APPENDIX 'A' GEOTECHNICAL REPORT





DATE: April 4, 2017

Richard Hawkins, C.E.T.

WSP Canada Inc. 1600 Buffalo Place

Winnipeg, Manitoba R3T 6B8

Tel: (204) 477-6650

c/o City of Winnipeg Public

Works Department

FILE: 151 13953 00

FROM: Silvestre S. Urbano Jr., P.Eng.

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WSP Canada Inc. 1600 Buffalo Place

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TO:

PAGES:

RE: Pavement Recommendations for proposed Loudoun Road Granular

Renewal from Wilkes Avenue to Wyper Road in Winnipeg, MB.

PAVEMENT RECOMMENDATIONS

A pavement investigation was conducted on February 8, 2016 to assess the general subsurface conditions for the proposed Loudoun Road Granular Renewal from Wilkes Avenue to Wyper Road in Winnipeg, Manitoba. It was requested that pavement recommendations for the proposed granular renewal be provided. A total of 14 testholes drilled between 3m (10 ft) and 6m (20 ft) depth revealed a general soil profile consisting of granular fill followed by a clay fill which ranged from 0.3m to 1.4m thick. This clay fill layer is underlain by clay layer, which extended to the depth explored with the exceptions of TH1, TH2, TH7, TH13 and TH14. At these testholes, silt layer was encountered beneath the clay fill layer. The existing granular fill ranged from 150mm to 1200mm thick. Detailed descriptions of the testhole logs are attached as well as the site plan and moisture content test results. No seepage and caving conditions were observed from the testholes during our investigation.

Since Loudoun Road is an existing road with anticipated heavy traffic loading (Equivalent Single Axle Load, ESAL of about 261,000), the intention is to utilize and design the new pavement structure based on the existing granular fill and clay fill subgrade.

Based on the existing subsurface conditions (approximate combined CBR of 1.8, average of 600mm granular fill over clay fill subgrade) and anticipated heavy traffic, the flexible structural number needed was determined to be 4.45.

With respect to the new pavement structure of Loudoun Road, it is anticipated that 25mm of Chip Seal asphalt over 75mm of 20mm down granular fill followed by 150mm of 50mm down granular fill and 400mm of 100mm to 150mm crushed limestone will be used on top of the existing Loudoun Road. This new pavement structure was analyzed and determined to have a flexible structure number of 4.62which is above the required number of 4.45.



Based on the Equivalent Single Axle Load (ESAL) of about 261,000 for heavy duty, the recommended pavement construction at this site should be as follows:

Pavement Thicknesses

	Heavy Duty	% Compaction
Asphalt	25 mm	n/a
Base Course (20mm down)	75mm	98% Std Proctor
Subbase(50mm down)	150mm	98% Std Proctor
Subbase (100mm to 150mm crushed limestone)	400mm	n/a

The existing granular fill could be reused as subbase material provided that it is free of organic and not contaminated with any hydrocarbon. The pavement section should be constructed on a prepared existing granular fill; prepared means that scarifying the existing 200mm thick and proof rolled with a heavy vibratory roller (min. 20 passes) which translates to at least 95% Std Proctor and inspected by qualified geotechnical engineer prior to the placement of the new overlying granular fill.

The granular base course and subbase materials should include organic-free, non-frozen, aggregate conforming to the City of Winnipeg gradation limits.

Where soft but dry spots are encountered at the subbase level, construction traffic should be restricted. Soft but dry spots should be excavated with a large backhoe fitted with a smooth bucket and covered with geotextile, to at least 300mm and replaced with a 300mm thick layer of 100mm crushed limestone. In this regard, the total granular fill thickness would be 900mm for heavy-duty traffic.

The combined aggregate gradation limits and physical requirements of the asphaltic concrete should be in accordance with the City of Winnipeg granular specification.

For the hot mix asphaltic concrete, gradation analysis of the aggregates (i.e. stone, fines and additive), compaction testing and sampling of at least one representative hot mix asphalt mixture (during construction) for laboratory Marshall testing should be undertaken. This will provide data to confirm that the asphaltic concrete pavement complies with the project specification. Hot mix asphaltic concrete should not be placed at ambient temperatures lower than +4°C. During placement, the temperature of the paving mix should be in the range of +120°C to +150°C and compaction should not take place at paving mix temperatures lower than +85°C.

