

DATE: July 25, 2014**FILE:** 141 18294 00**TO:** **Brent Jonson, P.Eng.**
Project Manager
WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba R3T 6B8
Tel: (204) 477-6650**FROM:** Silvestre S. Urbano Jr., P.Eng.
Sr. Geotechnical Engineer
WSP Canada Inc.
1600 Buffalo Place
Winnipeg, Manitoba R3T 6B8
Tel: (204) 477-6650**FAX:** (204) 474-2864**FAX:****PAGES:****RE: Pavement Recommendations for proposed Left Turn Lane and Median Opening at 765 Keewatin Street in Winnipeg, MB.**

PAVEMENT RECOMMENDATIONS

A pavement investigation was conducted on June 24, 2014 to assess the general subsurface conditions for the proposed left turn lane and median opening at 765 Keewatin Street in Winnipeg, Manitoba. It was requested that pavement recommendations for the proposed lane be provided. A total of 2 testholes drilled to 4.6m (15 ft) depth revealed a general soil profile of a layer of fill about 1.5m depth over a thick clay layer, which extended to the depth explored. Note that a testhole (TH1) was drilled at the existing street and another testhole was drilled at the existing median boundary (TH2). Detailed descriptions of the testhole logs are attached as well as the site plan. No seepage and caving conditions were observed from the testholes during our investigation.

Since the proposed left turn lane is connected to an existing street (Keewatin Street), the pavement recommendation for the proposed left turn lane should be the same as the existing street. The existing street has a pavement structure consisting of 50mm ASPHALT over 200mm of CONCRETE followed by 400mm of GRANULAR FILL over a CLAY FILL subgrade. Due to a weaker subgrade, the granular fill thickness was increased to 600mm and a non-woven geotextile is recommended on top of compacted CLAY FILL subgrade. 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	50 mm	98% Marshall
Concrete	200mm	n/a
Base Course	150mm	98% Std Proctor
Subbase(Class"C")	450mm	98% Std Proctor

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 CLAY FILL; prepared means that scarifying the existing 200mm thick subgrade 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 non-woven geotextile followed by the 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.

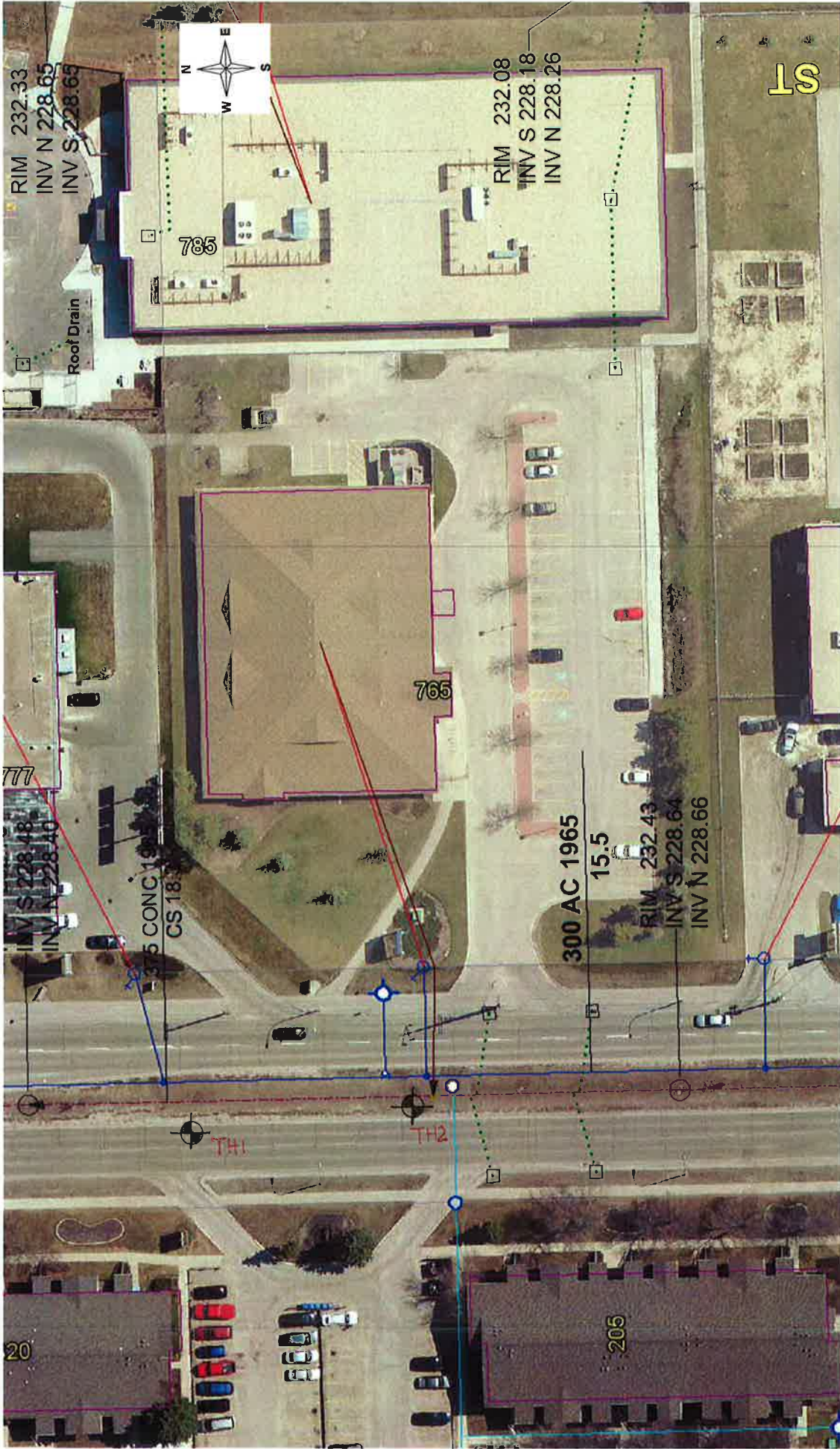
This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the geotechnical investigation. The material in this report reflects the Consultant's best judgment in light of the information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





