

GEOTECHNICAL EVALUATION

FOR THE PROPOSED KINGSVIEW PLAZA

LOCATED AT

**2914 KINGSVIEW BOULEVARD
AIRDRIE, ALBERTA**

SUBMITTED TO:

1234952 ALBERTA LTD.

C/O TRI VALE CONSTRUCTION LTD.

ATTENTION: MR. GORD MOROZOFF

PREPARED BY:

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1.0 INTRODUCTION

The following report presents results of a Geotechnical Investigation at the site of the proposed Kingsview Plaza located at 2914 Kingsview Boulevard, Airdrie, Alberta (see Plate I-1, Appendix I). The purpose of the investigation was to determine the subsurface soil conditions at the site and to provide geotechnical evaluation for the development of the proposed commercial buildings.

It is understood that the proposed development will consist of a large commercial and an industrial building without basement. Parking lot and driveway will be provided in the site.

Written authorization to proceed with this investigation was received on May 15, 2006 from Mr. Gord Morozoff of Tri Vale Construction Ltd. on behalf of 1234952 Alberta Ltd. Fieldwork was carried out on May 24, 2006. A total of six testholes were drilled at the site using a truck-mounted solid stem auger. Locations of the testholes are shown on the site plan (see Plate I-2, Appendix I). The preliminary testhole elevations were surveyed by Global Engineering and Testing Ltd.

2.0 FIELD AND LABORATORY INVESTIGATION

Six testholes were drilled at the site to delineate the subsoil stratigraphy and to provide samples for laboratory testing. The depth of borehole penetration was 4.6 to 6.1 metres below the existing grade. Disturbed soil samples from the drill were collected at regular intervals. Open standpipes were installed in the testholes to permit groundwater monitoring.

Standard laboratory tests were performed on representative soil samples acquired from the field to determine the soil identification and water-soluble sulphate contents.

Results of these tests are summarized on the testhole logs (see Plates I-3 to I-8 inclusive, Appendix I).

3.0 SITE DESCRIPTION

The subject Site is located at 2914 Kingsview Boulevard, Airdrie, Alberta. The Site is bounded by the Kingsway Boulevard to the west and a vacant lot to the south and north. The site is currently vacant and had been rough graded. Open water exists to the east vicinity of the Site. The local topography of the Site slopes towards the southeast and east (bigger slopes).

4.0 SUBSURFACE FEATURES

4.1 Subsoil Conditions

Based upon the testhole information, it is concluded that the stratigraphy of the site generally consists of fill, silty sand to sandy silt, and bedrock.

Detailed soil information is summarized on the testhole logs (see Plates I-3 to I-8, Appendix I). General soil information encountered at the site is described as follows:

4.1.1 Fill

About 0.9 to 2.8 metres deep of fill exists in most of the testholes. The fill consists of silty sand and sandy silt with inclusion of clay, gravel, siltstone pieces and traces of organic soil. The fill was found in a loose to compact relative density.

4.1.2 Sandy Silt to Silty Sand

Some sandy silt to silty sand was found in most area of the site. Most of the sandy silt to silty sand was found in a compact to dense relative density.

4.1.3 Bedrock

The bedrock was encountered at depth of 3.3 to 6.0 metres below the existing grade. The bedrock is of the Paskapoo formation, which consists of alternative layers of sandstone, siltstone mudstone and clayshale. The upper 3.0 metres is often the weathered bedrock.

4.2 Groundwater Conditions

Open standpipes were installed in all the testholes to monitor the groundwater level at the site. Groundwater was not found in any testholes immediately after the drilling of the testholes.

Fluctuation of the groundwater table can be expected, especially in response to snowmelt or heavy rainfall. It is recommended that the client should continue to monitor the water table to provide up-to-date information, particularly immediately prior to the start of construction. Alternatively, arrangements can be made for Global Engineering and Testing Ltd. to provide a water monitoring service.

5.0 EVALUATION AND PRELIMINARY RECOMMENDATIONS

Based on the evaluation and interpretation of subsurface soil conditions found in the testholes, the following recommendations are believed to be pertinent for the design/construction of the structure:

5.1 Site Development and Characteristics of the Subsoil

It is our understanding that the proposed development will consist of a one-storey commercial and an industrial building without basement. At the time of the investigation, the site was rough graded already and the ground is in a flat condition. It appeared surficial fill exists in some of the site area. It is recommended that the site should be scarified, watered and proof-rolled before placing the concrete and pavement structures. All the surficial weak soil must be removed in order to prevent future settlement. All of

the existing ground and new fill material should be inspected and tested by a geotechnical engineer.

5.2 Foundations

Based on the testhole information, continuous and/or spread footings are considered to be the most economical foundation system for supporting structural loads of the proposed building structures at the site. However, in the area with deep new fill, cast-in-place concrete piles may have to be used to support the building in order to prevent differential settlement problems.

5.2.1 Continuous and/or Spread Footings

Continuous and/or spread footings may be proportioned, based on a maximum net allowable bearing pressure of 145 kPa (3,000 psf). Footings must be founded at a minimum depth of 1.40 metres below the existing grade on the undisturbed, natural, competent and inorganic sandy silt to silty clay. All the footings should be placed below the organic soil and improper fill. It is recommended that the footing soil be inspected and verified by Global Engineering and Testing Ltd. to ensure the adequacy of the soil bearing capacity. It must be noted that the footing may have to be placed at 2.1 metres depth in some site area.

Minimum soil cover above footings for frost protection is 1.52 and 2.13 metres (5.0 and 7.0 feet) below the finished grade for heated and unheated buildings, respectively.

Footing surfaces should be hand-cleaned to remove all disturbed, loose or wet material. The minimum width of footing that can be used should conform to specifications in the appropriate building code.

Additional recommendations for continuous and/or spread footings are contained in Appendix II of this report.

5.2.2 Rock Socket Piles

Straight shaft rock socket piles may be used as foundation for the proposed structure. Piles may be designed for end-bearing, provided they have a minimum shaft diameter of 510 mm (20 inches) and a clean and dry base can be prepared. Piles should be founded at a minimum depth of 1.5 metres into the sound bedrock. A net allowable end-bearing pressure of 483 kPa may be used.

In addition to end-bearing, piles may be designed for skin friction. The allowable skin friction between pile and bedrock may be taken as 65 kPa. Any skin friction within 2.1 metres below the finished grade should be ignored.

It should be noted that allowance for skin frictional resistance in the upper 2.1 metres of pile embedment should be ignored to allow for seasonal moisture variation and frost penetration.

Steel casing may be used during pile installation if any groundwater seepage and soil sloughing into the pile holes occurs. The concrete should be poured into pile holes immediately after drilling completion and inspection approval.

It is recommended that all piles be installed under full-time inspection by Global Engineering and Testing Ltd. to verify the load-carrying capacities of the site soils.

Other recommendations, concerning rock socket piles, are contained in Appendix II.

5.2.3 Limitation of the Foundation Recommendation

If any new fill is placed on the site, the depth footings or piles, and the soil bearing capacity will have to be reviewed and modified, if necessary. Global Engineering and Testing Ltd. should be notified before the foundation constructions starts.

5.2.3 Settlement Evaluation

The recommended design parameters presented in this section are for preliminary design purposes. We believe that compliance with the recommendations would produce tolerable settlement under normal structures.