Sieve analysis and compaction testing of the granular base and subgrade materials should be conducted by qualified geotechnical personnel to ensure that the materials supplied and percent compactions are in accordance with design specifications.

CLOSURE

The findings and recommendations provided in this report were prepared by WSP Canada





Inc. (the Consultant) in accordance with generally accepted professional engineering principles and practices. The recommendations are based on the results of field and laboratory investigations and are reflective only of the actual testhole(s) and/or excavation(s) examined. If conditions encountered during construction appear to be different than those shown by the testhole(s) and/or excavation(s) at this site, the Consultant should be notified immediately in order that the recommendations can be reviewed and modified as necessary to address actual site conditions.

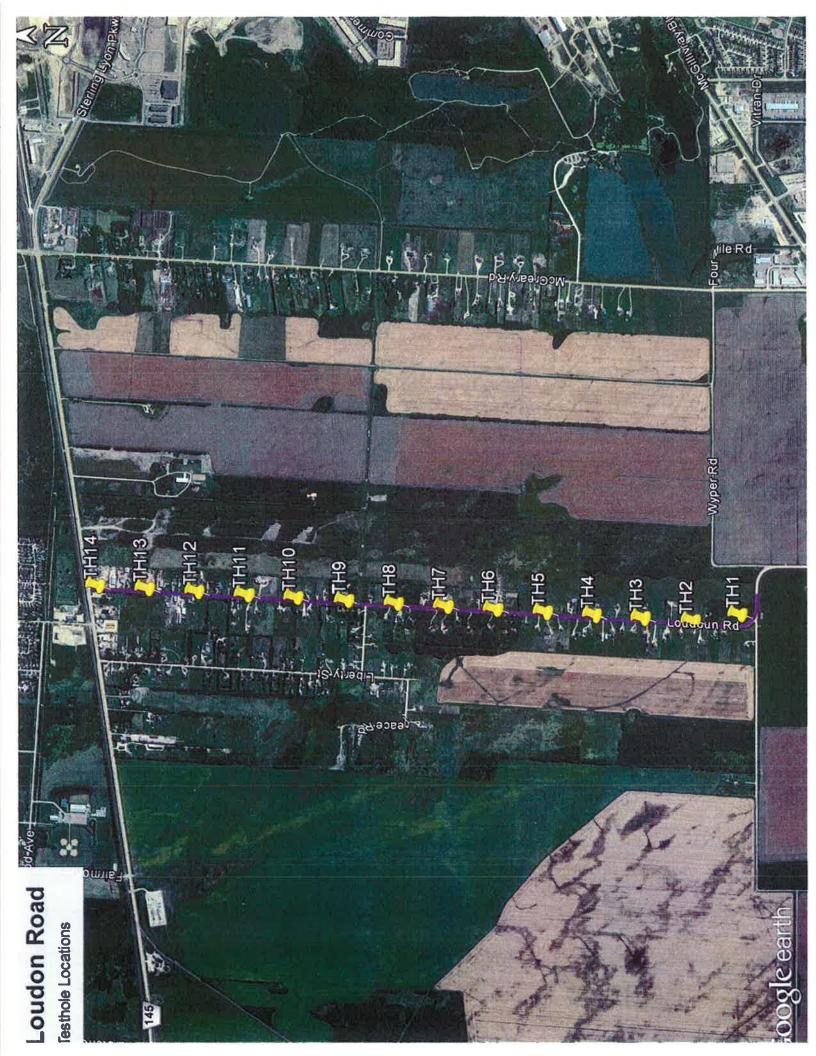
This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the geotechnical investigation. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report has been written to be read in its entirety, do not use any part of this report as a separate entity.

All files, notes, source data, test results and master files are retained by the Consultant and remain the property of the Consultant.



