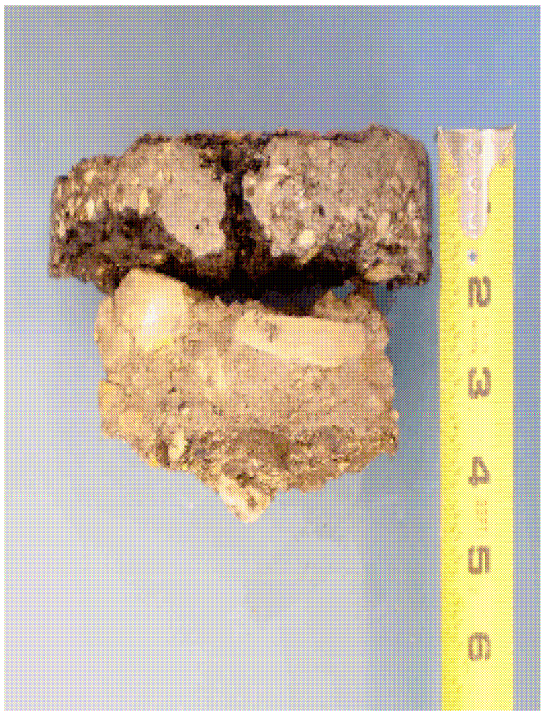
THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Kennedy Edmonton Alley, Sargent Ave. to Cumberland Ave.
Testhole Location: Southbound lane, 2.5 m south of the property line of 448 / 454 Cumberland Ave.

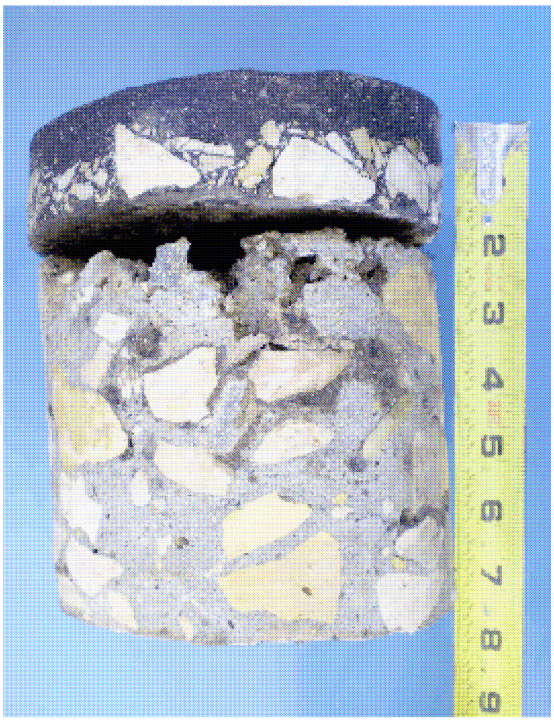
Date Drilled: January 26, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Granular Base					
		Clay -black, stiff, moist, high plasticity with trace fine gravel to 0.5 m - grey below 0.5 m	34 39				
0.5							
		Silt -tan, firm, moist, low to intermediate plasticity, some clay	38 26	0	1.8	70.7	27.5
1.0							
			20				
1.5			24				
			24				
2.0		• Frost present to 1.5 m • No water seepage or sloughing observed during or upon completion of drilling • Testhole was terminated at 2.1 m					
2.5							

Pavement Core Photos



Testhole TH1

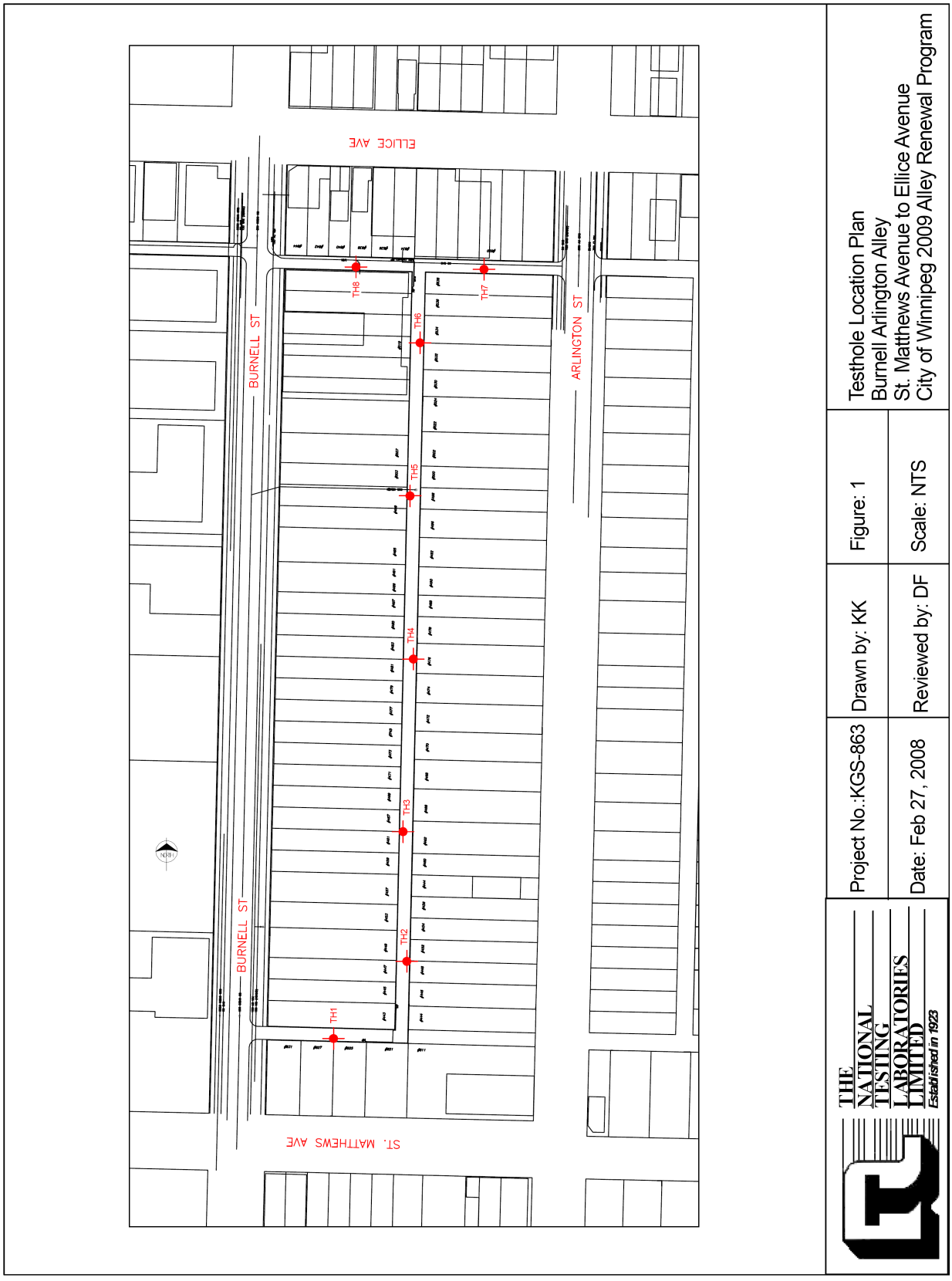


Testhole TH2

Testhole TH3

Geotechnical Report for Burnell / Arlington Alley

Test Hole Locations



Summary of Core Samples

Burnell Arlington Alley
St. Matthews Avenue to Ellice Avenue
City of Winnipeg 2009 Alley Renewal Program

