GEOTECHNICAL REPORT
PROPOSED BRONX COMMUNITY CENTRE
WINNIPEG, MANITOBA

Prepared for:

Number 10 Architectural Group
310-115 Bannatyne Avenue
Winnipeg, MB
R3B 0R3

Project No: WE 07102 00 WE

August, 2007

GENIVAR
600 – 5 DONALD STREET
WINNIPEG, MB R3L 2T4

ENGINEERS, SCIENTISTS & PROJECT MANAGERS

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1.0 SUMMARY

A geotechnical investigation was conducted for the proposed Bronx Park Community Centre in Winnipeg, Manitoba to assess the general subsurface conditions. It was requested that foundation recommendations for the proposed structure (a one storey with a partial mezzanine) be provided. A total of 8 testholes (three deep testholes drilled to auger refusal, one to 7.6m and four to 3m depths) revealed a general soil profile consisting of a layer of fill underlain by an upper clay layer over a thin saturated silt layer about 600mm to 1.07m thick followed by a lower clay layer over a till layer, which extended to the depth explored. Seepage and caving conditions were observed from the silt layers after completion of drilling.

Based upon the subsurface conditions encountered, the preferred foundation for the proposed structure is either a system of precast, prestressed driven concrete pile end bearing on dense till /suspected bedrock or cast-in-place friction piles.

2.0 INTRODUCTION

2.1 SCOPE OF WORK

Genivar was retained to undertake a soils investigation for the proposed facility (a one-storey structure with partial mezzanine) in Winnipeg, Manitoba. The purpose of this work was to establish the soil and groundwater conditions at the site and provide foundation and pavement recommendations for the proposed structure as well as comments on potential problems. Authorization to proceed with the work was provided by City of Winnipeg c/o Number 10 Architectural Group.

2.2 PROPOSED FACILITY

The proposed structure will be a heated single-storey structure (a 24,918 sqft total foot print). The anticipated floor for the structure will be a structural floor.

2.3 EXISTING SITE

The site is located at 131 Chelsea Place. There are currently three existing one-storey buildings and three hockey rinks located north and west of the existing buildings and a baseball diamond park at west of the hockey rinks. In addition, a paved parking lot is located immediately north of the existing buildings. The topography of the proposed site is fairly flat.

3.0 FIELD METHODOLOGY

The subsoils encountered were visually classified to the full extent in the testhole and representative soil samples were recovered at regular depth intervals. Pocket penetrometer tests were conducted on cohesive soil to determine the approximate unconfined compressive strength and random Standard Penetration Testing (SPT) was conducted to determine the relative density. Groundwater seepage and sloughing encountered in the testholes were noted.

4.0 FIELD TESTING

The field investigation was undertaken on July 4, 2007. A truck-mounted drill rig with a continuous flight auger was used to drill a total of eight testholes, four deep and four shallow testholes between 3 and 20m. The testhole location is shown on the site plan in Appendix A.

Random pocket penetrometer and SPT testing were conducted in the testhole to determine the strength and relative density of the soil. Detailed descriptions of the soil profiles in each testhole are shown on the attached testhole logs, TH1 to TH8 in Appendix B.

5.0 SUBSURFACE CONDITIONS

5.1 SOIL PROFILE/GROUNDWATER

Four deep and four shallow testholes drilled between 3m and 19.8m depth revealed a general soil profile consisting of a layer of fill underlain by an upper clay layer over a thin saturated silt layer about 600mm to 1.07m thick followed by a lower clay layer over a till layer, which extended to the depth explored. Seepage and caving conditions were observed from the silt layers after completion of drilling.

6.0 DISCUSSION AND RECOMMENDATIONS

6.1 GENERAL

The foundation recommendations are made on our understanding that the proposed structure is lightly to medium loaded structure. The anticipated floor for the proposed structure will be a structural slab floor.

6.2 FOUNDATIONS

Foundation alternatives, which were considered, include conventional footings, cast-in-place (CIP) concrete friction piles and precast concrete driven piles end-bearing on the native undisturbed dense till or suspected bedrock.

Due to swelling, shrinkage and long-term settlement, a conventional footing on clay is not recommended. The preferred foundation, which may be utilized for this structure, is either a system of precast concrete driven piles end-bearing on the native undisturbed dense till or suspected bedrock and cast-in-place friction piles.

6.2.1 Precast, Prestressed Driven Concrete Piles

One of the preferred foundation for the proposed 24,920 sqft Total Footprint building is a system of driven, prestressed, precast concrete piles. These units, when driven to practical refusal in the dense till with a heavy hammer capable of delivering a rated energy of 40672.4 N-m(30,000 ft-lbs) per blow, may be assigned the following allowable loads.

Pile Size mm(in)	Allowable Loads kN, (tons)
300(12) hex	443 (50)
350(14) hex	620 (70)
400(16) hex	797 (90)

Pile spacing should not be less than 3 pile diameters, centre to centre. Pile heaving at groups should be monitored and redriving done where pile heaving is found to be significant. The pile driving may induce some vibration and subsoil displacements. To avoid unjustified damage claim, a preconstruction survey of adjacent buildings in the form of inspection and taking photographic documentation should be enforced prior to the pile installation.

To reduce the effects of pile driving upon adjacent buildings and buried services, preboring to at least 1.5m below grade should be considered for all driven pile locations. The prebore hole should be equal to the nominal pile diameter.

To ensure that all piles can be driven adequately to a safe bearing stratum and to develop the recommended loads, full time pile inspection by qualified geotechnical personnel is recommended. Practical refusal can be defined as the final penetration resistance of 5, 8, and 12 blows per 25mm for the 300, 350 and 400mm sizes respectively. The final penetration resistances should be achieved at least 3 times for the final resistance. *Pile installation may also be adversely affected by loose backfill, numerous silt seams inclusions, cobbles and boulders.* Thus, contract documents should properly cover these potential obstacles during pile installation.

The estimated pile refusal depths at this location are approximately between 17.9 to 19.2m depths below grade on dense till or suspected bedrock.