	W	WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650					TH1 PAGE 1 OF 1	
CLIEN	T CI	y of Winnipeg	PROJECT NAME 2016 Granular Renewals					
PROJ	ECT N	MBER 151-13953-00	PROJECT LOCATION Loudoun Road, Winnipeg, MB					
DATE	STAR	TED 2/8/16 COMPLETED 2/8/16	GROUND ELEVATION	100 m 10	0	HOLE	SIZE _125 mm	
DRILL	ING C	ONTRACTOR Maple Leaf Drilling	GROUND WATER LEVE	ELS:				
DRILL	ING M	ETHOD Continuous Auger	AT TIME OF DRI	LLING				
LOGG	ED BY	Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRIL	LING				
NOTE	S CL	of SB Lane	AFTER DRILLING	3				
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	△ SPT N VALUE △ 20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80	
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1.0 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.5		CLAY FILL - frost to 1.22 m SILTY CLAY - tan-brown, stiff SILT - tan-brown, soft CLAY - brown to grey, stiff	PP = 125 kPa PP = 10 kPa		125			
3.0	11		PP = 100 kPa		100			

LIENT CI	Ity of Winnipeg	PROJECT NAME	2016 Gran	ular Re	newals	5	
ROJECT N	IUMBER 151-13953-00	PROJECT LOCATION Loudoun Road, Winnipeg, MB GROUND ELEVATION 100 m 100 HOLE SIZE 125 mm					
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2.0	SILT - tan-brown, soft						
	CLAY - brown to grey, stiff to firm	PP = 125 kPa		125			
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3.0		PP = 75 kPa		75			

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1.5		CLAY FILL - frost to 1.52 m, stiff						
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2.5		CLAY - brown to grey, stiff	PP = 125 kPa		125			
3.0			PP = 100 kPa		100			

DEPTH (m)	WSP 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650 CLIENT City of Winnipeg PROJECT NUMBER 151-13953-00 DATE STARTED 2/8/16 COMPLETED 2/8/16 DRILLING CONTRACTOR Maple Leaf Drilling DRILLING METHOD Continuous Auger			Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650 CLIENT City of Winnipeg PROJECT NAME 2016 Granular Renewal PROJECT NUMBER 151-13953-00 PROJECT LOCATION Loudoun Road, William Contractor Maple Leaf Drilling GROUND ELEVATION 100 m 100 HOW DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS: DRILLING METHOD Continuous Auger AT TIME OF DRILLING				HOLE	Winnipeg, MB OLE SIZE 125 mm		
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	1.5		CLAY FILL - frost to 1,37 m, stiff	PP = 150 KPa		150					

WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650

CLIEN	T City	of Winnipeg	PROJECT NAME 2016 Granular Renewals PROJECT LOCATION Loudoun Road, Winnipeg, MB							
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1.0	GRANULAR FILL - base course CLAY FILL - black SILT - tan-brown, frost to 1.37 m CLAY - brown to grey at 5.33 m, stiff to firm	PP = 200 kPa		POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80

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WSP Canada Inc. WSP 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650

PROJECT NAME 2016 Granular Renewals CLIENT City of Winnipeg PROJECT NUMBER 151-13953-00 PROJECT LOCATION Loudoun Road, Winnipeg, MB ▲ SPT N VALUE ▲ POCKET PEN. (kPa) MOISTURE CONTENT (%) TESTS AND REMARKS BLOW COUNTS (N VALUE) DEPTH (m)
GRAPHIC LOG LL H 80 MC MATERIAL DESCRIPTION ☐ FINES CONTENT (%) ☐ PP = 125 KPa CLAY - brown to grey at 5.33 m, stiff to firm (continued) 3.5 4.0

4.5 75 PP = 75 kPa GENERAL BH PLOTS - WSP. LOUDOUN ROAD TESTHOLES, GPJ. GINT STD CANADA, GDT. 2/24/16 5.0

PP = 75 kPa

75

Bottom of hole at 6.10 m.

6.0

PAGE 1 OF 1

	Telephone: (204)-477-6650						
CLIENT CIT	ty of Winnipeg	PROJECT NAME 2016 Granular Renewals					
PROJECT NO	MBER 151-13953-00	PROJECT LOCATE	ON Loudo	un Roa	ad, Wir	nnipeg, MB	
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	CLAY - brown to grey at 2.74 m, stiff	PP = 175 kPa		175			
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WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650

CLIEN	T City	of Winnipeg							
PROJE	CT NU	MBER 151-13953-00							
DATE	START	ED 2/8/16 COMPLETED 2/8/16	GROUND ELEVATION 100 m 100 HOLE SIZE 125 mm						
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1.5		CLAY - brown to grey, stiff	PP = 175 kPa		175				
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1.0 Cl	LAY FILL - brown/grey mixed, frost to 1.52 m LAY - grey, stiff ILTY at 1.83 m, tan-brown	PP = 175 kPa		175			