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		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	Westbound lane, at the property line between 827 and 825 St. Matthews Ave.	Concrete	152	Granular and clay fill	350	Silty Clay	0.9	33	0	7.7	35.2	57.1	64	16	48
TH2	Northbound lane, at the property line between 447 and 449 Burnell St.	Asphalt / Concrete	35 / 120	Granular and clay fill	350	-	-	-	-	-	-	-	-	-	-
TH3	Southbound lane, at the property line between 461 and 467 Burnell St.	Asphalt / Concrete	22 / 175	Granular and clay fill	100	-	-	-	-	-	-	-	-	-	-
TH4	Northbound lane, at the property line between 481 and 483 Burnell St.	Asphalt / Concrete	20 / 160	Granular and clay fill	580	-	-	-	-	-	-	-	-	-	-
TH5	Southbound lane, 4 m south of the property line between 499 and 503 Burnell St.	Concrete	187	Granular base	115	Clayey Silt	0.9	26	0	12.7	64.0	23.3	26	15	11
TH6	Northbound lane, at the property line between 532 and 534 Arlington St.	Concrete	135	Granular base	135	-	-	-	-	-	-	-	-	-	-
TH7	Eastbound lane, 26 m east of the east property line of 834 Ellice Ave.	Concrete	160	Granular and clay fill	350	-	-	-	-	-	-	-	-	-	-
TH8	Eastbound lane, 3 m east of the property line between 840 and 838 Ellice Ave.	Concrete	155	Granular and clay fill	600	-	-	-	-	-	-	-	-	-	-

Test Hole #1 for Burnell / Arlington Alley

TESTHOLE TH1

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Westbound lane, In line with propertly line of 827 / 825 St. Matthews Ave.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Concrete					
		Fill - brown, firm, moist, high plasticity clay, some sand and fine gravel	46				
0.5		**Silty Clay** - black, stiff, moist, high plasticity - layers of silt between 0.8 to 1.1 m - brown below 1.2 m - layer of silt between 1.5 to 1.8 m	42 38	0	7.7	35.2	57.1
1.0							
			26				
1.5			30				
			29				
2.0			28				
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m					
2.5							

Test Hole #2 for Burnell / Arlington Alley

TESTHOLE TH2

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Northbound lane, In line with propertly line of 447 / 449 Burnell St.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - mixture of granular material and clay - brown, firm, moist, high plasticity clay fill below 0.3 m	36
0.5		**Clay** - black, stiff, moist, high plasticity - layers of silt below 1.1 m	46
1.0			37
			35
1.5		**Silt** - tan, firm, moist, low plasticity	19
		Clay - brown, stiff, moist, high plasticity	29
2.0			31
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			

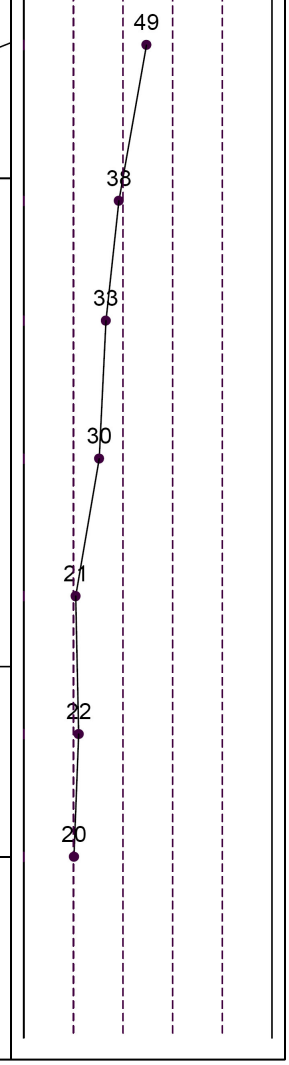
Test Hole #3 for Burnell / Arlington Alley

TESTHOLE TH3

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Southbound lane, In line with propertly line of 461 / 467 Burnell St.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - mixture of clay and granular material	
		Silt - grey, firm, moist, low to intermediate plasticity, with layers of clay to 0.5 m - tan, low plasticity below 0.5 m	
0.5			
		Clay - brown, stiff, moist, high plasticity with layers of silt to 0.7 m - layers of silt below 1.2 m, increasing with depth	
1.0			
1.5			
		Silt - tan, firm, moist, high plasticity - layers of clay below 2.0 m	
2.0			
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			



Test Hole #4 for Burnell / Arlington Alley

TESTHOLE TH4

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Southbound lane, In line with propertly line of 481 / 483 Burnell St.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - mixture of clay and granular material - brown, firm, moist, high plasticity clay fill below 0.3 m	36
0.5			36
		Silt - tan, firm, moist, low plasticity	26
1.0			
		Clay - brown, stiff, moist, high plasticity with layers of silt to 1.7 m	29
1.5			31
			28
2.0			29
		• Frost present to a depth of 1.7 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			

Test Hole #5 for Burnell / Arlington Alley

TESTHOLE TH5

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Southbound lane, 4 m south of the property line of 499 / 503 Burnell St.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Concrete					
		Granular Base - 20 mm maximum aggregate size	33				
		Clay - brown, stiff, moist, high plasticity, with layers of silt, with fine gravel to a depth of 0.4 m					
0.5			30				
		Clayey Silt - tan, firm, moist, low plasticity	26	0	12.7	64.0	23.3
1.0							
		Clay - brown, stiff, moist, high plasticity with layers of silt to 1.4 m	26				
1.5			30				
			33				
2.0			36				
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m					
2.5							

Test Hole #6 for Burnell / Arlington Alley

TESTHOLE TH6

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Northbound lane, In line with property line of 532 / 534 Arlington St.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Granular Base - 20 mm maximum aggregate size	
		Clay - brown, stiff, moist, high plasticity, with fine gravel to a depth of 0.4 m - layers of silt below 0.5 m	28
0.5			37
		Silt - tan, firm, moist, low plasticity	24
1.0			25
1.5			23
		Clay - brown, stiff, moist, high plasticity	30
2.0			36
		• Frost present to a depth of 1.4 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			

Test Hole #7 for Burnell / Arlington Alley

TESTHOLE TH7

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Eastbound lane, 26 m E of the east property line of 834 Ellice Ave.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill brown, firm, moist, high plasticity clay, some sand and fine gravel	28
0.5		**Clay** - black, stiff, moist, high plasticity - brown, with layers of silt below 0.8 m	37
			24
1.0		**Silt** - tan, firm, moist, low plasticity	25
1.5			23
		Clay - brown, stiff, moist, high plasticity	30
2.0			36
		• Frost present to a depth of 1.5 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			

