
**Geotechnical Evaluation
Whitehorse Copper - Sima Road
Area Development**

Project No. 0201-01-15236

June, 2003

GEOTECHNICAL EVALUATION
WHITEHORSE COPPER-SIMA ROAD AREA DEVELOPMENT
WHITEHORSE, YUKON

Submitted to:

LORIMER & ASSOCIATES

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
Whitehorse, Yukon

Project No. 0201-01-15236

June, 2003

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	SITE CHARACTERIZATION	2
2.1	REVIEW OF EXISTING GEOTECHNICAL INFORMATION	2
2.2	TERRAIN MAPPING	2
2.3	TESTPITTING PROGRAM.....	3
2.4	GEOTECHNICAL CONDITIONS	3
3.0	LOT DEVELOPMENT	5
3.1	DEVELOPMENT CONSIDERATIONS	5
4.0	ACCESS ROADS	7
4.1	ROADWAY STRUCTURE AND CONSTRUCTION	7
5.0	FOUNDATION RECOMMENDATIONS	8
5.1	FOOTING DEPTH AND FROST PROTECTION.....	8
5.2	SITE DRAINAGE AWAY FROM FOUNDATION ELEMENTS	9
6.0	ON-SITE SEWAGE DISPOSAL.....	9
7.0	LIMITATIONS.....	10
8.0	CLOSURE.....	10

1.0 INTRODUCTION

EBA Engineering Consultants Ltd. has completed a geotechnical evaluation of the proposed Whitehorse Copper/Mt. Sima Road Area development. The site is located in the Sima Road and Wolf Creek Subdivision area of Whitehorse. Development within the 1954 hectare study area is to include the construction of access roads to service 14 industrial lots in the Sima Road area and 132 country residential lots in the area bordered by Wolf Creek and the Alaska highway on the east side; the Copper Haul Road on the west side; the Sima Road Industrial Subdivision on the north side and Foothills Pipeline Easement at the south end of the area.

Authorization to proceed with the geotechnical evaluation phase of site development was received from Mr. Ian Robertson of Inukshuk Planning & Development.

The scope of work for EBA's Geotechnical Evaluation Services was defined in EBA's June 28, 2001 proposal to Inukshuk Planning & Development. Tasks completed include the following:

- A review of the Wolf Creek North and Mt. Sima Industrial Subdivision Geotechnical Evaluations (EBA project number 0201-00-14337) was completed.
- Historic and recent geology maps, air photographs, historic mining plans and existing geotechnical information were utilized to establish a baseline knowledge of pre-existing development prior to conducting a site reconnaissance trip.
- Detailed terrain mapping of the study area on 1:10,000 scale air photographs was completed to delineate polygons of differing surficial materials, texture, landforms, soil thickness and drainage, as well as the terrain stability hazard.
- The Whitehorse Copper mine site was assessed to identify potential hazards and risks associated with development in the vicinity of existing tailings ponds, open pits and location of underground structures associated with mining activity.
- A field investigation program consisting of the excavation of 27 testpits throughout the areas identified as developable was completed.

The findings and recommendations arising from the completed scope of work are contained in the following sections of this report. This report has been prepared in accordance with generally accepted geotechnical practice and engineering judgement has been used in the development of recommendations.

For additional information regarding the use of this report, please refer to the General Conditions, following the signature page, which form a part of this report.

2.0 SITE CHARACTERIZATION

2.1 Review of Existing Geotechnical Information

In March 2000, testpitting programs were completed in the Sima Road Industrial Subdivision area and the Wolf Creek North area. Information from testpits 14337-TP08, -TP09 and -TP10 in the Sima Road Industrial Subdivision area, as well as testpits 14337-TP03, -TP04, and TP05 in the area directly north of the Wolf Creek North Subdivision have been included in this report and have become part of the geotechnical evaluation. Locations of the testpits listed above are presented on Figure 1 in Appendix A of this report, along with the testpit logs and associated laboratory test results.

2.2 Terrain Mapping

Detailed terrain mapping was completed by Mr. Jack Dennett of EBA's Whitehorse office. The December 2001 submission to the design team presented eighty-three terrain polygons throughout the study area. The terrain map also included a legend describing terrain units; soil texture; geomorphological processes; materials; surface expression; and an assessment of terrain risk effecting development potential. In 2002, a second terrain risk map was developed with an additional terrain risk classification and adjustments to polygon locations based on the additional geotechnical data gathered during the testpitting program. The most recent version of the terrain map is presented in Appendix C.

Generally, terrain features associated with deglaciation characterize the proposed development area. Moderately steep to steep rock slopes at the foot of Mt. Sima form the western extent of the study area. Moderate gradient slopes with shallow bedrock and structurally controlled, sheer-sided glaciofluvial channels incised into bedrock characterize the upper slopes, which host the extensive mine workings of Whitehorse Copper, north of the Mt. Sima Road. A north-trending glacial outflow direction has left a complex of gently-sloping to flat outwash terraces separated by random, shallow, often poorly-drained channels or short terrace scarps. Drift thickens from west to east. The irregular surface of underlying bedrock often controls non-planar features of the terrain and shallow bedrock is common. Miles Canyon Basalt underlies much of the lower study area and forms the steep sidewalls of some gullies and depressions in the area.

Texture of the glacial drift is characterized by random channels, fans and plains of glaciofluvial, gravelly sands and gravelly, silty, sand till with rounded cobbles and boulders, assumed to be a basal melt-out till. The area is generally well-drained except on imperfectly to poorly-drained floors of glaciofluvial channels that host both permanent and perennial ponds. Permafrost is expected to be rare to absent in the study area.

2.3 Testpitting Program

Prior to initiating the testpitting program, access routes were identified during a site reconnaissance completed on April 11, 2002. Subsequently, a land use permit application was prepared showing proposed testpit locations and access routes to be utilized for equipment travel. Approval to proceed was received from YTG – Community and Transportation Services, Land Disposition Section on June 12, 2002.

EBA completed a site investigation program comprised of excavating a total of 27 testpits throughout the study area. Testpits 15236-TP01 to –TP18 were excavated during the first phase of testpitting between July 8 and July 10, 2002. Testpits 15236-TP19 to –TP27 were completed on August 1, 2002. All testpits were excavated with a Komatsu PC 95 tracked excavator contracted from Arctic Backhoe Services of Whitehorse, Yukon. The testpitting program was supervised by Mr. Myles Plaunt, C.E.T., of EBA's Whitehorse office.

At each testpit location, detailed logs describing geotechnical conditions were prepared. Grab samples were collected at regular intervals throughout the depth of each testpit and all samples were returned to EBA's Whitehorse laboratory for natural moisture content determination and visual classification.

Testpit locations are presented on Figure 1 in Appendix A of this report. The testpitting program is summarized in Table 1, following:

**Table 1
TESTPITTING PROGRAM SUMMARY**

TESTPIT NUMBER(s)	GENERAL LOCATION	PROPOSED LAND USE
15236-TP01	South of Whitehorse Copper Mine Site	Industrial Subdivision
15236-TP02 & 15236-TP03	South of Whitehorse Copper Mine Site	Industrial Subdivision
15236-TP04 to 15236-TP08	Old McCrae Military Subdivision	Country Residential Subd'n
15236-TP09 to 15236-EXP12	South End of Study Area	Country Residential Subd'n
15236-TP13 to 15236-TP18	Central Portion of Study Area	Country Residential Subd'n
15236-TP19 to 15236-TP27	South of Whitehorse Copper Mine Site	Industrial Subdivision

Access to all testpit locations was along existing trails, with the exception of testpits 15236-TP01; -TP02; and -TP03. Upon completion, all testpits were backfilled to grade and marked with flagging for future reference.

2.4 Geotechnical Conditions

Due to the size of the study area, geotechnical conditions are quite variable. Detailed geotechnical conditions are presented on the testpit logs in Appendix A and summarized in Table 2, below. Generally, conditions encountered reflect the conditions within the polygons shown on the terrain analysis map in Appendix C of this report.

