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TO:

Les Lawson, Technical Services Officer
Contracts and Operations Office
Operations – London
West Region
Ministry of Transportation
659 Exeter Road
London ON N6E 1L3

Date: June 2, 2010

Our Ref.: SW Paris – Phase 2 – Application for
Encroachment Permit

THE FOLLOWING ☐ CORRESPONDENCE is being ☐ MAILED ☐ FOR PICKUP
☒ REPORTS/DOCUMENTS ☒ COURIERED ☒ TO YOU
☐ SPECIFICATIONS ☐ RETURNED TO YOU

Copies	Description
1	Preliminary Geotechnical Investigation Southwest Paris Water and Wastewater Servicing Study

Message:

As requested please find attached the above noted report.

**Public Works Department
County of Brant**

Per: 
Wendy Whynott, Senior Administrative Assistant

cc file
M. Fehrman, Capital Project Manager

FILE # D08

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5703G1.R01

August 9, 2005

KMK Consultants Limited
220 Advance Boulevard
Brampton, Ontario
L6T 4J5

Attention: Mr. Ajay Puri, P.Eng.

Dear Sir:

**Re: Preliminary Geotechnical Investigation
Southwest Paris Water and Wastewater Servicing Study
Paris, County of Brant, Ontario**

We are pleased to submit this report for the preliminary geotechnical investigation recently completed for the above-referenced servicing study project. This report includes a summary of the investigation procedures and subsurface conditions encountered within the servicing study area. Preliminary geotechnical comments and recommendations are provided for the trunk watermain, two possible Highway 403 crossings, the water storage facility, a sanitary forcemain, and the Mile Hill road sewer.

We trust that this report is suitable for your present requirements and we wish to thank the County of Brant and KMK Consultants Limited to this opportunity to have provided geotechnical engineering services. If there are any questions or when you require further geotechnical input for this project, please do not hesitate to contact us.

Yours very truly,

Dave S. Naylor, P.Eng.
Senior Consulting Engineer

jmp

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List of Abbreviations

Figure 1 – Gradation Analyses

Borehole Logs – Boreholes 1 to 30, 32, and 33
 Boreholes 2 and 3 (previous Job No. 4315H1)

Drawing 1 – Pleistocene Geology Map

Drawing 2 – Site Plan

1. Introduction

Naylor Engineering Associates Ltd. (Naylor Engineering) was retained by KMK Consultants Limited (KMK) to carry out a preliminary geotechnical investigation for the Southwest Paris Water and Wastewater Servicing Study, which is currently in progress. This work was authorized by Mr. Ajay Puri, P.Eng. of KMK acting on behalf of the County of Brant in a letter dated April 28, 2005, following submission of a detailed fee proposal.

The County of Brant is conducting two Class EA studies for evaluating water and wastewater alternatives in Southwest Paris, and these studies are being managed by KMK. The project includes the following components (as shown on Drawing 1):

- watermain connection from a future Bethel Road well facility to the M. Sharpe Reservoir;
- two possible Highway 403 crossing locations for a trunk watermain;
- a future water storage facility on the north side of Highway 403 at the west crossing location;
- sanitary sewer along Mile Hill Road; and,
- forcemain from the Grandville Subdivision to the Mile Hill Road sanitary sewer.

The purpose of this geotechnical investigation was to provide subsurface soil and groundwater information for the servicing studies and prepare this preliminary geotechnical investigation report with recommendations pertaining to the trunk watermain, Highway 403 crossings, water storage facility, sanitary forcemain, and Mile Hill Road sanitary sewer.

2. Investigation Procedure

2.1 Previous Investigation

Naylor Engineering previously carried out a hydrogeology study for a proposed industrial park planned for the parcel of land immediately south of Highway 403 and west of Rest Acres Road. The fieldwork for this study included two relevant boreholes located along the proposed trunk watermain alignment south of Highway 403. These two boreholes (Boreholes 2 and 3) from our Project Number 4315H1 have been included in this report.

2.2 Pre-work Organization

Prior to undertaking the on-site borehole drilling work the boreholes were staked in the field so that the locations could be cleared of underground utilities. Drilling of the boreholes on Mile Hill Road required a temporary closure and this was arranged prior to the on-site drilling work. A permit was obtained from the MTO to drill the boreholes at the west crossing within the Highway 403 right-of-way. Permission was obtained from various land owners to access their properties to drill the exploratory boreholes.

2.3 Borehole Drilling

The fieldwork for this investigation was carried out between June 5 and June 27, 2005, and included the drilling of thirty-two boreholes to depths between approximately 6 and 14 m (Boreholes 1 to 30, 32, and 33). The borehole locations are shown on the appended Drawing 2.

The boreholes were advanced using truck and track mounted drillrigs equipped with continuous flight solid stem augers, supplied and operated by a specialist drilling contractor. Soil samples were recovered from the boreholes at regular 0.75 and 1.50 m depth intervals using a 50 mm OD spilt-spoon sampler, in accordance with the standard penetration test (SPT) procedure. The SPT values recorded are plotted on the individual borehole logs.

Standpipes were installed in eight of the boreholes drilled in order to permit measurement of stabilized groundwater levels. The standpipe installations comprised 19 mm diameter PVC pipe, with slotted and filtered screens, and bentonite seals. Details of the installations and groundwater observations and measurements are provided on the individual borehole logs.

The fieldwork was supervised throughout by a member of our engineering staff who directed the drilling and sampling procedures, documented the results of SPT testing, logged the soil conditions encountered, and cared for the recovered soil samples.

The borehole locations and ground surface elevations were surveyed by KMK, and the information forwarded to us. We understand the elevations have been referenced to a geodetic datum.

2.4 Laboratory Testing

All soil samples recovered during this investigation were returned to our laboratory for visual examination, as well as moisture content tests. The moisture content test results are plotted on the individual borehole logs.

A total of five gradation analyses were carried out on selected samples taken from the boreholes. The resulting grain size distribution curves are plotted on Figure 1.

The soil samples will be stored for a period of four months from the date of sampling. After this time they will be discarded unless prior arrangements have been made for longer storage.

3. Summarized Conditions

3.1 Area Geology

The Paris Moraine traverses through the west side of the study area, trending in a northeast to southwest direction. This moraine is generally comprised of Wentworth till, a stoney/silty sand material. Outwash granular deposits are present between the moraine and the Grand River in the area south of Powerline Road, and there are a couple of gravel pits in this area. The general Pleistocene geology is shown on Drawing 1, as derived from Map No. 2240 from the Ontario Department of Mines and Northern Affairs.

3.2 Subsurface Conditions

We refer to the appended borehole logs for detailed soil descriptions and stratigraphies, results of SPT testing, moisture content profiles, details of standpipe installations, and groundwater observations and measurements.

3.2.1 Trunk Watermain Route

The proposed trunk watermain route is along the westerly side of Rest Acres Road from the built-up area of Paris, across Highway 403, southerly between Highway 403 and Bethel Road along a current property boundary approximately 450 m west of Rest Acres Road, and along Bethel Road to Rest Acres Road. The trunk watermain route is generally underlain by deposits of silt, sand, and silty sand/sandy silt till. The predominant soil conditions encountered along the trunk watermain route are the layered silty sand and silt. Interspersed within these outwash deposits are layers of glacial till, the stoney silty sand/sandy silt material comprising the Paris Moraine.

Groundwater was not encountered in any of the recent boreholes drilled along the trunk watermain alignment. Boreholes 2 and 3 from our previous hydrogeology study encountered groundwater at depths of 6 to 14 m, well below the depth of excavation for a trunk watermain.

3.2.2 Highway 403 Crossings

Boreholes 1 and 2 were drilled at the east crossing location along the alignment of Potruff Road and encountered predominantly sand and gravel material, including cobbles and possible boulders. Groundwater was not encountered to the exploration depth of approximately 6 m.

Boreholes 3 to 6 were drilled at the west crossing location, approximately 450 m west of Rest Acres Road. At this potential crossing location the boreholes encountered variable soil conditions including sand deposits and glacial till, with some sand and gravel and silt layers present as well. Groundwater was not encountered to the exploration depths at this crossing location.

3.2.3 Sanitary Forcemain Route

The potential sanitary forcemain route is along the west side of Rest Acres Road southerly from the built up area of Paris, and then through a future easement to Mile Hill Road. Boreholes 23 to 27 were drilled along this route and encountered variable soil conditions including some silt and silt till deposits, with the predominant soil type comprising sand. Groundwater was encountered only in Borehole 26, at a depth of 5.5 m.

3.2.4 Mile Hill Road Sewer

A gravity sanitary sewer is proposed along Mile Hill Road from a future road right-of-way north of Powerline Road to connect to an existing sewer on Hillside Avenue. Mile Hill Road is a narrow winding roadway built into the Grand River Valley slope.

Boreholes 8 to 22 were drilled along the sanitary sewer alignment on Mile Hill Road and generally encountered layered deposits of silt and fine sand. Groundwater was encountered in a number of the boreholes drilled along Mile Hill Road; however, is generally present at depths between approximately 4 and 6 m.

4. Geotechnical Discussion

4.1 General

The County of Brant is currently conducting two Class EA studies for evaluating water and wastewater servicing alternatives in the southwest Paris urban settlement area and these studies are being managed by KMK Consultants Limited (KMK). The study project includes the following components:

- watermain connection from a future Bethel Road well facility to the M. Sharpe Reservoir;
- two possible Highway 403 crossing locations for the trunk watermain;
- a future water storage facility on the north side of Highway 403 at the west crossing location;
- sanitary sewer along Mile Hill Road; and,
- forcemain from the Grandville subdivision to the Mile Hill Road sanitary sewer.

Subsurface conditions throughout the servicing study area, as revealed by the boreholes drilled for this investigation, generally comprise deposits of glacial till or sandy silt/silty sand. Some sand and gravel deposits are present as well. Groundwater was generally not encountered in the boreholes drilled for this investigation with the exception of a few boreholes along Mile Hill Road, and therefore groundwater is not expected to have any impact on the servicing construction.

4.2 Trunk Watermain

Approximately 4.0 km of trunk watermain is to be installed along the west of Rest Acres Road from the built up area of Paris to Highway 403, crossing the highway at one of two potential locations, and through to Bethel Road to connect a new well facility. Subsurface soil conditions are variable along the length of the route but generally quite suitable for conventional trenching and installation of the trunk watermain.

Temporary excavations to depths for installation of the trunk watermain must comply with Regulation 213/91 (Construction Projects) under the Ontario Health and Safety Act. The predominant soils encountered in the boreholes along the trunk watermain route would be classified as Type 3 Soils, and therefore temporary side slopes must be cut at an inclination of 1 horizontal to 1 vertical or less from the base of the excavation. Where space limitations (from utility poles, existing underground services, and above ground structures, etc.) do not permit overburden cut slopes at an inclination of 1 horizontal to 1 vertical, a steeper cut slope can be employed if trench boxes are used to protect the workers. Some movement/slumping of the cohesionless sandy soils adjacent to the trench box is to be expected if this option is used.

Generally the trench excavation to install the trunk watermain is not expected to encounter groundwater. Any minor seepage which may be present, as well as any ponded rainwater runoff, should be easily controlled by conventional sump pumping techniques.

No bearing problems are anticipated for flexible or rigid pipes founded in the native soil deposits. Conventional Class B bedding will be suitable for the trunk watermain pipe. The bedding should comprise Granular 'A' material compacted in thin lifts to a minimum 98% standard Proctor maximum dry density (SPMDD).

The excavated soils along the trunk watermain route are expected to be quite suitable for reuse as trench backfill. Some portions of the silt may require air drying to reduce the moisture content for proper compaction. The trench backfill should be placed in lifts and compacted 95% SPMDD.

4.3 Highway 403 Crossings

It is understood that trenchless construction will be the preferred method for installing the trunk sanitary sewer below Highway 403, at one of the two potential crossing locations. The east crossing location (Boreholes 1 and 2) is underlain by a deposit of sand and gravel, which includes cobbles and boulders. The west crossing location (Boreholes 4 and 5) is underlain by inter-layered deposits of sand and silt till, with some sand and gravel silt layers present as well. Groundwater was not encountered in the boreholes drilled at either crossing location.

Installing the proposed trunk watermain by jack and bore would be the most geotechnically feasible method based on the soils conditions encountered at both crossing locations. Horizontal directional drilling (HDD) would not be recommended at either crossing location due to the presence of cobbles and boulders in the soil deposits, particularly at the east crossing location.

Excavations for the sending and receiving pits for the jack and bore operation should be carried in compliance with Ontario Regulation 213/91 (Construction Projects) under the Occupational Health and Safety Act. The predominant soils encountered will be classified as Type 3 soils, and therefore temporary unsupported excavations must be sloped to 1 horizontal to 1 vertical or less from the base of the excavation. Steeper cut slopes can be employed if some form of excavation support (such as trench liner boxes or shoring) is used to protect the workers.

During the jack and bore procedure the casing must be continuously advanced to the face of the bore, and the contractor must ensure that no overmining of the soil at the face is occurring, which may create voids above the casing. The casing should have an appropriate wall thickness to withstand the jacking forces during construction as well as loading from the overburden and traffic.

Contractors must be made fully aware of the presence of oversized cobbles and boulders. The preferred method for removal of soil from the bore may be hand mining instead of augering due to the presence of the oversized particles. Further geotechnical investigation should be undertaken at the Highway 403 crossing location, including test pits to better reveal the cobbles and boulders that may be present.

4.4 Water Storage Facility

A future elevated water storage tower is being considered at the west crossing location, on the north side of Highway 403. At this location Borehole 3 encountered deposits of sand and sand/silt till. The upper 2.5 m at this location is in a loose state of relative density with SPT-N values of 6 to 7 blows per 300 mm. Below a depth of approximately 2.5 m the sand till deposit becomes compact, with SPT-N values between 15 and 20 blows per 300 mm. Foundations for the elevated water storage structure should be constructed within the compact sand till deposit encountered below a depth of 2.5 m at Borehole 3. It should be noted that additional boreholes will be necessary at the water tower location, as the design-build contractors require a minimum of three boreholes.

For preliminary design purposes a net allowable bearing pressure of 300 kPa may be assumed in the compact sand till deposit below 2.5 m depth at Borehole 3.

The excavation to construct the elevated water storage structure is expected relatively straight forward. Groundwater is not anticipated in the excavation and the side slopes may be trimmed back to 1 horizontal to 1 vertical from the base of the excavation.

4.5 Sanitary Forcemain

Approximately 1.2 km of sanitary forcemain may be installed on the west side of Rest Acres Road from the built up area of Paris, and then through a possible easement to Mile Hill Road. Boreholes 23 to 27 were drilled along this route and encountered variable conditions comprising deposits of silt, sand, and glacial till.

Temporary excavations to conventional depths for the sanitary forcemain along this route must comply with Regulation 213/91 (Construction Projects) under the Ontario Occupational Health and Safety Act. The predominant soils encountered in the boreholes would be classified as Type 3 soil, and therefore temporary side slopes must be cut at an inclination of 1 horizontal to 1 vertical or less from the base of the excavation for open cut pipe installation. Where space limitations do not permit overburden cut slopes at the inclinations specified above, a steeper cut slope can be employed if a trench box is used to protect the workers. Some movement/slumping of the cohesionless sandy soils adjacent to the trench box is to be expected if this option is used.

The sanitary forcemain pipe may be supported on conventional Class B bedding, comprising Granular 'A' material compacted to 98% SPMDD.

Along the sanitary forcemain alignment between Rest Acres Road and Mile Hill Road the pipe will need to be installed in a slope area located immediately west of Mile Hill Road. Based on survey information provided to us by KMK, the slope is generally inclined at about 2 horizontal to 1 vertical. Based on the soil conditions and a detailed inspection of the slope, it is considered inherently stable. Installation of the pipe within the slope area can be undertaken using conventional trenching methods. The slope rehabilitation should be carefully undertaken to ensure continued stability following the construction. We would suggest consideration be given to the application of an erosion control product over the disturbed area in order to minimize erosion and enhance the re-vegetation process.

4.6 Mile Hill Road Sewer

A gravity sewer is to be installed along Mile Hill Road from a future road right-of-way north of Powerline Road to connect to an existing sewer on Hillside Avenue. Generally it is anticipated that the sewer will be at conventional depths; however, due to the vertical profile of this narrow winding roadway, some deeper excavations are anticipated. Excavations along Mile Hill Road are expected to encounter predominantly deposits of silt and sand, with some glacial till. Although groundwater may be encountered at isolated locations, it is anticipated that conventional sump pumping techniques will be sufficient to control the inflow.

Excavations to the anticipated depths for installation of the gravity sewer along Mile Hill Road must comply with Regulation 213/91 (Construction Projects) under the Ontario Occupational Health and Safety Act. The predominant soils encountered in the boreholes along Mile Hill Road would be classified as Type 3 soils, and therefore temporary side slopes must be cut at an inclination of 1 horizontal to 1 vertical or less from the base of the excavation for open cut pipe installation.

Wherever groundwater seepage is occurring in the excavation then the slopes should be trimmed back to a flatter angle to achieve stability.

It is anticipated that some of the trench work along Mile Hill Road will require use of a trench box to minimize size of the excavation. Some movement/slumping of the cohesionless sandy soils adjacent to the trench box is to be expected if this option is used.

We carried out a detailed inspection of the slopes along both sides of Mile Hill Road, down slope to the Grand River and up slope towards Rest Acres Road. Generally the slopes appear inherently stable based on our visual observations and the subsurface conditions encountered in the boreholes. There are a couple of minor locations where the slope immediately adjacently to the roadway has been cut rather steep, and these should be trimmed back slightly after removing a few trees that are leaning inwards toward the roadway. The sewer installation is not expected to have any detrimental impact on the overall stability of the slopes both up hill and down hill along the sides of Mile Hill Road.

The sanitary sewer can be supported on conventional Class B bedding. Granular 'A' material is recommended and should be compacted to minimum 98% SPMDD. The excavated soils should be generally suitable to reuse as trench backfill, with the exception of silt material, which may be overly wet at some locations where groundwater seepage is occurring. The trench backfill should be compacted in lifts to 95% SPMDD in order minimize post construction settlement following reconstruction of the roadway.

The trench backfill material will comprise the roadway subgrade and for preliminary design purposes the following pavement structure is suggested:

Pavement Structure Summary	
Pavement Component	Mean
Asphaltic Concrete	90 mm
Granular 'A' Base	150 mm
Granular 'B' Subbase	350 mm

It should be noted that this geotechnical investigation should be considered preliminary in nature, as the project is currently at the Class EA Study stage. Further geotechnical investigations and reports should be undertaken during the design stage of the various project components.

Respectfully submitted,

Thom Staples, C.E.T.
Brantford Area Manager

Dave S. Naylor, P.Eng.
Senior Consulting Engineer

jmp



**Naylor
Engineering
Associates**
CONSULTING ENGINEERS

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Kitchener, Ontario N2K 2Y5
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5703G1.L03

July 26, 2006

EMAIL TRANSMISSION

**KMK Consultants Limited
220 Advance Boulevard
Brampton, Ontario
L6T 4J5**

Attention: Mr. Chris Hamel, P.Eng.

Dear Sir:

**Re: Geotechnical Comments
June 24, 2006 Site Walk
Southwest Paris Water and Wastewater Servicing Study
Paris, Ontario**

This letter provides our geotechnical comments resulting from the site walk on June 24, 2006 to view old gypsum mine entrances along the base of the Grand River slope at Mile Hill Road.