Test Hole #8 for Burnell / Arlington alley

TESTHOLE TH8

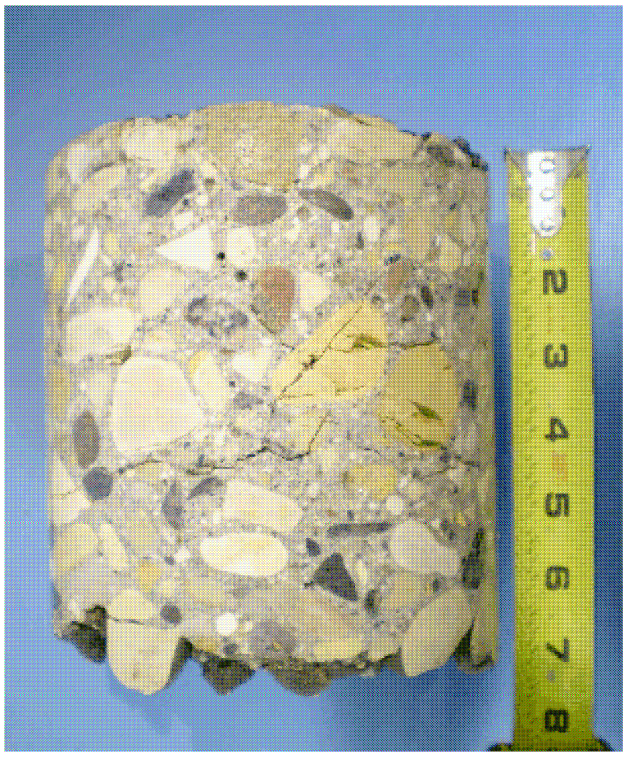
THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Burnell Arlington Alley, St. Matthews Ave. to Ellice Ave.
Testhole Location: Eastbound lane, 3 m E of the property line of 840 / 838 Ellice Ave.

Date Drilled: January 23 , 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill - mixture of granular material and clay - brown, firm, moist, high plasticity clay fill with sand and fine gravel below 0.5 m	30
0.5			32
		Clay - black, stiff, moist, high plasticity with layers of silt	
1.0		**Silt** - tan, firm, moist, low plasticity	24
		Clay - brown, stiff, moist, high plasticity	29
1.5			26
			31
2.0			40
		• Frost present to a depth of 1.5 m • No water seepage or sloughing were observed during or upon completion of drillling • Testhole was terminated at 2.1 m	
2.5			