Note - this is for information only. There is no guarantee as to the accuracy or completeness of the data. For record drawing information, please contact the Underground Structures Branch at 986-6401.

Project No: 141-18294-00

Client: City of Winnipeg, Public Works Dep't.

TH1

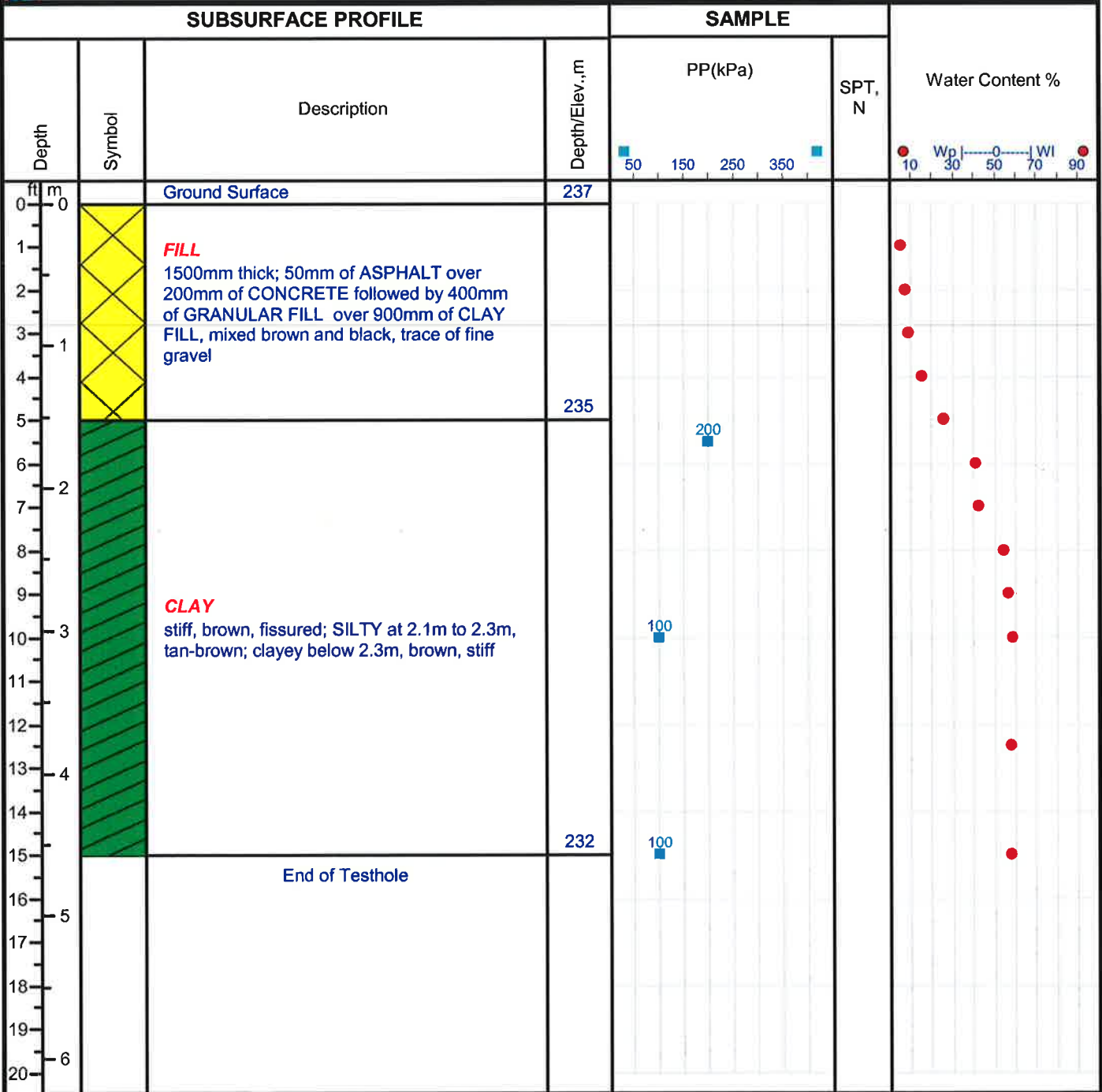
Project: LEFT TURN LANE and MEDIAN OPENING