A number of possible old gypsum mine entrances were indicated to us, generally thought to be present based on an arrangement of old support timbers. Apparently the gypsum mines extended into the hillside westerly from the entrances near the base of the slope at the Grand River.

Further to our previous geotechnical comments, the potential presence of old gypsum mines are not expected to have any impact on the construction of a sanitary sewer along Mile Hill Road. Apparently the mines are of mid-1800s vintage and there are many houses constructed between the possible entrances and Mile Hill Road, which have been present for many years without any problems. The possible presence of the old gypsum mines, while of historical interest, should not have any impact on the proposed sanitary sewer to be installed along Mile Hill Road.

I trust that these geotechnical comments are suitable for your requirements. If you have any questions, please do not hesitate to call.

Yours very truly,

**Dave S. Naylor, P.Eng.
Senior Consulting Engineer
cs**

LIST OF ABBREVIATIONS

The abbreviations commonly employed on the borehole logs, on the figures, and in the text of the report, are as follows:

Sample Types		Soil Tests and Properties	
AS	auger sample	SPT	Standard Penetration Test
CS	chunk sample	UC	unconfined compression
RC	rock core	FV	field vane test
SS	split spoon	ϕ	angle of internal friction
TW	thin-walled, open	γ	unit weight
WS	wash sample	w_p	plastic limit
		w	water content
		w_l	liquid limit
		I_L	liquidity index
		I_p	plasticity index
		PP	pocket penetrometer

Penetration Resistances

Dynamic Penetration Resistance	The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a 50 mm (2 in.) diameter 60 " cone a distance 0.30 m (12 in.). The cone is attached to 'A' size drill rods and casing is not used.
Standard Penetration Resistance, N (ASTM D1586)	The number of blows by a 63.5 kg (140 lb.) hammer dropped 0.76 m (30 in.) required to drive a standard split spoon sampler 0.30 m (12 in.)
WH	sampler advanced by static weight of hammer
PH	sampler advanced by hydraulic pressure
PM	sampler advanced by manual pressure

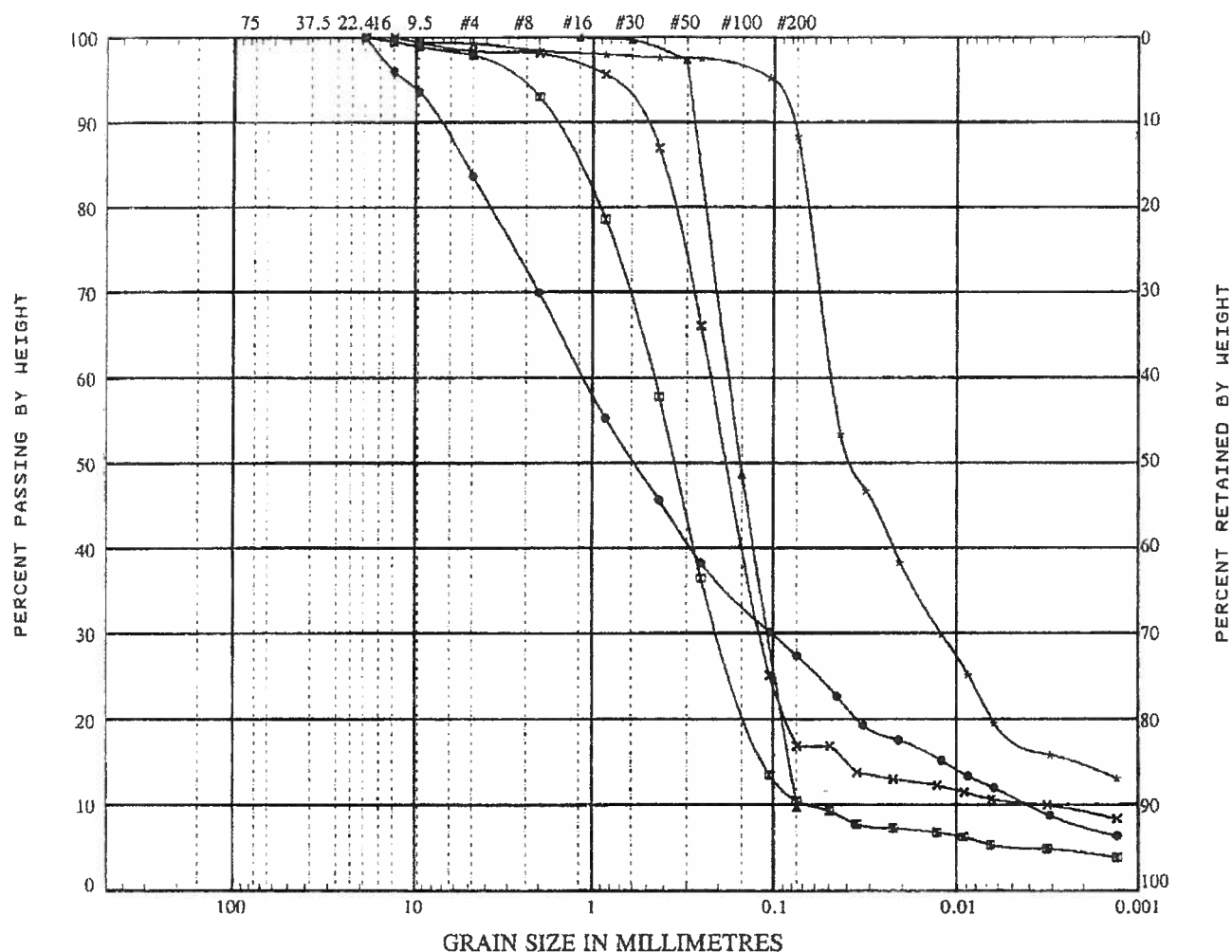
Soil Description

Cohesionless Soils		SPT 'N' Value	D_r (%)
Relative Density (D_r)		(blows per 0.30 m)	
Very Loose		0 to 4	0 to 20
Loose		4 to 10	20 to 40
Compact		10 to 30	40 to 60
Dense		30 to 50	60 to 80
Very Dense		over 50	80 to 100
Cohesive Soils		Undrained Shear Strength (C_u)	
Consistency		kPa	psf
Very Soft		less than 12	less than 250
Soft		12 to 25	250 to 500
Firm		25 to 50	500 to 1000
Stiff		50 to 100	1000 to 2000
Very Stiff		100 to 200	2000 to 4000
Hard		over 200	over 4000
DTPL	Drier than plastic limit		
APL	About plastic limit		
WTPL	Wetter than plastic limit		

Naylor Engineering Associates Ltd.

UNIFIED SOIL CLASSIFICATION

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN MILLIMETRES			U.S. STANDARD SIEVE No.			HYDROMETER



PROJECT Southwest Paris Water and Wastewater Servicing Study

LOCATION Rest Acres Road, Paris, Ontario

JOB NO. 5703G1

CURVE ID	BOREHOLE/TEST PIT	SAMPLE NO.	DEPTH (ft)	SOIL DESCRIPTION
●	BH1	5	4.57-5.03	Silty SAND AND GRAVEL
□	BH4	4	3.05-3.51	SAND, trace Silt and Gravel
▲	BH13	4	3.05-3.51	SAND, trace Silt
*	BH18	4	3.05-3.51	SILT, some Sand and Clay
x	BH24	3	2.29-2.74	SAND, trace Silt

REMARKS



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Figure No. 1



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Borehole Number: 1

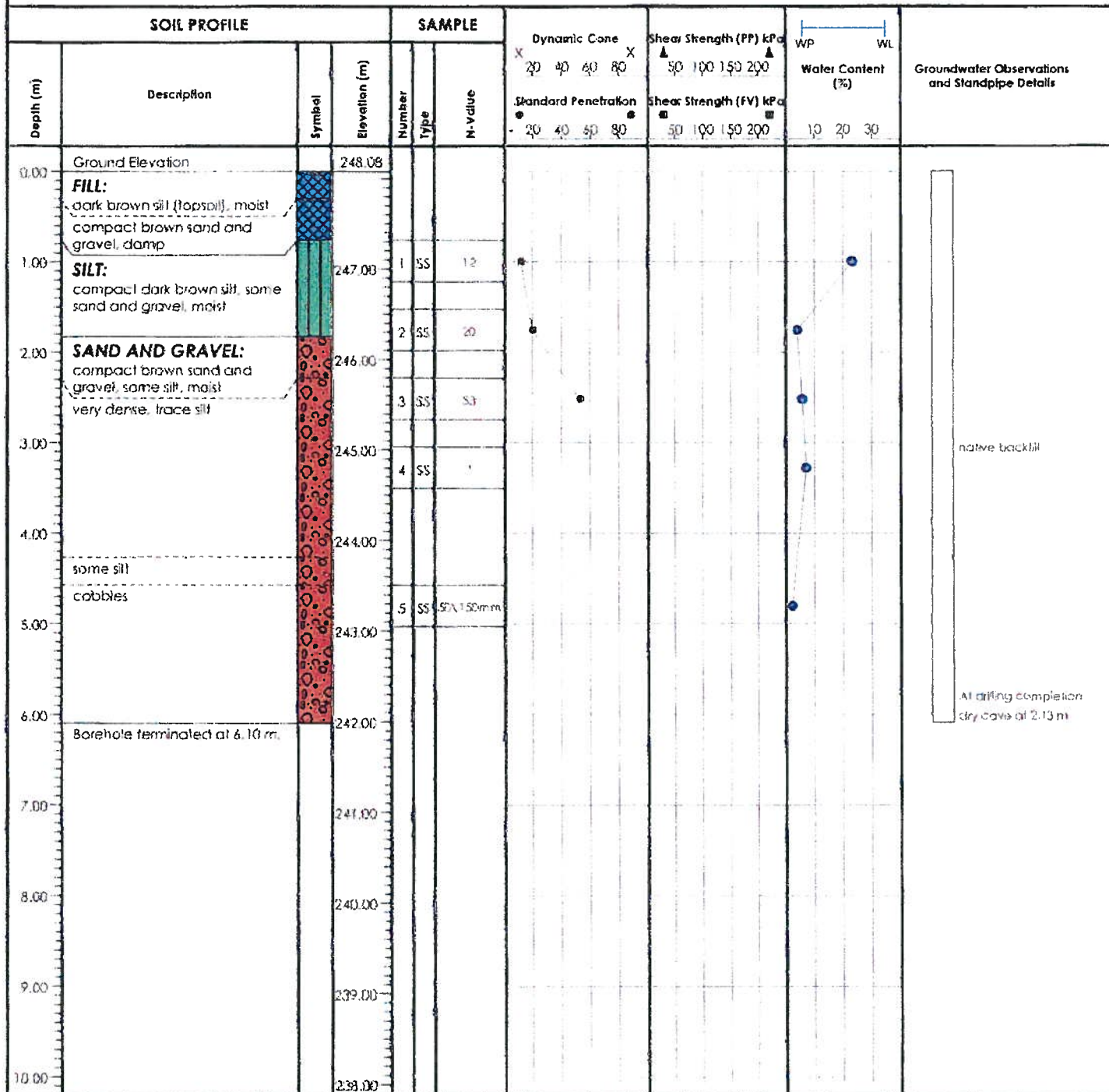
Ground Elevation: 248.08 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: * Split spoon driving on gravel.

Drafted by: A.G. 01a



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Borehole Number: 2

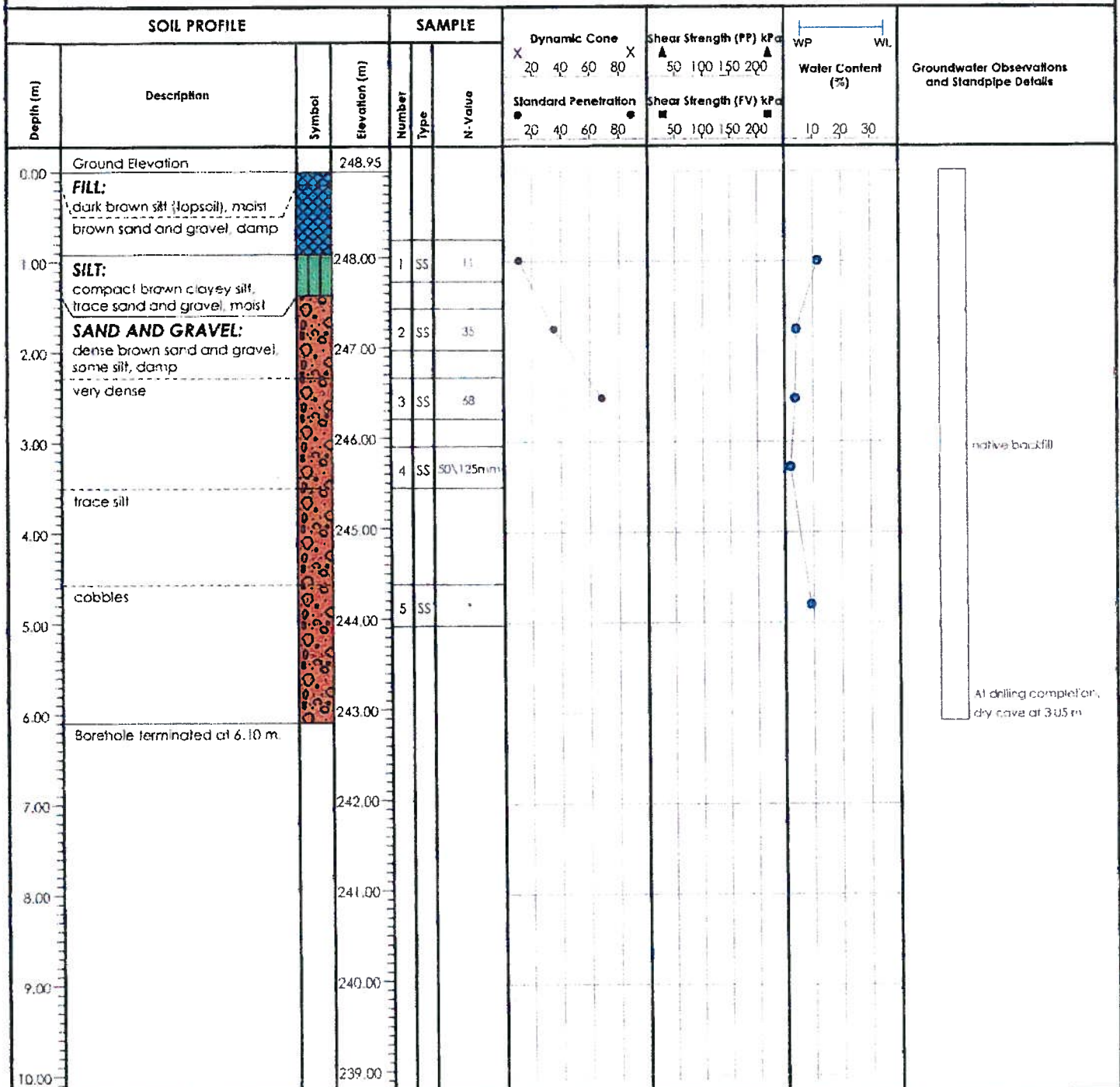
Ground Elevation: 248.95 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: * Split spoon driving on cobbles.

Drafted by: A.G. 01a



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Borehole Number: 3

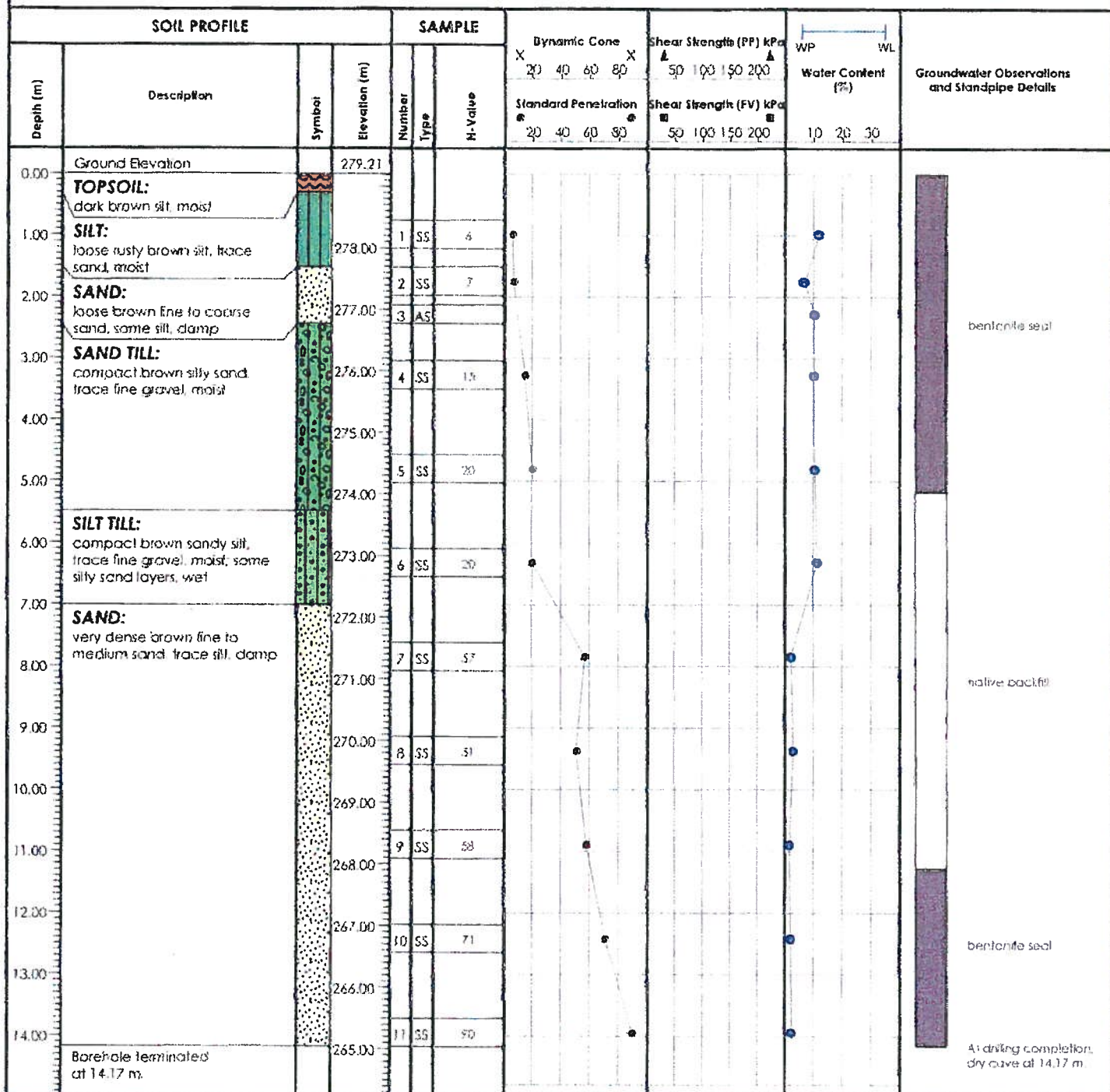
Ground Elevation: 279.21 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 27, 2005



Reviewed by: T.S.

Field Tech.: R.M.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: Bulk sample taken from 3.05 to 4.57 m.