CLIENT City of PROJECT NUMB DATE STARTED DRILLING CONT DRILLING METH	WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650 f Winnipeg BER 151-13953-00 2/8/16 COMPLETED 2/8/16 TRACTOR Maple Leaf Drilling HOD Continuous Auger Dana Bredin CHECKED BY Silvestre Urbano SB Lane	PROJECT LOCATION GROUND ELEVATION GROUND WATER LEVE AT TIME OF DRILL AT END OF DRILL	JECT NAME 2016 Granular Renewals JECT LOCATION Loudoun Road, Winnipeg, MB DELEVATION 100 m 100 HOLE SIZE 125 mm D WATER LEVELS: T TIME OF DRILLING T END OF DRILLING FTER DRILLING			nipeg, MB E SIZE 125 mm
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1.0	CLAY FILL - tan-brown, SILTY, frost to 1,52 m CLAY - brown to grey, stiff	PP = 175 kPa		175		

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	WS	WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650					TH12 PAGE 1 OF 1
LIEN	T City	y of Winnipeg	PROJECT NAME	2016 Gran	ular Re	newale	.
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IOTE	S CL	of Road	AFTER DRILLIN		_		
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 60 PL MC LL 20 40 60 80 PINES CONTENT (%) 20 40 60 80
		GRANULAR FILL - base course			†		20 40 80 80
1.0		CLAY - black, frost to 1.22 m CLAY - brown to grey, stiff	PP = 175 kPa		175		
2.5			PP = 100 kPa		100		

GENERAL BH PLOTS - WSP LOUDOUN ROAD TESTHOLES GPJ GINT STD CANADA GDT 2224/16

PROJECT NUMBER OF START OFFILLING CO DRILLING ME COGGED BY	Telephone: (204)-477-6650 NT City of Winnipeg ECT NUMBER 151-13953-00 ESTARTED 2/8/16 COMPLETED 2/8/16 GROUND ELEVATION 100 m 100 GROUND WATER LEVELS: LING METHOD Continuous Auger GED BY Dana Bredin CHECKED BY Silvestre Urbano AFTER DRILLING AFTER DRILLING			ad, Winnipeg, MB HOLE SIZE 125 mm		
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
1.5	CLAY FILL - black SILT - tan-brown, frost to 1.22 m, moist at 1.52 m, soft CLAY - brown to grey, stiff	PP = 10 kPa		10		

Teleph ENT City of Winnipeg DJECT NUMBER 151- TE STARTED 2/8/16 ILLING CONTRACTOR ILLING METHOD Con	.13953-00 COMPLETED 2/8/16 Maple Leaf Drilling	PROJECT LOCATION Loudoun Road, Winnipeg, MB GROUND ELEVATION 100 m 100 HOLE SIZE 125 mm GROUND WATER LEVELS: AT TIME OF DRILLING AT END OF DRILLING AFTER DRILLING			nipeg, MB E SIZE 125 mm	
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.5 SILT - tai	AR FILL - base course L - black, frost to 1.22 m n-brown, moist, soft	PP = 10 kPa		10		



CLIENT: WSP		TEST NO:	1	PROJECT NO: 1	03-1602	
PROJECT: Loudon Rd		DATE SAMPL	.ED:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:		
Hole	1	1	1	1 1	1	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	141.20	100.60	81.60	90.40	104.10	
Wt Dry Sample + Tare	122.70	80.20	63.80	69.90	83.10	
Wt Water	18.50	20.30	17.80	20.50	20.90	
Wt Tare	4.40	4.60	4.30	5.10	5.00	
Wt Dry Sample	118.30	75.60	59.50	64.80	78.10	
Moisture Content (%)	15.7	26.9	29.9	31.6	26.9	
Hole	1	1	1			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	141.10	173.40	92.30			
Wt Dry Sample + Tare	114.30	140.10	64.10			
Wt Water	26.80	33.20	28.10			
Wt Tare	4.30	4.40	4.40			
Wt Dry Sample	110.00	135.70	59.70			
Moisture Content (%)	24.4	24.5	47.1			
Hole	2	2	2	2	2	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	96.60	113.90	89.00	76.10	100.50	
Wt Dry Sample + Tare	89.00	95.20	75.40	61.60	80.20	
Wt Water	7.50	18.60	13.60	14.40	20.20	
Wt Tare	4.30	4.30	4.20	4.60	4.20	
Wt Dry Sample	84.70	90.90	71.20	57.00	76.00	
Moisture Content (%)	9.0	20.5	19.1	25.3	26.6	
Hole	2	2	2			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	132.20	115.70	96.00	-		
Wt Dry Sample + Tare	108.30	84.40	67.20			
Wt Water	23.90	31.30	28.70			
Wt Tare	4.20	4.30	4.20			
Wt Dry Sample	104.10	80.10	63.00			
Moisture Content (%)	23.0	39.2	45.6			