Table 2
SUMMARY of GEOTECHNICAL CONDITIONS

Designated Area & Testpits	General Geotechnical Site Conditions	Development Constraints	Development Potential
Wolf Creek North Phase II – Testpits 14337-TP03, -TP04 and TP05 (proposed Country Residential)	On bench where lot development is proposed, soil conditions vary from sand till to gravely sand soils. Good potential for borrow for road construction but wet soils conditions will be encountered at the Alaska Highway exit	Seasonal surface water and poorly drained soils close to highway as well as moderately steep slopes overlooking the highway.	Good in areas where lot development is proposed
Old McCrae Military Subdivision Area – Testpits 15236-TP04, -TP05, -TP06, -TP07, and -TP08 (proposed Country Residential)	Area is predominantly sand till soils overlying siltier, dense tills. Area is well drained and there is a history of satisfactory soil conditions for on-site sewage disposal system installation.	Old dumpsite should be properly decommissioned with all waste removed from slope and hauled to landfill.	Good development potential as long as lot size is suitable to support on-site sewage disposal system construction in till soils.
Large Centrally Located Country Residential Development Area – Testpits 15236-TP13, -TP14, -TP15, TP16, TP17 & TP18 (proposed country residential)	Soil conditions vary from wet silty sand soils in low-lying areas (-TP13 area) to granular in central portion of site to shallow bedrock along west edge of proposed development area (TP18 area). Large portion of this area was assessed by airphoto analysis with little ground proofing.	Isolated low lying areas may require additional granular structure for roadway construction and shallow bedrock areas may make on-site sewage disposal construction difficult.	Good throughout majority of area with isolated areas that will require additional attention during roadway construction and septic field construction.
South End Of Study Area – Testpits 15236-TP09, -TP10, -TP11 & -EXP12 (initially proposed as country residential but no development scheduled for immediate future)	This portion of the study area is underlain with coarse granular soils. Terrain and geotechnical conditions are ideal for roadway construction and lot development. Shallow bedrock was noted along the west edge of the area.	Shallow bedrock would have been the only issue on some lots along the west edge.	Excellent potential for future country residential lot development.
Sima Road Industrial Subdivision Phase II Area – Testpits 14337-TP08, -TP09, & -TP10 (proposed industrial subdivision development area)	Previously completed geotechnical investigation noted sand till soils throughout majority of area will bedrock at east end and possibly west edge as well. Some low lying areas will be wet with significant organic soils at surface	Possible wet area may require additional granular structure for roadway construction & shallow bedrock may effect onsite sewage disposal.	Good potential for Industrial Subdivision development.
Sima Road Infill Areas – Testpits 15236-TP01 to TP03 and 15236-TP19 to -TP27 (proposed industrial subdivision in vicinity of Whitehorse Copper Mine Site)	Testpits 15236-TP01 excavated on a small granular terrace; 15236-TP02 & 03 excavated in a low lying wet area with up to a metre of organic cover and underlain by bedrock or saturated soils; 15236-TP19 to -TP27 have varying thicknesses of soil cover over bedrock and moderately steep slopes accessing this area from Sima Road.	Thick organics, soft subgrade conditions and shallow bedrock would make this area difficult to construct access roads and develop industrial lots.	Fair to poor as an Industrial Subdivision. Testpit 02 and 03 area has some potential as a topsoil source.

3.0 LOT DEVELOPMENT

3.1 Development Considerations

As with all new subdivisions, the main development considerations are suitable geotechnical conditions for roadway construction and adequate lot sizes in areas not serviced by sewer and water infrastructure to ensure that environmental health concerns such as safe water supply and on-site sewage disposal are addressed.

Based on the terrain and geotechnical conditions noted during this site evaluation, development of the proposed country residential and light industrial development areas shown on Figure 1 are considered feasible. Clean granular soils and silty sand till soils encountered during the field investigation are considered suitable for roadway subgrade construction and the 1 hectare minimum lot size chosen for the both the country residential subdivision and light industrial subdivision lots ensures adequate space for the construction of a house or shop structure and the subsequent placing of an on-site sewage disposal system and well for water supply.

However, within each of the four proposed development areas, some geotechnical and or environmental constraints do exist. These constraints are mentioned in Table 1 above and are discussed below:

- The country residential development area located directly north of the Wolf Creek North subdivision (captioned Wolf Creek North Ph. II in Table 2) includes the construction of 12 lots along a cul-de-sac and an access road that intersects with the Alaska Highway directly across from the Meadow Lakes Golf Course. Lot development and roadway construction in the cul-de-sac should not be problematic, however, access road construction at the Alaska Highway intersection will have to include the installation of culverts in soft, saturated soils. The surface water sitting in this area is not very well channelled and is prone to extreme glaciation in the winter. It should also be noted that when EBA and Inukshuk Planning were involved in the preliminary design stages of the Meadow Lakes Golf Club, Water Board input was required for the ponds constructed on the fairways located close to the highway, which are being fed by groundwater from the source that we will be dealing with during access road construction. Additional permitting and hydrogeological work may be required in this area to ensure that ground water flow to the ponds on the golf course are not interrupted by structures built during roadway construction.
- Proposed development in the old Military Subdivision across from the McCrae Industrial Subdivision includes the construction of 20 lots along a new access road alignment. Smooth grades and silty sand subgrade soils will make roadway construction simple and the presence of near surface sand till soils are considered suitable for shallow bury absorption fields. Past experience in this area has noted the presence of siltier till soils along the west edge of the proposed development area (proposed Lots 2, 3, 19 & 20), with soil percolation rates significantly higher than those anticipated for Lots 1, and 4 to

18. Therefore, identifying an accepting soil unit throughout the till soils on the four lots along the west edge may require careful consideration. As mentioned in Table 2, an old landfill site is located along the slope that defines the west edge of the development area (located southwest of testpit 15236-TP08). EBA did not complete an audit or assessment of the landfill site as part of this project, but it appears that the majority of the debris is metal (tin cans etc.), glass and timbers. The debris along the slope should be removed for environmental and aesthetic reasons, as well as ensuring that regulated setbacks from existing or decommissioned landfills will not reduce the amount of developable land in this area.

- The large proposed country residential development area centrally located within the study area includes the development of 70 lots and a school site along a large loop road with tie-ins to the other two residential site development areas listed above and the Sima Road Light Industrial Subdivision expansion area. Much of this area is located on a terrace located above the White Pass Railroad right-of-way and generally, the site slopes gently upwards towards the west edge of the area. Soil conditions, based on testpit information throughout the east and south sides of the area, as well as terrain analysis for the remainder of the area, are generally granular and considered suitable for roadway construction and lot development, except for along the southwest edge of the development area where shallow bedrock may be a constraint for on-site sewage disposal system construction (refer to testpit logs 15236-TP18 and 15236-TP10). Roadway construction along the sections of access road connecting this area with the other three development areas will cross the White Pass Railway at one location and creeks at two other locations. As well, a section of roadway will have to be constructed in the wet, low-lying area located in the vicinity of testpit 15236-TP13.
- Construction within the Sima Road Light Industrial Subdivision expansion area includes the construction of roadways connecting with Collins Lane and McFadden Way and servicing 24 lots of varying sizes. Conditions for roadway construction will be very similar to the existing Sima Road Industrial area with predominantly silty sand till soils. Shallow bedrock is likely to be encountered at the north end of the site (Lot 1 and possibly 2). From the cul-de-sac at the end of Collins Lane, the new access road runs down slope next to a pond which is in a low lying area where wet subgrade soils may be encountered during construction.

The areas with geotechnical concerns listed above may effect roadway construction, so it is recommended that additional evaluations of the areas with potential concerns be evaluated after the roadway right-of-ways are cleared. This work is usually best completed in spring when wet, soft areas are easiest to delineate.

4.0 ACCESS ROADS

4.1 Roadway Structure and Construction

Subgrade soils along the proposed access road will vary from clean granular soils to silty sand till. The soils are considered appropriate for subgrade construction and the following recommendations apply to roadway construction:

- Ideally, all organics and surficial silts should be stripped and wasted. In all but the Old Military Subdivision Area, this will relate to an average subcut depth of 0.3 m. Up to 0.5 m sand and silt were noted underlying the organics and overlying the till soils in the Military Subdivision area.
- The exposed TILL subgrade soils may be marginally frost susceptible in some areas but are suitable for unpaved roadways as long as they are not excessively wet or unstable. All subgrade surfaces should be scarified (to remove cobbles and boulders and to ensure a homogeneous surface). To ensure maximum stability along the subgrade surface, the moisture content should be moisture conditioned to between 3% - 5% below optimum moisture. Once graded, the subgrade should be compacted to 98% of Standard Proctor maximum dry density (SPMDD). In excessively wet or unstable areas, additional subcuts may be required. Subcuts should be a minimum of 600 mm in thickness and backfilled with a clean, well-graded pit run gravel to bridge the wet, unstable soils. A medium weight geotextile can also be utilized to bridge excessively soft areas.
- Sections with clean granular soils will also have to be scarified to remove large cobbles and boulders from the subgrade surface and then graded, moisture conditioned (water added to achieve moisture contents within 3% of optimum moisture), and compacted to 98% SPMDD.
- Recommended granular structure for roadways should be at least 300 mm thick. The gravel sub-base should be at least 200 mm thick and be comprised of well-graded pit run gravel. The sub-base can then be capped with a 100 mm thick traffic course of 20 mm crushed basecourse gravel. All proposed imported gravels should be non-frost susceptible and must be tested and approved prior to use.
- Imported gravels should be placed in lifts not exceeding 200 mm in thickness; moisture conditioned and compacted to at least 98% of Standard Proctor maximum dry density.
- The minimum thicknesses of the individual roadway structure components are presented in Table 3 and the gradation specifications for imported sub-base and basecourse gravels are presented in Tables 4 and 5, below.
- As mentioned above, specific areas such as creek crossings and other wet areas may require site specific recommendations to be provided once roadways have been cleared, permitting proper access.