Drafted by: A.G._01a



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Borehole Number: 4

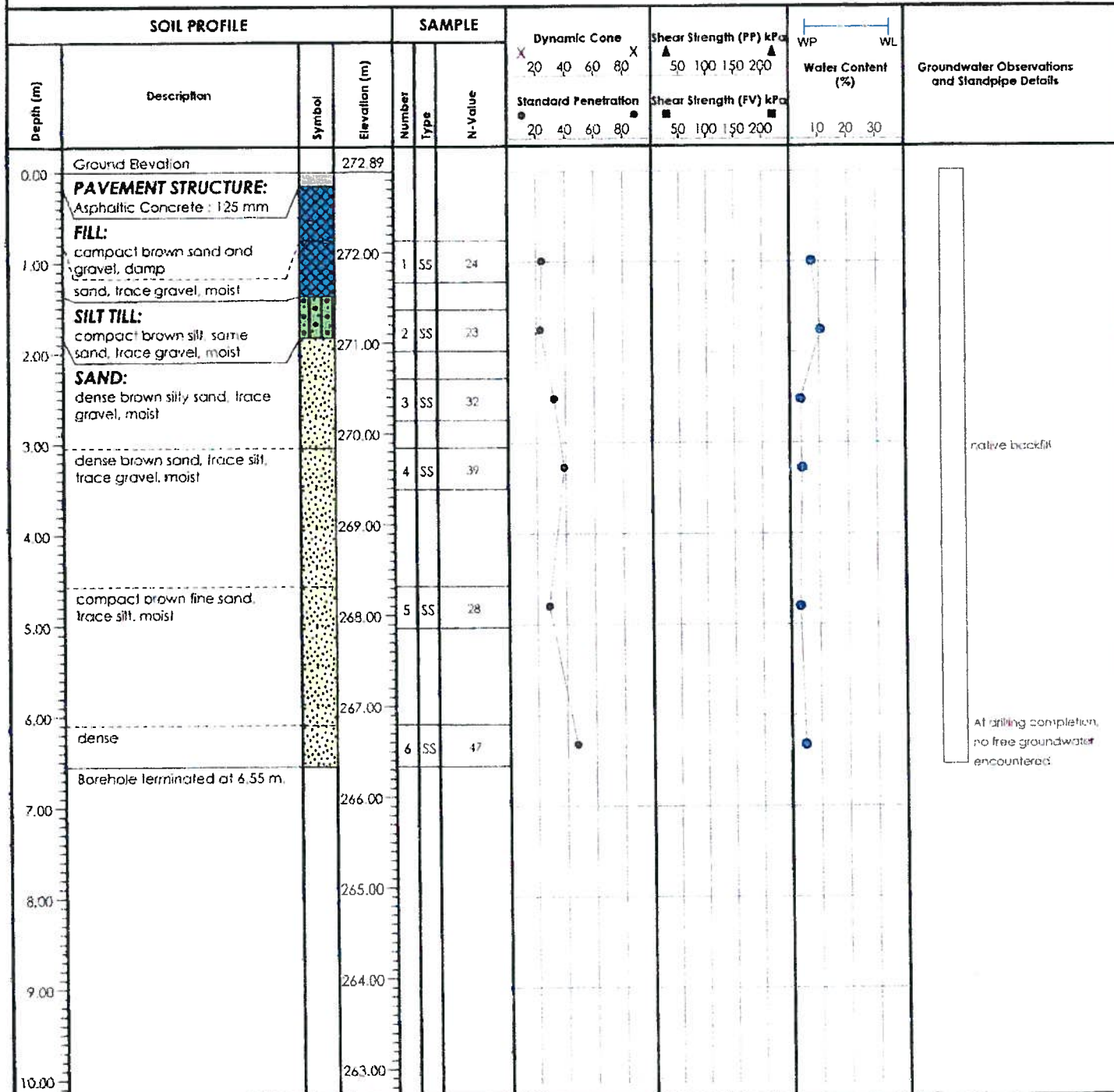
Ground Elevation: 272.89 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 16, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

Drafted by: A.G. 01a



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Borehole Number: 5

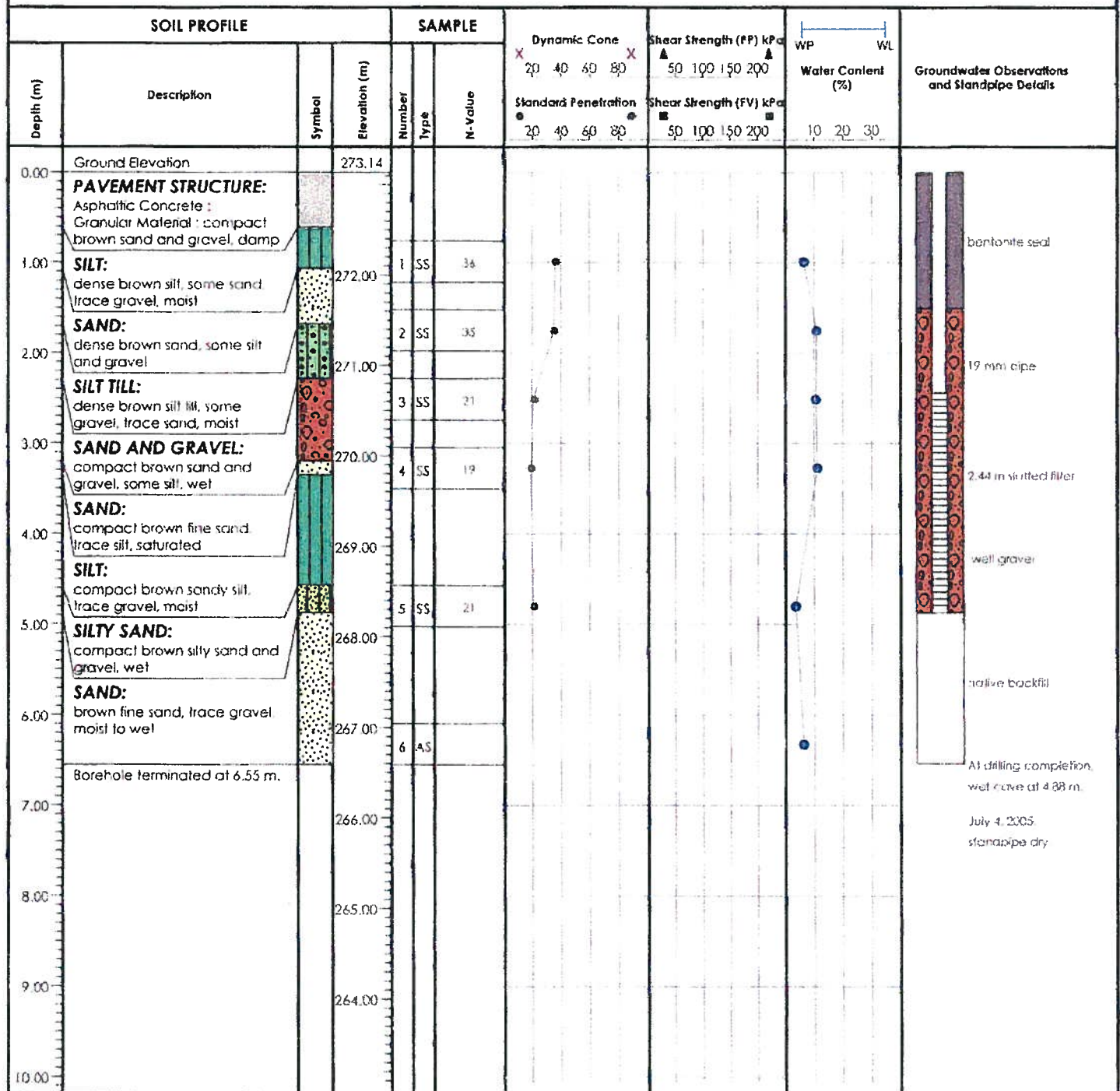
Ground Elevation: 273.14 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 16, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

Drafted by: A.G._01a



**Naylor
Engineering
Associates**
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Borehole Number: 6

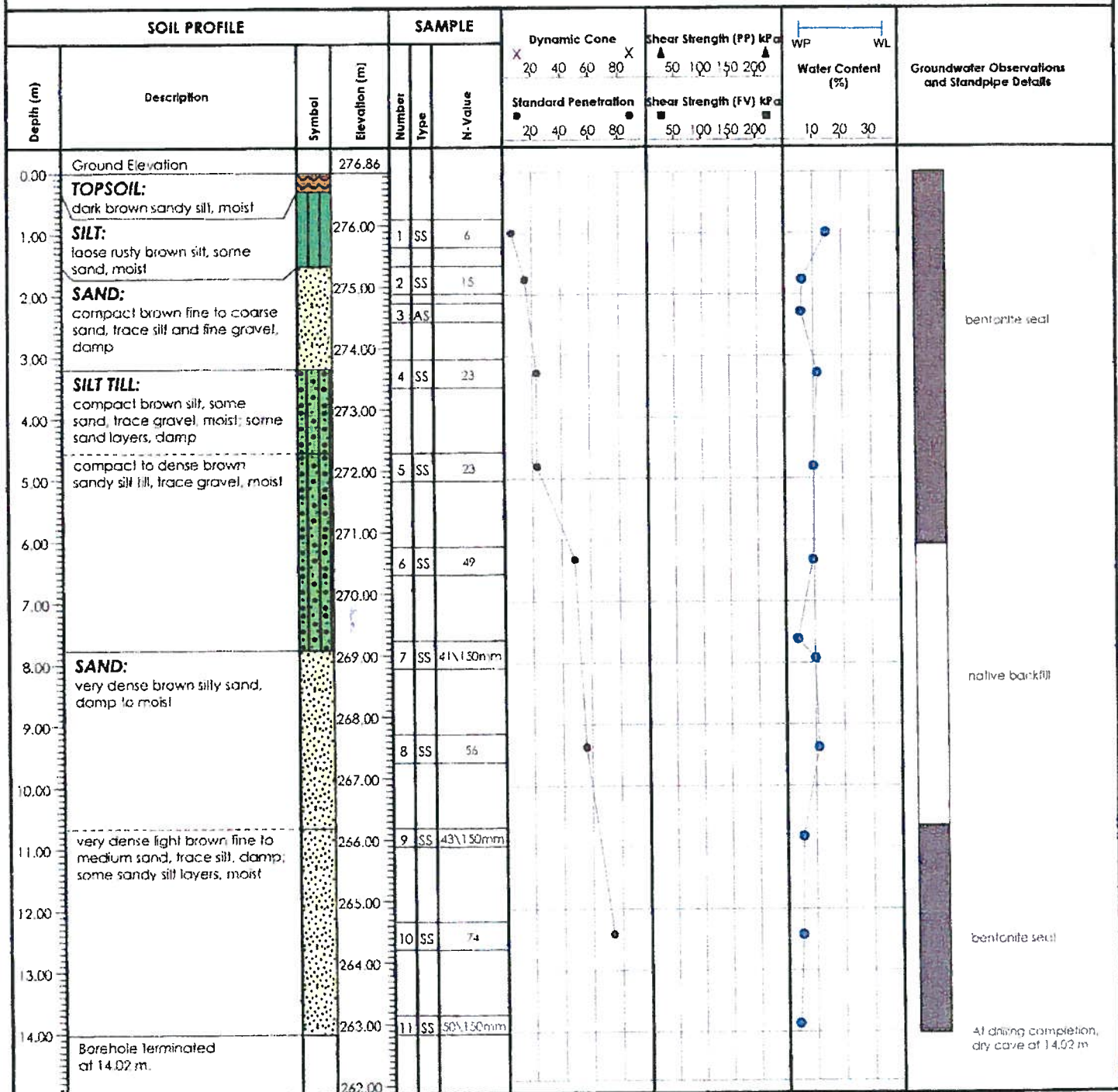
Ground Elevation: 276.86 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 27, 2005



Reviewed by: T.S.

Field Tech.: R.M.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: Bulk sample taken from 3.20 to 4.27 m.

Drafted by: A.G._01a



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Borehole Number: 7

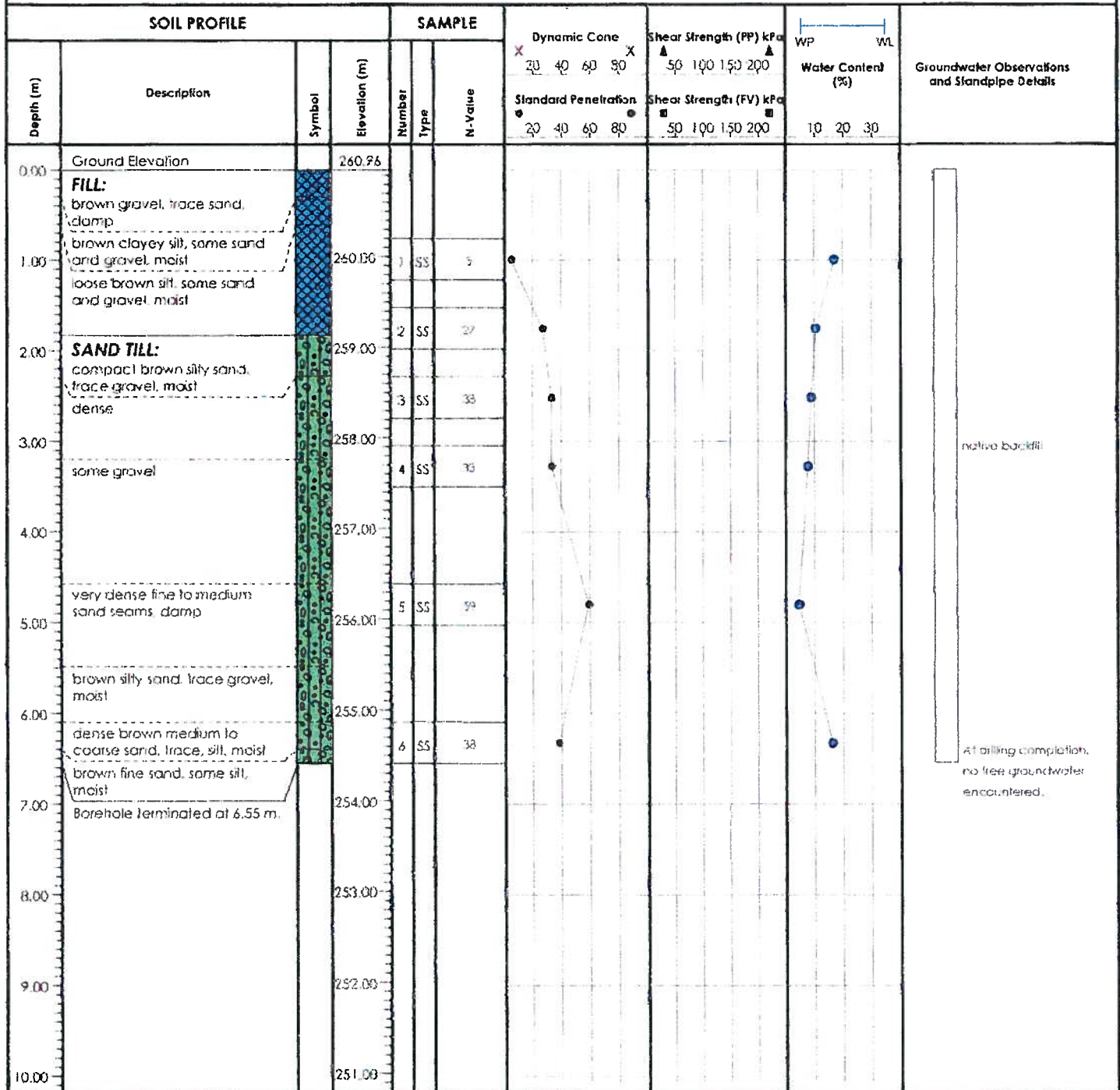
Ground Elevation: 260.96 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 8

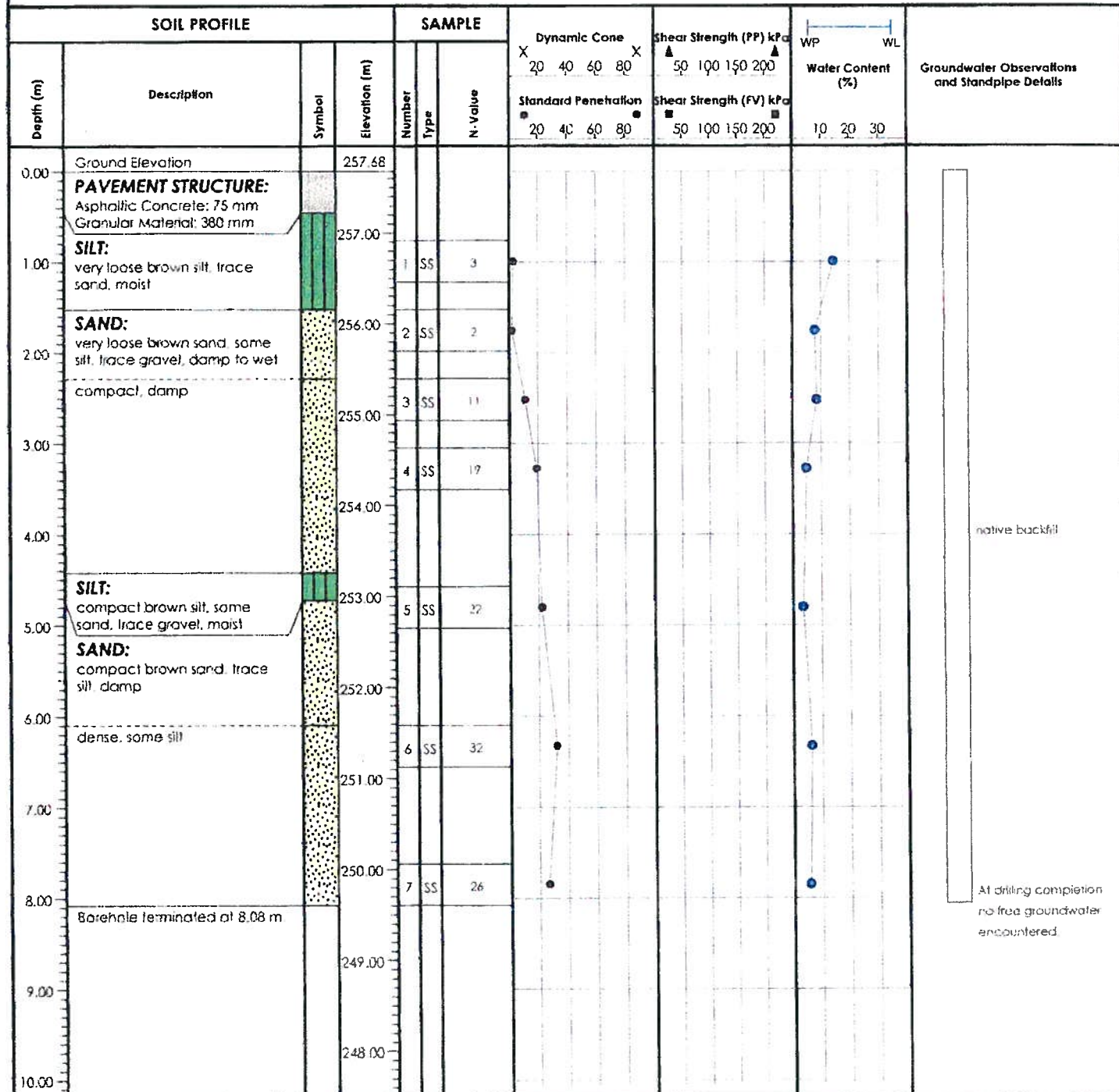
Ground Elevation: 257.68 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 9