Location: 765 Keewatin Street



Enclosure:

Engineer: SSU



Drill Method: S/S Auger

WSP Canada Inc.
1600 Buffalo Place
Winnipeg, MB.
R3T 6B8

Elevation: Assumed 100.0m

Drill Date: 06/24/14

Checked by: SSU

Hole Size: 125mm

Sheet: 1 of 1

Project No: 141-18294-00

Client: City of Winnipeg, Public Works Dept.

TH2

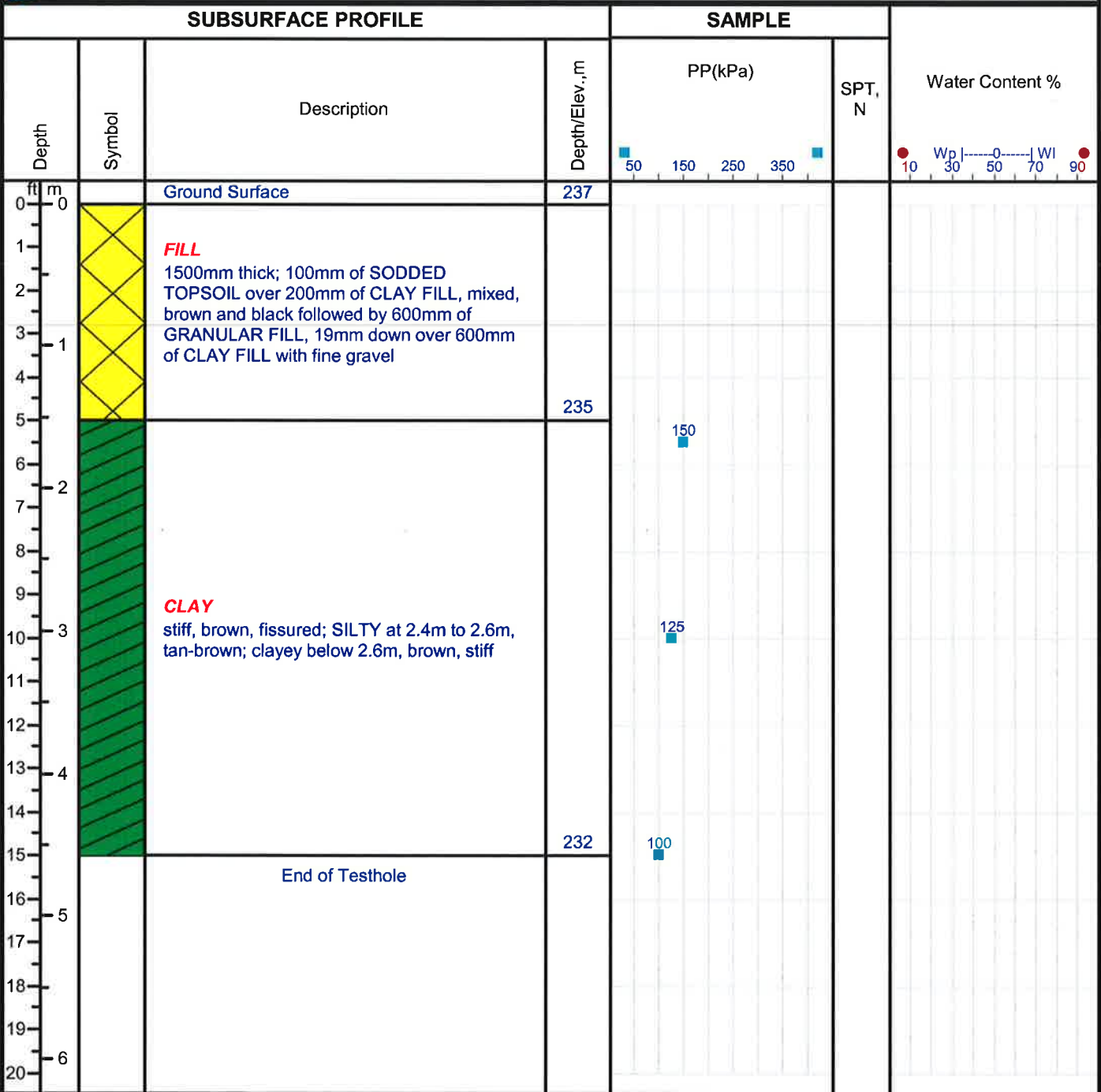
Project: LEFT TURN LANE and MEDIAN OPENING

Location: 765 Keewatin Street



Enclosure:

Engineer: SSU



Drill Method: S/S Auger

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Elevation: Assumed 100.0m

Drill Date: 06/24/14

Checked by: SSU

Hole Size: 125mm

Sheet: 1 of 1

1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
 Winnipeg, Manitoba Phone: 204 697-3854 Cell: 204 997-1355
 Email: hmanal@mts.net

CLIENT: WSP	TEST NO: HM 131		PROJECT NO 14-58		
PROJECT: 765 Keewatin	DATE SAMPLED: 02-Jul-14		SAMPLED BY SU		