Table 3
RECOMMENDED ROADWAY STRUCTURE THICKNESSES

Granular Component	Thickness
Prepared Subgrade	N/A
20 mm Crushed Basecourse	100 mm
Sub-Base Pit Run Gravel	200 mm

Table 4
80 mm PIT RUN SUB-BASE GRAVEL

Sieve Size (mm)	Weight Passing (%)
80.00	100
25.00	55 – 100
12.50	42 – 84
5.00	26 – 65
1.25	11 – 47
0.315	3 – 30
0.080	0 – 8

Table 5
20 mm CRUSHED BASECOURSE GRAVEL

Sieve Size (mm)	Weight Passing (%)
20.00	100
12.50	64 – 100
5.00	36 – 72
1.25	12 – 42
0.315	4 – 22
0.080	3 – 6

5.0 FOUNDATION RECOMMENDATIONS

The soil conditions noted throughout the study area are considered suitable for the design and construction of conventional shallow foundation systems typically utilized for residential and light industrial or commercial structures (strip and spread footing or monolithic slab-on-grade foundation systems). Footings can be designed and constructed to bear onto any of the native soils or, in isolated areas, on bedrock if encountered.

5.1 Footing Depth and Frost Protection

For heated structures in the Whitehorse area, a minimum un-insulated footing depth of 1.8 m is recommended for all exterior footings placed on frost susceptible soils (areas with silty till soils). Shallow footings are particularly appropriate for country residential development where

deep foundations make it difficult to tie into on-site sewage disposal systems. Therefore, a footing depth of 1.2 m with 50 mm of perimeter insulation should be considered. The 50 mm thickness horizontal insulation would have to be placed for a width of 1.2 m around the building perimeter. The horizontal insulation should extend at least 1.2 m beyond any corner of the building.

For foundation systems constructed on non-frost susceptible granular soils, no perimeter insulation will be required and although depth of burial is not as critical, some soil cover is still suggested to resist the effects of seasonal frost penetration.

5.2 Site Drainage Away From Foundation Elements

The main concern with foundation systems constructed in the Yukon is ensuring that the surface water and roof runoff be directed away from the foundation elements in order to minimize the potential for frost heave caused by the freezing of saturated soils next to and beneath the footings. Control of surface water runoff and the use of rain gutters and downspouts onto slash pads are recommended around all buildings

6.0 ON-SITE SEWAGE DISPOSAL

The potential for on-site sewage disposal is not only dependent upon geotechnical (soil and groundwater) conditions, but also the proposed minimum lot size. The soils delineated throughout the majority of the study area where lots are proposed should be suitable as accepting soils for absorption field or shallow absorption trench construction. EBA usually suggests a minimum lot size of 1 ha for country residential development, which reflects the minimum lot sizes proposed for the study area.

There are some lots founded on areas with shallow bedrock (southwest corner of study area and northeast corner of the Sima Road Industrial Subdivision expansion area. On these lots, an area with at least 1.2 m of soil separation is required between the base of the drain rock and the bedrock surface in order to comply with YTG Environmental Health guidelines. Past experience suggests that the bedrock surface in this area of Whitehorse will be very irregular. Therefore, it is likely that areas with appropriate thickness of soil cover can be delineated.

In Appendix B of this report are figures applicable to on-site sewage disposal system design. The setback requirements for all septic systems are presented on Figure 2 and a typical absorption field design for granular soils with a 5 min/25 mm percolation rate is presented on Figure 3. For soil types noted during current and previous testpitting programs, percolation rates of less than 1 min/25 mm to up to 30 min/25 mm are anticipated. Absorption field sizes will be proportionally larger in areas with percolation rates greater than 5 min/25 mm.

7.0 LIMITATIONS

It should be noted that geological conditions are variable and are seldom spatially uniform. The recommendations prepared and presented in this report are based on the geotechnical data gathered by EBA during this project. The provided data, in the form of testpit information and associated laboratory index property test results has been supplemented by EBA's direct observations of the site.

This report and the recommendations contained within are intended for use by Lorimer and Associates and the Government of Yukon – Community Development, as well as Inukshuk Planning & Development and other members of the design team working on this project. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by others. Any such unauthorized use of this report is at the sole risk of the user.

8.0 CLOSURE

EBA trusts that this report meets with your approval. Please do not hesitate to contact the undersigned should you have any questions or comments.

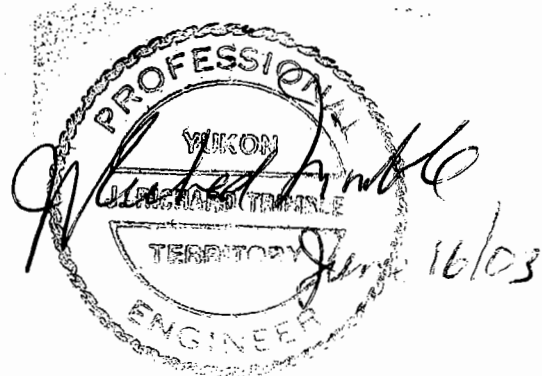
Yours truly,

EBA Engineering Consultants Ltd.



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This report incorporates and is subject to these “General Conditions”.

1.0 USE OF REPORT AND OWNERSHIP

This geotechnical report pertains to a specific site, a specific development and a specific scope of work. It is not applicable to any other sites nor should it be relied upon for types of development other than that to which it refers. Any variation from the site or development would necessitate a supplementary geotechnical assessment.

This report and the recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analyses or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. EBA does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

3.0 LOGS OF TEST HOLES

The test hole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive.

Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

4.0 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. EBA does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

5.0 SURFACE WATER AND GROUNDWATER CONDITIONS

Surface and groundwater conditions mentioned in this report are those observed at the times recorded in the report. These conditions vary with geological detail between observation sites; annual, seasonal and special meteorologic conditions; and with development activity. Interpretation of water conditions from observations and records is judgmental and constitutes an evaluation of circumstances as influenced by geology, meteorology and development activity. Deviations from these observations may occur during the course of development activities.

6.0 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

7.0 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

EBA Engineering Consultants Ltd. (EBA)
GEOTECHNICAL REPORT – GENERAL CONDITIONS

**A.8 INFLUENCE OF CONSTRUCTION
ACTIVITY**

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer, when the final design and construction techniques are known.

**A.9 OBSERVATIONS DURING
CONSTRUCTION**

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

A.10 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems that will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

A.11 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

A.12 SAMPLES

EBA will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of

samples can be made at the client's expense upon written request, otherwise samples will be discarded.

A.13 STANDARD OF CARE

Services performed by EBA for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practising under similar conditions in the jurisdiction in which the services are provided. Engineering judgement has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

**A.14 ENVIRONMENTAL AND REGULATORY
ISSUES**

Unless stipulated in the report, EBA has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

A.15 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding. The hard copy versions submitted by EBA shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by EBA shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

The Client recognizes and agrees that electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

APPENDIX A
SITE PLAN AND TESTPIT LOGS

Geotechnical Evaluation		CLIENT: Lorimer and Associates		BOREHOLE NO: 15236-TP01			
Whitehorse Copper/Mt. Sima Devel. Area		EXCAVATOR: Komatsu PC 95 Tracked Excav.		PROJECT NO: 0201-01-15236			
Whitehorse, YT		UTM ZONE: 8 N6721650 E497600		ELEVATION:			
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL							
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	<input checked="" type="checkbox"/> STANDARD PENETRATION <input type="checkbox"/> PERCENT GRAVEL 10 20 30 40 20 40 60 80	ELEVATION(ft)
						PLASTIC M.C. LIQUID -----●----- 10 20 30 40 20 40 60 80	
0.0					ORGANIC ROOT MAT		0.0
					SAND AND SILT - some gravel; rootlets throughout; dry; light reddish brown		
					SAND AND GRAVEL - cobbles and boulders to 200 mm in size throughout depth of testpit, trace of silt; sand is medium to coarse; gravel is subangular to well rounded; damp; dark brown		
1.0							
					- silt till lens from 1.8 to 2.3 m		
2.0							
					- silt till lens from 2.6 to 2.8 m		
3.0					END OF TESTPIT @ 3.0 m		
					- poplar tree cover with some small spruce		
					- some surface boulders		
4.0							
EBA Engineering Consultants Ltd.						LOGGED BY: MCP	COMPLETION DEPTH: 3 m
Whitehorse, Yukon						REVIEWED BY: JRT	COMPLETE: 08/07/02

Geotechnical Evaluation		CLIENT: Larimer and Associates	BOREHOLE NO: 15236-TP02
Whitehorse Copper/Mt. Sima Devel. Area		EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT		UTM ZONE: 8 N6722150 E497500	ELEVATION:
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB SAMPLE	<input type="checkbox"/> NO RECOVERY	<input checked="" type="checkbox"/> STANDARD PEN.
		<input type="checkbox"/> 75 mm SPOON	<input type="checkbox"/> CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	
0.0						ORGANIC ROOT MAT																				0.0		
						SILT - some clay, trace of fine sand; marginally frozen; wet when exposed; soft; medium olive grey																						
						BEDROCK - granodiorite; very competent; difficult to rip with small excavator																						
						END OF TESTPIT @ 0.7 m Refusal in bedrock																						
1.0						Tree cover - mature spruce Ground cover - moss and tea Wet in spring; area is poorly drained																						
2.0																												
3.0																												
4.0																												