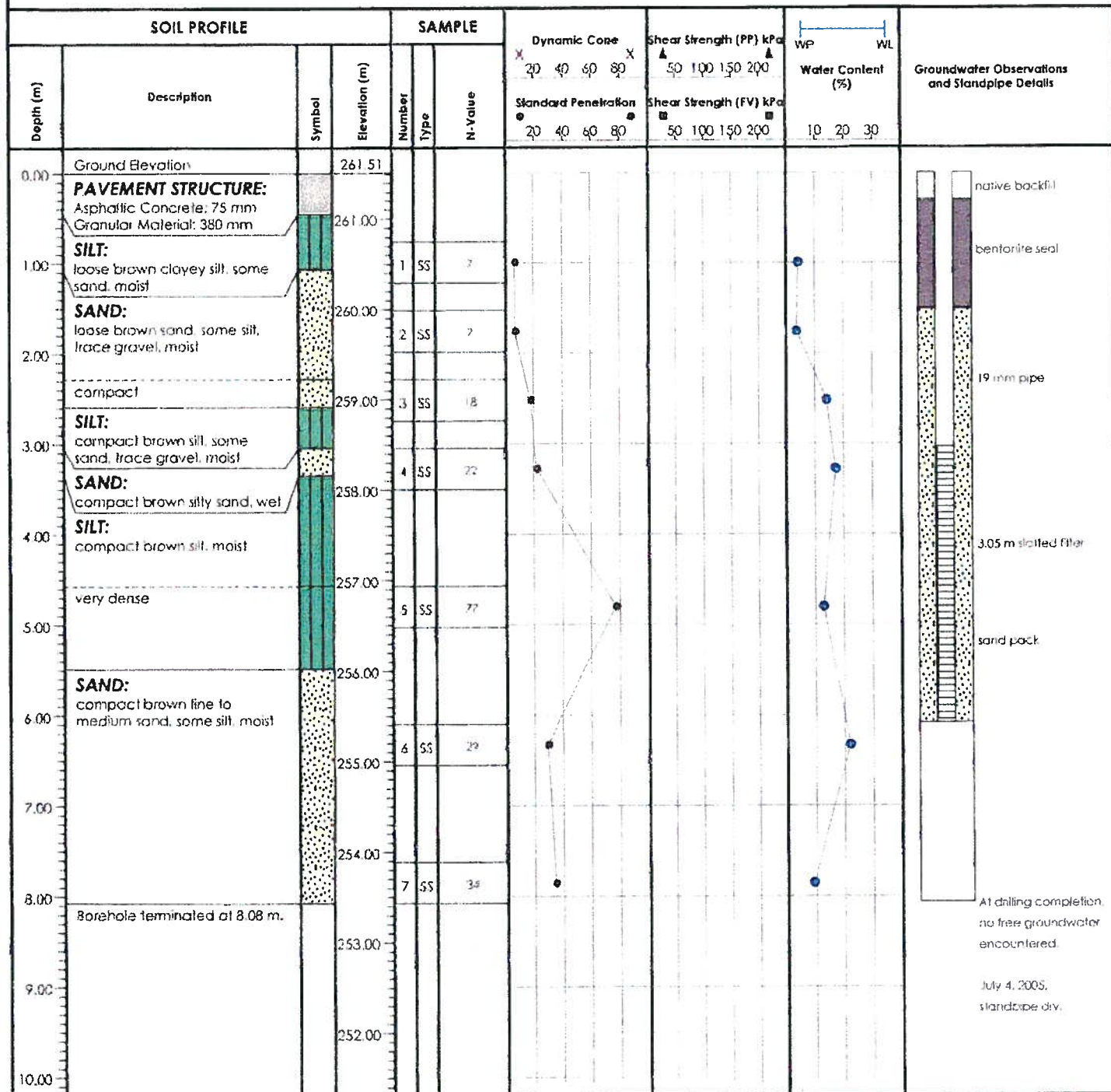
Ground Elevation: 261.51 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 10

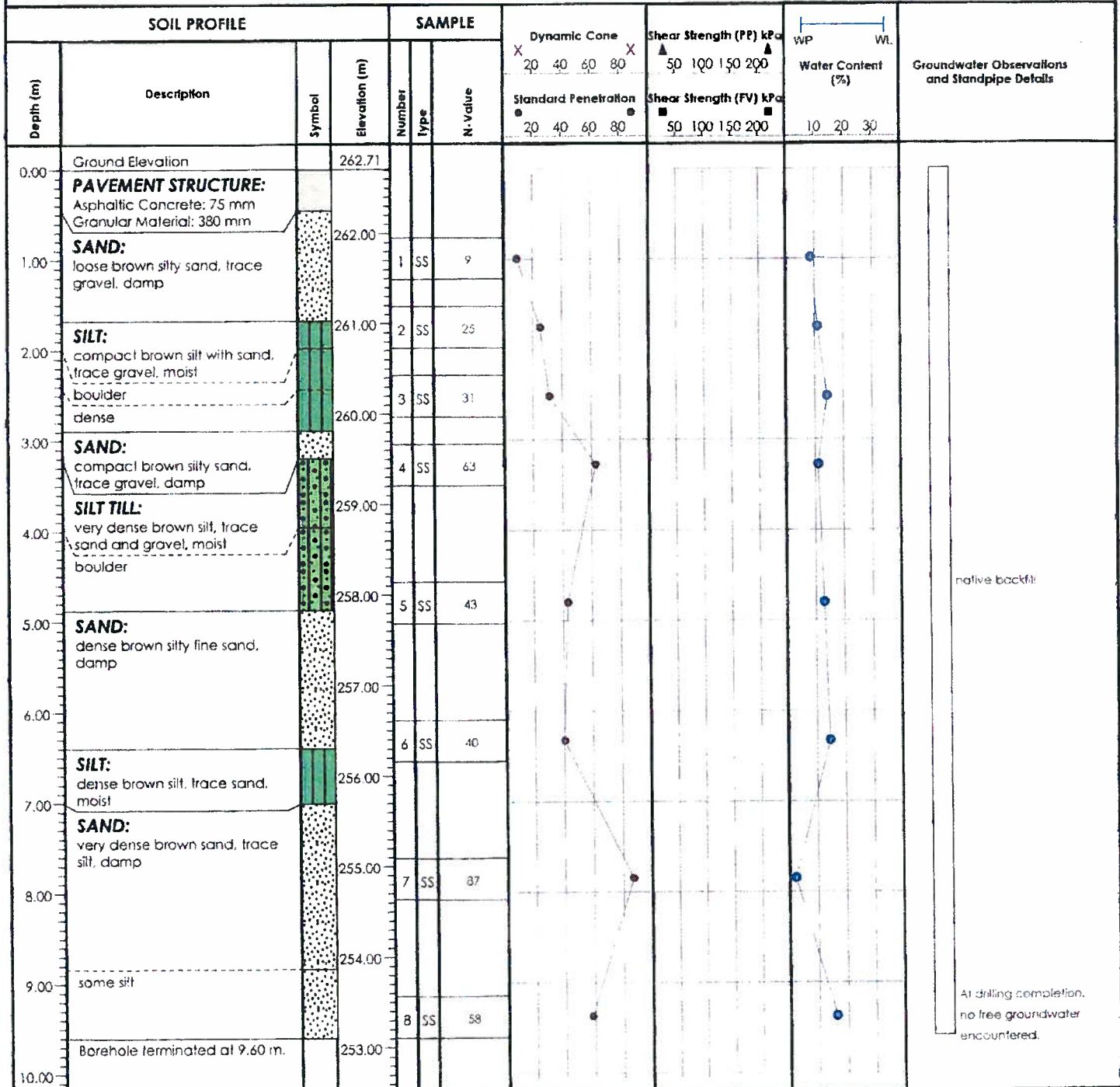
Ground Elevation: 262.71 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 11

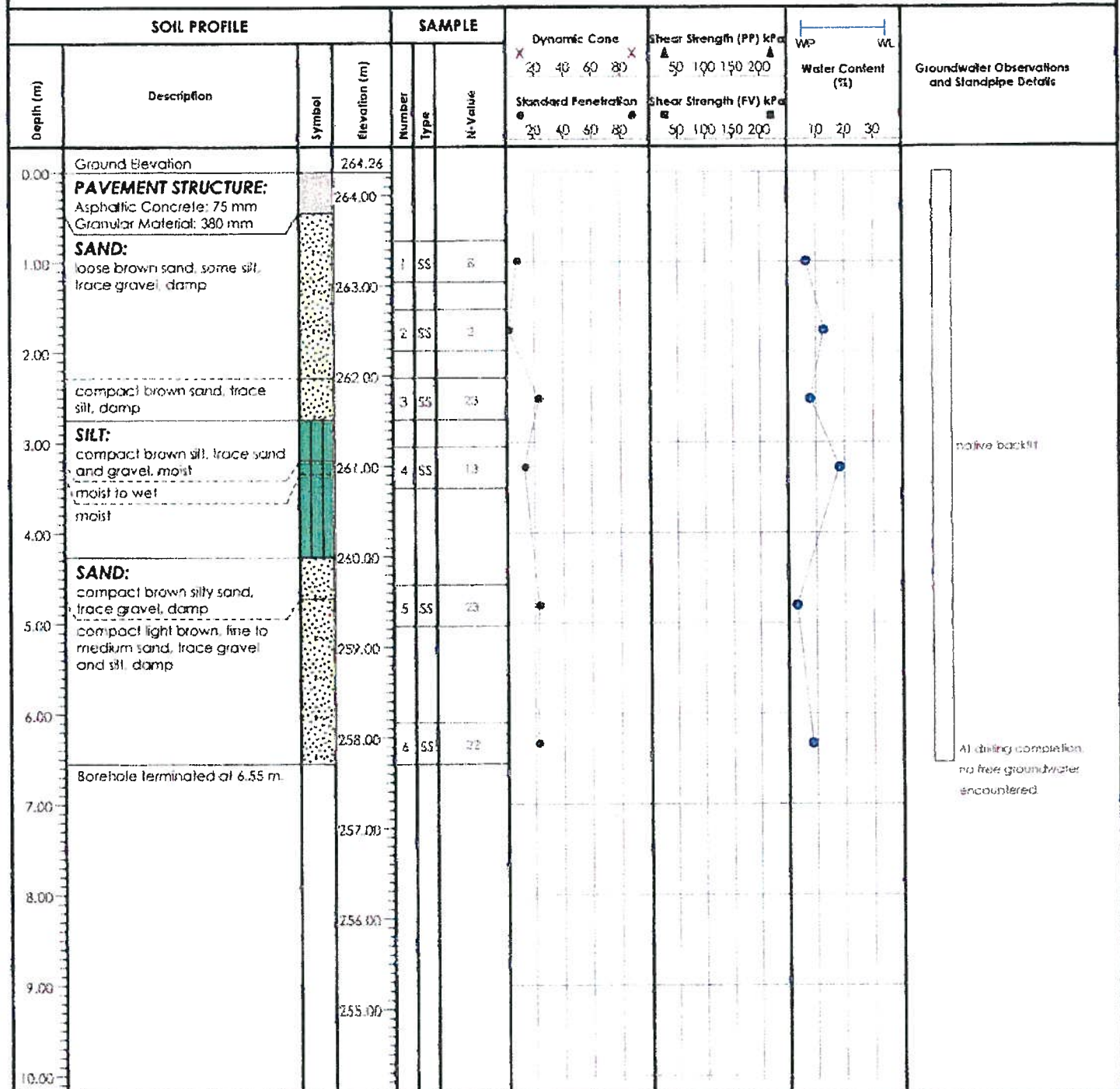
Ground Elevation: 264.26 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 12

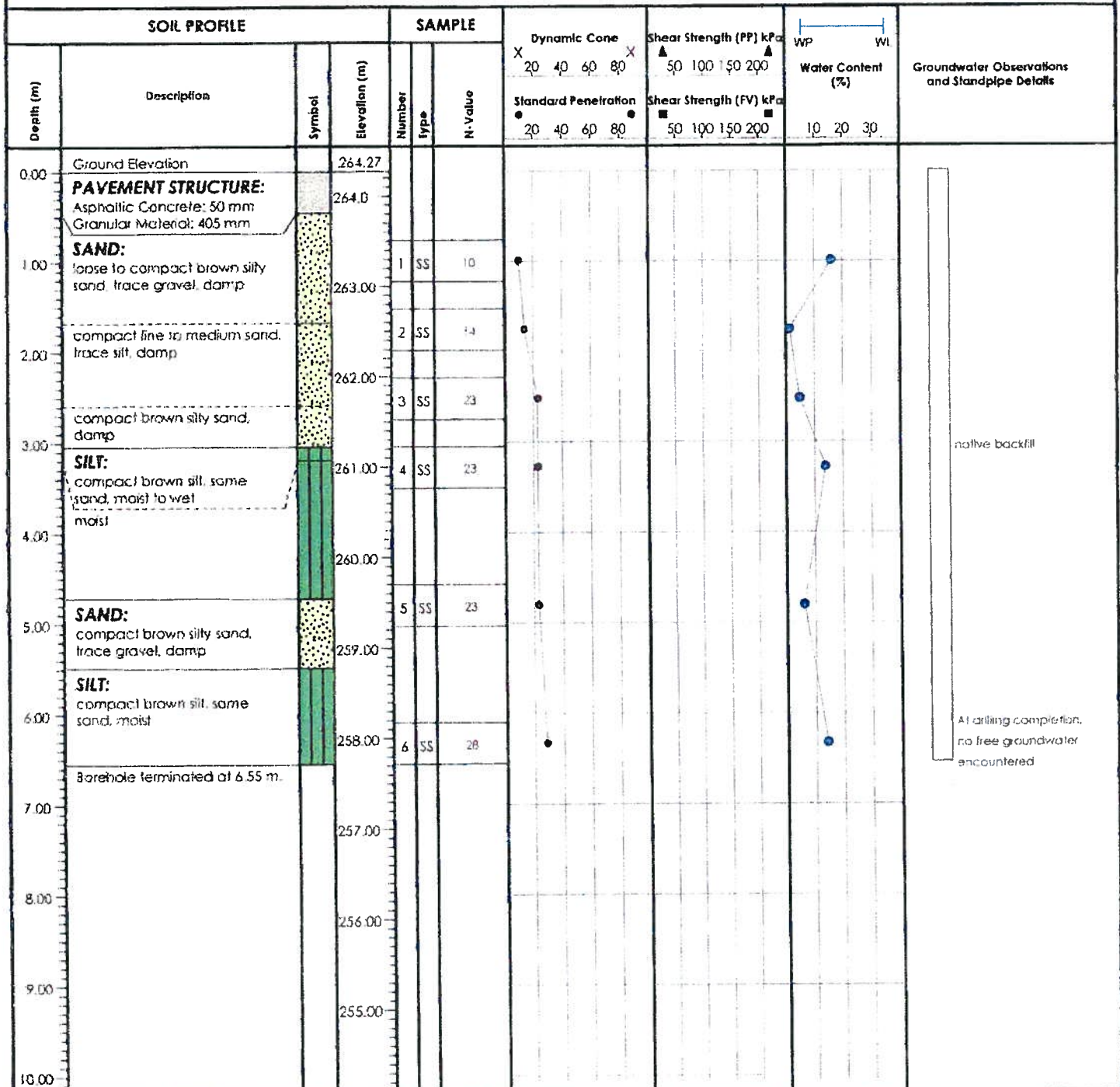
Ground Elevation: 264.27 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 13

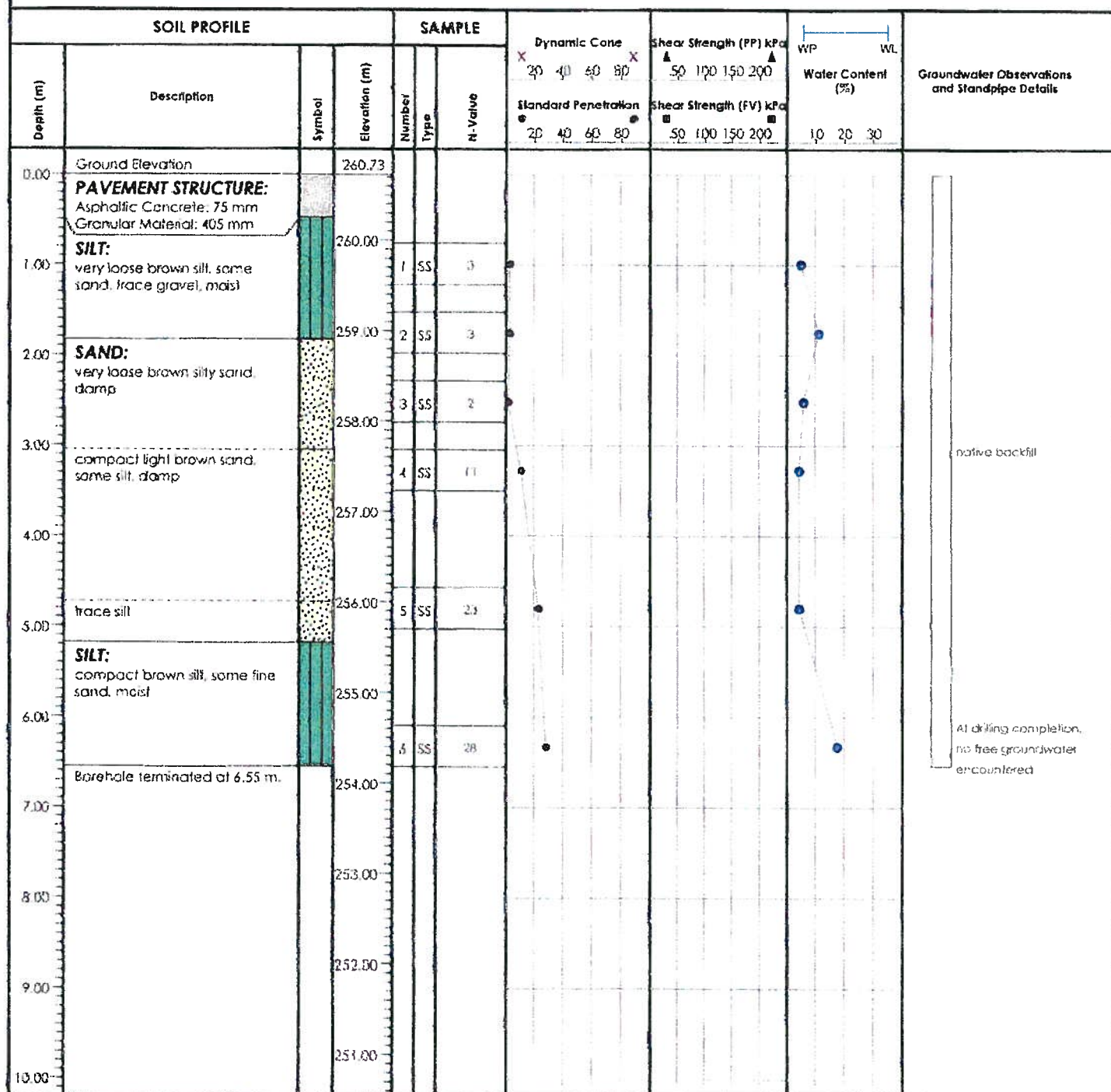
Ground Elevation: 260.73 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 14