6.2.2 Cast-in-Place Friction Piles

The other preferred foundation is the use of cast-in-place friction piles. An allowable shaft adhesion value for each pile length is calculated and is shown in the table 1 below this section. This pile design is only applied to the pile circumference within the native clay. A maximum length of 15.2m piles below grade should be used due to a presence of till layer beyond the

15.2m depths.

TABLE 1

PILE LENGTH, m	FRICTION VALUE, kPa
7.6m (25 ft)	19.1 kPa (400 psf)
9.1m (30 ft)	19.1 kPa (400 psf)
10.7m (35 ft)	16.6 kPa (346.6 psf)
12.2m (40 ft)	15.2 kPa (316.6 psf)
13.7m (45 ft)	14.1 kPa (295.2 psf)
15.2m (50 ft)	14.0 kPa (293.0 psf)

For the exterior piles, the upper 3.0m(10 ft) of the piles should be ignored. If heavier loads are used, the utilization of a single, larger diameter friction pile is preferred.

Pile spacing should be at least three pile diameters, centre to centre. *Seepage and sloughing was noted from 1m to 4m depth in the testhole logs, temporary steel sleeves should be on hand and used as required during pile installation.* To minimize pile construction difficulties, the total number of pile holes left open at any given time should not be more than four and the pile holes should be poured with concrete as soon as they are drilled to the design diameters and depths.

Piles located in unheated areas should be provided with full-length reinforcements, a minimum pile length of 7.62m(25 ft) and the top 2.1m(7 ft) of the pile should be wrapped with greased sona tube to reduce the potential for frost jacking.

Pile installation may be adversely affected by loose backfill and the possible presence of existing concrete slabs from existing buildings. Thus, contract documents should properly cover these potential obstacles during pile installation.

Pile inspection by qualified geotechnical personnel should therefore be employed to ensure a satisfactory foundation installation. No more than four pile holes should be left open at any one time and each pile hole should be poured with concrete as soon as it is cleaned, inspected and approved.

6.2.3 Floor Slab

The anticipated floor slab structure is a structural slab. A structural floor supported on piles and separated from the underlying subsoils with a minimum 150mm void space is recommended. A similar void should be provided under grade beams and pile caps.

6.3 SITE CLASSIFICATION

Using the new 2005 National Building Code of Canada (NBC), the combined 30m depth of this site has an average strength in excess of 100 kPa. Thus, the geotechnical site classification with respect to seismic site response is *Class C*.

6.4 PAVEMENT RECOMMENDATIONS

The anticipated subgrade for the whole site is clay subgrade. Based on this assumption, (i.e. mainly a fill subgrade), the recommended asphaltic concrete pavement construction at this site, based on the assumption of using an Equivalent Single Axle Load (ESAL) of about 21,000 and 261,000 for light duty and heavy duty traffic respectively, should be as follows:

Pavement Structure

	Light Duty	Heavy Duty	% Compaction
Asphalt	75 mm	100 mm	98% Marshall
Base Course	150 mm	150 mm	98% STD
Subbase	200 mm	375 mm	98% STD

The above pavement sections should be constructed on a prepared clay subgrade. The anticipated site stripping at the proposed building structure parking lot is about 200 to 300mm to 600mm depending on the traffic. The average depth of topsoil (see TH5 and TH6) is 200mm. The prepared subgrade should be proof rolled with a heavy sheepsfoot roller (min. 20 passes) which translates to at least 95% Std Proctor.

The granular base course and subbase materials should include organic-free, non-frozen, aggregate conforming to the City of Winnipeg gradation limits. The existing granular at the parking lot could be reused as subbase material provided that it is free from organic and asphalt debris (crushed asphalt fill).

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

Where soft but dry spots are encountered at the subgrade level, construction traffic should be restricted. Soft spots should be excavated 300mm and covered with woven geotextile. The excavated material should be replaced with 300mm thick of 150mm down limestone. Any saturated subgrade conditions should be dried off quickly by excavation of sump pit or installation of permanent subdrains (600mm below the subgrade level) connected to positive outlet (catch basin) prior to placing the granular fill structure. At these locations, the placing of granular fill should follow the geotextile specifications for soft grounds spot.

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

For any concrete apron, sidewalk, curbs, the pavement structure should consist of 150mm reinforced concrete followed by 150mm of compacted (98% Standard Proctor Density) base course over the compacted subgrade. If a silt layer was encountered as subgrade, the application of woven geotextile over the silt layer is recommended.

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 $+4^0$C. During placement, the temperature of the paving mix should be in the range of $+120^0$C to $+150^0$C and compaction should not take place at paving mix temperatures lower than $+85^0$C.

7.0 ADDITIONAL CONSIDERATIONS

Concrete should be manufactured with sulphate-resistant (Type 50) cement and air content between 4% and 7%. Any concrete subject to cycles of freezing and thawing should be air entrained in accordance with the latest edition of CSA A23.1, Concrete Materials and Methods of Concrete Construction.

8.0 CLOSURE

The findings and recommendations provided in this report were prepared in accordance with generally accepted professional engineering principles and practices. The recommendations are based on the results of field and laboratory investigations. If conditions encountered during construction appear to be different than those shown by the testholes at this site, this office should be notified immediately in order that the recommendations can be reviewed.

This report has been prepared by Genivar for the benefit of the client to whom it is addressed. The information and data contained herein represent Genivar best professional judgment in light of the knowledge and information available to Genivar at the time of preparation. Except as required by law, this report and the information and data contained herein are to be treated as confidential and may be used and relied upon only by the client, its officers and employees. Genivar denies any liability whatsoever to other parties who may obtain access to this report for any injury, loss or damage suffered by such parties arising from their use of, or reliance upon, this report or any of its contents without the express written consent of Genivar and the client.