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 0.7 m
	REVIEWED BY: JRT	COMPLETE: 08/07/02

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(ft)	
						10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80						
0.0						MOSS AND TEA GROUND COVER, ORGANIC ROOT MAT - very thick																									
						- boulders in organic matrix from 0.5 to 1.0 m																									
1.0						SILT - some clay, trace of angular gravel; very wet; soft; mottled brown and olive																									
2.0						GRAVEL AND SAND - trace to some silt; saturated with water running at interface with silt																									
						END OF TESTPIT @ 2.5 m																									

Geotechnical Evaluation	CLIENT: Lorimer and Associates	BOREHOLE NO: 15236-TP04
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6722300 E499700	ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)
						10	20	30	40	20	40	60	80	
0.0					TEA GROUND COVER AND ORGANIC ROOT MAT - damp; black; surface boulders									0.0
					SILT AND SAND - rootlets throughout; fine grained; uniform; damp; medium brown									
					SAND - gravelly, trace to some silt, occasional cobbles and boulders to 200 mm diameter; damp; compact; no sloughing; dark grey									
1.0														
2.0														
3.0					END OF TESTPIT @ 3.0 m - Aspen and Lodgepole Pine tree cover									10.0
4.0														14.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 3 m
	REVIEWED BY: JRT	COMPLETE: 08/07/02

Geotechnical Evaluation			CLIENT: Lorimer and Associates			BOREHOLE NO: 15236-TP05																								
Whitehorse Copper/Mt. Sima Devel. Area			EXCAVATOR: Komatsu PC 95 Tracked Excav.			PROJECT NO: 0201-01-15236																								
Whitehorse, YT			UTM ZONE: 8 N6722040 E499900			ELEVATION:																								
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																											
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80		
0.0						BASE OF SMALL EXPOSURE SAND AND SILT - trace of gravel, rootlets throughout; dry; light brown																					0.0			
						SAND (TILL) - gravelly, some silt, occasional cobbles and boulders throughout; subrounded; damp; very compact; medium olive grey																					-2.0			
1.0																											-4.0			
2.0																											-6.0			
3.0																											-8.0			
						END OF TESTPIT @ 3.0 m - tree cover mix of Lodgepole Pine, spruce and poplar																					-10.0			
4.0																											-12.0			
																											-14.0			
EBA Engineering Consultants Ltd.						LOGGED BY: MCP						COMPLETION DEPTH: 3 m																		
Whitehorse, Yukon						REVIEWED BY: JRT						COMPLETE: 08/07/02																		

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP06								
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236								
Whitehorse, YT				UTM ZONE: 8 N6721750 E500050				ELEVATION:								
SAMPLE TYPE				<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL												
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				<input checked="" type="checkbox"/> STANDARD PENETRATION <input checked="" type="checkbox"/> PERCENT GRAVEL <input checked="" type="checkbox"/> PERCENT SAND <input checked="" type="checkbox"/> PERCENT SILT OR FINES <input checked="" type="checkbox"/> PERCENT CLAY				ELEVATION(ft)		
						10	20	30	40	20	40	60	80		20	40
0.0						MOSS AND TEA GROUND COVER, ORGANIC ROOT MAT										0.0
						SILT AND SAND - trace of gravel, rootlets throughout; dry; medium brown										
						SAND (TILL) - gravelly, some silt, occasional cobbles and boulders to 300 mm diameter; damp; very compact; olive grey	●									-2.0
1.0																-4.0
																-6.0
2.0																-8.0
						- siltier and dense below 2.5 m	●									-10.0
3.0						END OF TESTPIT @ 3.0 m										-12.0
4.0																-14.0

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: MCP
REVIEWED BY: JRT

COMPLETION DEPTH: 3 m
COMPLETE: 08/07/02

Geotechnical Evaluation			CLIENT: Lorimer and Associates			BOREHOLE NO: 15236-TP07												
Whitehorse Copper/Mt. Simo Devel. Area			EXCAVATOR: Komatsu PC 95 Tracked Excav.			PROJECT NO: 0201-01-15236												
Whitehorse, YT			UTM ZONE: 8 N6722040 E499600			ELEVATION:												
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL															
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				<input checked="" type="checkbox"/> STANDARD PENETRATION <input checked="" type="checkbox"/> PERCENT GRAVEL <input checked="" type="checkbox"/> PERCENT SAND <input checked="" type="checkbox"/> PERCENT SILT OR FINES <input checked="" type="checkbox"/> PERCENT CLAY				ELEVATION(ft)				
						10	20	30	40	20	40	60	80		20	40	60	80
0.0						THIN VENEER OF GRAVEL FILL												0.0
						SILT AND SAND - rootlets throughout; dry; light brown												
						SAND (TILL) - gravelly, some silt, cobbles and boulders throughout to 300 mm diameter; damp; compact to dense; medium olive grey												
1.0																		
2.0																		
3.0						END OF TESTPIT @ 3.0 m												
4.0																		
EBA Engineering Consultants Ltd.						LOGGED BY: MCP			COMPLETION DEPTH: 3 m									
Whitehorse, Yukon						REVIEWED BY: JRT			COMPLETE: 08/07/02									

Geotechnical Evaluation	CLIENT: Lorimer and Associates	BOREHOLE NO: 15236-TP08
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6722580 E499580	ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION		PERCENT GRAVEL		PERCENT SAND		PERCENT SILT OR FINES		PERCENT CLAY		ELEVATION(ft)	
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20		40
0.0						THIN VENEER OF GRAVEL (OLD BUILDING SITE)													0.0
						SILT AND SAND - rootlets throughout; dry; light brown													
						SAND (TILL) - gravelly, some silt, cobbles and boulders to 500 mm diameter; subrounded; damp; compact to very compact; olive grey													
1.0						- some siltier lenses throughout depth of testpit													
2.0																			
3.0						END OF TESTPIT @ 3.0 m													
4.0																			

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: MCP	COMPLETION DEPTH: 3 m
REVIEWED BY: JRT	COMPLETE: 08/07/02
Page 1 of 1	

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	
0.0						MOSS AND TEA GROUND COVER OVER ORGANIC ROOT MAT																				0.0		
						SILT AND SAND - rootlets throughout, trace to some gravel; dry; medium brown																						
						GRAVEL - sandy, trace of silt, cobbles and boulders throught to 700 mm diameter; very coarse; sand is medium to coarse; damp; compact; dark greyish brown																						
1.0																												
2.0																												
3.0						END OF TESTPIT @ 3.0 m																						
4.0																												

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP11														
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236														
Whitehorse, YT				UTM ZONE: 8 N6719750 E500500				ELEVATION:														
SAMPLE TYPE				<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																		
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)				
										10	20	30	40	20	40	60	80		20	40	60	80
						PLASTIC M.C. LIQUID 				● PERCENT SAND ● 20 40 60 80				▲ PERCENT SILT OR FINES ▲ 20 40 60 80				◆ PERCENT CLAY ◆ 20 40 60 80				
0.0						TEA GROUND COVER AND ORGANIC ROOT MAT																0.0
						SAND - silty, rootlets throughout; damp; dark brown																
						GRAVEL - sandy, trace of silt, cobbles and boulders to 200 mm diameter; sand is coarse grained; damp; compact; dark brown																-2.0
1.0						SAND - trace of gravel; coarse grained; damp; compact; dark greyish brown																-4.0
						GRAVEL - sandy, trace of silt, cobbles to 100 mm diameter; sand is coarse; damp; greyish brown																-6.0
2.0						END OF TESTPIT @ 3.2 m																-8.0
3.0																						-10.0
4.0																						-12.0
																						-14.0
EBA Engineering Consultants Ltd.						LOGGED BY: MCP				COMPLETION DEPTH: 3.2 m												
Whitehorse, Yukon						REVIEWED BY: JRT				COMPLETE: 09/07/02												
										Page 1 of 1												

Geotechnical Evaluation			CLIENT: Lorimer and Associates			BOREHOLE NO: 15236-EXP12							
Whitehorse Copper/Mt. Sima Devel. Area						PROJECT NO: 0201-01-15236							
Whitehorse, YT			UTM ZONE: 8 N6719260 E500750			ELEVATION:							
SAMPLE TYPE			<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL										
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION			STANDARD PENETRATION		PERCENT GRAVEL		ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	
0.0						MOSS AND TEA AT SURFACE							0.0
						SILT AND SAND - some gravel; damp; medium brown							
						GRAVEL - sandy, trace of silt, cobbles and boulders throughout to 500 mm diameter very coarse; damp; greyish brown							
1.0													
2.0						END OF EXPOSURE @ 2.0 m NOTE: Exposure along cut slope of existing trail							
3.0													
4.0													
EBA Engineering Consultants Ltd.						LOGGED BY: MCP			COMPLETION DEPTH: 2 m				
Whitehorse, Yukon						REVIEWED BY: JRT			COMPLETE: 09/07/02				