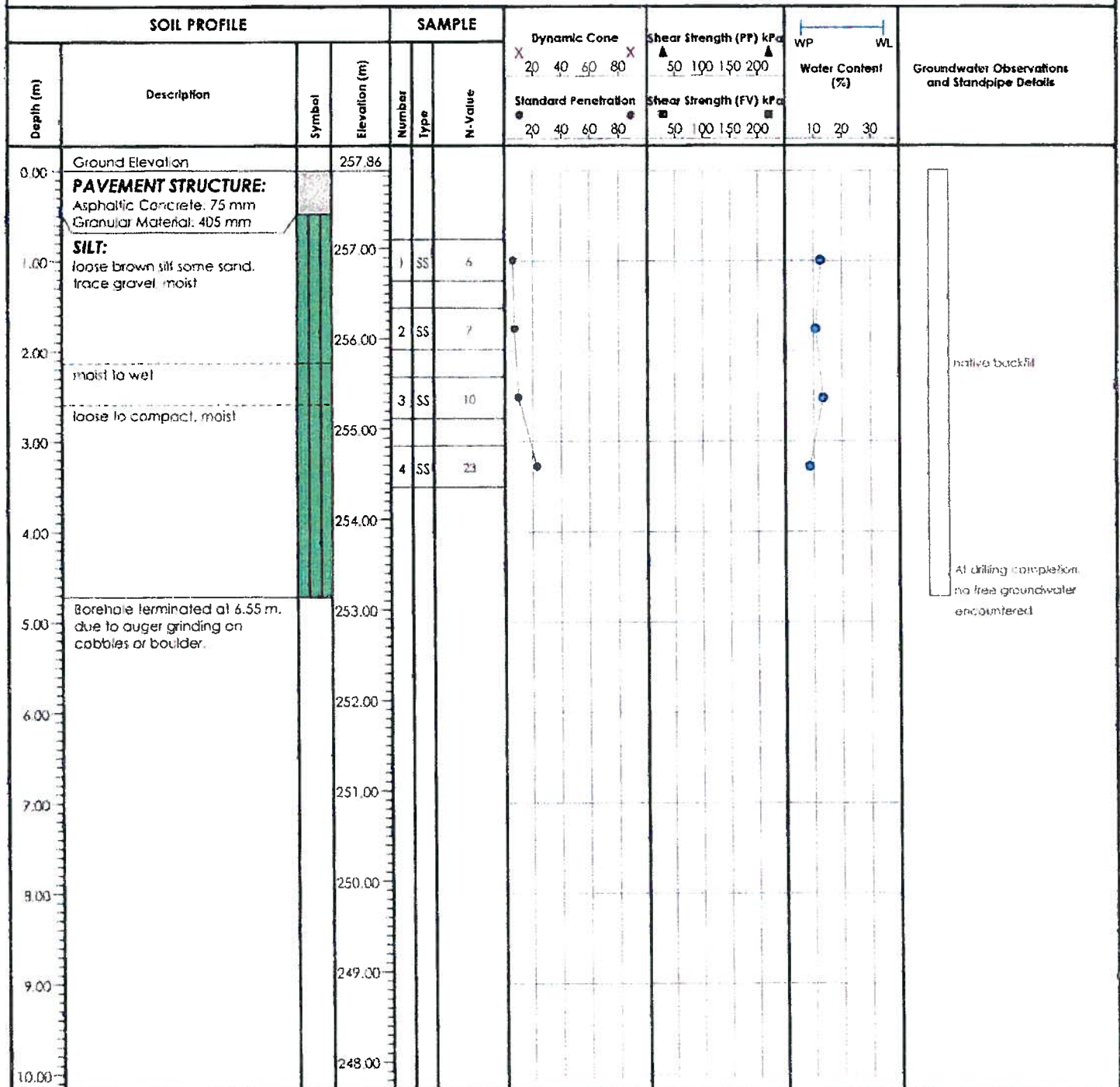
Ground Elevation: 257.86 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 15

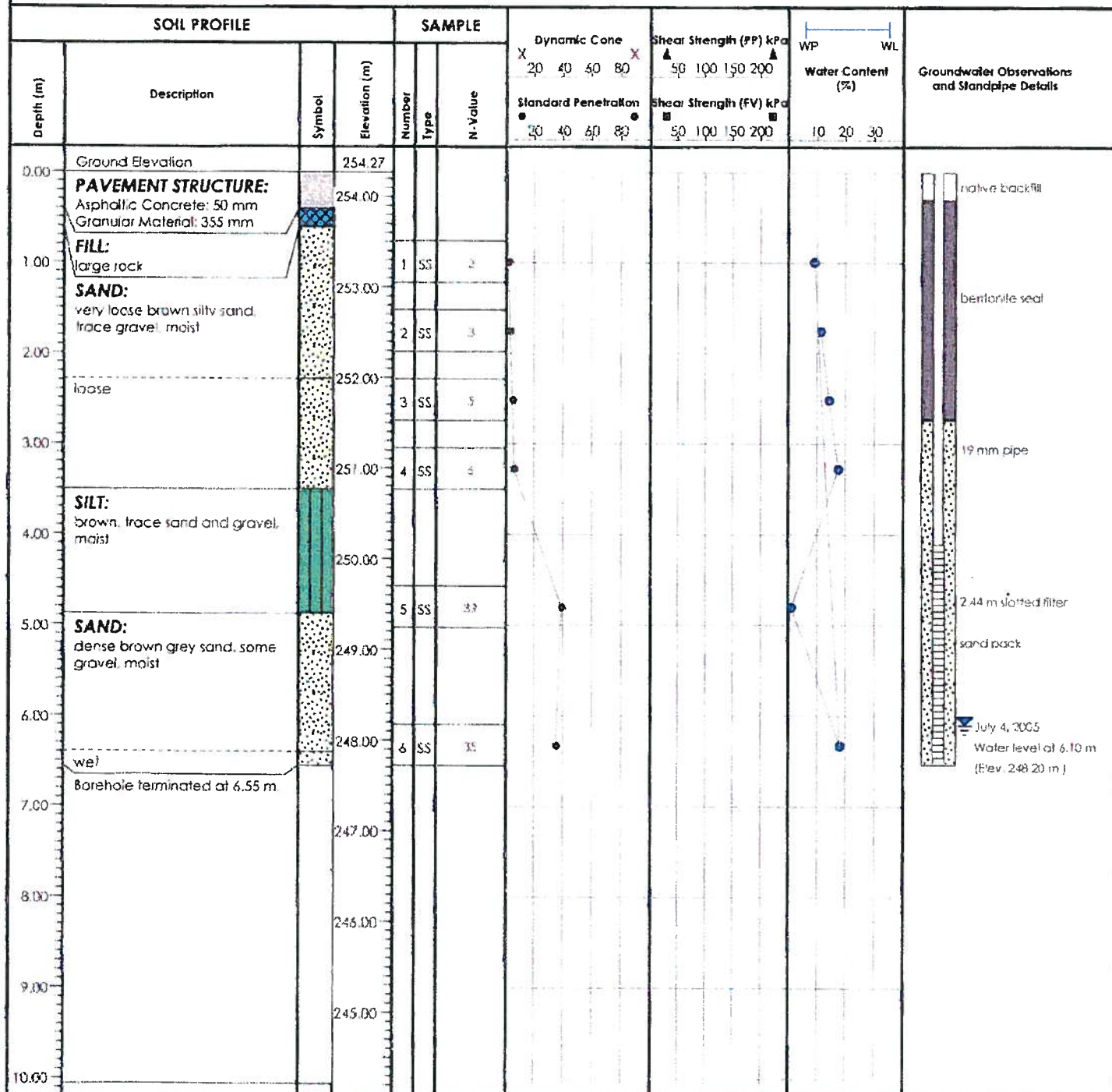
Ground Elevation: 254.27 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 16

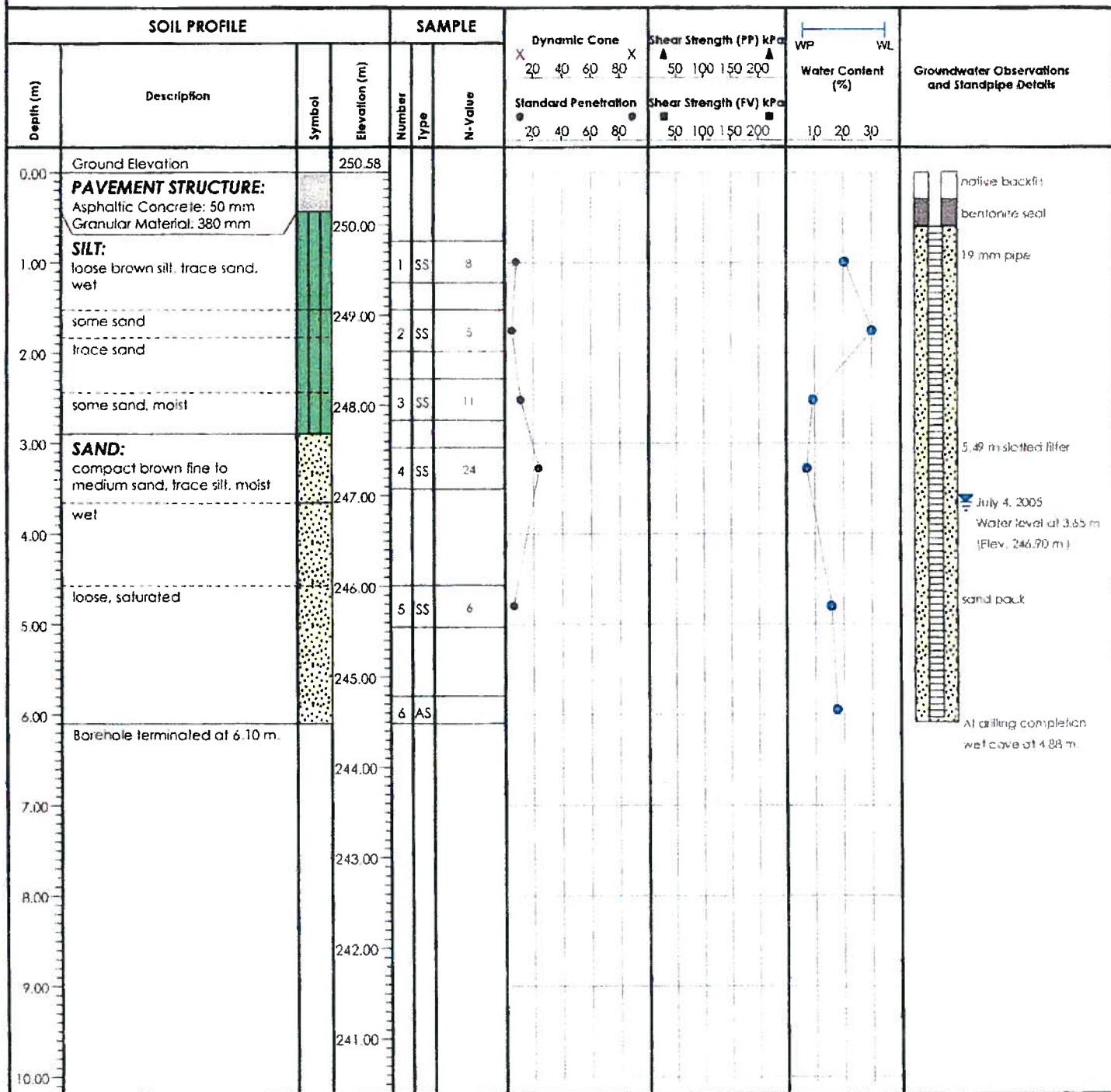
Ground Elevation: 250.58 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 17

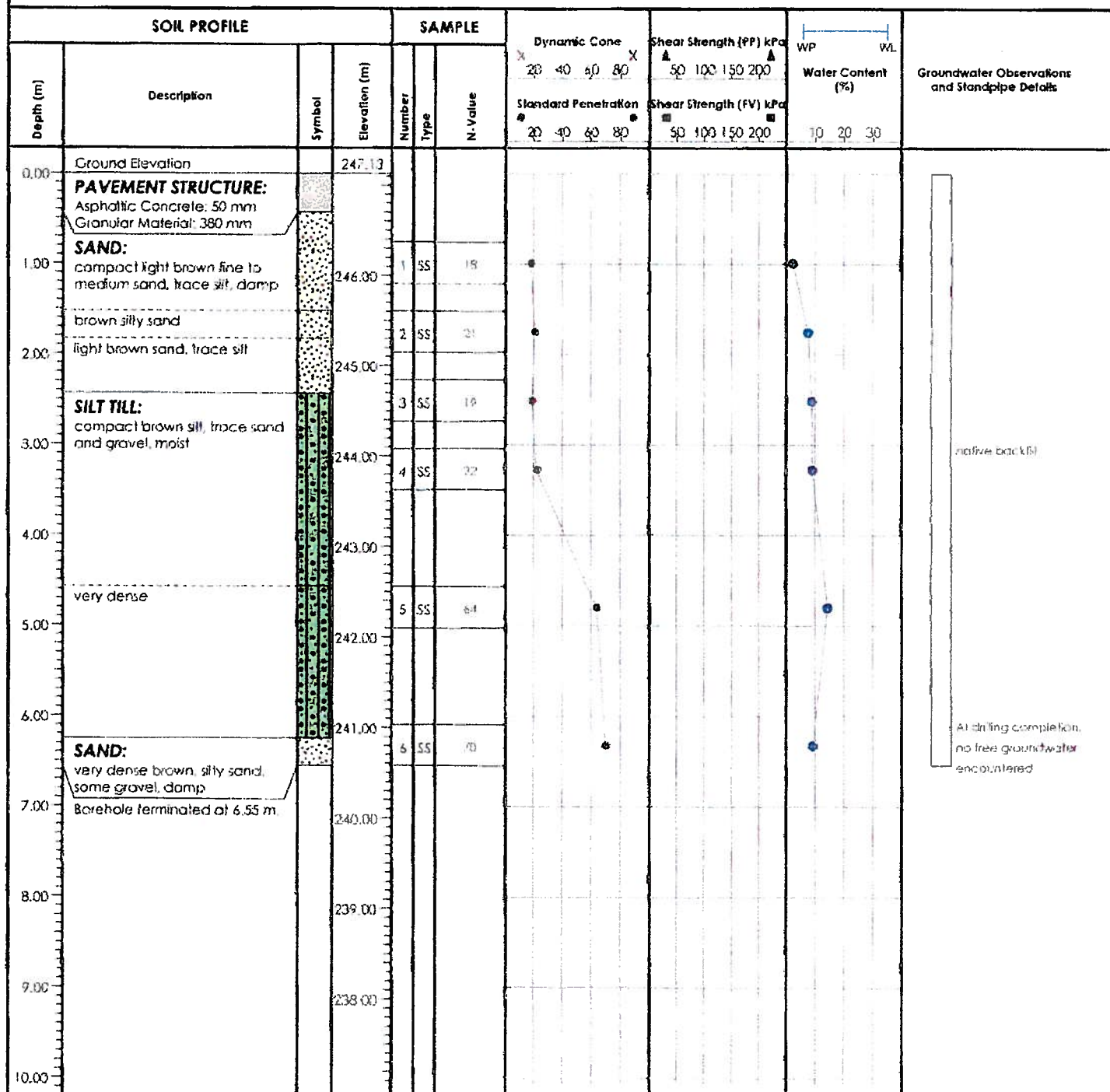
Ground Elevation: 247.13 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 22, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 18

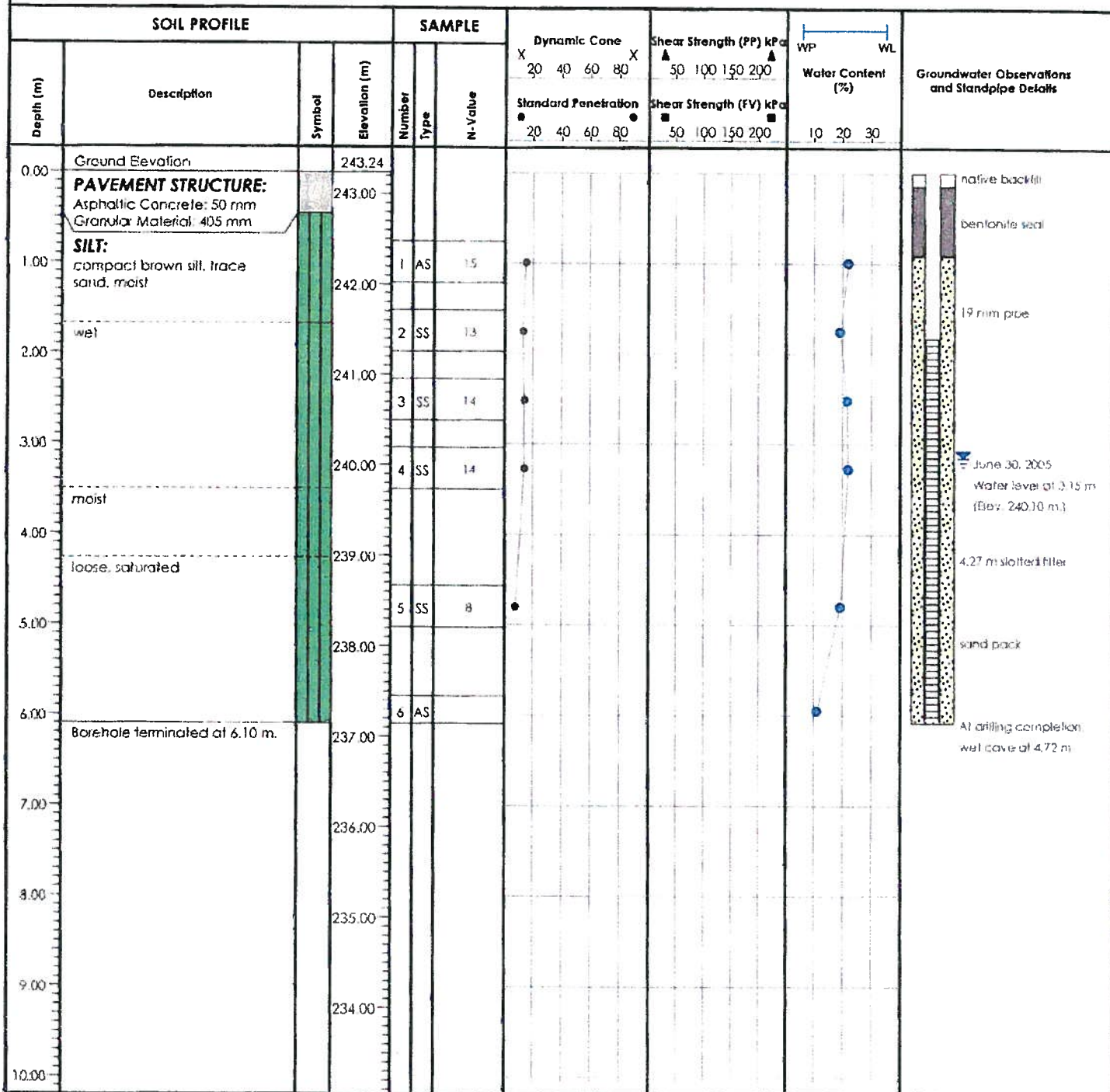
Ground Elevation: 243.24 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 23, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 19