CLIENT: WSP		TEST NO:	1	PROJECT NO: 10	03-1602		
PROJECT: Loudon Rd		DATE SAMPL	.ED:	SAMPLED BY:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:			
Hole	3	3	3	3	3		
Depth (ft)	1.00	2.00	3.00	4.00	5.00		
Tare No:	159	160	161				
Wt Wet Sample + Tare	94.90	137.50	96.50	106.50	84.80		
Wt Dry Sample + Tare	88.10	125.60	87.30	87.20	60.90		
Wt Water	6.80	11.80	9.10	19.20	23.90		
Wt Tare	4.30	4.20	4.20	4.50	4.20		
Wt Dry Sample	83.80	121.40	83.10	82.70	56.60		
Moisture Content (%)	8.1	9.7	11.0	23.3	42.3		
Hole	3	3	3				
Depth (ft)	6.00	7.00	10.00				
Tare No:	159	160	161				
Wt Wet Sample + Tare	88.10	103.70	101.70				
Wt Dry Sample + Tare	68.10	74.80	67.60				
Wt Water	20.00	28.90	34.00				
Wt Tare	4.50	4.30	4.40				
Wt Dry Sample	63.60	70.50	63.20				
Moisture Content (%)	31.5	40.9	53.9				
Hole	4	4	4	4	4		
Depth (ft)	1.00	2.00	3.00	4.00	5.00		
Tare No:	159	160	161				
Wt Wet Sample + Tare	134.60	93.60	124.70	115.10	95.70		
Wt Dry Sample + Tare	124.80	77.40	99.80	81.70	68.10		
Wt Water	9.80	16.20	24.90	33.40	27.60		
Wt Tare	4.20	4.70	4.80	4.30	4.20		
Wt Dry Sample	120.60	72.70	95.00	77.40	63.90		
Moisture Content (%)	8.2	22.3	26.3	43.2	43.3		
Hole	4	4	4				
Depth (ft)	6.00	7.00	10.00				
Tare No:	159	160	161				
Wt Wet Sample + Tare	100.20	96.70	117.10				
Wt Dry Sample + Tare	71.20	69.10	77.70				
Wt Water	28.90	27.50	39.40				
Wt Tare	4.20	4.10	4.20				
Wt Dry Sample	67.00	65.00	73.40				
Moisture Content (%)	43.2	42.3	53.7				



CLIENT: WSP		TEST NO:	1	PROJECT NO: 10	03-1602	
PROJECT: Loudon Rd		DATE SAMPLE	ED:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTED	DATE TESTED:			
Hole	5	5	5	5	5	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	160.70	150.80	152.00	146.70	145.30	
Wt Dry Sample + Tare	154.90	114.10	115.00	109.40	108.00	
Wt Water	5.70	36.70	37.00	37.30	37.30	
Wt Tare	4.30	4.30	4.60	4.30	4.20	
Wt Dry Sample	150.60	109.80	110.40	105.10	103.80	
Moisture Content (%)	3.9	33.4	33.5	35.5	35.9	
Hole	5	5	5			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	152.20	164.50	145.30			
Wt Dry Sample + Tare	108.50	118.00	97.30			
Wt Water	43.70	46.50	48.00			
Wt Tare	4.30	4.50	4.30			
Wt Dry Sample	104.20	113.50	93.00			
Moisture Content (%)	41.9	41.0	51.6			
Hole	6	6	6	6	6	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	160.30	147.80	156.40	146.00	158.20	
Wt Dry Sample + Tare	155.10	113.80	120.30	111.10	119.30	
Wt Water	5.20	34.00	36.10	34.90	38.90	
Wt Tare	4.30	4.60	4.20	4.20	4.20	
Wt Dry Sample	150.80	109.20	116.10	106.90	115.10	
Moisture Content (%)	3.4	31.1	31.1	32.6	33.8	
Hole	6	6	6			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	153.70	172.00	156.50			
Wt Dry Sample + Tare	108.80	123.00	108.30			
Wt Water	44.90	49.00	48.20			
Wt Tare	4.30	4.20	4.20			
Wt Dry Sample	104.50	118.80	104.10			
Moisture Content (%)	43.0	41.2	46.3			