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION		PERCENT GRAVEL		ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	20	40	60	
0.0						MOSS GROUND COVER AND ORGANIC ROOT MAT - wet; black						0.0
						SAND AND SILT - frozen; wet when thawed; dark grey						
						SAND - trace of silt; medium to coarse grained; very wet; loose; dark grey						
1.0						- sand becomes gravelly from 1.0 to 1.3 m, with water seeping into testpit						
2.0												
						END OF TESTPIT @ 2.5 m Refusal on bedrock - spruce and small willow tree cover - very wet						
3.0												
4.0												

Geotechnical Evaluation	CLIENT: Larimer and Associates	BOREHOLE NO: 15236-TP14
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6720950 E499900	ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	
0.0						MOSS AND TEA GROUND COVER OVER ORGANIC ROOT MAT																					0.0	
						SAND - some silt to silty, rootlets throughout; damp to moist; loose; dark brown																					-2.0	
1.0						GRAVEL - sandy, trace of silt, cobbles to 150 mm throughout; subrounded gravel; medium to coarse sand; damp; loose; greyish brown																					-4.0	
2.0																										-6.0		
3.0						END OF TESTPIT @ 3.0 m - area is much higher and drier than TP03																				-8.0		
4.0																										-10.0		
																										-12.0		
																										-14.0		

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 3 m
	REVIEWED BY: JRT	COMPLETE: 10/07/02

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)
						10	20	30	40	20	40	60	80	
SOIL DESCRIPTION						PLASTIC M.C. LIQUID 				● PERCENT SAND ● 20 40 60 80 ▲ PERCENT SILT OR FINES ▲ 20 40 60 80 ◆ PERCENT CLAY ◆ 20 40 60 80				
0.0					ORGANIC ROOT MAT AND SILTY SAND									0.0
					GRAVEL – sandy, trace of silt, cobbles throughout to 150 mm diameter; subrounded; medium to coarse sand; damp; loose; greyish brown									-2.0
1.0														-4.0
2.0														-6.0
3.0					END OF EXPOSURE @ 3.0 m (Base of Borrow Pit) NOTE: Exposure located along west side of existing borrow area									-10.0
4.0														-14.0

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP16											
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236											
Whitehorse, YT				UTM ZONE: 8 N672050 E499750				ELEVATION:											
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																			
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION			STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)		
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80		PERCENT SAND	PERCENT SILT OR FINES
0.0						GRASS GROUND COVER OVER ORGANIC ROOT MAT SILT AND SAND - rootlets throughout; damp; medium brown GRAVEL - sandy, trace of silt, cobbles and boulders to 300 mm diameter; subrounded; sand is medium to coarse; damp; compact; greyish brown													0.0
1.0						SAND (TILL) - gravelly, some silt to silty, cobbles throughout; damp; compact; medium grey													-2.0
2.0																			-4.0
3.0																			-6.0
4.0						END OF TESTPIT @ 3.0 m - willows and standing dead spruce in this area indicative area is not as well drained (due to till)													-8.0
																			-10.0
																			-12.0
																			-14.0
EBA Engineering Consultants Ltd.						LOGGED BY: MCP			COMPLETION DEPTH: 3 m										
Whitehorse, Yukon						REVIEWED BY: JRT			COMPLETE: 10/07/02										
												Page 1 of 1							

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP17										
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236										
Whitehorse, YT				UTM ZONE: 8 N6720350 E499700				ELEVATION:										
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																		
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID		20	40	60	80	20	40	60	80	
0.0						MOSS AND TEA GROUND COVER OVER ORGANIC ROOT MAT												0.0
						SILT AND SAND - rootlets throughout; damp; medium brown												
						GRAVEL - sandy, trace of silt, cobbles and boulders throughout to 300 mm diameter sand is medium to coarse; damp; compact; brownish grey												
1.0						- sloughing during excavation												
2.0																		
3.0																		
						END OF TESTPIT @ 3.0 m Note: Excavated beside Underhill's pin #5309												
4.0																		
EBA Engineering Consultants Ltd. Whitehorse, Yukon						LOGGED BY: MCP REVIEWED BY: JRT				COMPLETION DEPTH: 3 m COMPLETE: 10/07/02								

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP18											
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236											
Whitehorse, YT				UTM ZONE: 8 N6720160 E499420				ELEVATION:											
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB SAMPLE <input checked="" type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																			
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)	
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	PERCENT SAND		PERCENT SILT OR FINES
0.0						MOSS AND TEA GROUND COVER													0.0
						SILT AND SAND - rootlets throughout; damp; medium brown													
						GRAVEL - sandy, trace of silt, cobbles and boulders to 700 mm diameter; very coarse; sand is medium to coarse; damp; medium brown													-2.0
1.0						DECOMPOSED GRANITE - competent by 2.0 m													-4.0
						END OF TESTPIT @ 2.2 m Bedrock is at surface at end of survey line													-8.0
2.0																			-10.0
3.0																			-12.0
4.0																			-14.0
EBA Engineering Consultants Ltd.						LOGGED BY: MCP				COMPLETION DEPTH: 2.2 m									
Whitehorse, Yukon						REVIEWED BY: JRT				COMPLETE: 10/07/02									
										Page 1 of 1									

Geotechnical Evaluation	CLIENT: Lorimer and Associates	BOREHOLE NO: 15236-TP19
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6720850 E497200	ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION	STANDARD PENETRATION 10 20 30 40	PERCENT GRAVEL 20 40 60 80	PERCENT SAND 20 40 60 80	PERCENT SILT OR FINES 20 40 60 80	PERCENT CLAY 20 40 60 80	ELEVATION(ft)
							PLASTIC M.C. LIQUID ----- ----- ----- 10 20 30 40					
0.0						ORGANIC ROOT MAT						0.0
						GRAVEL - some sand, trace of silt, cobbles to boulders throughout with >30% larger than 75 mm; gravel is poorly sorted; sand is coarse; subrounded; dry; loose; medium brown						-2.0
						BEDROCK - limestone; competent						-4.0
						END OF TESTPIT @ 0.8 m						-14.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: JTD REVIEWED BY: JRT	COMPLETION DEPTH: 0.8 m COMPLETE: 01/08/02
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Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP20							
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236							
Whitehorse, YT				UTM ZONE: 8 N6720850 E497450				ELEVATION:							
SAMPLE TYPE				<input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL											
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				<input checked="" type="checkbox"/> STANDARD PENETRATION <input type="checkbox"/> PERCENT GRAVEL <input type="checkbox"/> PERCENT SAND <input type="checkbox"/> PERCENT SILT OR FINES <input type="checkbox"/> PERCENT CLAY				ELEVATION(ft)	
						10	20	30	40	20	40	60	80		20
0.0						ORGANIC ROOT MAT									0.0
						GRAVEL (COLLUVIUM) – some silt, trace of subrounded gravel and sand; colluvium is very angular – becomes sandy, trace of silt; unsorted; dry; loose; dark olive brown									
1.0						BEDROCK – granitic; badly weathered; dark green									
						END OF TESTPIT @ 1.4 m									
2.0															
3.0															
4.0															
EBA Engineering Consultants Ltd.						LOGGED BY: JTD				COMPLETION DEPTH: 1.4 m					
Whitehorse, Yukon						REVIEWED BY: JRT				COMPLETE: 01/08/02					

Geotechnical Evaluation	CLIENT: Larimer and Associates	BOREHOLE NO: 15236-TP21
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6720320 E497600	ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION		PERCENT GRAVEL		PERCENT SAND		PERCENT SILT OR FINES		PERCENT CLAY		ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	40	20	40	60	80	20	40	
0.0						ORGANIC ROOT MAT OVER SILTY SAND												0.0
1.0						GRAVEL - sandy, trace of silt, cobbles and boulders throughout with 20% larger than 10 mm; poorly sorted; subrounded gravel; coarse sand; dry; loose; light brown												-2.0
2.0						- some sloughing during excavation												-6.0
3.0						END OF TESTPIT @ 2.9 m												-10.0
4.0																		-14.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: JTD	COMPLETION DEPTH: 2.9 m
	REVIEWED BY: JRT	COMPLETE: 01/08/02

Geotechnical Evaluation CLIENT: Lorimer and Associates BOREHOLE NO: 15236-TP22

Whitehorse Copper/Mt. Sima Devel. Area EXCAVATOR: Komatsu PC 95 Tracked Excav. PROJECT NO: 0201-01-15236

Whitehorse, YT UTM ZONE: 8 N6720450 E497940 ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION		PERCENT GRAVEL		PERCENT SAND		PERCENT SILT OR FINES		PERCENT CLAY		ELEVATION(ft)	
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20		40
0.0						ORGANIC ROOT MAT													0.0
						GRAVEL - some sand to sandy, trace of silt, cobbles and boulders throughout with 20% larger than 100 mm; poorly sorted; subrounded; sand is coarse; dry; loose; light brown													-2.0
1.0						BEDROCK - surface is irregular, granitic													-4.0
2.0						END OF TESTPIT @ 1.9 m Refusal in bedrock													-6.0
3.0																			-8.0
4.0																			-10.0
																			-12.0
																			-14.0