It should be noted, however, that foundation settlements are a function of the foundation layout and the construction procedure. We recommend that Global Engineering and Testing Ltd. should review the final design of the foundation system prior to construction.

5.3 Floor Slabs Supported on Grade

Floor slabs supported on grade must be designed for the intended loads, including those resulting from material storage and the operation of machinery. Proof rolling must be applied to the subgrade to detect any soft subgrade prior to the placing of the gravel base course. All topsoil, organic soil and improper fill materials must be over-excavated and replaced by gravel materials. Floor slabs should be supported on a well-compacted gravel base to ensure uniform distribution of floor loadings over the subgrade. The required thickness of this gravel base course is dependent upon the magnitude of the loadings, but should not be less than 150 mm. The subgrade soil, gravel base course and any other fill material placed in the building area should be compacted to at least 98% of standard proctor maximum dry density.

Recommendations pertaining to concrete floor slabs supported on grade are contained in Appendix II.

5.4 Subgrade Protection

Subgrade soils beneath foundation elements must be protected from frost penetration during and after construction. Detrimental heaving due to soil freezing and/or settlement resulting from subsequent thawing of frozen soils may result. It is essential to ensure that

footings and floor slabs are not placed on the organic soil, non-uniform fill and frozen subsoils, and that the soil below the floor slab and the foundation soils are protected from frost actions at all times.

Similarly, all foundation excavations must be protected from rain, snow and the ingress of free water. Surface ponding should not be allowed on any excavated surfaces.

Unnecessary prolonged exposure of bearing surfaces should be avoided to limit effects of weathering and deterioration of the integrity of the subgrade soils.

5.5 Lateral Earth Pressure

For walls, well-graded and well-drained granular materials should be used as backfill.

The lateral earth pressure on walls can be estimated with the following equation:

$$P = \frac{K\gamma H^2}{2}$$

Where, P = lateral earth pressure force per unit length of wall

K_o = coefficient of at rest earth pressure (use 0.5)

K_a = coefficient of active earth pressure (use 0.30)

K_p = coefficient of passive earth pressure (use 3.0)

γ = unit weight of soil (use 2100 kg/m³)

H = wall height

The above expression does not include surcharge and/or hydrostatic loads and these should be added where applicable.

It should be noted that the top 0.6 metres (2.0 feet) of backfill should consist of relatively impermeable materials (e.g., clayey soil) to prevent surface water infiltration.

5.6 Cement Type

Moderate concentrations of water soluble sulphates were observed in the soil samples tested. Based on the test results, it is recommended that type 50 sulphate resistant cement be used for concrete foundation elements. A minimum 28 days compressive strength of 30 MPa is recommended. Air entrainment of four to six percent should be used, especially for concrete in contact with soil and exposed to freeze/thaw conditions.

5.7 Temporary Excavation Sideslopes, Fill, Backfill and Underground Pipes

Temporary excavations at the site should be sloped or shored for worker and foundation protection. Construction must conform to good practice and comply with regulations, such as the Alberta Construction Safety Regulations. For temporary excavations in the natural soil, existing at the site, a construction side slope of 1.0 vertical to 1.0 horizontal may be used up to a depth of 3.0 metres (10 feet) under dry conditions. Deeper excavation should be shored or sloped at a flatter angle.

Global Engineering and Testing Ltd. should verify any construction sideslope differing from the suggested.

Excavation must be protected from rain, snow or any ingress of free water. Prolonged exposure of excavated areas should be avoided to prevent deterioration of exposed soil with resultant slope instability. Similarly, excavated materials should be stockpiled away from the excavations to avoid any slope instability and to prevent materials from falling back into the excavations.

All the underground pipes must be placed on the firm ground. Any soft soil, existing below the pipes, must be over-excavated and replaced with well-compacted pit-run gravel. The subgrade soil and bedding soil beneath the pipes should not be allowed to be frozen. All the fill and backfill material in the trench should be free of organic and frozen

soil. All the material for filling and backfilling purposes must be placed in 150-mm lifts and compacted to 98% of standard proctor maximum dry density.

Additional recommendation for the drainage material is provided in the Appendix II.

5.8 Asphalt Pavement

In addition to the subsoil conditions, pavement requirements for truck or car parking areas are a function of vehicle loadings and frequency of traffic use. In the absence of any specific design data, the following pavement sections are suggested for parking areas:

HEAVY TRUCKS	COURSE THICKNESS	
Asphalt surfaces	10 cm	4 inches
Crushed gravel base	5 cm	2 inches
Pit-run gravel sub base (Subgrade compaction 98%)	30 cm	12 inches

CARS AND LIGHT TRUCKS	COURSE THICKNESS	
Asphalt surfaces	5.1 cm	2 inches
Crushed gravel base	5 cm	2 inches
Pit-run gravel base (Subgrade compaction 98%)	25 cm	10 inches

The surficial soils at the site are considered frost susceptible. Some heaving of the paved areas due to soil freezing in winter months can be expected. Proof rolling should be applied to the subgrade prior to placing base course to detect weak areas. Any organic and soft fill encountered at the pavement subgrade should be over-excavated and replaced by granular material compacted to 98% of standard proctor maximum dry density. However, all the crushed gravel base course and pit-run gravel sub base course must be compacted to a minimum 98% of standard proctor maximum dry density.

In the area of the asphalt pavement around the loading dock and the asphalt or concrete pavement area for the very heavy trucks and semi-trucks must be specially designed.

Additional recommendations for pavements are presented in Appendix II, together with suggested gradation limits for crushed gravel base and pit-run gravel sub base material.

5.9 Drainage

Final site grading should direct surface run-off away from the proposed structure to prevent surface water infiltration.

5.10 Inspection

It is recommended that Global Engineering and Testing Ltd. be engaged to perform the inspection of the footing soil bearing and pile installation, and to provide compaction and concrete testing services during the construction stages of this project.

7.0 CLOSURE

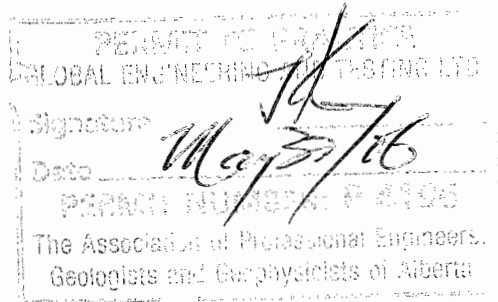
The recommendations presented in this report were based on interpreted subsurface conditions, found in the six testholes drilled at the site. Additional recommendations contained in Appendix II should be read in conjunction with the text of this report.

It should be noted that the natural conditions can be variable. Individual recommendations in this report should not be used out of context with the entire report, and the interpretation of any part of this report should be made in consultation with our office to avoid any misinterpretation.

Due to the complexity and variability of the subsurface soil existing in the ground, Global Engineering and Testing Ltd. will not be responsible for any consequence in the proposed development as a result of soil problems, if Global Engineering and Testing Ltd. is not called for verification of the subgrade and foundation soil during construction.

Yours respectfully submitted,

GLOBAL ENGINEERING AND TESTING LTD.