CLIENT: WSP		TEST NO:	1	PROJECT NO: 1	03-1602	
PROJECT: Loudon Rd		DATE SAMPL	.ED:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:		
Hole	7	7	7	7	7	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	173.50	147.30	159.00	151.90	155.50	
Wt Dry Sample + Tare	164.70	115.40	130.20	124.70	126.70	
Wt Water	8.80	31.90	28.80	27.20	28.80	
Wt Tare	4.40	4.20	4.20	4.60	4.30	
Wt Dry Sample	160.30	111.20	126.00	120.10	122.40	
Moisture Content (%)	5.5	28.7	22.9	22.6	23.5	
Hole	7	7	7			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161		11-	
Wt Wet Sample + Tare	176.60	162.90	154.40			
Wt Dry Sample + Tare	129.20	115.10	101.70			
Wt Water	47.40	47.80	52.70			
Wt Tare	4.60	4.40	4.30			
Wt Dry Sample	124.60	110.70	97.40			
Moisture Content (%)	38.0	43.2	54.1			
Hole	8	8	8	8	8	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	175.60	171.00	143.60	180.20	153.40	
Wt Dry Sample + Tare	161.10	146.90	118.10	146.80	116.40	
Wt Water	14.50	24.10	25.50	33.40	37.00	
Wt Tare	4.50	4.20	4.20	4.40	4.20	
Wt Dry Sample	156.60	142.70	113.90	142.40	112.20	
Moisture Content (%)	9.3	16.9	22.4	23.5	33.0	
Hole	8	8	8			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	156.70	169.80	157.60			
Wt Dry Sample + Tare	111.60	120.20	103.90			
Wt Water	45.10	49.60	53.70			
Wt Tare	4.40	4.20	4.40			
Wt Dry Sample	107.20	116.00	99.50			
Moisture Content (%)	42.1	42.8	54.0			



CLIENT: WSP		TEST NO:	11	PROJECT NO: 10	03-1602	
PROJECT: Loudon Rd		DATE SAMPL	.ED:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:		
Hole	9	9	9	9	9	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	109.80	113.80	111.60	77.70	119.80	
Wt Dry Sample + Tare	104.50	91.50	84.30	58.90	90.70	
Wt Water	5.30	22.20	27.30	18.70	29.00	
Wt Tare	4.30	4.20	4.20	4.30	4.30	
Wt Dry Sample	100.20	87.30	80.10	54.60	86.40	
Moisture Content (%)	5.3	25.5	34.1	34.3	33.6	
Hole	9	9	9			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	113.70	132.10	119.30			
Wt Dry Sample + Tare	81.70	92.60	81.80			
Wt Water	32.00	39.40	37.40			
Wt Tare	4.30	4.30	4.30			
Wt Dry Sample	77.40	88.30	77.40			
Moisture Content (%)	41.4	44.6	48.4			
Hole	10	10	10	10	10	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	195.20	94.50	107.90	97.40	90.30	
Wt Dry Sample + Tare	187.80	81.40	88.90	71.40	66.20	
Wt Water	7.40	13.00	18.90	26.00	24.10	
Wt Tare	4.40	4.30	4.30	4.60	4.20	
Wt Dry Sample	183.40	77.10	84.60	66.80	62.00	
Moisture Content (%)	4.0	17.0	22.4	38.9	38.9	
Hole	10	10	10			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	100.20	134.60	117.40			
Wt Dry Sample + Tare	71.80	95.60	81.00			
Wt Water	28.30	38.90	36.30			
Wt Tare	4.30	4.20	4.60			
Wt Dry Sample	67.50	91.40	76.40			
Moisture Content (%)	42.0	42.6	47.6			