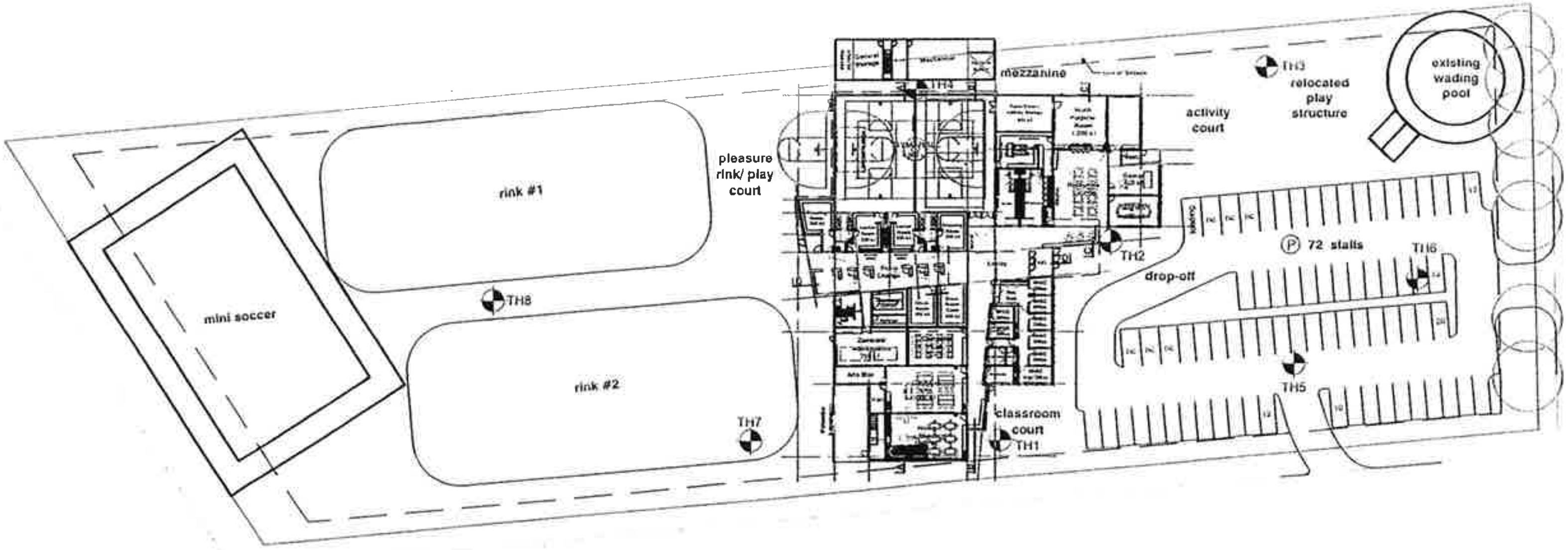
Prepared by: Silvestre S. Urbano Jr., P.Eng.
Reviewed by: Ross Webster, P.Eng.

PROVINCE OF MANITOBA
S. S.
URBANO
AUG. 29/07
REGISTERED PROFESSIONAL ENGINEER

APEGM
Certificate of Authorization
Genivar Consultants Limited Partnership
No. 4318 Date: April 30, 2008

APPENDIX A

Site Plan



TESTHOLE LOCATION PLAN

NOT TO SCALE

GENIVAR
600-5 DONALD STREET
WINNIPEG, MB R3L 2T4
Tel: (204)477-6650
Fax: (204)474-2864

Seals

Consultants

THIS DRAWING AND DESIGN MAY NOT BE USED ON OTHER PROJECTS WITHOUT WRITTEN PERMISSION FROM GENIVAR

ISS.	REV	DATE	APP	DESCRIPTION

NUMBER 10 ARCHITECTURE
BRONX PARK COMMUNITY CENTRE
FACILITY REDEVELOPMENT
WINNIPEG MANITOBA

GEOTECHNICAL

TESTHOLE LOCATION PLAN

DESIGNED	S.S.U.	APPROVED	S S U
DRAWN	RO	SCALE	NOT TO SCALE
CHECKED	S.S.U.	DATE	07/07/20
PROJECT NO.	WE07102	DRAWING NO. G01	REV 0

ACAD No. BXXXX

APPENDIX B

Testhole Logs

GENIVAR

Project No: WE-07-102-00-WE

TH1

Project: Bronx Park Community Center

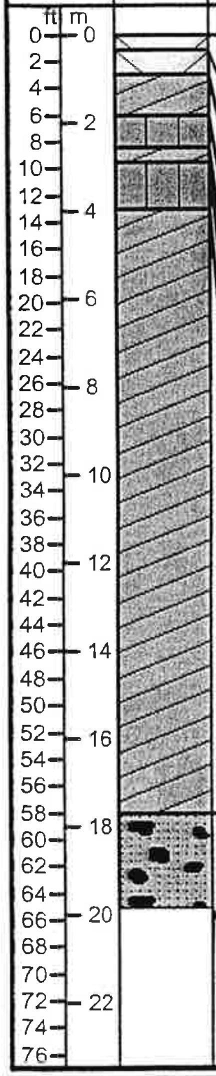
Client: Number 10 Architectural Group

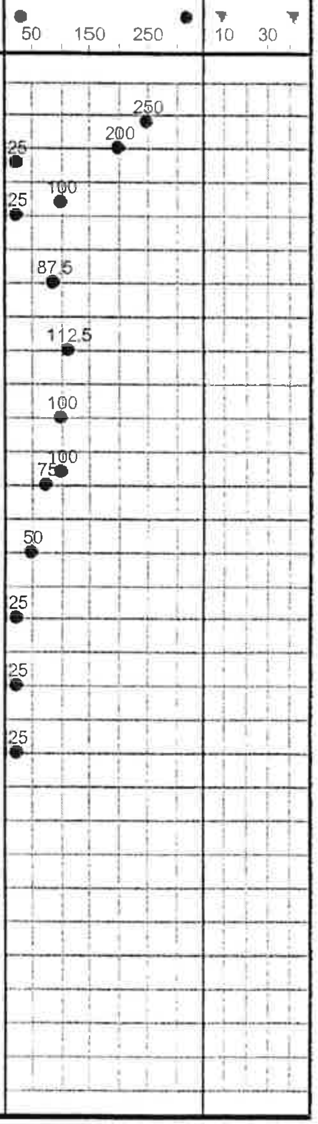
Location: Winnipeg, Manitoba

Logged: RO

Engineer: S.S.U

Depth	Symbol	DESCRIPTION	Elevation (m)	SPT (blows/ 0.3m)	Field Vane, KN-m	Pocket Penetrometer Test kPa	Water Content %
		Ground Surface	100				
		PAVEMENT SECTION -63mm thick aspahalt over 305mm thick granular fill	98.2				
		FILL -clay mixed with gravel	97.4				
		CLAY -brown, stiff, fissured	96				
		SILT -soft, clayey, moist to wet					
		CLAY -grey-brown, stiff, fissured					
		SILT -soft, tan-brown, moist to wet					
		CLAY -stiff to firm, brown; grey at 8.23m, trace of fine gravel below 9.75m; soft below 10.67m	82.3				
		TILL -soft, tan-brown, trace of fine gravel, moist to wet; medium dense at 19.2m. AUGER REFUSAL ON SUSPECTED BEDROCK AT 19.8M. SLOUGH-IN AT 8.23M AFTER COMPLETION OF DRILLING.	80.2				
		End of Testhole					





Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH2

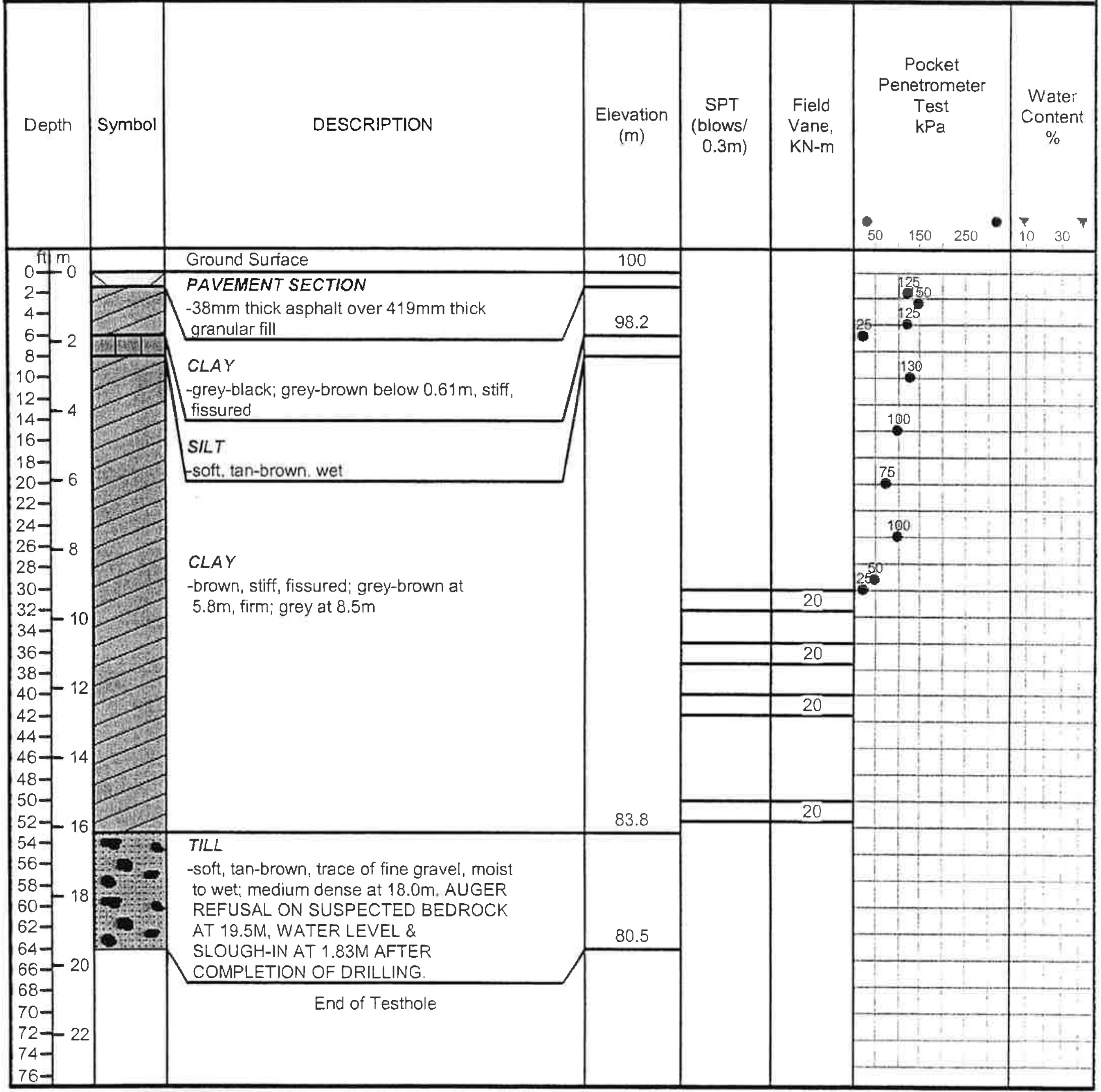
Project: Bronx Park Community Center

Client: Number 10 Architectural Group

Logged: RO

Location: Winnipeg, Manitoba

Engineer: S.S.U



Ground Surface

PAVEMENT SECTION

-38mm thick asphalt over 419mm thick granular fill

CLAY

-grey-black; grey-brown below 0.61m, stiff, fissured

SILT

-soft, tan-brown, wet

CLAY

-brown, stiff, fissured; grey-brown at 5.8m, firm; grey at 8.5m

TILL

-soft, tan-brown, trace of fine gravel, moist to wet; medium dense at 18.0m. AUGER REFUSAL ON SUSPECTED BEDROCK AT 19.5M, WATER LEVEL & SLOUGH-IN AT 1.83M AFTER COMPLETION OF DRILLING.