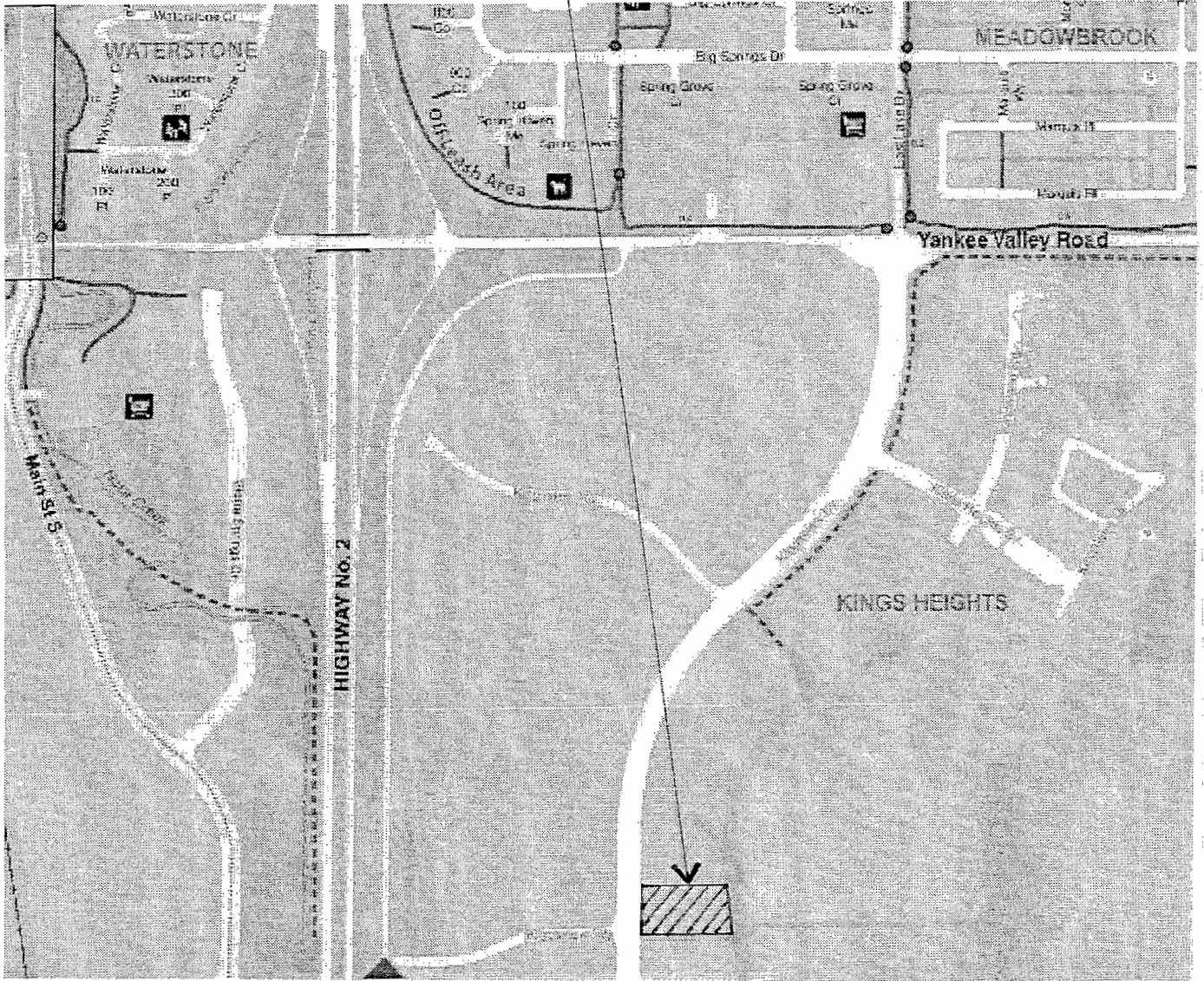
Jack Kao, M.Sc., P.Eng.
President

JK/wk

APPENDIX I



SUBJECT SITE



SITE MAP

GLOBAL ENGINEERING AND TESTING LTD.

TITLE: Site map for 2914 Kingsview Boulevard, Airdrie, AB.

DRAWN BY: CK

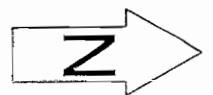
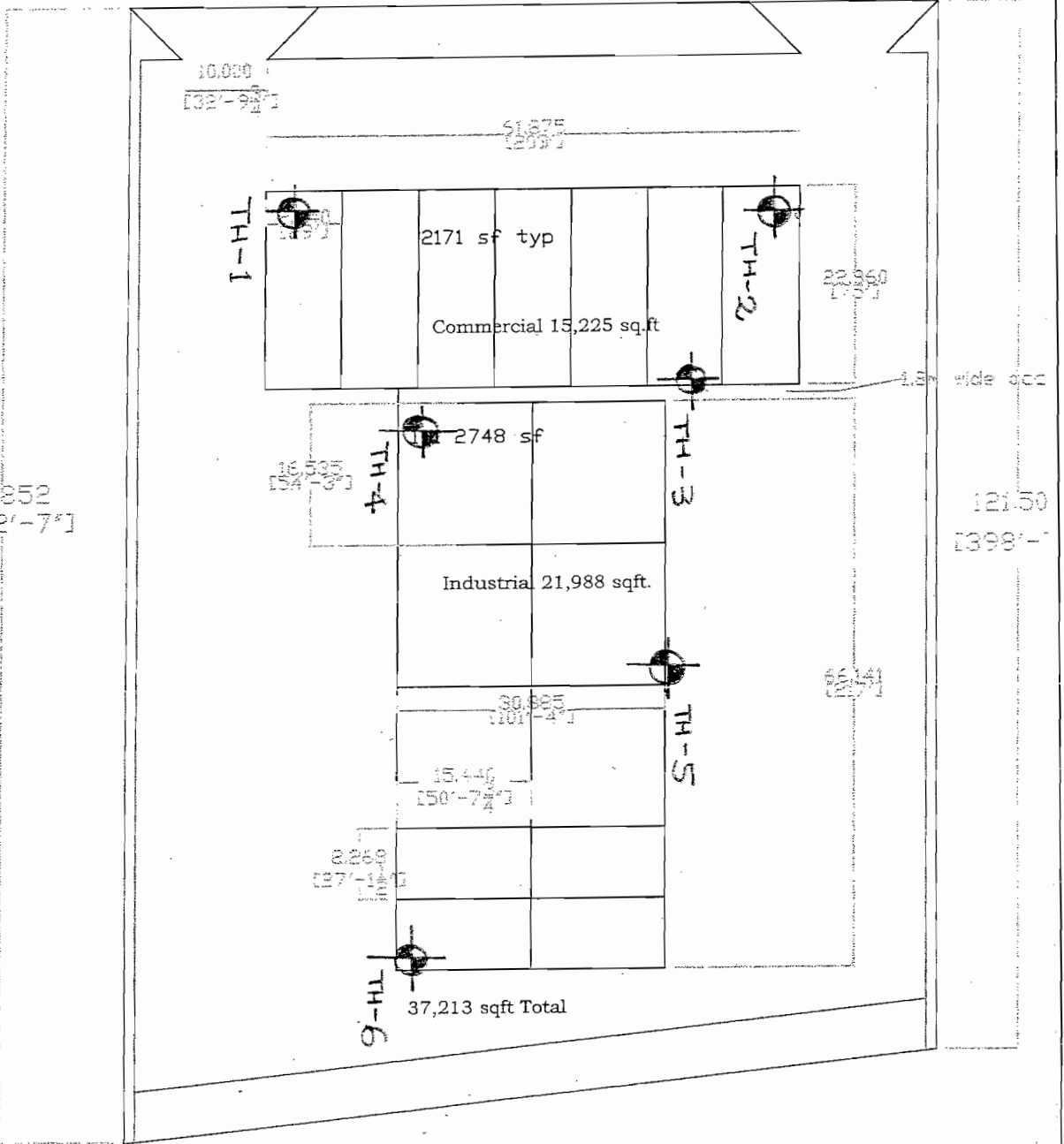
DATE: May 26, 2006

PROJECT NO.: 062-1577-1

SCALE: SEE MAP

PLATE NO.: I - 1

Kingsview Blvd.