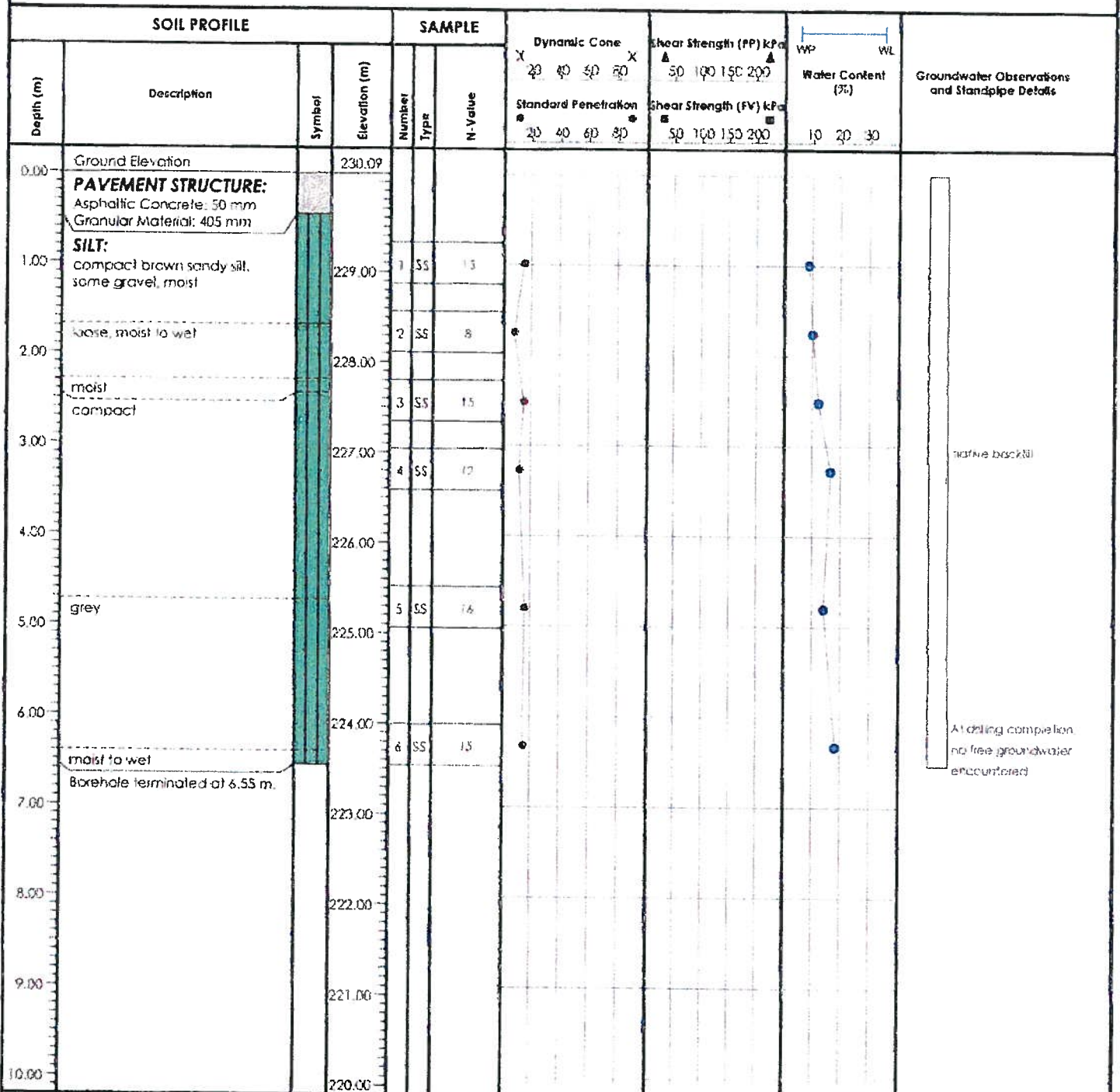
Ground Elevation: 230.09 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 23, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 20

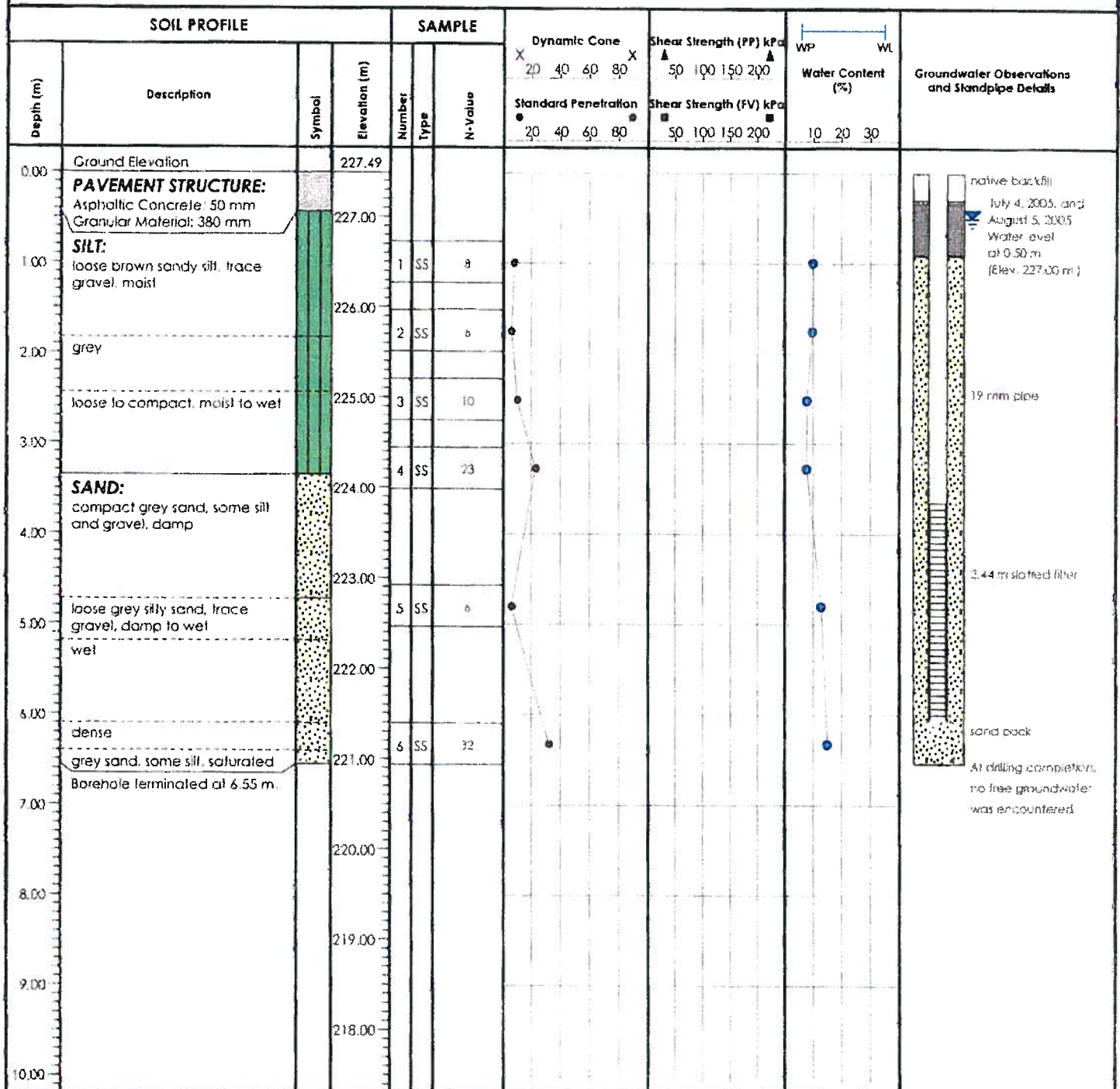
Ground Elevation: 227.49 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 23, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 21

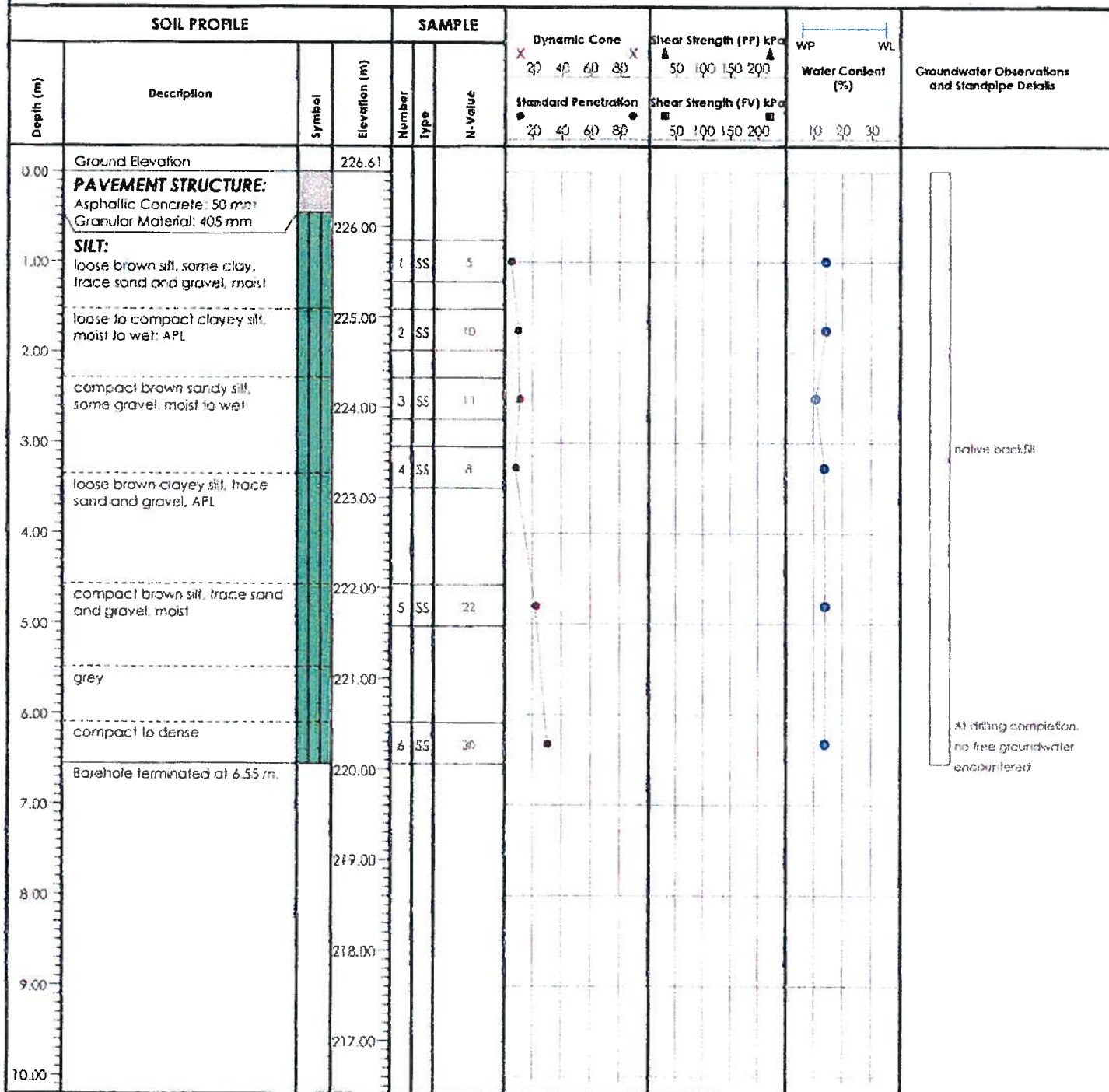
Ground Elevation: 226.61 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 23, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 22

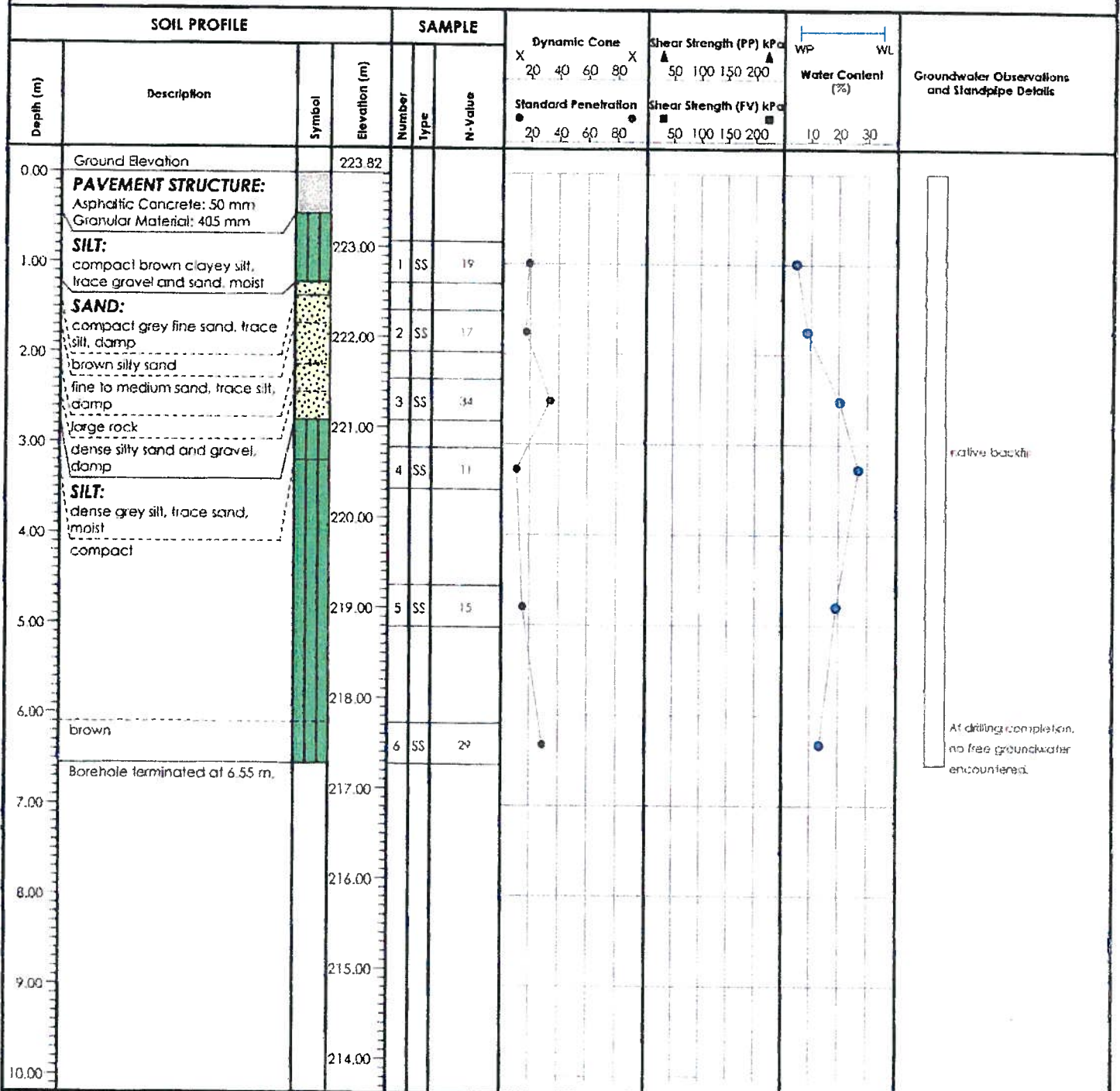
Ground Elevation: 223.82 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 23, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 23

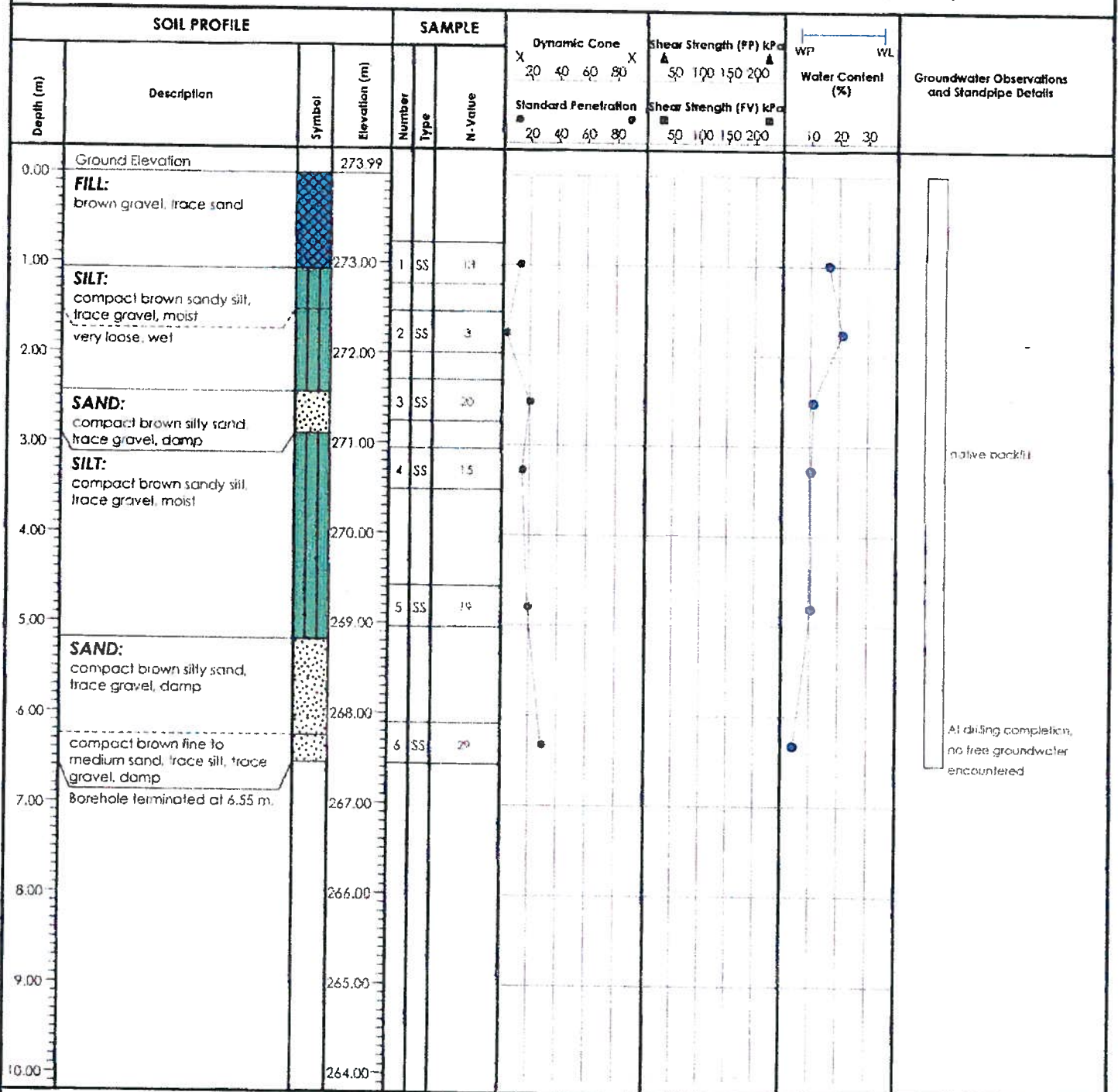
Ground Elevation: 273.99 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 5, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 24