EBA Engineering Consultants Ltd.
Whitehorse, Yukon

LOGGED BY: JTD

REVIEWED BY: JRT

COMPLETION DEPTH: 1.9 m

COMPLETE: 01/08/02

Geotechnical Evaluation				CLIENT: Lorimer and Associates				BOREHOLE NO: 15236-TP23													
Whitehorse Copper/Mt. Sima Devel. Area				EXCAVATOR: Komatsu PC 95 Tracked Excav.				PROJECT NO: 0201-01-15236													
Whitehorse, YT				UTM ZONE: 8 N6720700 E498200				ELEVATION:													
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB SAMPLE <input type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL																					
Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION				STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)			
										10	20	30	40	20	40	60	80		20	40	60
						PLASTIC M.C. LIQUID 				PERCENT SAND 20 40 60 80				PERCENT SILT OR FINES 20 40 60 80				PERCENT CLAY 20 40 60 80			
0.0						ORGANIC ROOT MAT															0.0
1.0						GRAVEL - sandy to some sand, trace of silt, cobbles and boulders throughout with 30% larger than 100 mm; poorly sorted; subrounded to rounded; dry; loose; light brown															-2.0
2.0						- some sloughing during excavation															-6.0
3.0						- continuous throughout depth of testpit															-8.0
4.0						END OF TESTPIT @ 3.5 m															-10.0
																					-12.0
																					-14.0
EBA Engineering Consultants Ltd.						LOGGED BY: JTD				COMPLETION DEPTH: 3.5 m											
Whitehorse, Yukon						REVIEWED BY: JRT				COMPLETE: 01/08/02											

Geotechnical Evaluation CLIENT: Lorimer and Associates BOREHOLE NO: 15236-TP24

Whitehorse Copper/Mt. Sima Devel. Area EXCAVATOR: Komatsu PC 95 Tracked Excav. PROJECT NO: 0201-01-15236

Whitehorse, YT UTM ZONE: 8 N6720600 E498120 ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)
						10	20	30	40	20	40	60	80	
0.0					ORGANIC ROOT MAT									0.0
					GRAVEL - some sand to sandy, trace of silt, occasional cobbles with less than 5% larger than 100 mm; subrounded to rounded; dry; loose; light brown									
					- some sloughing during excavation									
					END OF TESTPIT @ 2.9 m									

EBA Engineering Consultants Ltd. LOGGED BY: JTD COMPLETION DEPTH: 2.9 m
 Whitehorse, Yukon REVIEWED BY: JRT COMPLETE: 01/08/02

Geotechnical Evaluation CLIENT: Lorimer and Associates BOREHOLE NO: 15236-TP25
 Whitehorse Copper/Mt. Sima Devel. Area EXCAVATOR: Komatsu PC 95 Tracked Excav. PROJECT NO: 0201-01-15236
 Whitehorse, YT UTM ZONE: 8 N6720800 E497900 ELEVATION:

SAMPLE TYPE GRAB SAMPLE NO. RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION		PERCENT GRAVEL		ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	
0.0						ORGANIC ROOT MAT OVER SILTY SAND						0.0
						GRAVEL - some sand to sandy, trace of silt, cobbles and boulders throughout with 10% larger than 100 mm; unsorted; subrounded to rounded; dry; loose; orangey brown						
1.0						- becomes medium brown with depth						
2.0												
3.0												
						END OF TESTPIT @ 3.1 m						
4.0												

EBA Engineering Consultants Ltd. LOGGED BY: JTD COMPLETION DEPTH: 3.1 m
 Whitehorse, Yukon REVIEWED BY: JRT COMPLETE: 01/08/02

Geotechnical Evaluation	CLIENT: Lorimer and Associates	BOREHOLE NO: 15236-TP26
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6720400 E497620	ELEVATION:
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB <input checked="" type="checkbox"/> NO RECOVERY <input checked="" type="checkbox"/> STANDARD PEN. <input type="checkbox"/> 75 mm SPOON <input type="checkbox"/> CRREL BARREL <input type="checkbox"/> DISTURBED	
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE <input type="checkbox"/> PEA GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> DRILL CUTTINGS <input type="checkbox"/> SAND	

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	INSTRUMENTATION DATA	SOIL DESCRIPTION	STANDARD PENETRATION			PERCENT GRAVEL		PERCENT SAND		PERCENT SILT OR FINES		PERCENT CLAY		Depth(ft)
						PLASTIC	M.C.	LIQUID	20	40	60	80	20	40	60	80	
0.0					ORGANIC ROOT MAT OVER SILTY SAND												0.0
0.0					GRAVEL - some sand to sandy, trace of silt, cobbles and boulders throughout with 20% larger than 150 mm; poorly sorted; subrounded to rounded; dry; loose; light brown												2.0
1.0																	4.0
2.0																	6.0
3.0																	8.0
4.0																	10.0
5.0																	12.0
																	14.0
																	16.0
																	18.0
					END OF TESTPIT @ 5.0 m Note: Testpit excavated in an old trench exposure												

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: JTD	COMPLETION DEPTH: 5 m
	REVIEWED BY: JRT	COMPLETE: 01/08/02
		Page 1 of 1

Geotechnical Evaluation	CLIENT: Lorimer and Associates	BOREHOLE NO: 15236-TP27
Whitehorse Copper/Mt. Sima Devel. Area	EXCAVATOR: Komatsu PC 95 Tracked Excav.	PROJECT NO: 0201-01-15236
Whitehorse, YT	UTM ZONE: 8 N6720950 E497400	ELEVATION:

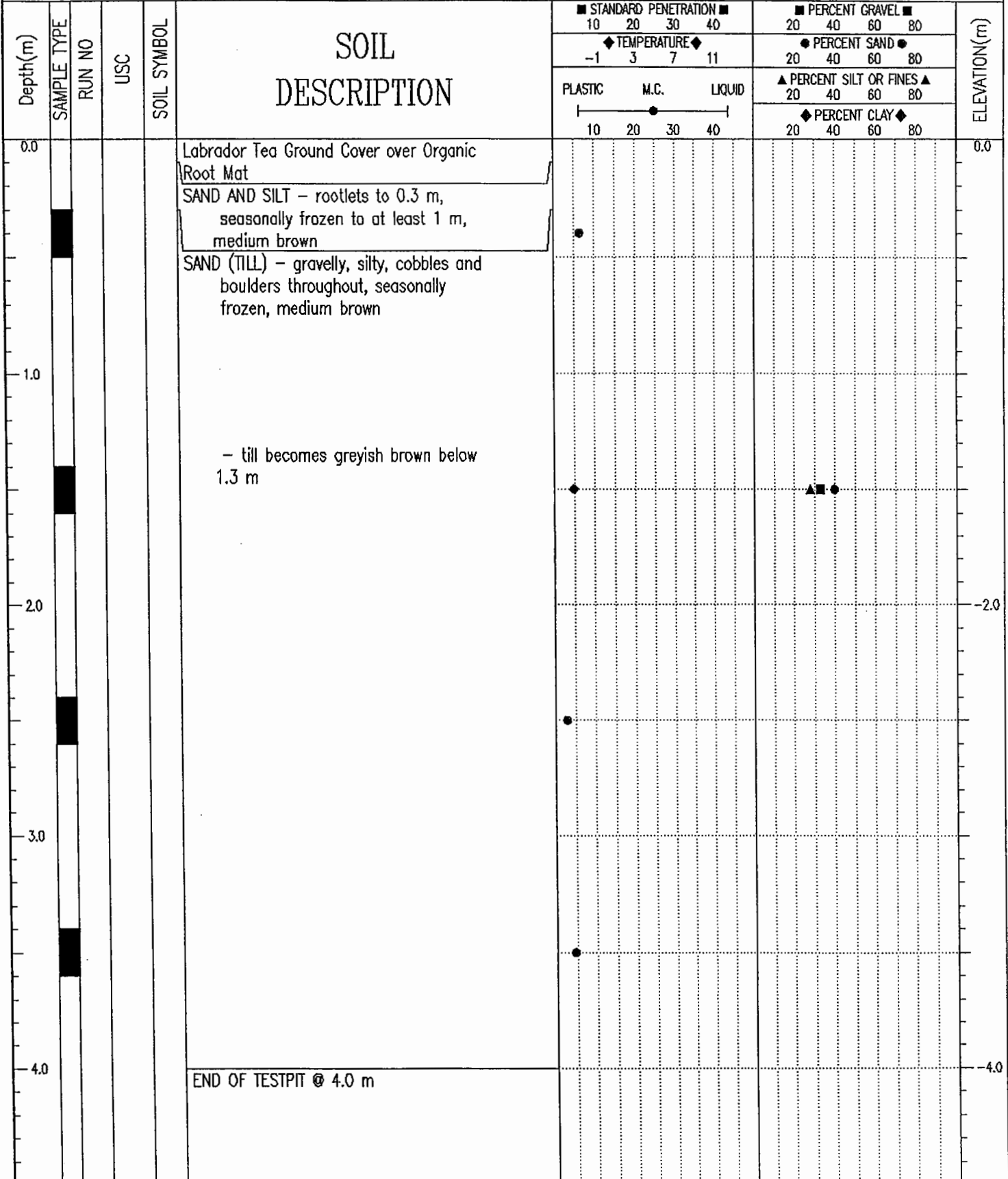
SAMPLE TYPE GRAB SAMPLE NO RECOVERY STANDARD PEN. 75 mm SPOON CRREL BARREL

Depth(m)	SAMPLE TYPE	RUN NO	SPT(N)	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(ft)
						PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	
0.0						ORGANIC ROOT MAT OVER SILTY SAND										0.0
0.0 - 3.0						GRAVEL - some sand to sandy, trace of silt, cobbles and boulders throughout with 25% larger than 100 mm; poorly sorted; subrounded to rounded; dry; loose; light brown										
						- consistent throughout depth of testpit										
3.0						END OF TESTPIT @ 3.0 m										10.0