GLOBAL ENGINEERING & TESTING LTD.

TITLE: SITE PLAN FOR 2914 KINGSVIEW BOULEVARD, AIRDRIE, AB

DATE: MAY 26, 2006

PROJECT NO.: 062-1577-1

SCALE: N.T.S.

CHECKED BY: JK

DRAWN BY: CK

PLATE: I-2

2914 KINGSVIEW BOULEVARD, AIRDRIE, AB

TRUCK MOUNTED RIG WITH SOLID STEM AUGER

BOREHOLE NO: TH-1

1234952 ALBERTA LTD. (KINGS VIEW PLAZA)

PROJECT NO: 062-1577-1

PROJECT ENGINEER: JK

ELEVATION: 101.15 m

SAMPLE TYPE Disturbed

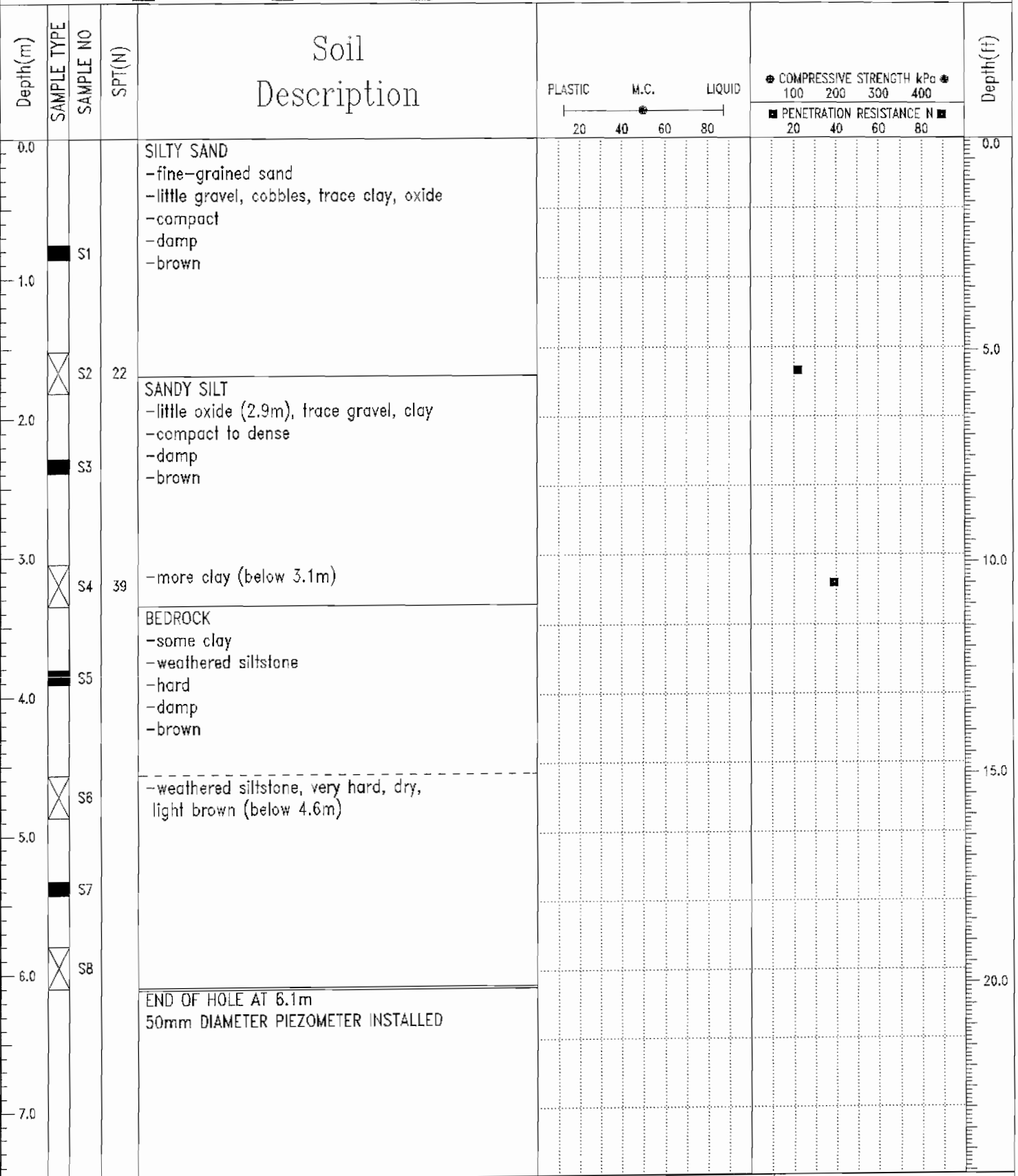