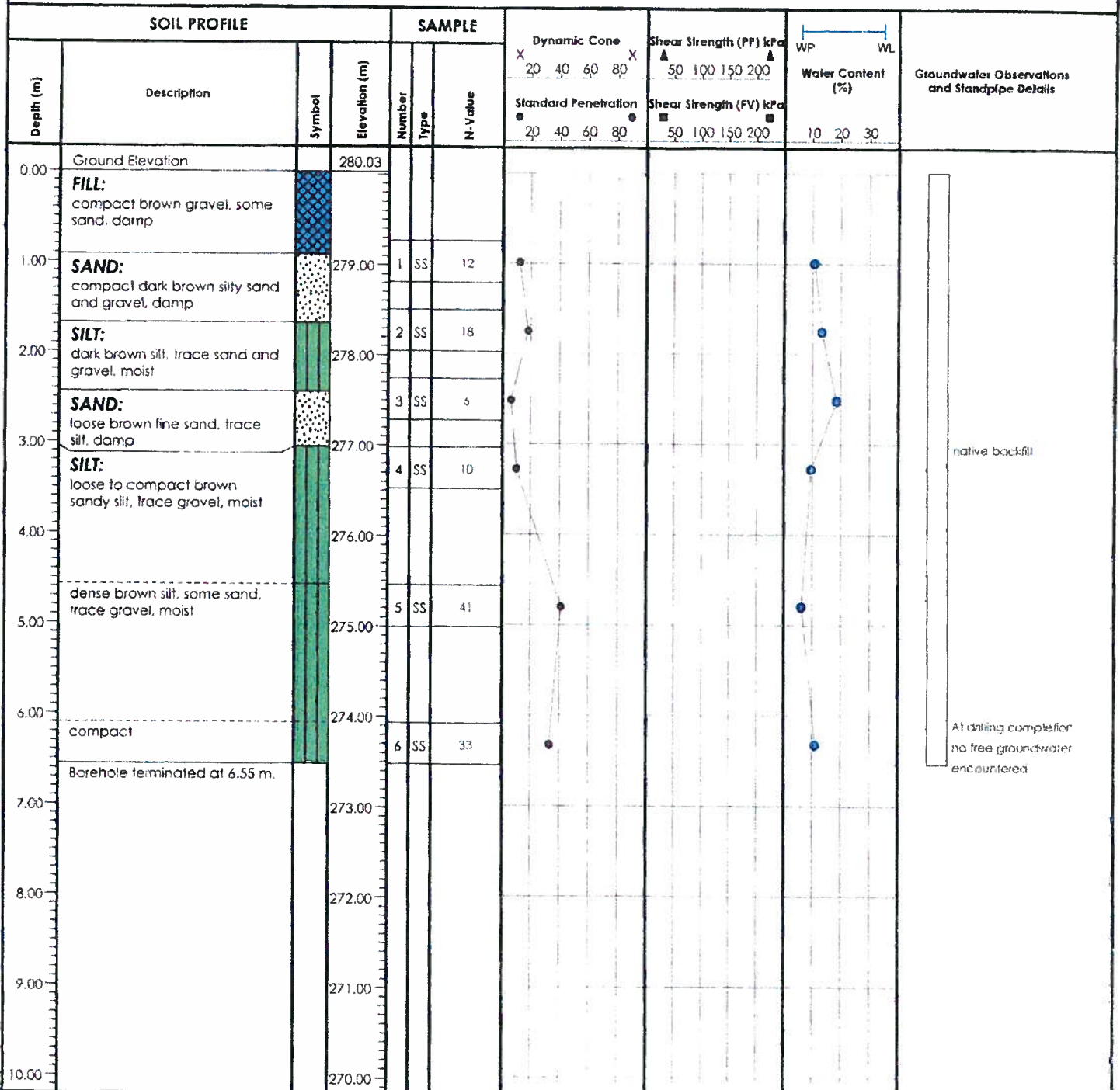
Ground Elevation: 280.03 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 25

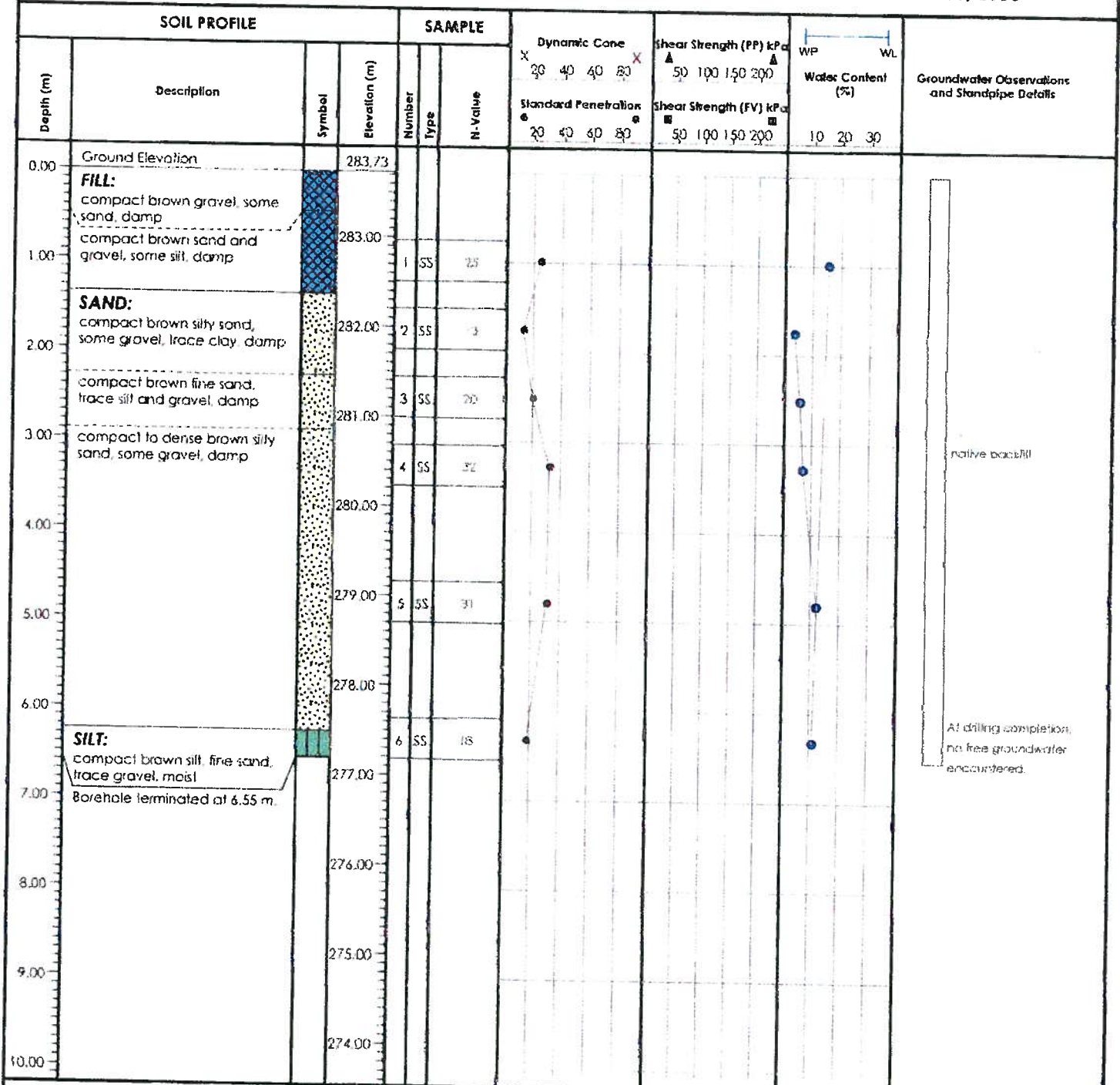
Ground Elevation: 283.73 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 26

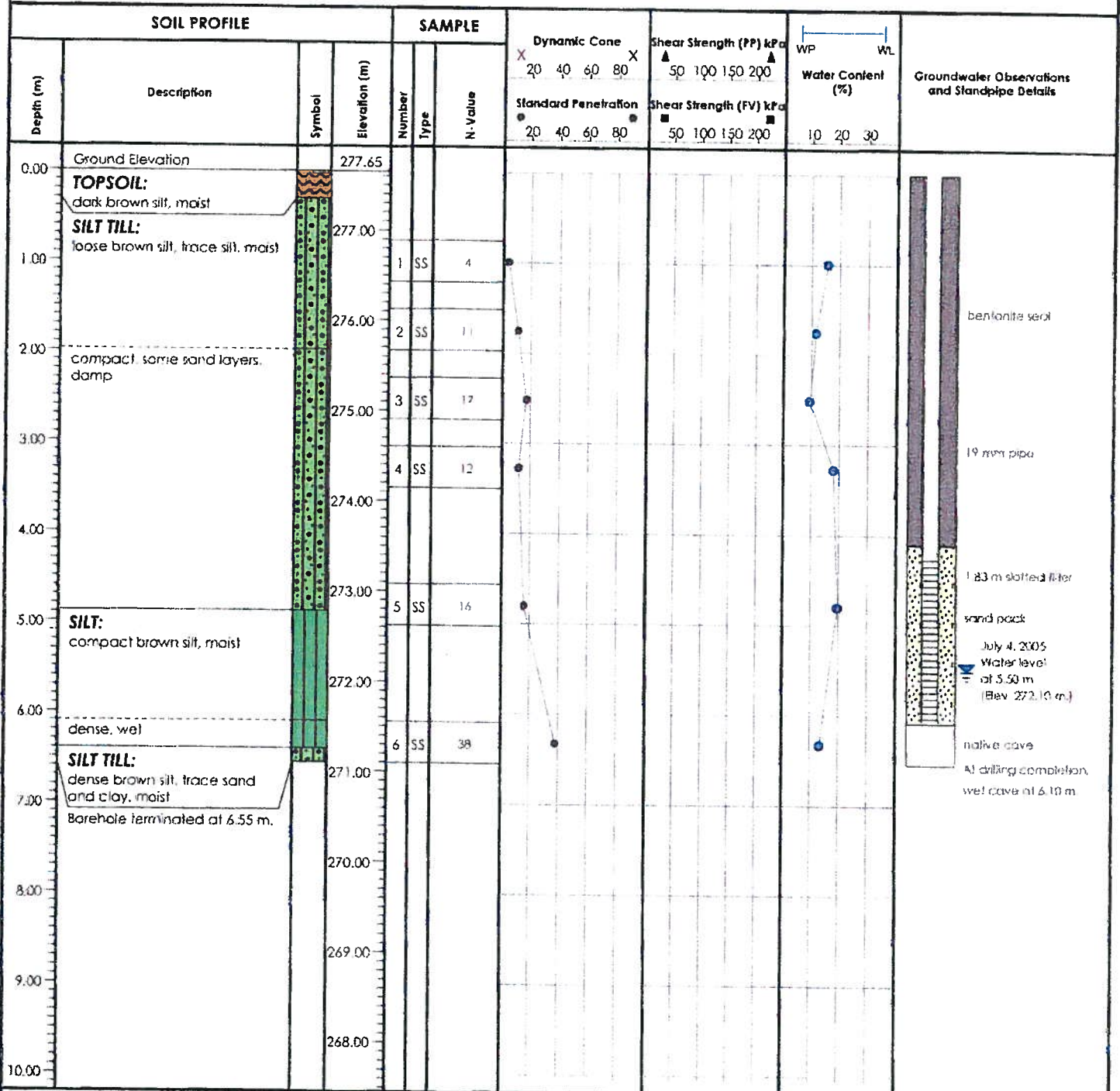
Ground Elevation: 277.65 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 27, 2005



Reviewed by: T.S.

Field Tech.: R.M.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: Bulk sample taken from 2.44 to 3.66 m.

Drafted by: A.G._01a



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Borehole Number: 27

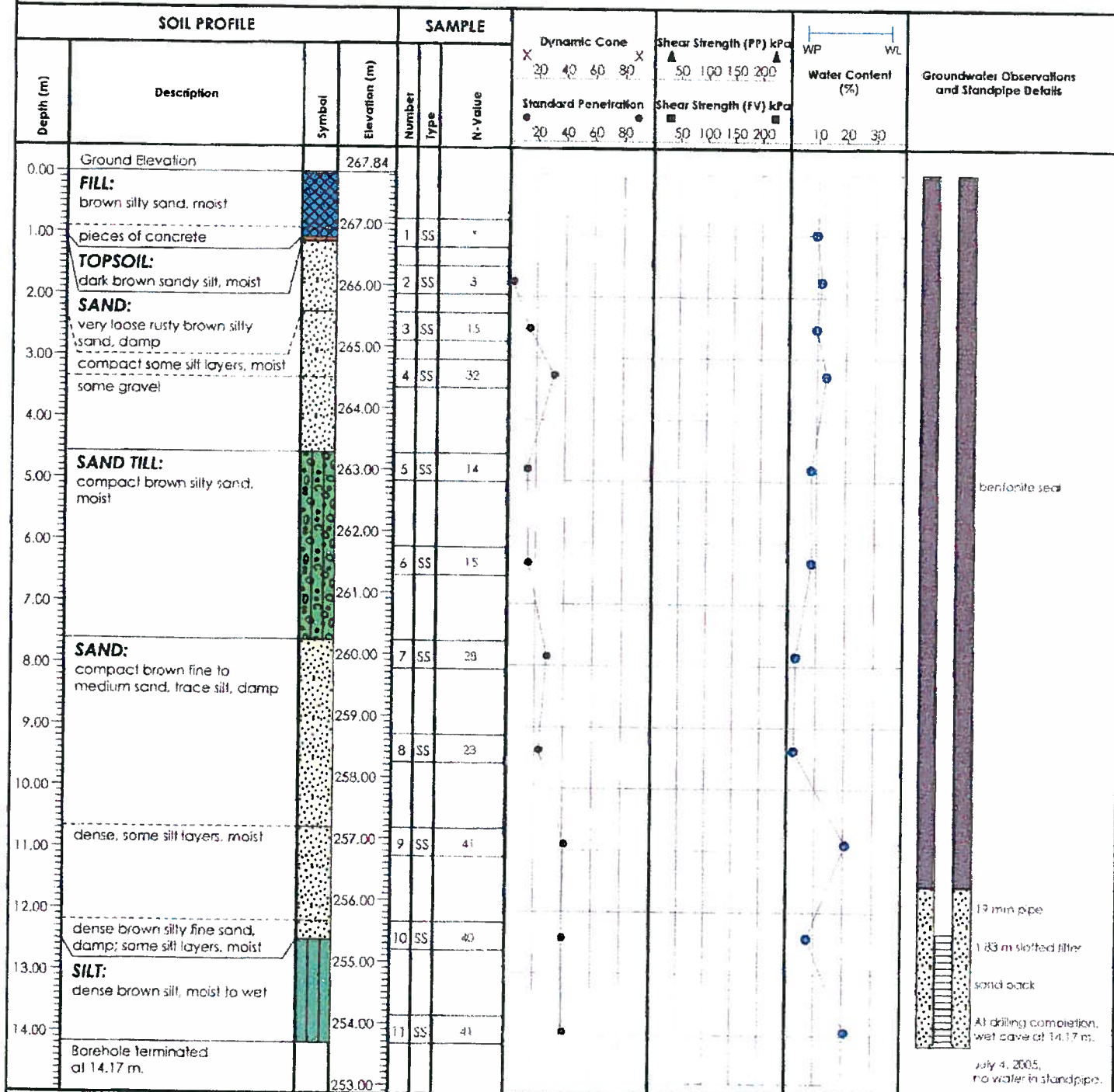
Ground Elevation: 267.84 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 27, 2005



Reviewed by: T.S.

Field Tech.: R.M.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes: * Sampler driving on concrete. Bulk sample taken from 4.57 to 6.10 m. Drafted by: A.G._01a



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Borehole Number: 28

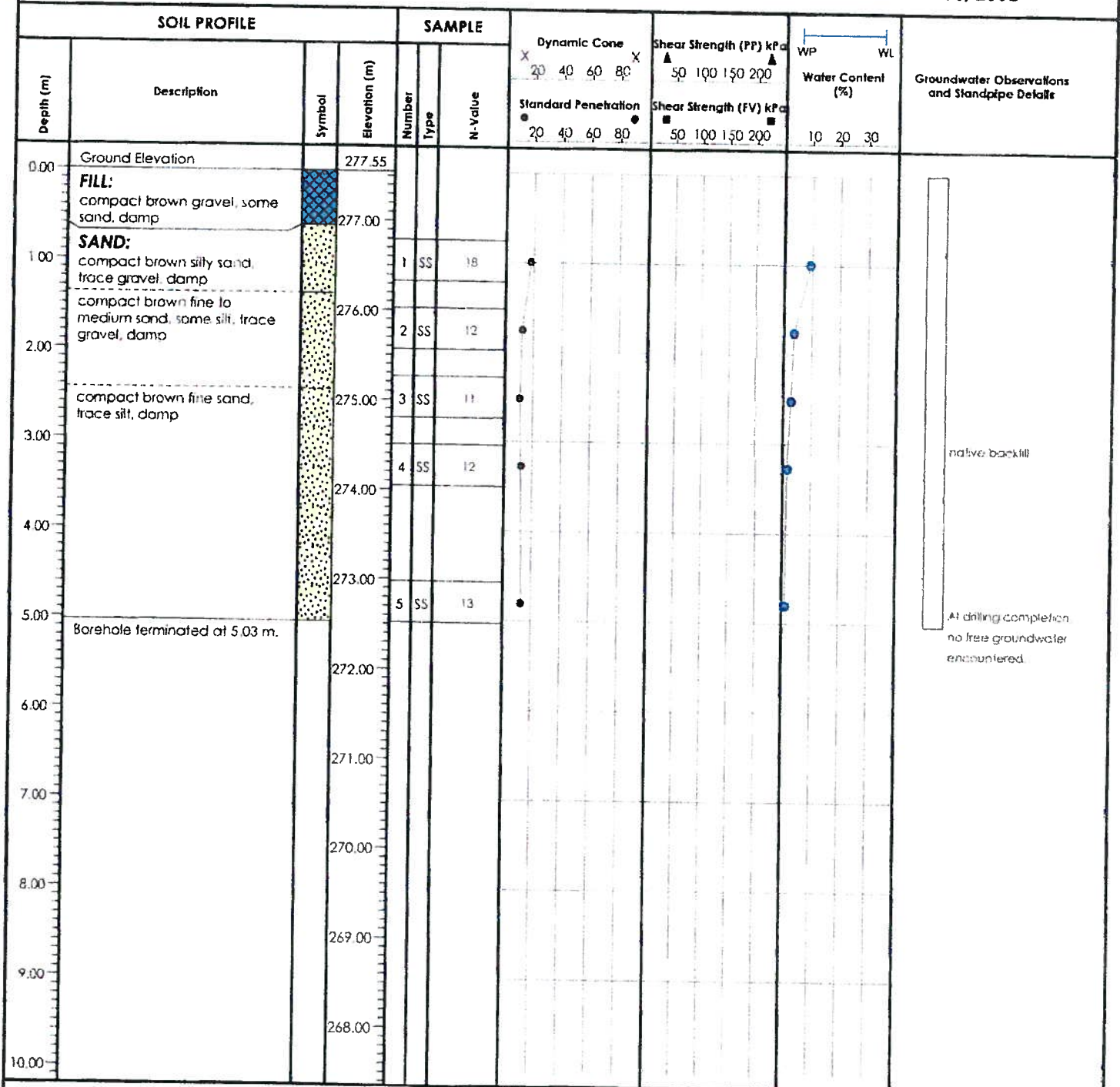
Ground Elevation: 277.55 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 29