End of Testhole

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U

GENIVAR

Project No: WE-07-102-00-WE

Project: Bronx Park Community Center

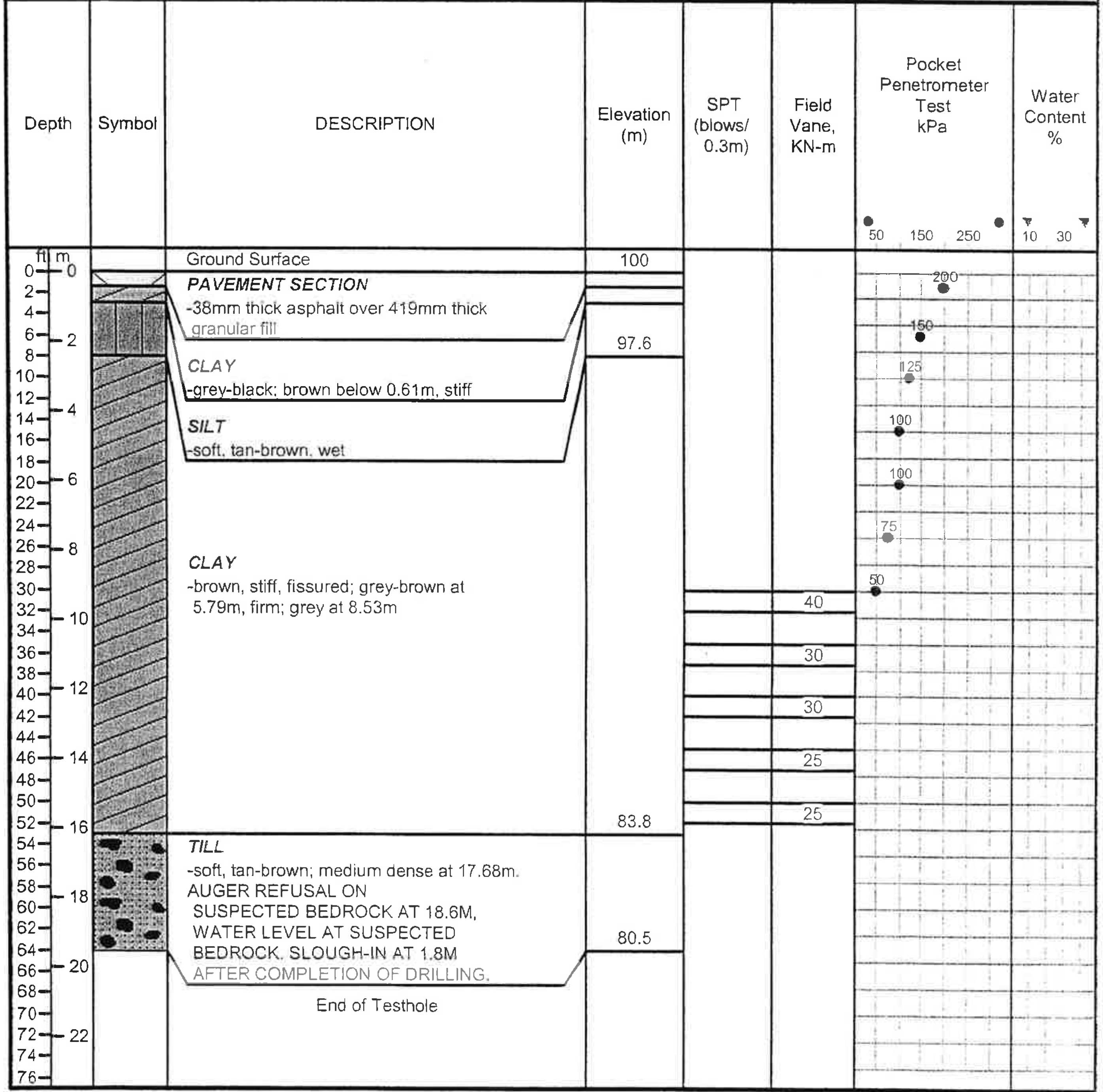
Client: Number 10 Architectural Group

Location: Winnipeg, Manitoba

TH3

Logged: RO

Engineer: S.S.U



DESCRIPTION	Elevation (m)	Field Vane, KN-m
Ground Surface	100	
PAVEMENT SECTION -38mm thick asphalt over 419mm thick granular fill		
CLAY -grey-black; brown below 0.61m, stiff	97.6	
SILT -soft, tan-brown, wet		
CLAY -brown, stiff, fissured; grey-brown at 5.79m, firm; grey at 8.53m		40 30 30 25 25
TILL -soft, tan-brown; medium dense at 17.68m. AUGER REFUSAL ON SUSPECTED BEDROCK AT 18.6M, WATER LEVEL AT SUSPECTED BEDROCK. SLOUGH-IN AT 1.8M AFTER COMPLETION OF DRILLING.	83.8 80.5	
End of Testhole		