No recovery

SPT

A-Casing

Shelby Tube

Core



Global Engineering & Testing Limited
Calgary, Alberta

LOGGED BY: CK

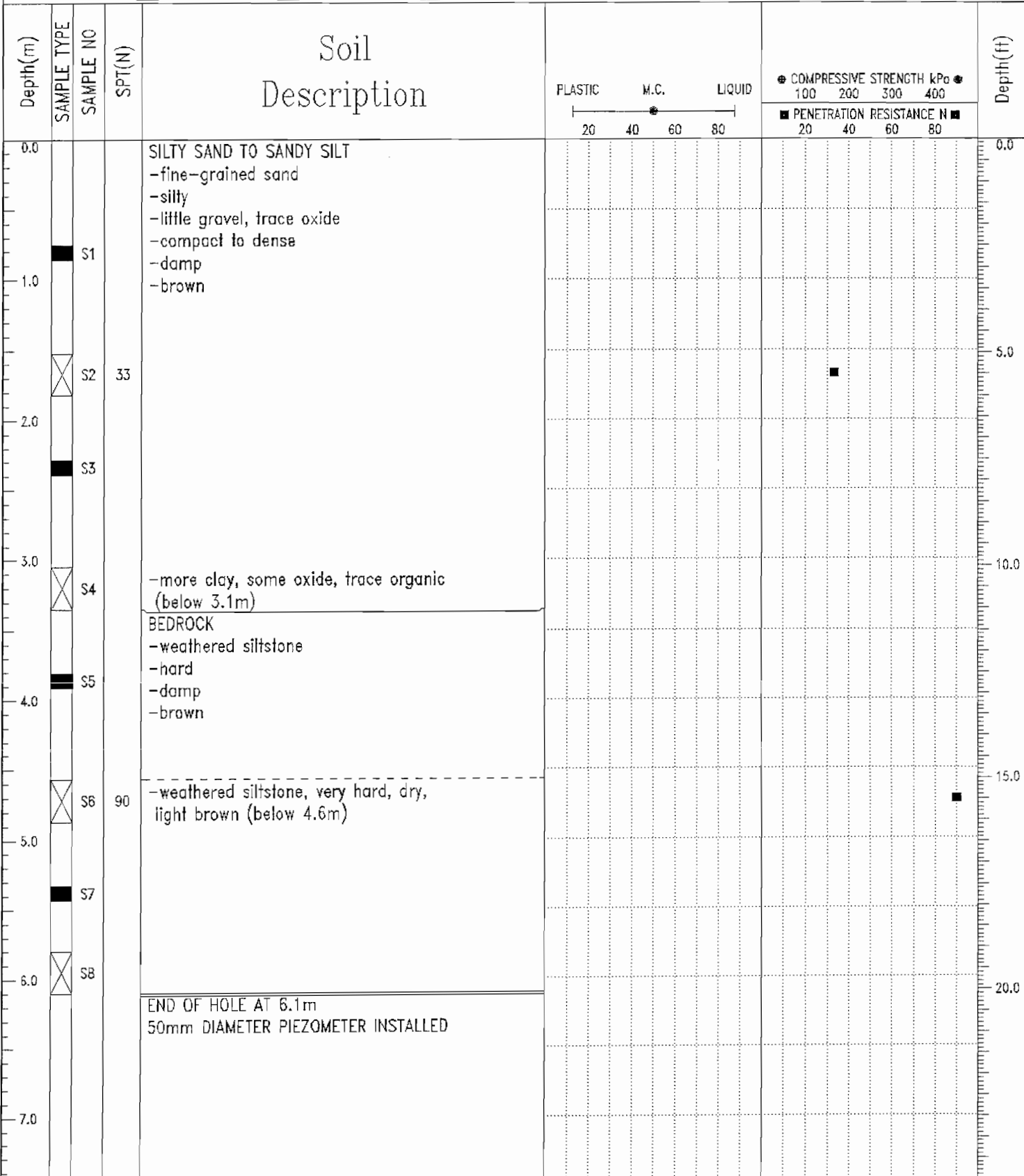
REVIEWED BY: JK

Fig. No: I-3

COMPLETION DEPTH: 6.1 m

COMPLETE: 05/24/06

Page 1 of 1



06/05/26 01:50PM (GEO 26)

2914 KINGSVIEW BOULEVARD, AIRDRIE, AB

TRUCK MOUNTED RIG WITH SOLID STEM AUGER

BOREHOLE NO: TH-3

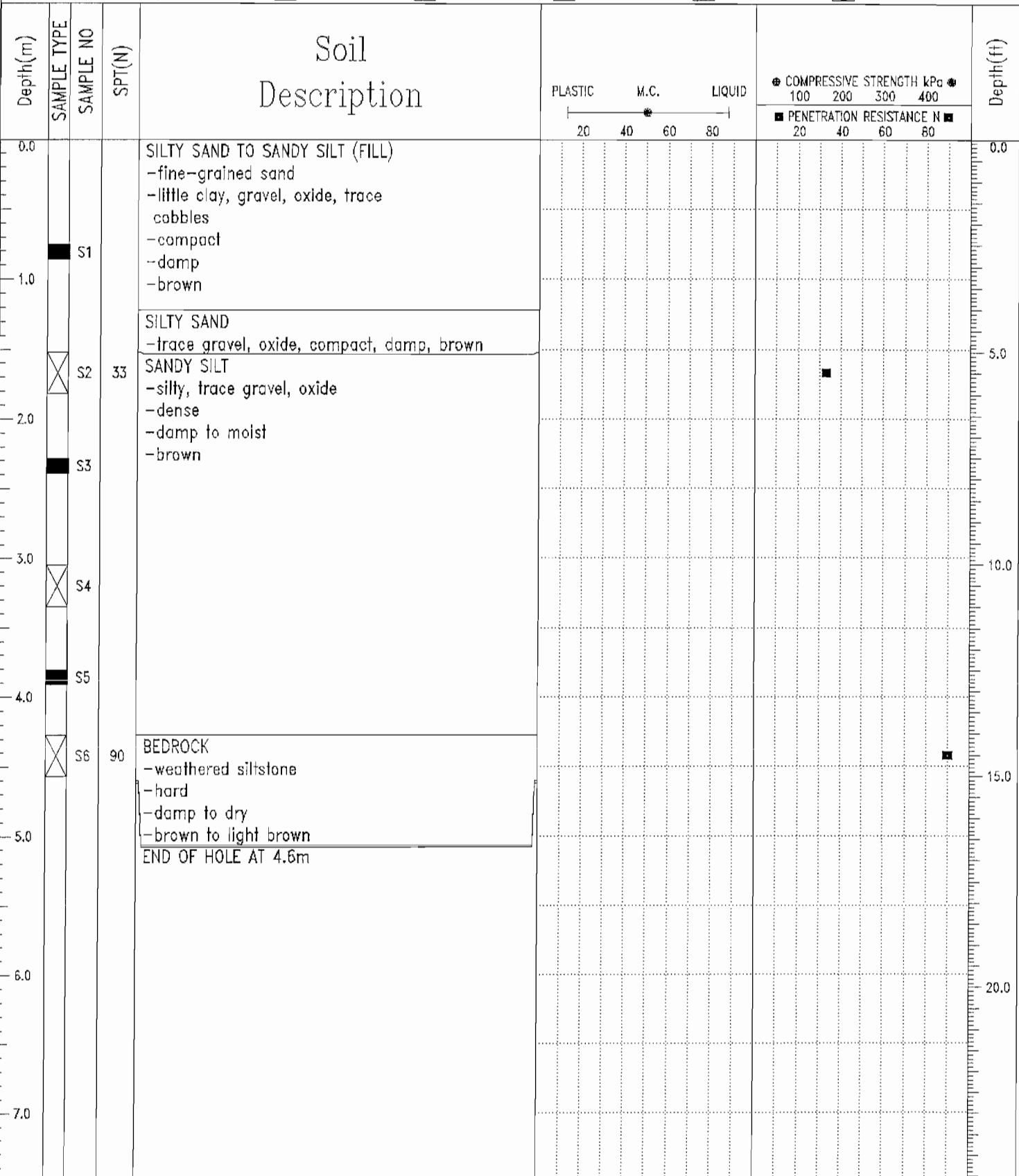
1234952 ALBERTA LTD. (KINGS VIEW PLAZA)