Pavement Core Photos



Testhole TH1

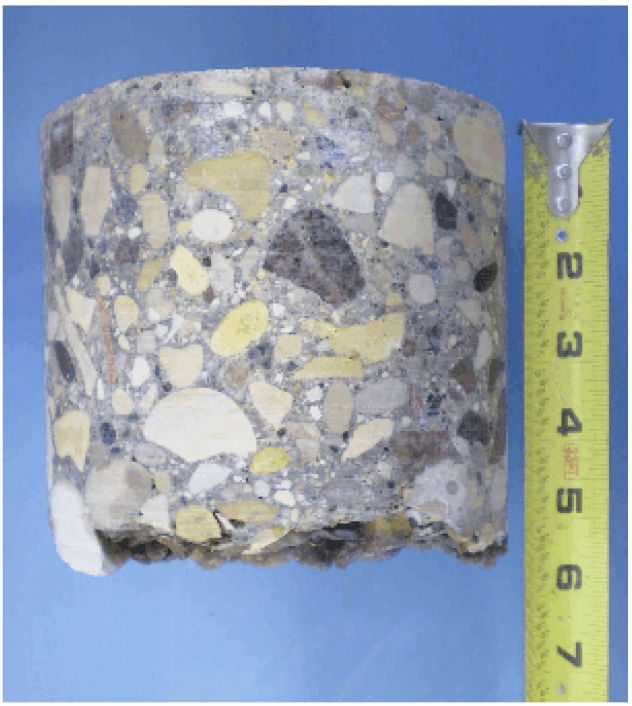
Testhole TH2

Testhole TH3

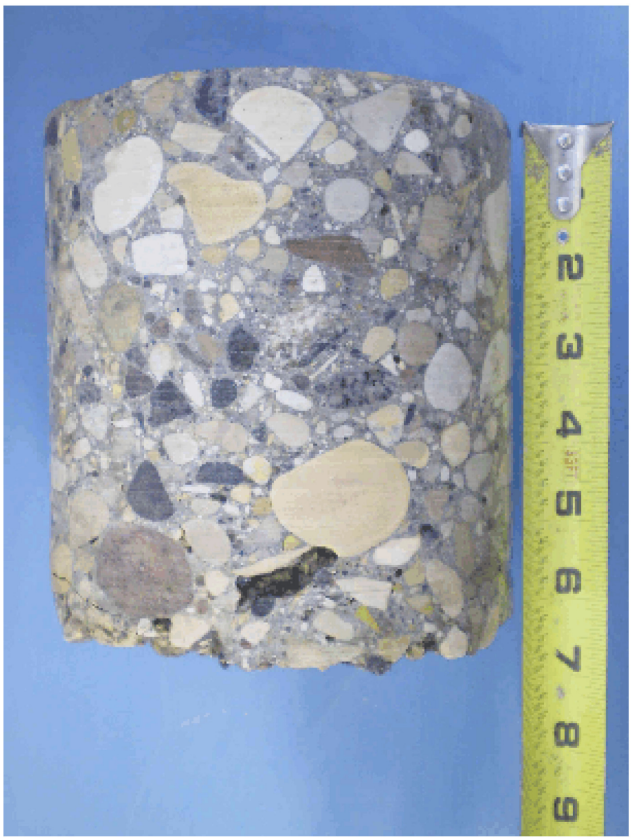
Testhole TH4

Pavement Core Photos

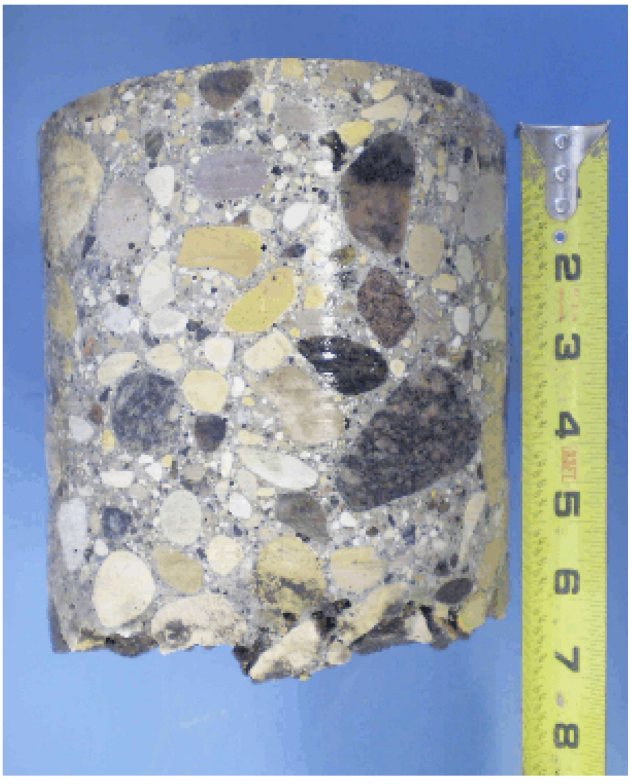
Testhole TH5



Testhole TH6



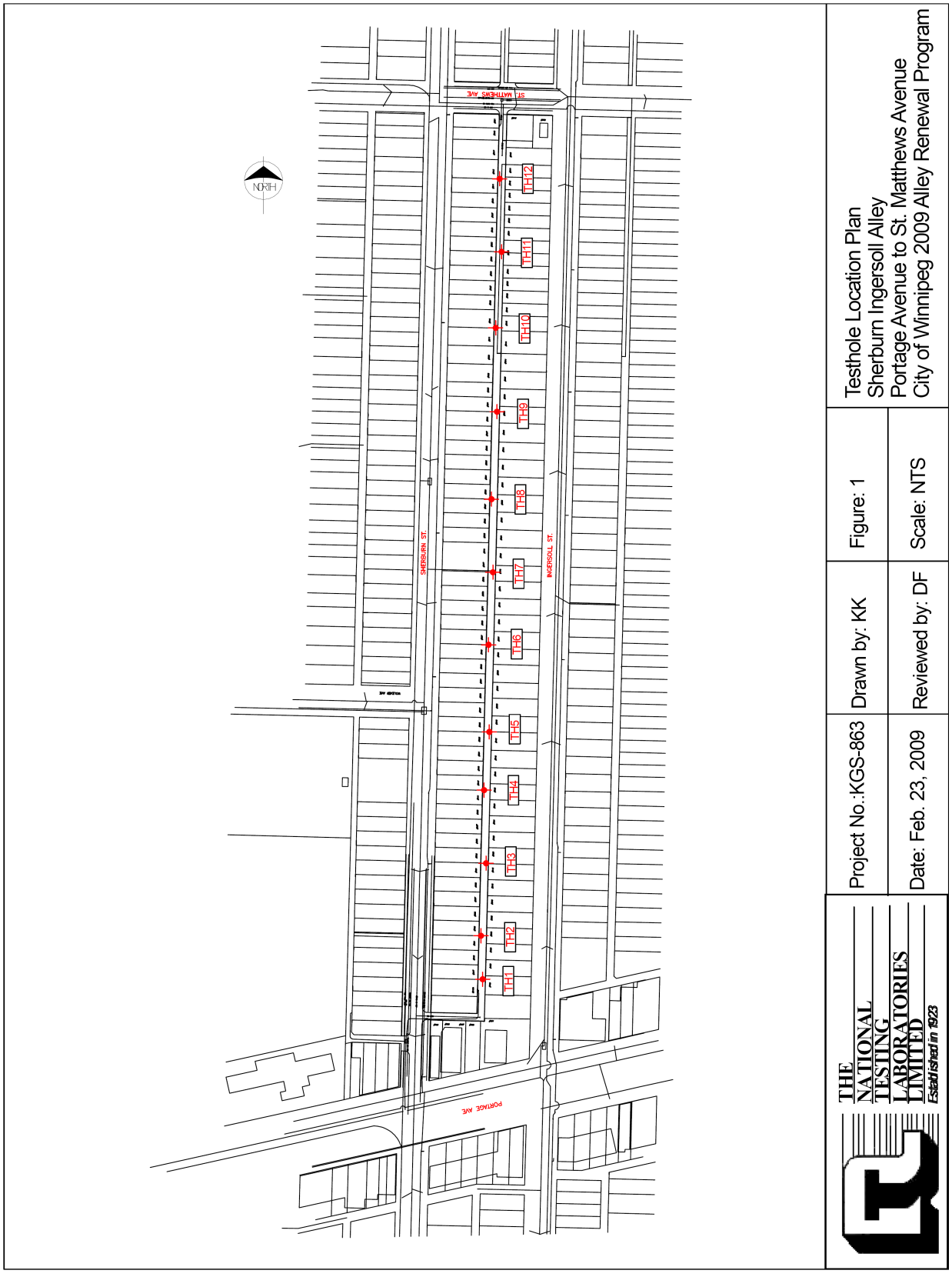
Testhole TH7



Testhole TH8

Geotechnical Report for Sherburn / Ingersoll Alley

Test Hole Locations



Summary of Core Samples

Sherburn Ingersoll Alley
Portage Avenue to St. Matthews Avenue
City of Winnipeg 2009 Alley Renewal Program

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		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	Northbound lane, at the property line between 515 and 517 Sherburn Street	Concrete	190	Granular and clay fill	570	-	-	-	-	-	-	-	-	-	-
TH2	Southbound lane, at the property line between 521 and 523 Sherburn Street	Concrete	230	Granular Base/ Granular and clay fill	50 / 520	-	-	-	-	-	-	-	-	-	-
TH3	Northbound lane, at the property line between 531 and 533 Sherburn Street	Asphalt / Concrete	50 / 212	Granular Base/ Granular and clay fill	40 / 400	-	-	-	-	-	-	-	-	-	-
TH4	Southbound lane, at the property line between 541 and 547 Sherburn Street	Concrete	228	Granular Base/ Granular and clay fill	20 / 200	-	-	-	-	-	-	-	-	-	-
TH5	Northbound lane, at the property line between 553 and 555 Sherburn Street	Concrete	215	Granular and clay fill	140	-	-	-	-	-	-	-	-	-	-
TH6	Southbound lane, at the property line between 565 and 567 Sherburn Street	Concrete	220	Granular and clay fill	390	-	-	-	-	-	-	-	-	-	-
TH7	Northbound lane, at the property line between 575 and 577 Sherburn Street	Asphalt / Concrete	120 / 245	Granular and clay fill	140	-	-	-	-	-	-	-	-	-	-
TH8	Southbound lane, at the property line between 587 and 589 Sherburn Street	Asphalt / Concrete	15 / 210	Granular and clay fill	240	-	-	-	-	-	-	-	-	-	-
TH9	Northbound lane, at the property line between 599 and 601 Sherburn Street	Concrete	190	Granular and clay fill	270	-	-	-	-	-	-	-	-	-	-
TH10	Southbound lane, at the property line between 611 and 615 Sherburn Street	Concrete	200	Granular and clay fill	260	-	-	-	-	-	-	-	-	-	-
TH11	Northbound lane, at the property line between 631 and 633 Sherburn Street	Concrete	198	Granular and clay fill	560	Clayey Silt	1.2	25	0	6.8	64.2	29.0	29	17	12
TH12	Southbound lane, at the property line between 641 and 643 Sherburn Street	Concrete	210	Granular Base/ Granular and clay fill	50 / 500	Clay	0.9	37	0	5.6	27.7	66.7	93	29	64