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: JTD	COMPLETION DEPTH: 3 m
	REVIEWED BY: JRT	COMPLETE: 01/08/02

GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP03
WOLF CREEK NORTH	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
COUNTRY RESIDENTIAL SUBDIVISION	UTM ZONE: 8 N6720840 E500380	ELEVATION:

SAMPLE TYPE GRAB NO RECOVERY

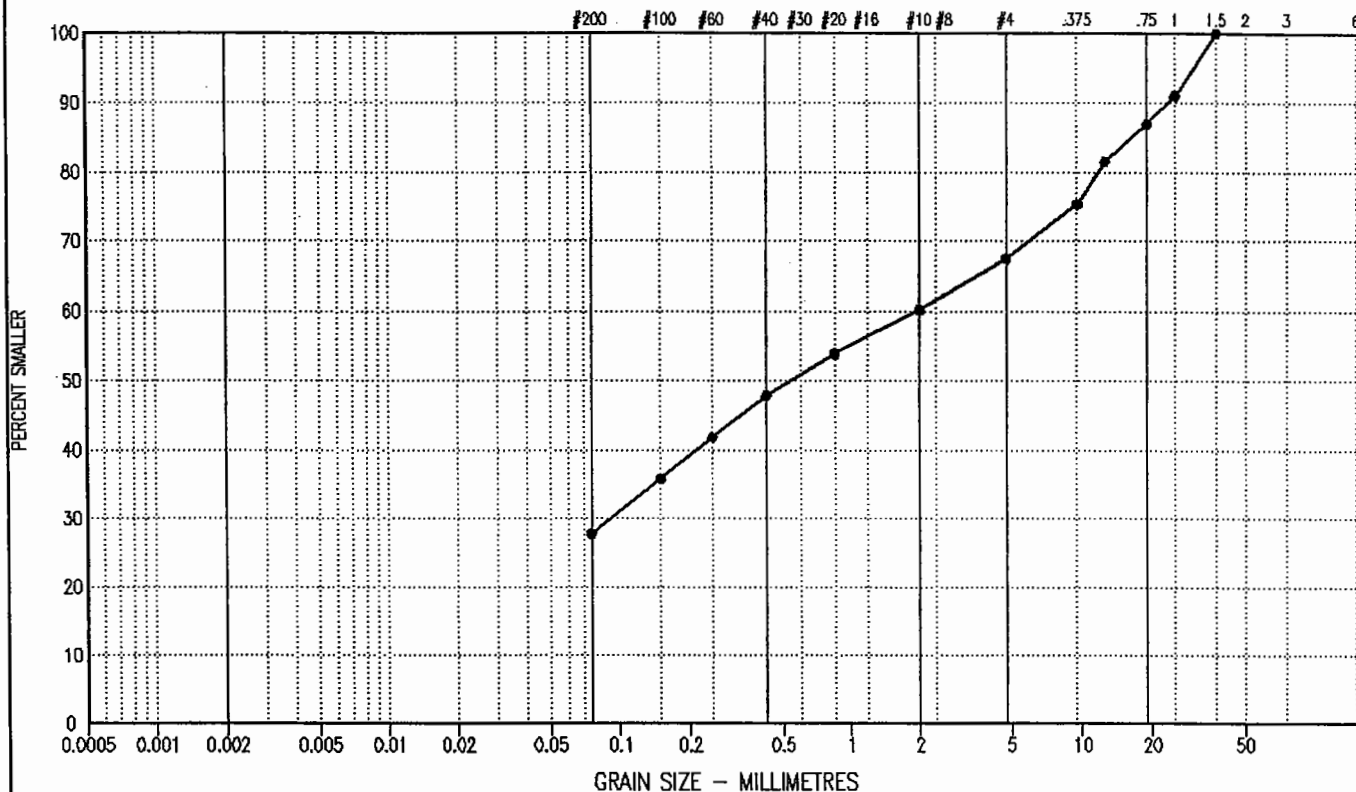


EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4 m
	REVIEWED BY: MCP	COMPLETE: 00/03/02

PARTICLE SIZE - ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

U.S. STANDARD SIEVE SIZES



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	14337-TP03	1.50 - 1.60	28	40	33	-	-	

Project: 0201-00-14337

Date Tested: 00/03/16

BY: JEP

Tested in accordance with ASTM D422 unless otherwise noted.

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GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP04
WOLF CREEK NORTH	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
COUNTRY RESIDENTIAL SUBDIVISION	UTM ZONE: 8 N6720590 E500380	ELEVATION:

SAMPLE TYPE GRAB NO RECOVERY

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION	STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(m)
						10	20	30	40	20	40	60	80	
						◆ TEMPERATURE ◆				● PERCENT SAND ●				
						PLASTIC M.C. LIQUID				▲ PERCENT SILT OR FINES ▲				
						10 20 30 40				20 40 60 80				
						10 20 30 40				20 40 60 80				
0.0					Labrador Tea Ground Cover over Organic Root Mat									0.0
					SAND AND SILT - gravelly, some cobbles, seasonally frozen to at least 1 m, medium brown									
			GW	AA	GRAVEL - sandy, trace of silt, sand is very coarse, cobbles and boulders throughout, clast supported, subangular, damp, compact below frost, brownish grey									
1.0														
2.0														
					- gravel stained dark iron oxide reddish brown below 2.5 m									
3.0														
					SAND (TILL) - silty, gravelly, cobbles throughout, moist to wet, firm, olive brown									
4.0					END OF TESTPIT @ 4.0 m									4.0

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Whitehorse, Yukon

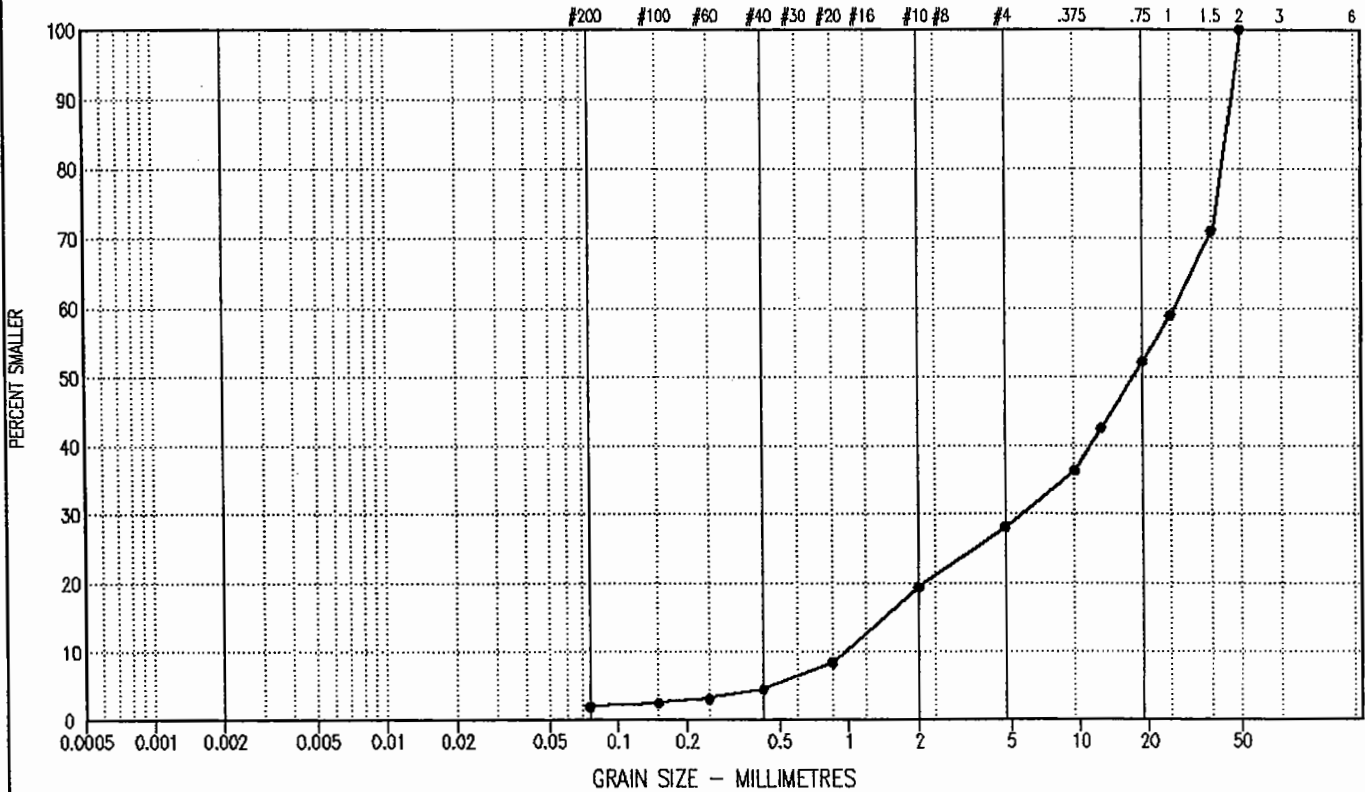
LOGGED BY: MCP
REVIEWED BY: MCP

COMPLETION DEPTH: 4 m
COMPLETE: 00/03/02

PARTICLE SIZE - ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

U.S. STANDARD SIEVE SIZES



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	14337-TP04	0.50 - 0.60	2	26	72	25.8	1.3	GW

Project: 0201-00-14337

Date Tested: 00/03/16

BY: JEP

Tested in accordance with ASTM D422 unless otherwise noted.