PROJECT NO: 062-1577-1

PROJECT ENGINEER: JK

ELEVATION: 101.35 m

SAMPLE TYPE Disturbed No recovery SPT A-Casing Shelby Tube Core



Global Engineering & Testing Limited
Calgary, Alberta

LOGGED BY: CK

REVIEWED BY: JK

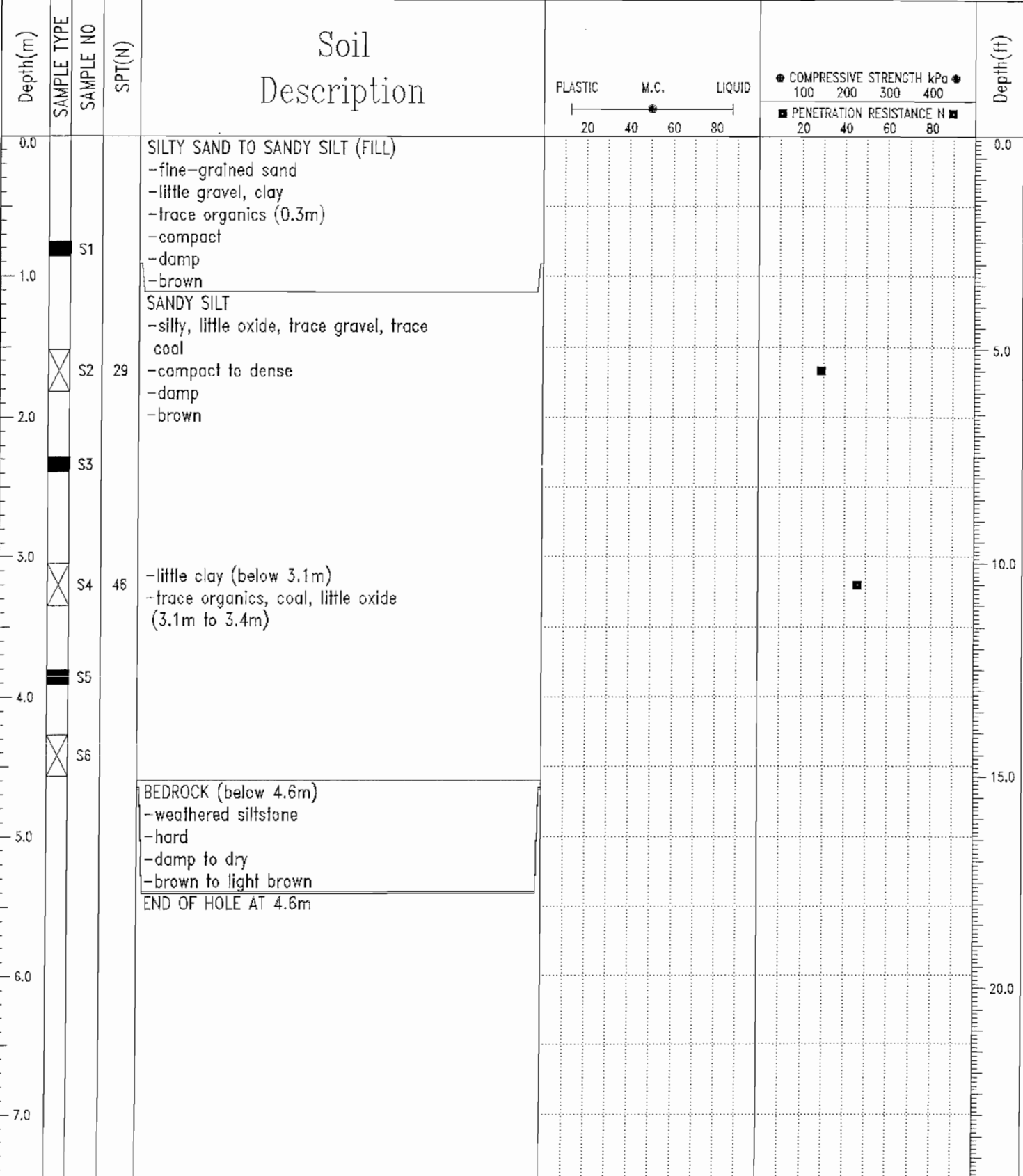
Fig. No: I-5

COMPLETION DEPTH: 4.6 m

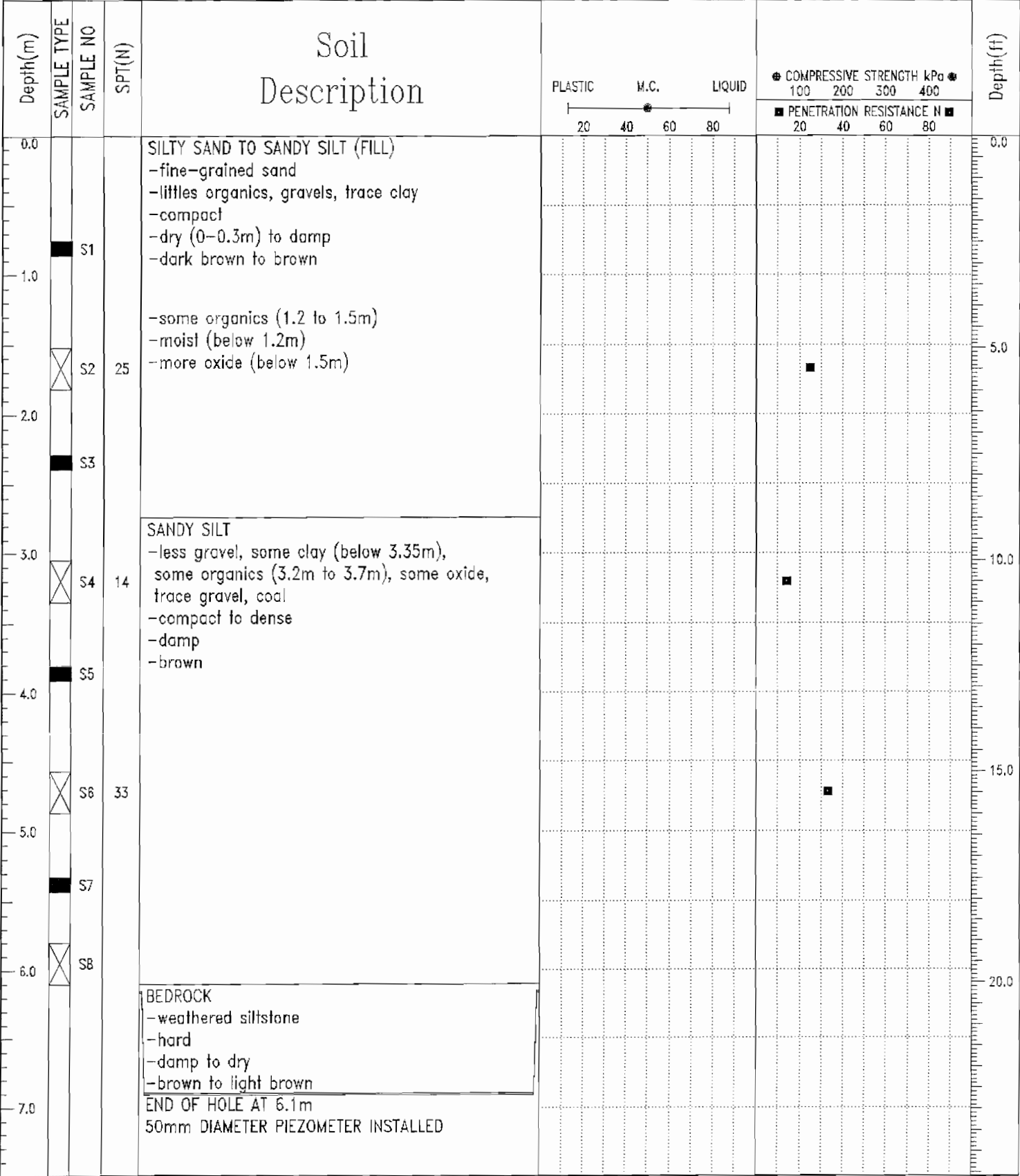
COMPLETE: 05/24/06

Page 1 of 1

SAMPLE TYPE Disturbed No recovery SPT A-Casing Shelby Tube Core

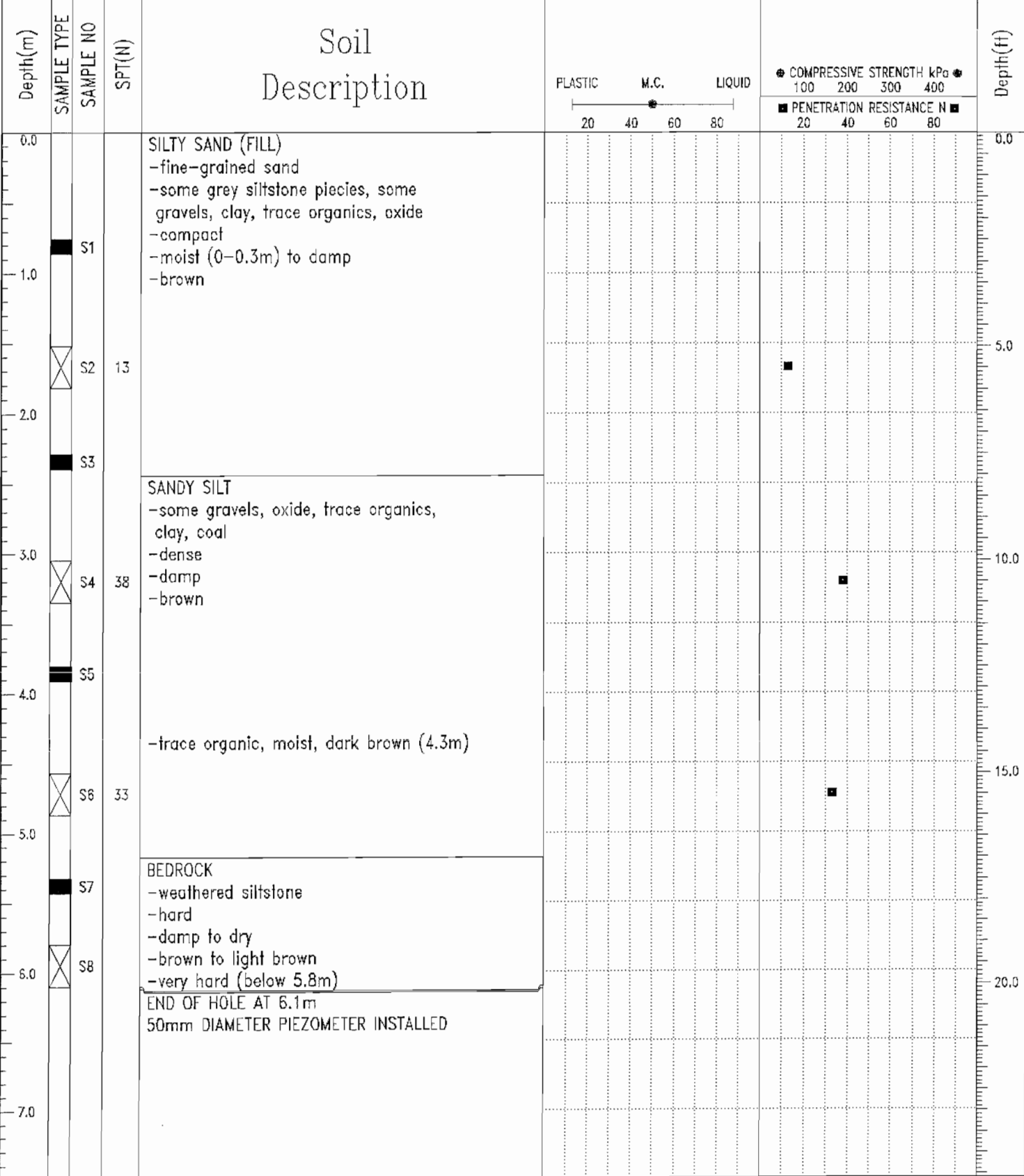


SAMPLE TYPE Disturbed No recovery SPT A-Casing Shelby Tube Core



06/05/26 01:50PM (GEO 20)

SAMPLE TYPE Disturbed No recovery SPT A-Casing Shelby Tube Core



06/05/26 01:50PM (Geo 26)

**EXPLANATIONS OF SOIL DESCRIPTIONS AND
SYMBOLS SHOWN ON TESTHOLE LOGS**

1. DEFINITION OF SOIL TYPES

Material	Grain Size
Boulders	Larger than 200 mm
Cobbles	80 - 200 mm
Gravel: Coarse	20 - 80 mm
Fine	5 - 20 mm
Sand: Coarse	2 - 5 mm
Medium	425 μ m - 2 mm
Fine	75 μ m - 424 μ m
Silt and Clay	Smaller than 75 μ m

2. COMPOSITION OF SOIL

- 2.1 Principal component – Major soil type representing at least 50% of weight of material.
- 2.2 Minor component – Minor soil types identified by the following terms with respect to their percentages by weight of material:

“Little”	10 - 20 %
“Trace”	1 - 10%
“And”	35 - 50%
“Some”	20 - 35%

3. CONSISTENCY OR STRENGTH OF SOIL

- 3.1 Coarse-grained soils (principal component larger than 75 μ m) – The following terms are used relative to the standard penetration test (ASTM D 1586):

No. of blows per foot	Description
Less than 4	Very Loose
4 - 10	Loose
10 - 30	Compact
30 - 50	Dense
Over 50	Very Dense

- 3.2 Fine-grained soils (principal component smaller than 75 μ m) – The following terms are used relative to the unconfined compressive strength:

Unconfined Compressive Strength kPa (tsf)	Description
24 (0.25)	Very soft
24 – 48 (0.25 - 0.5)	Soft
48 – 96 (0.5 - 1.0)	Firm
96 – 190 (1.0 - 2.0)	Stiff