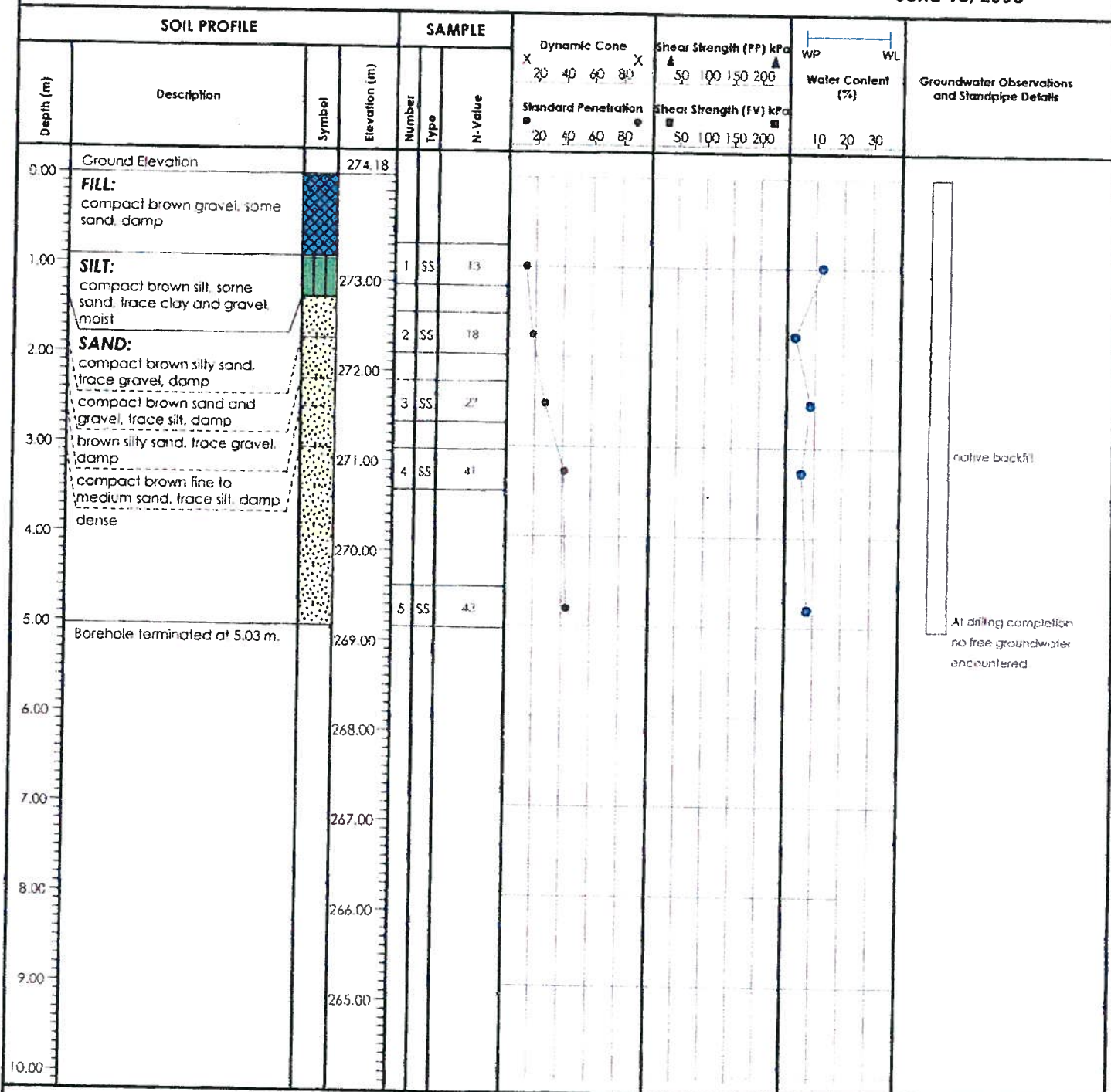
Ground Elevation: 274.18 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 30

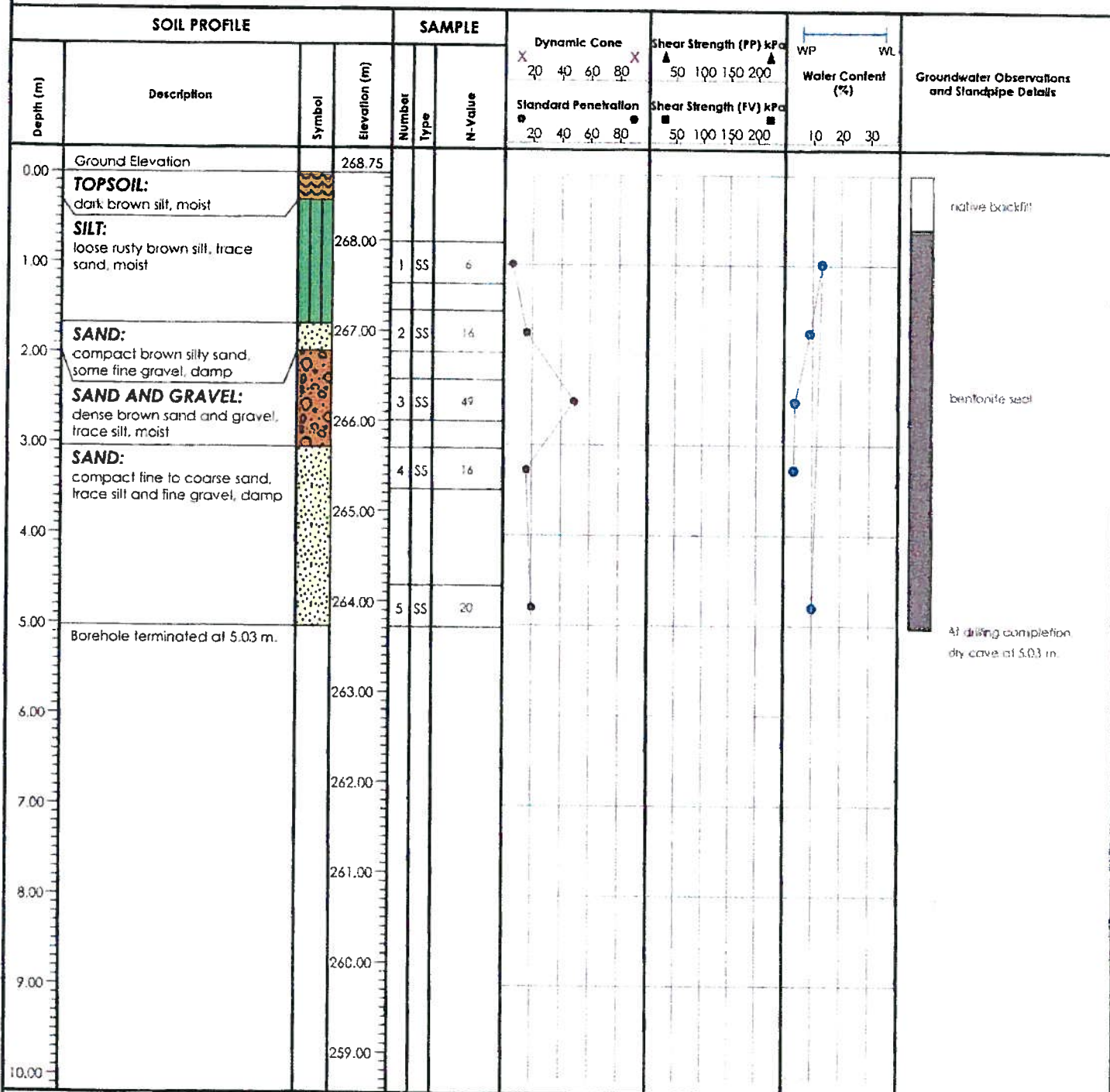
Ground Elevation: 268.75 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 27, 2005



Reviewed by: T.S.

Field Tech.: R.M.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

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Borehole Number: 32

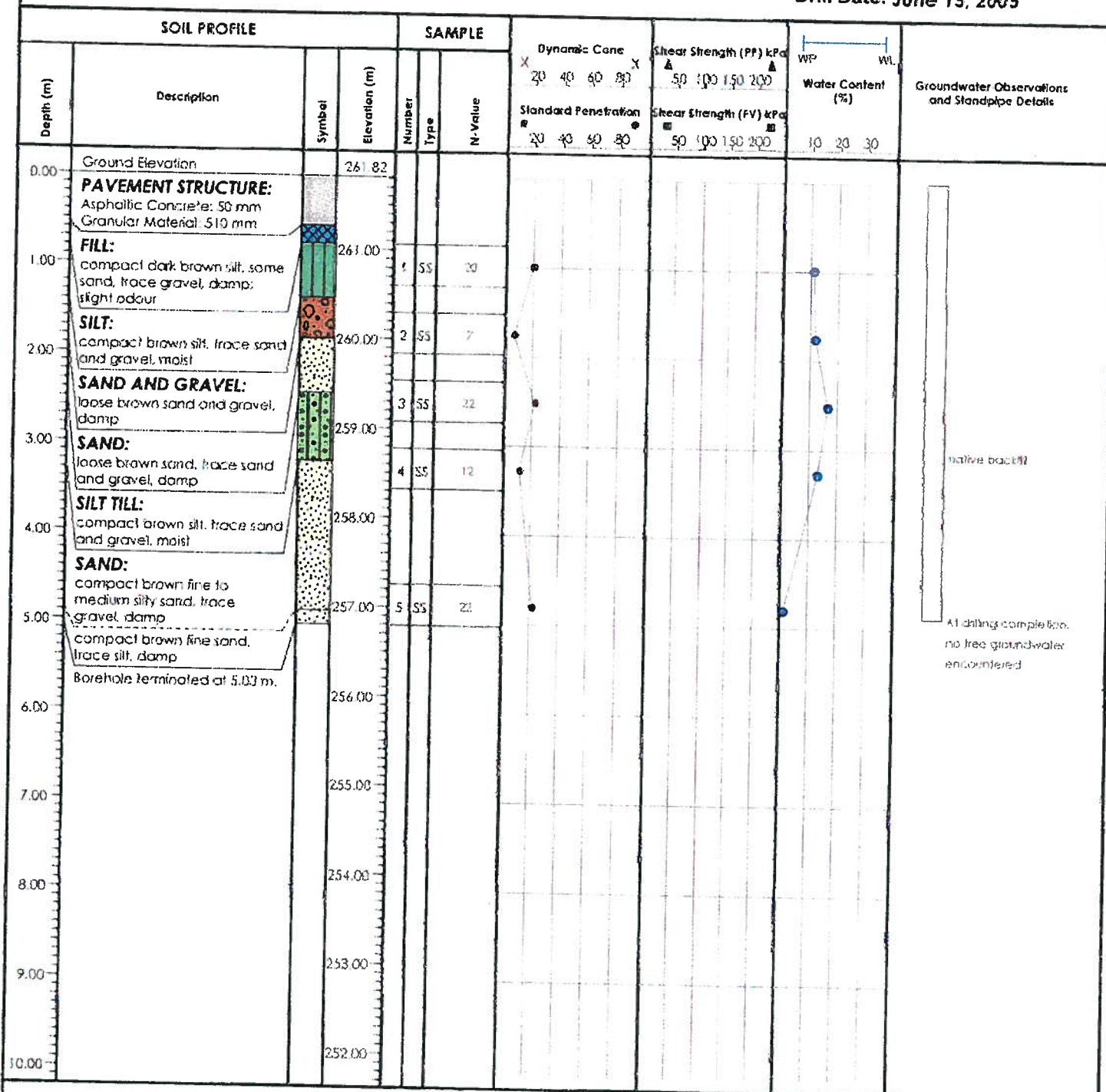
Ground Elevation: 261.82 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Drill Method: Solid Stem Auger

Notes:

Field Tech.: D.B.

Sheet: 1 of 1

Drafted by: A.G. 01a



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Borehole Number: 33

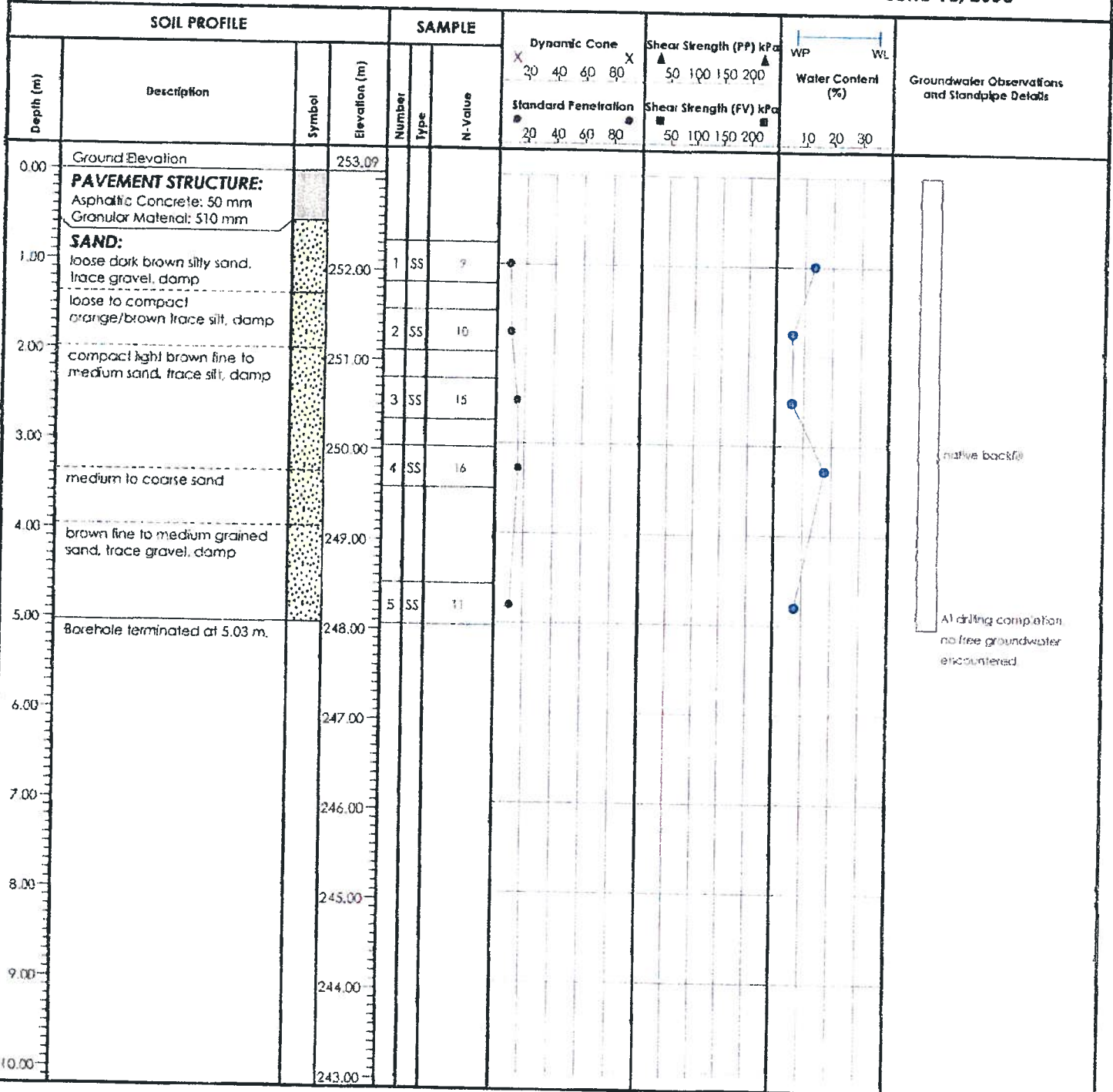
Ground Elevation: 253.09 m

Project: Southwest Paris Water and Wastewater Servicing Study

Job No.: 5703G1

Location: Rest Acres Road, Paris, Ontario

Drill Date: June 15, 2005



Reviewed by: T.S.

Field Tech.: D.B.

Drill Method: Solid Stem Auger

Sheet: 1 of 1

Notes:

Drafted by: A.G. 01a

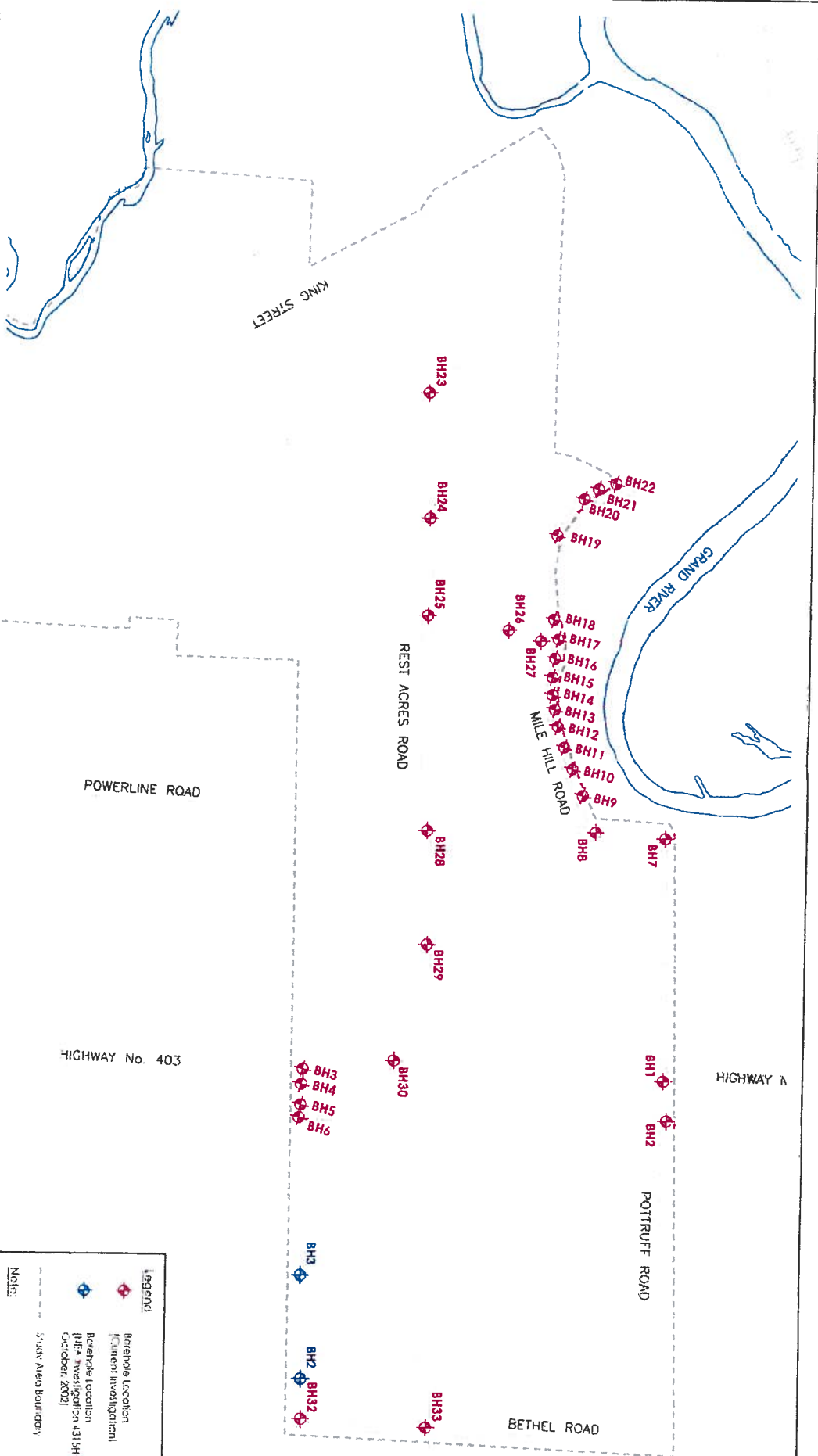


FIGURE 2. Borehole Locations

Note:
Locations of sites indicated at the
top of the map are for reference only.
Borehole locations are indicated
by the numbers in the table.

Plot	Report Issued	Date
1	Aug. 2005	
2		
3		



Southwest Paris Water and Wastewater
Serving Study, Rest Acres Road
Paris, Ontario

SITE PLAN			
Scale	Scale	Scale	Scale
Aug. 2005	1:12500	5703G-1	2

Legend

- Borehole Location
- Current Investigation
- Borehole Location (JFA Investigation 431 SH1, October 2002)
- Study Area Boundary

Note:
See Appendix 1 for ground elevations of the boreholes.