Test Hole Log #1 for Sherburn / Ingersoll Alley

TESTHOLE TH1

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 515 and 517 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill - black, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	44
0.5			41
		Clay - brown, stiff, moist, high plasticity, with layers of silt to 1.1 m	36
1.0			32
1.5			29
			30
2.0			41
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Test Hole Log #2 for Sherburn / Ingersoll Alley

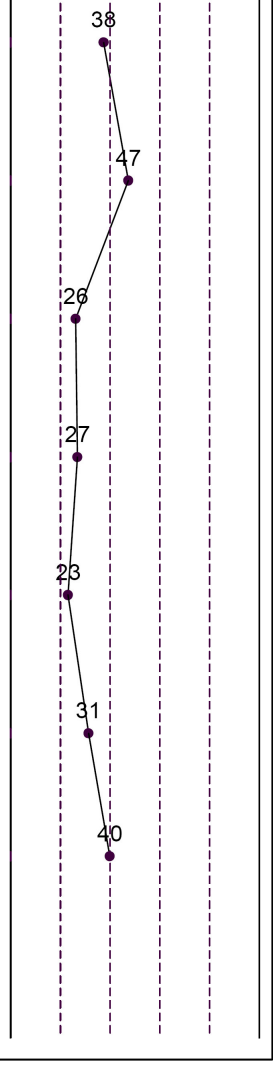
TESTHOLE TH2

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 521 and 523 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Granular Base	
		Fill - black, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	
0.5			
		Clayey Silt - tan, firm, moist, low to intermediate plasticity, with layers of clay to 1.0 m	
1.0			
		Clay - brown, stiff, moist, high plasticity, with layers of silt to 2.0 m	
1.5			
2.0			
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			



Test Hole Log #3 for Sherburn / Ingersoll Alley

TESTHOLE TH3

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 531 and 533 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Granular Base	41
		Fill - black, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	
0.5			44
		Clay - black, stiff, moist, high plasticity, with layers of silt below 0.9 m	37
1.0			
		Clayey Silt - tan, firm, moist, low to intermediate plasticity	27
1.5			22
		Clay - brown, stiff, moist, high plasticity	28
2.0			32
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Test Hole Log #4 for Sherburn / Ingersoll Alley

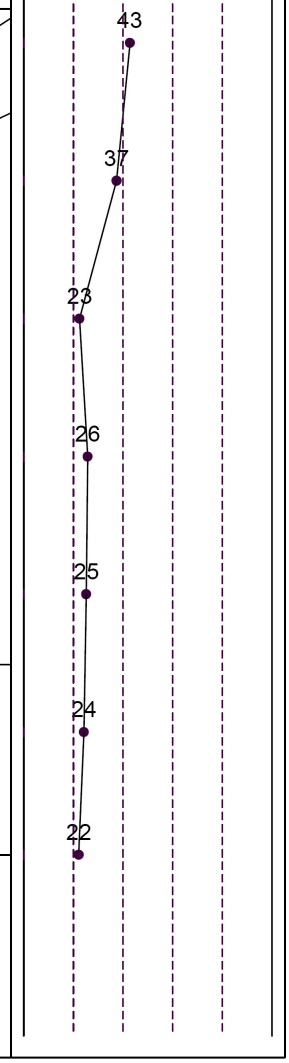
TESTHOLE TH4

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 541 and 547 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Granular Base	
		Fill - black, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	
0.5		**Silty Clay** - black, stiff, moist, intermediate to high plasticity, with layers of silt between 0.7 to 1.1 m - brown below 0.8 m - layers of silt below 1.5 m	
1.0			
1.5		**Clayey Silt** - tan, firm, moist, low to intermediate plasticity	
2.0			
2.5		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage was observed during or upon completion of drilling • Sloughing observed below 2.0 m upon completion of drilling	



Test Hole Log #5 for Sherburn / Ingersoll Alley

TESTHOLE TH5

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 553 and 555 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill - black mixture of compact, fine to coarse grained sand with some clay, trace fine gravel	
0.5		**Clay** - black, stiff, moist, high plasticity, with sand and fine gravel to 0.5 m - grey, with layers of silt below 0.8 m - brown below 1.0 m	40
1.0			37 33
1.5		**Clayey Silt** - tan, firm, moist, low to intermediate plasticity - saturated below 1.7 m	23 21
2.0			24
2.5		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage was observed during or upon completion of drilling • Sloughing observed below 2.0 m upon completion of drilling	

Test Hole Log #6 for Sherburn / Ingersoll Alley

TESTHOLE TH6

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 565 and 567 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Fill - black, firm, moist, intermediate to high plasticity clay, with sand, trace fine gravel	36
0.5			35
		Silty Clay - grey, stiff, moist, intermediate plasticity, with layers of silt	34
1.0			
		Clayey Silt - tan, firm, moist, intermediate plasticity	31
		Clay - brown, stiff, moist, high plasticity, with layers of silt	35
1.5			
			33
2.0			37
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Test Hole Log #7 for Sherburn / Ingersoll Alley

TESTHOLE TH7

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 575 and 577 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - brown/grey, firm, moist, intermediate to high plasticity clay, with sand and fine gravel	32
0.5		**Clay** - brown, stiff, moist, high plasticity	35
			34
1.0			31
1.5			35
			33
2.0			37
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling • Testhole was located 1.0 m from an existing catch basin	
2.5			

Test Hole Log #8 for Sherburn / Ingersoll Alley

TESTHOLE TH8

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 587 and 589 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - black mixture of fine to coarse grained sand, some clay, trace fine gravel	
0.5		**Clay** - black, stiff, moist, high plasticity, with trace fine gravel to 0.6 m - grey below 0.7 m - brown below 1.4 m - layers of silt below 1.7 m	49
1.0			50
			44
1.5			36
			37
2.0			42
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Test Hole Log #9 for Sherburn / Ingersoll Alley

TESTHOLE TH9

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 599 and 601 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
		Ground Surface	
0.0		**Concrete**	
		Fill - black mixture of fine to coarse grained sand, some clay, trace fine gravel	
0.5		**Clay** - black, stiff, moist, high plasticity, with trace fine gravel to 0.6 m - grey, with layers of silt below 0.8 m, increasing with depth - brown below 1.1 m	48 45 32
1.0			
1.5		**Silt** - tan, firm, moist, low plasticity	29
		Clay - brown, stiff, moist, high plasticity	32
2.0			39
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