190 – 380 (2.0 - 4.0)	Very Stiff
380 (4.0)	Hard

4. SAMPLE TYPES OF SOIL

SYMBOL	SAMPLE TYPE
<input type="checkbox"/>	Undisturbed
<input checked="" type="checkbox"/>	Disturbed
<input checked="" type="checkbox"/>	Lost Sample

APPENDIX II

GENERAL CONDITIONS

This geotechnical investigation pertains to a specific site and development described in the introduction of the report. It may not be applicable in full to other types of development or modifications to the original proposed development.

It is not valid for other sites. Developments, which may influence soil structure interaction, should undergo a geotechnical review in order to determine the validity of the design concepts utilized.

The soils encountered have been visually classified by methods accepted in professional geotechnical practice. Identification of geological units is judgmental in nature as to both type and condition. Global Engineering and Testing Ltd. does not warrant that the soils represented herein are exact, but infers accuracy only to the extent that is common in geotechnical practice. The boring logs are compiled from field classification and test data. The interpreted geological strata, indicated by a line on the logs, are in fact often a gradual transition.

In general, the stratigraphy is known only at the boring. The actual stratigraphy may vary between boreholes as is inherent in all geological formations. Caution in interpolation between boreholes is required.

Because of the nature of geological deposits, soil conditions can be materially altered by construction procedures and environmental changes. Should construction procedures cause reworking, stress changes or exposure to changed environment, a geotechnical engineer should carry out an additional investigation. These investigations then may serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein for the benefit of the project.