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH4

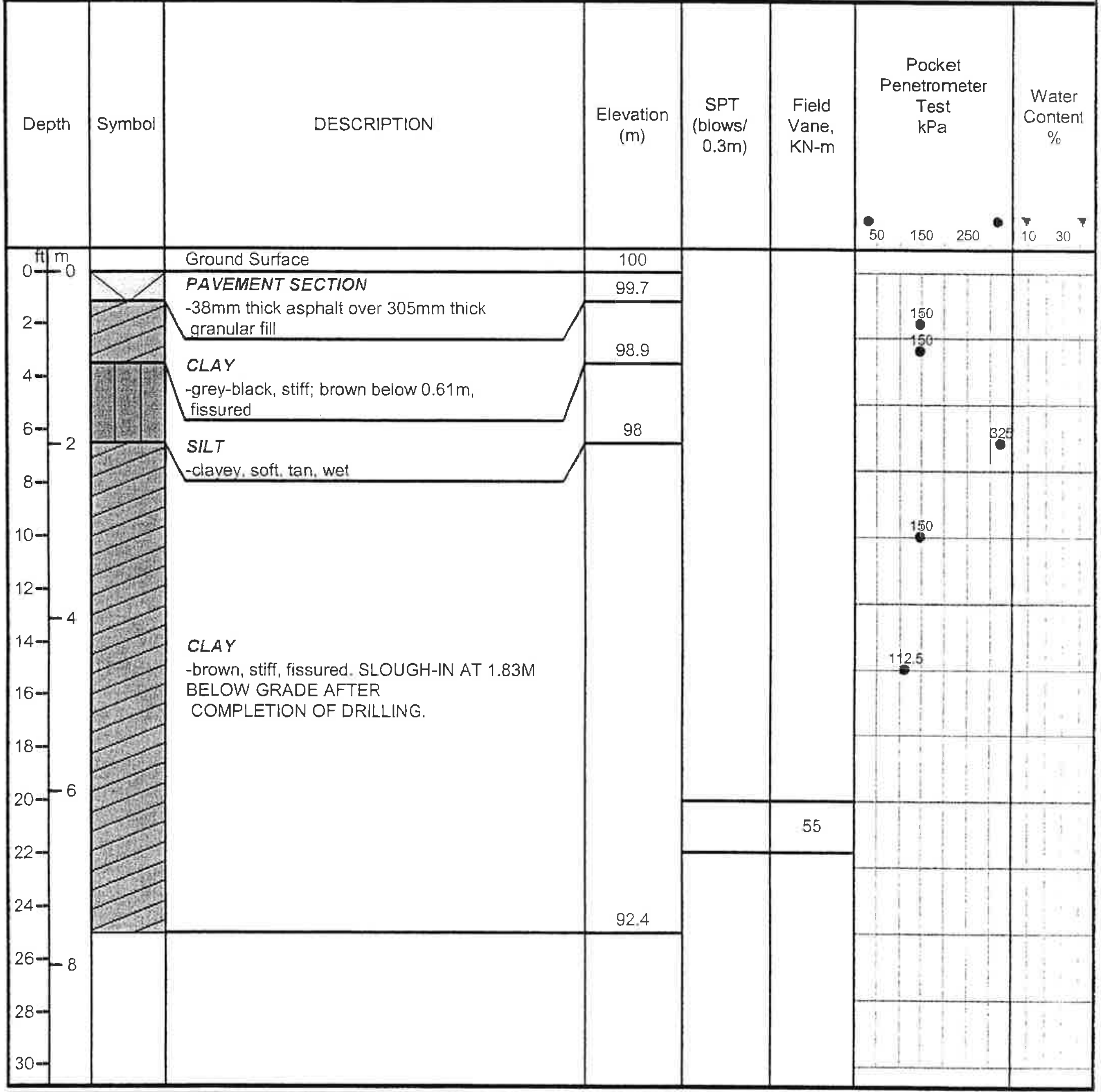
Project: Bronx Park Community Center

Client: Number 10 Architectural Group

Location: Winnipeg, Manitoba

Logged: RO

Engineer: S.S.U



Ground Surface

PAVEMENT SECTION

-38mm thick asphalt over 305mm thick granular fill

CLAY

-grey-black, stiff; brown below 0.61m, fissured

SILT

-clayey, soft, tan, wet

CLAY

-brown, stiff, fissured. SLOUGH-IN AT 1.83M BELOW GRADE AFTER COMPLETION OF DRILLING.