PROJECT CONTACT: S. Urbano	DATE TESTED: 03-Jul-14		TESTED BY: Le Yang		
Test Hole No.	1	2	3	4	5
Depth	1'	2'	3'	4'	5'
Tare No.	1	2	3	4	5
Wt Wet Sample + Tare	229.3	317.9	355.7	440.8	428
Wt Dry Sample + Tare	216.5	294.4	325.7	381.9	340.7
Wt Water	12.8	23.5	30	58.9	87.3
Wt Tare	7.4	6.9	7.2	7.1	7.1
Wt Dry Sample	209.1	287.5	318.5	374.8	333.6
Moisture Content (%)	6.12	8.17	9.42	15.72	26.17
Test Hole No.	6	7	8	9	10
Depth	6'	7'	8'	9'	10'
Tare No.	6	7	8	9	10
Wt Wet Sample + Tare	416.7	568.1	486	389	452
Wt Dry Sample + Tare	296.8	400.5	316.4	251.1	288
Wt Water	119.9	167.6	169.6	137.9	164.1
Wt Tare	7.2	7.0	7.0	7.4	6.9
Wt Dry Sample	289.6	393.5	309.4	243.7	281.1
Moisture Content (%)	41.40	42.60	54.82	56.59	58.40
Hole No.	11	12			
Depth	12.5'	15'			
Tare No.	11	12			
Wt Wet Sample + Tare	477.6	564.3			
Wt Dry Sample + Tare	305.2	359.4			
Wt Water	172.4	204.9			
Wt Tare	7.0	7.3			
Wt Dry Sample	298.2	352.1			
Moisture Content (%)	57.81	58.19			