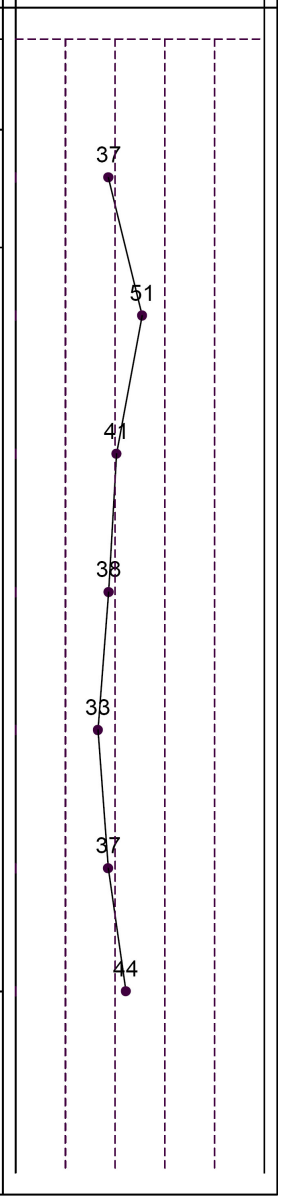
Test Hole Log #10 for Sherburn / Ingersoll Alley

TESTHOLE TH10

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 611 and 615 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%)
0.0		Ground Surface	
		Concrete	
		Fill - mixture of black/brown, firm, high plasticity clay with fine to coarse grained sand, trace fine gravel	
0.5		**Clay** - black, stiff, moist, high plasticity - grey below 0.8 m - brown below 1.0 m - layers of silt between 1.0 to 1.7 m	
1.0			
1.5			
2.0			
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			



Test Hole Log #11 for Sherburn / Ingersoll Alley

TESTHOLE TH11

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Northbound lane, In line with property line of 631 and 633 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Concrete					
		Fill - mixture of black/brown clay with fine to coarse grained sand, trace fine gravel	37				
0.5							
		Clay - black, firm, moist, high plasticity, with layers of silt, increasing with depth	37				
1.0							
		Clayey Silt - tan, firm, moist, low to intermediate plasticity, with layers of clay	25	0	6.8	64.2	29.0
		Clay - brown, stiff, moist, high plasticity	26				
1.5							
			31				
2.0							
			39				
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling					
2.5							

Test Hole Log #12 for Sherburn / Ingersoll Alley

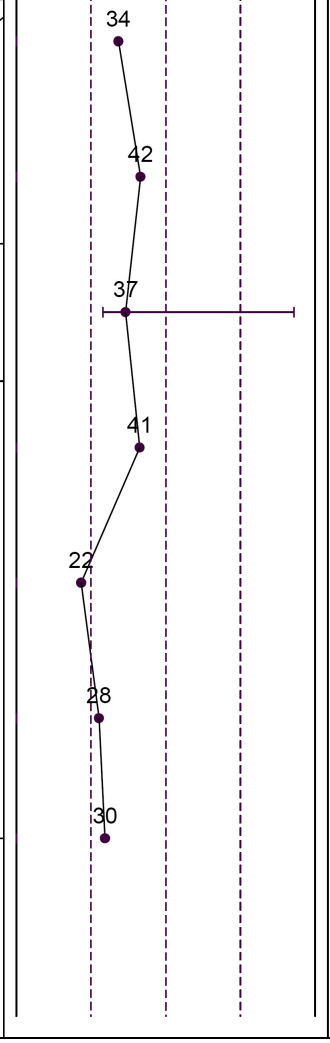
TESTHOLE TH12

THE NATIONAL TESTING LABORATORIES LIMITED

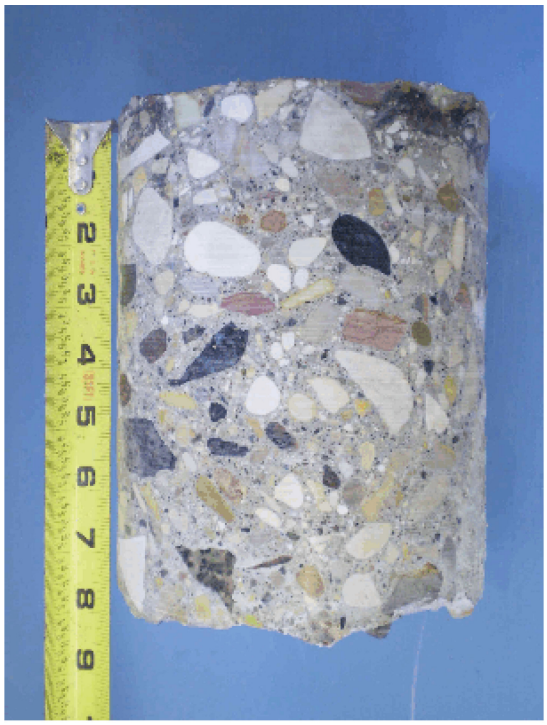
Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Sherburn Ingersoll Alley, Portage to St. Matthews Ave.
Testhole Location: Southbound lane, In line with property line of 641 and 643 Sherburn Street

Date Drilled: January 22, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

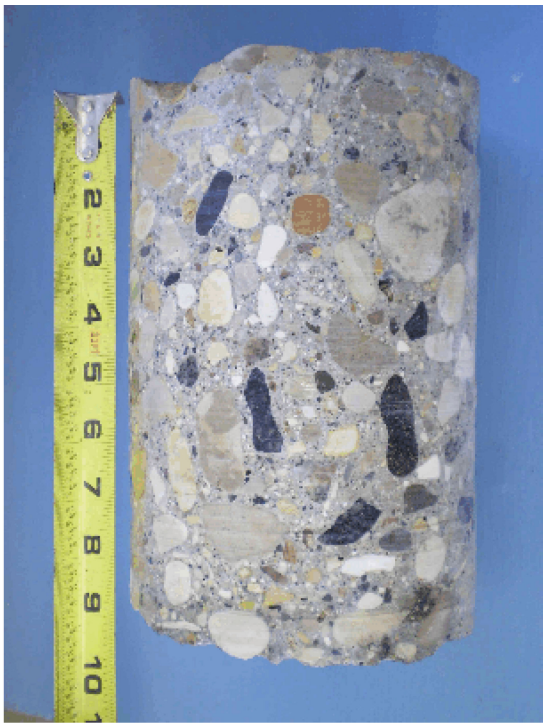
Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Concrete					
		Granular Base					
		Fill - mixture of black/brown, firm, moist, high plasticity clay with fine to coarse grained sand, trace fine gravel					
0.5							
		Clay - black, firm, moist, high plasticity - grey below 0.9 m		0	5.6	27.7	66.7
1.0							
		Clayey Silt - tan, firm, moist, low to intermediate plasticity, with layers of clay to 1.4 m - layers of clay below 1.8 m					
1.5							
2.0							
		• Frost present to a depth of 1.4 m • Testhole was terminated at 2.1 m • No water seepage was observed during or upon completion of drilling • Sloughing observed below 1.8 m upon completion of drilling					
2.5							