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH5

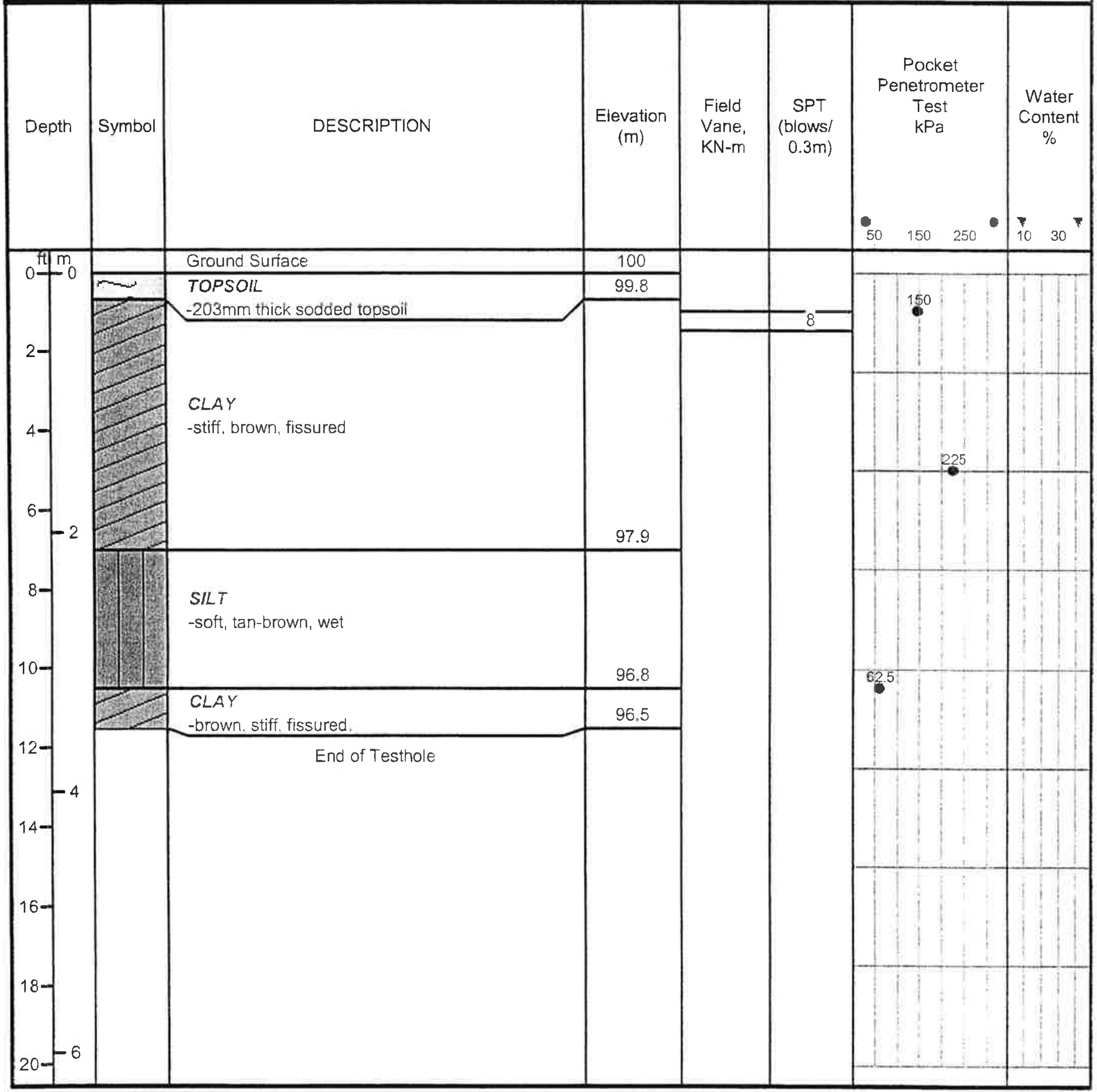
Project: Bronx Park Community Center

Client: Number 10 Architectural Group

Location: Winnipeg, Manitoba

Logged: RO

Engineer: S.S.U



Depth	Symbol	DESCRIPTION	Elevation (m)	Field Vane, KN-m	SPT (blows/ 0.3m)	Pocket Penetrometer Test kPa	Water Content %
0		Ground Surface	100				
		TOPSOIL -203mm thick sodded topsoil	99.8				
		CLAY -stiff, brown, fissured	97.9		8	150 225	
		SILT -soft, tan-brown, wet	96.8				
		CLAY -brown, stiff, fissured.	96.5			62.5	
		End of Testhole					

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH6

Project: Bronx Park Community Center

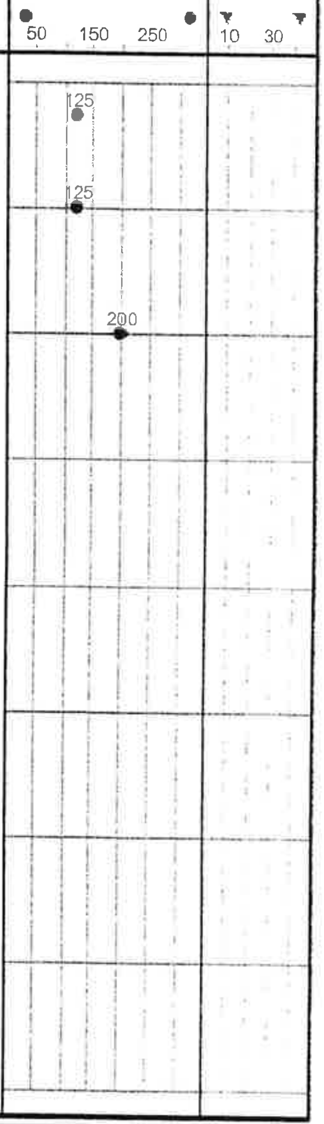
Client: Number 10 Architectural Group

Location: Winnipeg, Manitoba

Logged: RO

Engineer: S.S.U

Depth (ft / m)	Symbol	DESCRIPTION	Elevation (m)	SPT (blows/ 0.3m)	Field Vane, KN-m	Pocket Penetrometer Test kPa	Water Content %
0 / 0		Ground Surface	100				
		TOPSOIL -203mm thick topsoil	99.8				
		CLAY -grey-black; brown below 0.31m, stiff, fissured	97.6			125 125 200	
		SILT -soft, tan-brown, moist to wet	96.6				
		CLAY -brown, stiff, fissured	96.3				
		End of Testhole					



Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH7

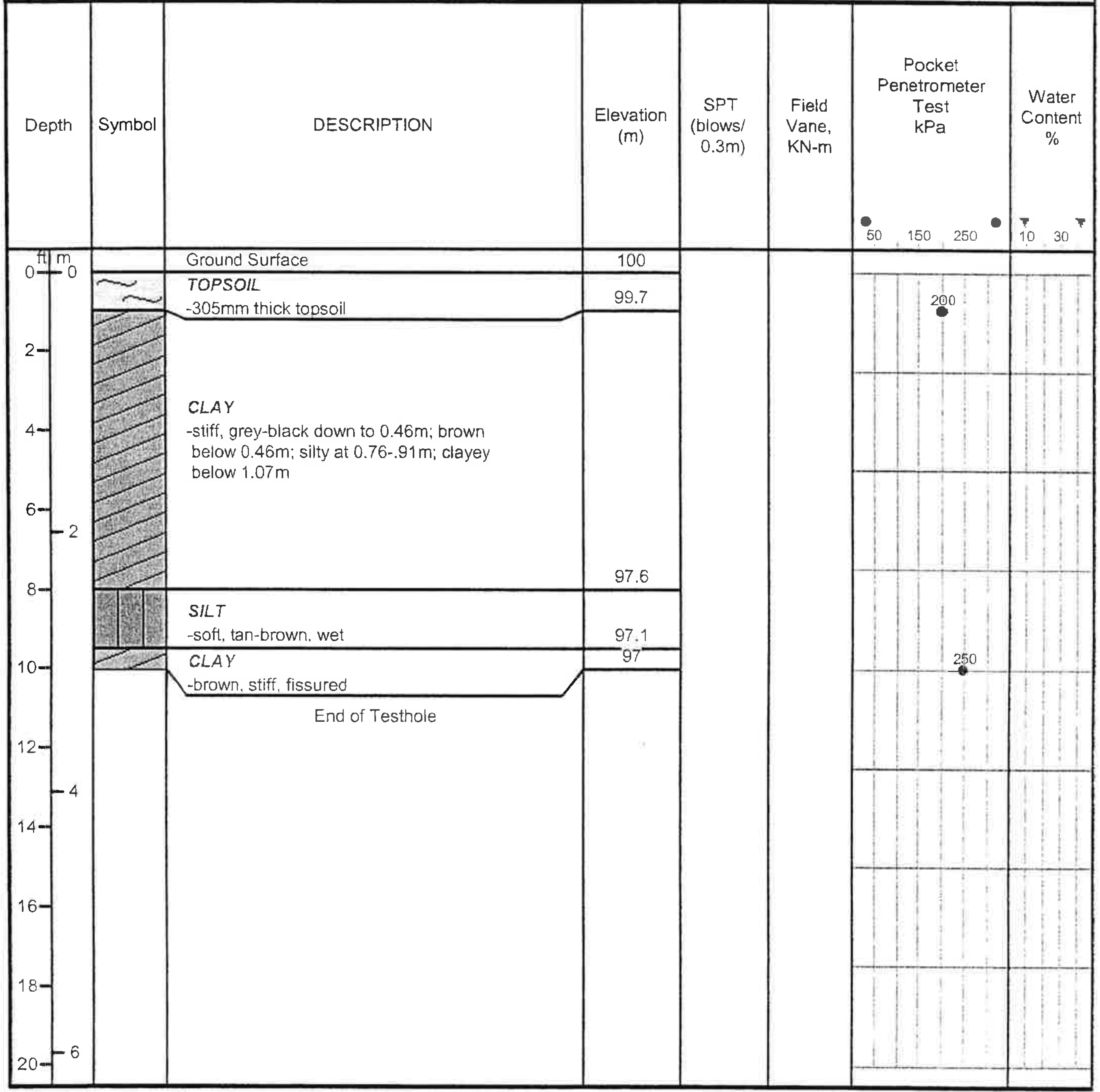
Project: Bronx Park Community Center

Client: Number 10 Architectural Group

Location: Winnipeg, Manitoba

Logged: RO

Engineer: S.S.U



Depth	Symbol	DESCRIPTION	Elevation (m)	SPT (blows/ 0.3m)	Field Vane, KN-m	Pocket Penetrometer Test kPa	Water Content %
		Ground Surface	100				
		TOPSOIL -305mm thick topsoil	99.7			200	
		CLAY -stiff, grey-black down to 0.46m; brown below 0.46m; silty at 0.76-.91m; clayey below 1.07m	97.6				
		SILT -soft, tan-brown, wet	97.1				
		CLAY -brown, stiff, fissured	97			250	
		End of Testhole					

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

GENIVAR

Project No: WE-07-102-00-WE

TH8

Project: Bronx Park Community Center

Client: Number 10 Architectural Group

Logged: RO

Location: Winnipeg, Manitoba

Engineer: S.S.U

Depth ft / m	Symbol	DESCRIPTION	Elevation (m)	SPT (blows/ 0.3m)	Field Vane, KN-m	Pocket Penetrometer Test kPa 50 150 250	Water Content % 10 30
0 / 0		Ground Surface	100				
		TOPSOIL -50mm sod over 203mm thick topsoil	99.7				
2, 4, 6 / 2		***CLAY*** -grey-black; brown below 0.61m	97.9			200 200 300 25	
8, 10, 12		***SILT*** -soft, tan-brown	96.3				
14 / 4		***CLAY*** -brown, stiff, fissured	95.4			150	
16, 18, 20 / 6		End of Testhole					

Drill Method: S/S Auger

Drill Date: 7/05/07

Hole Size: 125 mm

GENIVAR
#600-5 Donald Street
Winnipeg, Manitoba
R3L 2T4

Elevation: Assumed

Checked by: S.S.U.

APPENDIX C

Granular Specification

CW 3110 - SUB-GRADE, SUB-BASE AND BASE COURSE CONSTRUCTION

1. DESCRIPTION

1.1 General

.1 This specification covers pavement removal, excavation, preparation of sub-grade, supply and placement of sub-base and base course materials, ditch grading and boulevard grading for pavements, slab renewals, curbs, miscellaneous concrete slabs, sidewalks and other related works.

1.2 Definitions

.1 Sub-grade - the natural in-situ material.

.2 Sub-base - where required, the layer of material provided between the sub-grade and the base course.

.3 Base course – the layer of material immediately underlying the pavement.

1.3 Referenced Standard Construction Specifications

.1 CW 1130 – Work Site Requirements.
.2 CW 3130 – Supply and Installation of Geotextile Fabrics.
.3 CW 3450 – Planing of Pavement.

2. MATERIALS

2.1 Sub-Base Materials

.1 Sub-base material of the type(s) shown on the Drawings or indicated in the Specifications will be supplied in accordance with the following requirements:

  .1 Suitable site sub-base material will be of a type approved by the Contract Administrator.

  .2 Clay borrow sub-base material will be of a type approved by the Contract Administrator.

  .3 Crushed sub-base material will be well-graded and conform to the following grading requirements:

TABLE CW 3110.1 - Crushed Sub-Base Material Grading Requirements

CANADIAN METRIC SIEVE SIZE	PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE	
	50 mm MAX. AGG.	150 mm MAX. AGG.
150 000		90% - 100%
100 000		75% - 90%
50 000	100%	
25 000		50% max.
5 000	25% - 80%	
80	5% - 18%	

150 millimetre crushed limestone material when subjected to the abrasion test will have a loss of not more than 40% when tested in accordance with grading 1 of ASTM C535, Test for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

50 millimetre crushed limestone material when subjected to the abrasion test will have a loss of not more than 40% when tested in accordance with grading A of ASTM C131, Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

Crushed pavement sub-base material will be a mixture of concrete, asphaltic concrete, granular material and clay. The mix will contain no more than 15% by weight passing the 80 µm sieve.

2.2 Base Course Material

.1 Base course material will be approved by the Contract Administrator.

.2 Base course material will consist of sound, hard, crushed rock or crushed gravel and will be free from organic or soft material that would disintegrate through decay or weathering.

.3 The base course material will be well graded and conform to the following grading requirements:

TABLE CW 3110.2 – Base Course Material Grading Requirements

CANADIAN METRIC SIEVE SIZE	PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE	
	Granular	Crushed Limestone
25 000	100%	
20 000	80% - 100%	100%
5 000	40% - 70%	40% - 70%
2 500	25% - 55%	25% - 60%
315	13% - 30%	8% - 25%
80	5% - 15%	6% - 17%

Base course material when subjected to the abrasion test will have a loss of not more than 35% when tested in accordance with grading B of ASTM C131, Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

The material passing the 315 sieve will have a liquid limit not greater than 25 and a plasticity index not greater than 6.

Where base course is being placed under an asphaltic concrete pavement, the aggregate retained on a No. 5 000 sieve will contain not less than 35% crushed aggregate as determined by actual particle count. Crushed aggregate will be considered as that aggregate having at least one fractured face.

2.3 Asphalt Cuttings for Base Course Material

.1 Asphalt cuttings produced from planing of asphalt pavements or overlays in accordance with CW 3450 may be used as a base course material where indicated in the Specifications or as approved by the Contract Administrator.

.2 Asphalt cuttings will be well graded and have a maximum particle size of 40 millimetres.