CLIENT: WSP	***	TEST NO:	1	PROJECT NO: 1	03-1602	
PROJECT: Loudon Rd		DATE SAMPL	ED:	SAMPLED BY:		
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:		
Hole	11	11	11	11	11	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	159.70	151.70	150.30	160.30	159.50	
Wt Dry Sample + Tare	151.40	133.50	126.30	126.70	127.90	
Wt Water	8.20	18.20	24.00	33.60	31.60	
Wt Tare	4.60	4.20	4.30	4.20	4.20	
Wt Dry Sample	146.80	129.30	122.00	122.50	123.70	
Moisture Content (%)	5.7	14.1	19.7	27.4	25.5	
Hole	11	11	11			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	144.30	153.10	158.90			
Wt Dry Sample + Tare	106.20	109.30	107.30			
Wt Water	38.10	43.80	51.60			
Wt Tare	4.50	4.20	4.20			
Wt Dry Sample	101.70	105.10	103.10			
Moisture Content (%)	37.5	41.7	50.0			
Hole	12	12	12	12	12	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	152.90	-152.70	148.50	157.90	152.90	
Wt Dry Sample + Tare	125.50	112.70	110.00	116.10	113.60	
Wt Water	27.40	40.00	38.50	41.80	39.30	
Wt Tare	4.40	4.30	4.40	4.20	4.20	
Wt Dry Sample	121.10	108.40	105.60	111.90	109.40	
Moisture Content (%)	22.6	36.9	36.5	37.4	35.9	
Hole	12	12	12			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	170.30	158.10	166.40			
Wt Dry Sample + Tare	118.70	109.70	113.20			
Wt Water	51.60	48.40	53.20			
Wt Tare	4.40	4.20	4.20			
Wt Dry Sample	114.30	105.50	109.00			
Moisture Content (%)	45.1	45.9	48.8			



CLIENT: WSP		TEST NO:	1	PROJECT NO: 103-1602		
PROJECT: Loudon Rd	DATE SAMPL	.ED:	SAMPLED BY:			
PROJECT CONTACT:		DATE TESTE	D:	TESTED BY:		
Hole	13	13	13	13	13	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	153.40	175.90	153.60	160.50	181.10	
Wt Dry Sample + Tare	145.60	138.60	122.60	128.20	148.00	
Wt Water	7.80	37.30	31.00	32.30	33.10	
Wt Tare	4.60	4.20	4.20	4.30	4.30	
Wt Dry Sample	141.00	134.40	118.40	123.90	143.70	
Moisture Content (%)	5.5	27.8	26.2	26.1	23.0	
Hole	13	13	13			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	162.60	155.90	154.60			
Wt Dry Sample + Tare	126.40	111.00	105.00			
Wt Water	36.20	44.90	49.60			
Wt Tare	4.30	4.20	4.30			
Wt Dry Sample	122.10	106.80	100.70			
Moisture Content (%)	29.6	42.0	49.3			
Hole	14	14	14	14	14	
Depth (ft)	1.00	2.00	3.00	4.00	5.00	
Tare No:	159	160	161			
Wt Wet Sample + Tare	162.10	150.40	154.80	149.20	150.30	
Wt Dry Sample + Tare	150.30	108.10	118.20	115.90	115.90	
Wt Water	11.80	42.30	36.60	33.30	34.40	
Wt Tare	4.60	4.20	4.20	4.50	4.20	
Wt Dry Sample	145.70	103.90	114.00	111.40	111.70	
Moisture Content (%)	8.1	40.7	32.1	29.9	30.8	
Hole	14	14	14			
Depth (ft)	6.00	7.00	10.00			
Tare No:	159	160	161			
Wt Wet Sample + Tare	184.90	179.00	157.90			
Wt Dry Sample + Tare	151.10	148.00	114.70			
Wt Water	33.80	31.00	43.20			
Wt Tare	4.20	4.60	4.30			
Wt Dry Sample	146.90	143.40	110.40			
Moisture Content (%)	23.0	21.6	39.1			