Pavement Core Photos



Testhole TH1



Testhole TH2

Testhole TH3

Testhole TH4

Pavement Core Photos

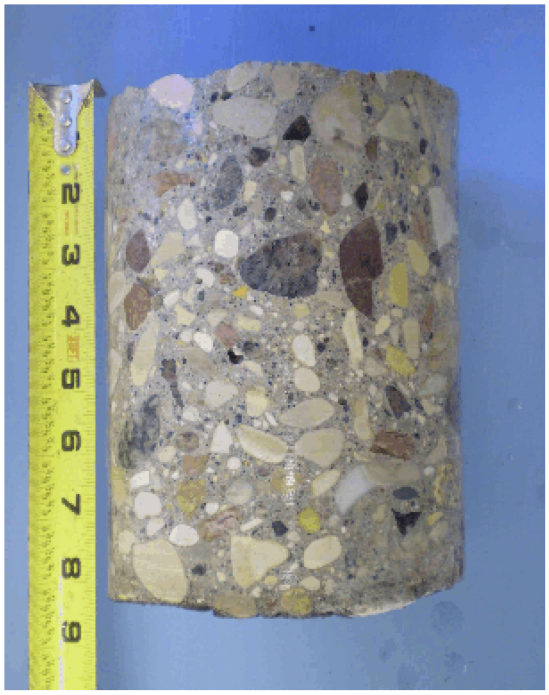
Testhole TH5

Testhole TH6

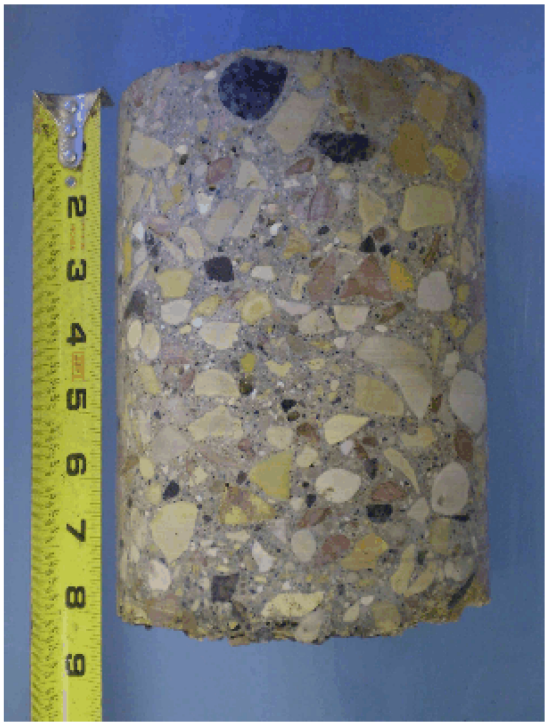
Testhole TH7

Testhole TH8

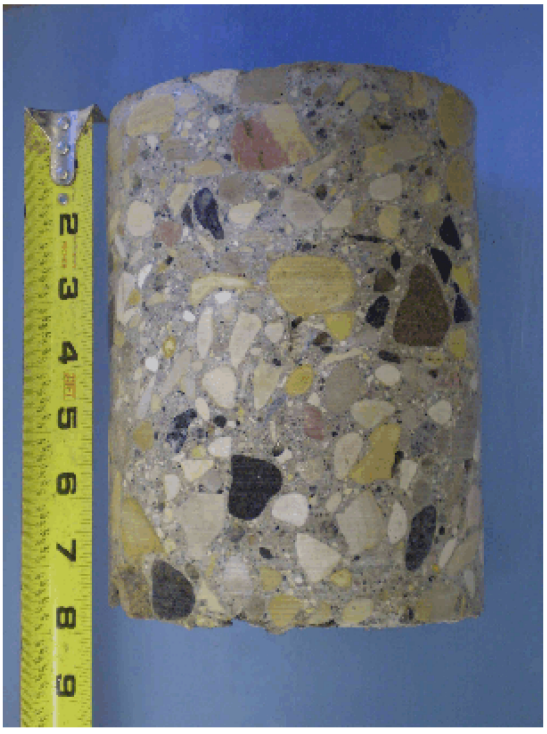
Pavement Core Photos



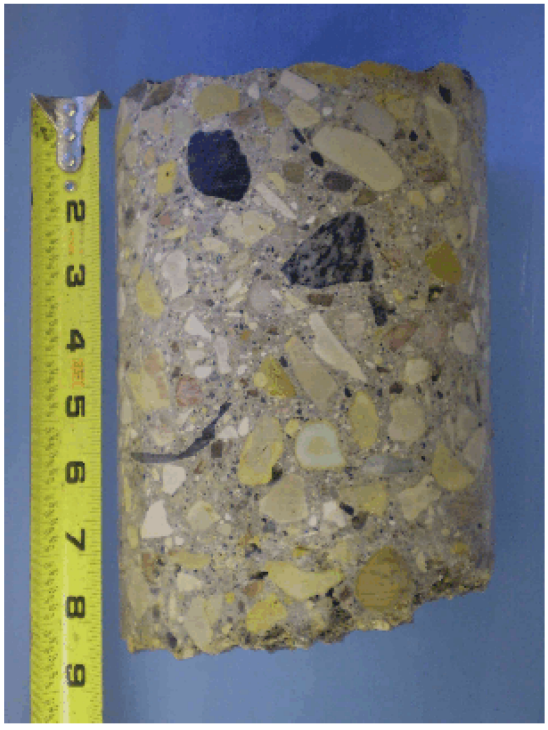
Testhole TH9



Testhole TH10



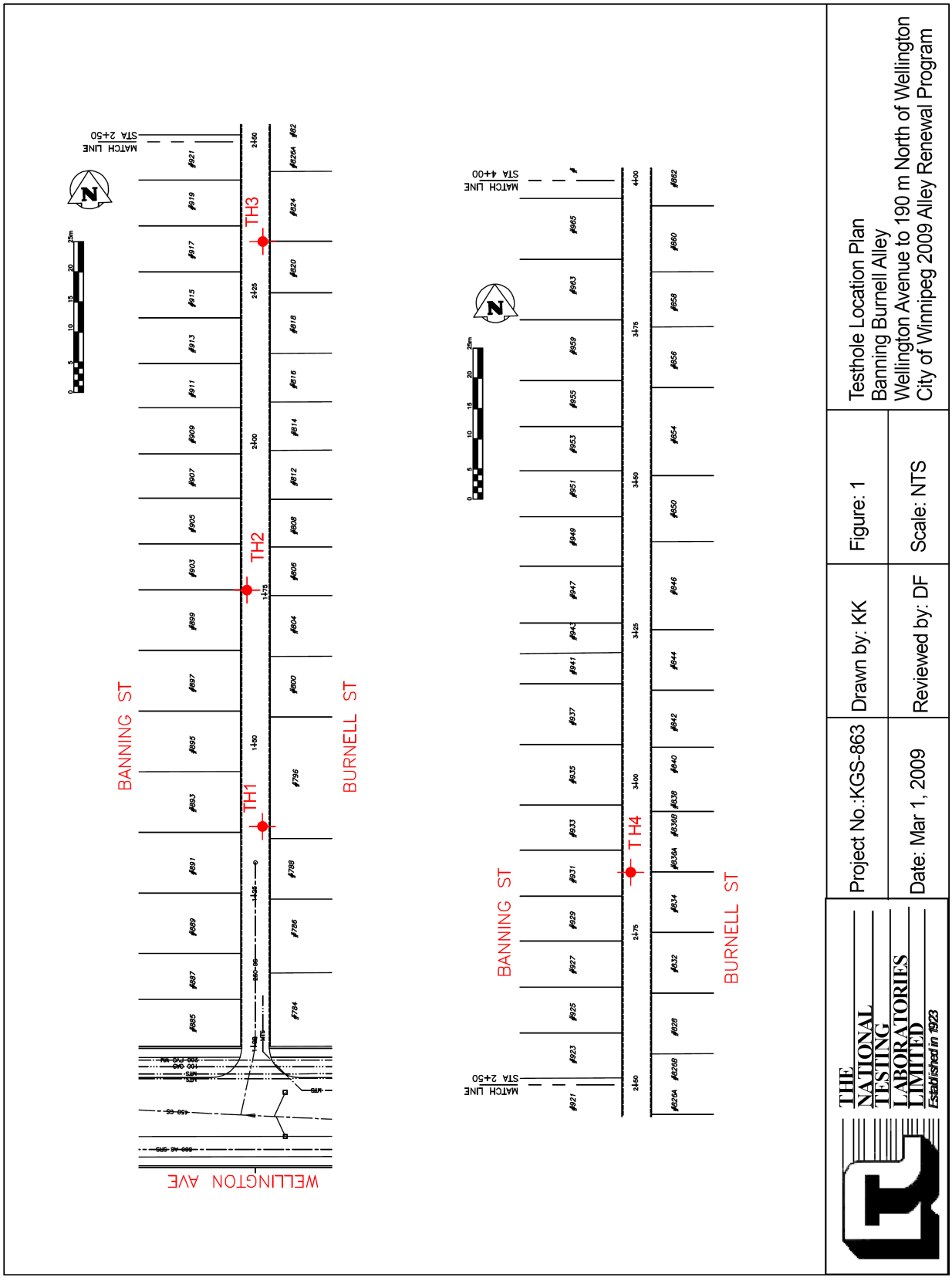
Testhole TH11



Testhole TH12

Geotechnical Report for Banning / Burnell Alley

Test Hole Locations



Summary of Core Samples

Banning Burnell Alley
Wellington Avenue to 190 m North of Wellington
City of Winnipeg 2009 Alley Renewal Program

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		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	Northbound lane, 2 m north of the property line between 788 and 796 Burnell Street	Asphalt / Concrete	50 / 185	Granular and clay fill	530	Clayey Silt	1.2	34	0.1	1.7	52.2	46.0	38	18	20
TH2	Southbound lane, at the property line between 804 and 806 Burnell Street	Asphalt / Concrete	30 / 170	Granular and clay fill	300	-	-	-	-	-	-	-	-	-	-
TH3	Northbound lane, at the property line of 820 and 824 Burnell Street	Asphalt / Concrete	45 / 240	Granular and clay fill	520	Clay	1.2	33	0	2.9	20.7	73.4	76	20	56
TH4	Southbound lane, at the property line of 834 and 836 Burnell Street	Concrete	225	Crushed Limestone	970	-	-	-	-	-	-	-	-	-	-

Test Hole #1 for Fort Banning / Burnell Alley

TESTHOLE TH1

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Banning / Burnell Alley, Wellington Ave. to 190 m North
Testhole Location: Northbound lane, 2 m north of the property line of 788 / 796 Burnell Street

Date Drilled: January 21, 2009
Depth of Testhole: 2.1 m
Logged by: Jeff Brant

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Fill - mixture of black high plasticity silty clay with sand and fine gravel	35				
0.5			43				
		Clay - brown, stiff, moist, high plasticity	32				
1.0							
		Clayey Silt - grey, firm, moist, low to intermediate plasticity - tan, low plasticity below 1.4 m - layers of clay below 2.0 m	34	0.1	1.7	52.2	46.0
1.5			21				
			23				
2.0			38				
		• Frost to a depth of 1.5 m • Testhole terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling					
2.5							

Test Hole #2 for Banning / Burnell Alley

TESTHOLE TH2

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Banning / Burnell Alley, Wellington Ave. to 190 m North