FOOTINGS

Footings should be founded on undisturbed, native, inorganic soil with the required bearing capacity. Weak or soft foundation soils may exist at the site that is not encountered in the test borings. Over-excavation below footing levels may be required to ensure that footings are founded on competent bearing strata. Global Engineering and Testing Ltd. should inspect all footing excavations prior to concreting.

All loose, disturbed material should be removed from bearing surfaces of footing excavations. Hand cleaning will be required if acceptable bearing surfaces cannot be prepared by machines.

Footing excavation should be protected from rain, snow, drying and ingress of free water at all times. Prolonged exposure of the foundation excavations should be avoided.

Foundation soils beneath footings must be protected from frost action during and after construction. Adequate frost protection should be provided to all footings. Footings in heated areas should be founded at a depth of at least 1.37 metres (4.5 feet) below final grade. Footings in unheated areas should have a minimum soil cover of 2.13 metres (7 feet).

Footings and foundation walls should be adequately reinforced to tolerate a reasonable amount of differential foundation movement. If grade beams are used, a void space or a layer of compressible material should be placed between grade beams and the ground surface to limit any heaving pressures resulting from soil expansion.

Backfill around foundation walls and grade beams should consist of inorganic soils. Backfill should not be placed until the concrete foundation elements have developed sufficient strength and are laterally supported to resist earth pressure. The use of heavy equipment for compaction should be avoided. Backfill should be compacted in layers not exceeding 0.15 metres (6 inches) in compacted thickness, and should be compacted to a uniform dry density of 98% standard proctor maximum dry density. The backfill material should be capped with a minimum of 0.6 metres of compacted and impermeable soils to minimize surface water infiltration. The final site grading should be sloped away from the building walls.

ROCK-SOCKET CONCRETE PILES

Shafts should have a minimum diameter of 40 cm (16 inches). For piles designed for end bearing, the bases must be free of any loose, disturbed or sloughed material prior to pouring. Hand cleaning will be required if acceptable pile bases cannot be prepared by mechanical equipment. Should hand cleaning be required, a minimum shaft diameter of 76 cm (30 inches) is recommended.

Steel reinforcement should be provided for at least the top 3.0 metres (10 feet) of piles to resist potential damage to the pile as a result of frost action and soil moisture variation.

Temporary steel casings may be required during drilling pile holes to prevent groundwater seepage and soil sloughing. In particular where hand cleaning and pile base inspection are required, the pile shaft must be cased for the full length prior to personnel entering the pile hole.

Concrete should be poured immediately upon completion of each pile hole excavation and inspection. The pile concrete should have a slump not less than 100 mm (4 inches). Records should be kept on the volume of concrete poured. Suitable inspection should be adopted to ensure that a continuous pile section has been formed without voids. No loose soil should be placed around the pile on the ground surface to prevent the soil sloughing into the hole during pouring concrete.

A void space or layer of compressible material should be provided to separate pile caps and grade beams from the ground surface in order to limit uplift pressure due to soil expansion.

Belled piles, if used, should be spaced not closer than 1.5 times the bell diameter. For piles spaced at less than 2.5 diameters, the drilling of adjacent piles may affect the previously poured concrete. Therefore, the drilling must not be carried out adjacent to newly installed pile within a period of 24 hours to permit the fresh concrete to set.

It is recommended that all piles should be installed under full-time inspection by Global Engineering and Testing Ltd.

FLOOR SLAB-ON-GRADE

Proof rolling must be applied on the subgrade prior to placing base course to detect weak subgrade soil. All topsoil and soils containing organic material should be removed from beneath slab areas. In addition, soft or weak areas should be over-excavated to competent material. The final grade can be restored to its intended level with well-compacted backfill materials.

Locally derived inorganic soils or granular soils may be approved for backfill. The backfill materials should be compacted in 0.15-metre (6-inch) lifts to a uniform dry density of 98% standard proctor maximum dry density.

A well-graded granular base should be provided directly beneath floor slabs. The use of large size gravel should be avoided to limit potential stress concentration under floor slabs. Frost and ice lenses should not be allowed to occur in the subgrade soil before and after the completion of the floor slab.

It is recommended that the floor slabs should contain an adequate number of construction and expansion joints to ensure controlled cracking of concrete. Also, slabs may be structurally separated from foundation elements to allow uniform settlement. Slabs, supporting dynamic loading, should be specially designed.

ASPHALT PAVEMENTS

All topsoil and soils containing organic material should be stripped to native materials, proof rolling should be applied to the subgrade soil prior to placing base course to detect any weak subgrade soil. All soft or weak areas should be over-excavated and backfilled with well-compacted, inorganic soils. Alternatively, suitable filter cloth may be used to increase the strength of the subgrade. However, it must be utilized under the supervision of a qualified geotechnical engineer.

Frost and ice lenses should not be allowed to exist in the subgrade prior to placing the base course and asphalt. Otherwise, settlement and cracks may be resulting in the pavement structure.

All backfill and base course materials should be compacted in layers not exceeding 0.15 metres (6 inches) in compacted thickness and should be compacted to a uniform dry density of 98% standard proctor maximum dry density.

Adequate surface drainage of paved areas is essential to the performance of the pavement structure. Surface ponding should be avoided and a minimum surface gradient of 1.5% is recommended.

All the base course and asphalt material should meet the project specifications and the requirements of the City of Calgary. The pavement compaction and construction procedures should also follow the above requirements.

RECOMMENDED GRADATION LIMITS FOR
CRUSHED GRANULAR BASE COURSE MATERIALS

NOMINAL GRAVEL SIZE	Pit Run	112 mm	56 mm	28 mm
Sieve Size	Percent Passing by Weight			
224 mm	100*			
160 mm	80 – 96*			
112 mm		100		
80 mm	60 – 80	90 – 100		
56 mm			100	
40 mm		60 – 80	90 – 100	
28 mm	60 – 100**			100
20 mm		40 – 65	50 – 75	95 - 100
14 mm				
10 mm		25 – 48	25 – 52	60 – 80
5 mm	25 – 45**	15 – 35	20 – 40	40 – 60
2.5 mm		10 – 30	12 – 26	28 – 48
1.25 mm	16 – 25**			
630 μ m	8 – 18**	6 – 18	4 – 13	13 – 29
315 μ m				9 – 21
160 μ m	4 – 10**	3 – 10	2 – 7	6 – 15
80 μ m	2 – 6**	2 – 8	1 – 6	4 - 10

NOTE: * Percent by weight on total sample.
** Percent by weight on sample material passing 80 mm sieve.

**RECOMMENDED GRADATION LIMITS FOR
BEDDING AND DRAINAGE MATERIALS**

NOMINAL GRAVEL SIZE	56 mm	40 mm	Sand
Sieve Size	Percent Passing by Weight		
80 mm			
56 mm	100		
40 mm	90 - 100	100	
28 mm		95 - 100	
20 mm	35 - 70		
14 mm		25 - 60	
10 mm	10 - 30		100
5 mm	0 - 5	0 - 10	95 - 100
2.5 mm		0 - 5	80 - 100
1.25 mm			50 - 85
630 μm			25 - 60
315 μm			10 - 30
160 μm			2 - 10
80 μm			