Testhole Location: Southbound lane, In line with the property line of 804 / 806 Burnell Street

Date Drilled: January 21, 2009
Depth of Testhole: 2.1 m
Logged by: Jeff Brant

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Fill - black / brown, stiff, intermediate to high plasticity clay, with sand and fine gravel	30
0.5		**Clay** - grey, stiff, moist, high plasticity - brown below 0.9 m - layers of silt below 1.7, increasing with depth	32
1.0			33
1.5			32
			25
2.0		**Silt** - tan, firm, moist, low plastcity	21
		• Frost to a depth of 1.5 m • Testhole terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Test Hole #3 for Banning / Burnell Alley

TESTHOLE TH3

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Banning / Burnell Alley, Wellington Ave. to 190 m North
Testhole Location: Northbound lane, In line with the property line of 820 / 824 Burnell Street

Date Drilled: January 21, 2009
Depth of Testhole: 2.1 m
Logged by: Jeff Brant

Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Fill - mixture of black, high plasticity silty clay with sand and fine gravel	49, 21				
0.5							
		Clay - grey, stiff, moist, high plasticity - brown below 1.0 m	27, 33	0	2.9	20.7	73.4
1.0							
		Silt - tan, firm, moist, low plastcity, some clay	26, 21				
1.5							
2.0			25				
		• Frost to a depth of 1.5 m • Testhole terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling					
2.5							

Test Hole #4 for Banning / Burnell Alley

TESTHOLE TH4

THE NATIONAL TESTING LABORATORIES LIMITED

Project Name: City of Winnipeg 2009 Alley Renewal Program
Client: KGS Group Inc.
Site: Banning / Burnell St., Wellington Ave. to 190 m North
Testhole Location: Southbound lane, In line with the property line of 834 / 836 Burnell Street

Date Drilled: January 21, 2009
Depth of Testhole: 2.1 m
Logged by: Jeff Brant

Subsurface Profile			Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 100
0.0		Ground Surface	
		Concrete	
		Crushed Limestone Base - 20 mm maximum aggregate size - 50 mm maximum aggregate size below 0.6 m	11
0.5			5
			4
1.0			
		Silt - tan, firm, moist, low to intermediate plasticity, some clay	27
1.5			22
			22
2.0			22
		• Frost to a depth of 1.5 m • Testhole terminated at 2.1 m • No water seepage or sloughing were observed during or upon completion of drilling	
2.5			

Pavement Core Photos

Testhole TH1

Testhole TH2

Testhole TH3

Testhole TH4