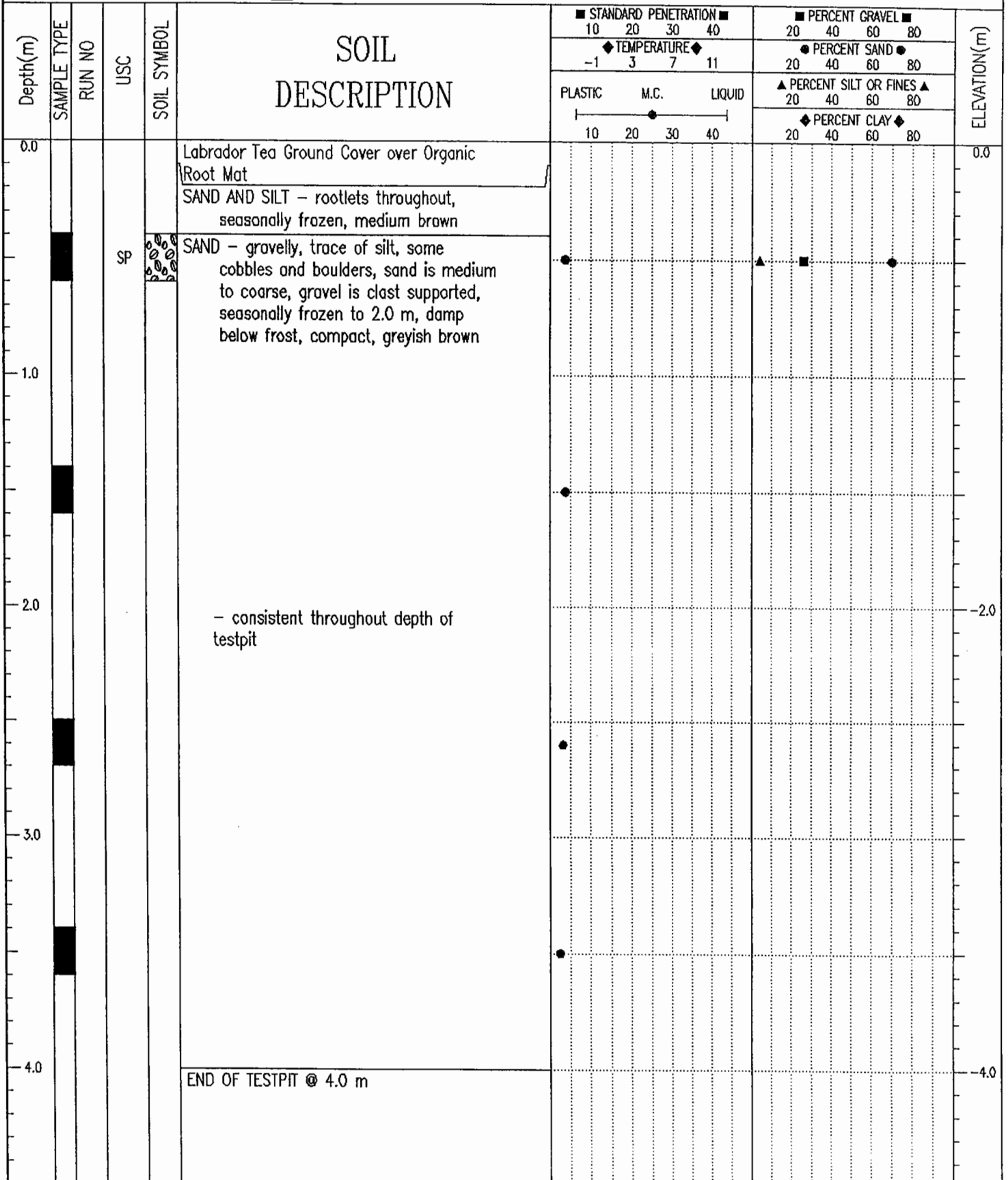
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GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP05
WOLF CREEK NORTH	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
COUNTRY RESIDENTIAL SUBDIVISION	UTM ZONE: 8 N6720440 E500700	ELEVATION:

SAMPLE TYPE GRAB NO RECOVERY



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Whitehorse, Yukon

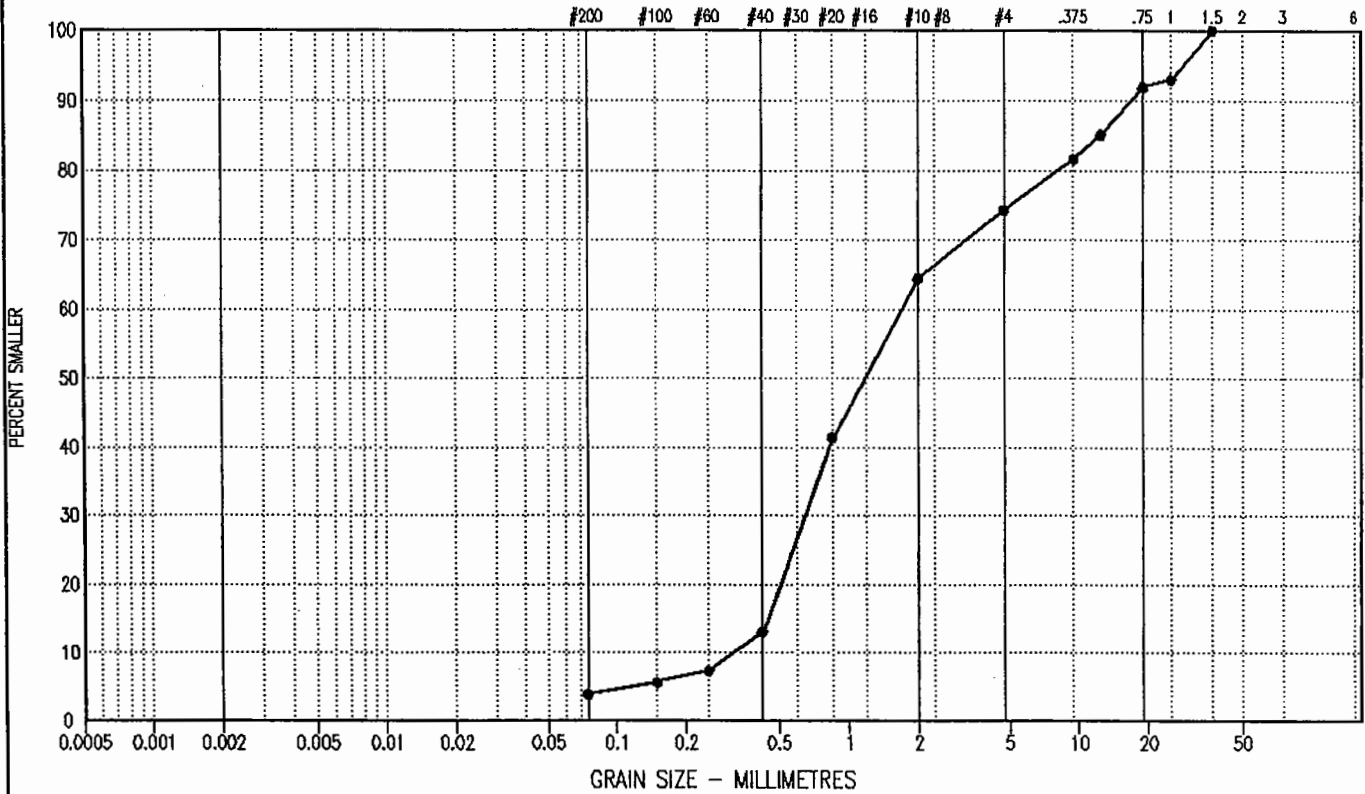
LOGGED BY: MCP
REVIEWED BY: MCP

COMPLETION DEPTH: 4 m
COMPLETE: 00/03/02

PARTICLE SIZE - ANALYSIS OF SOILS

CLAY	SILT	SAND			GRAVEL	
		FINE	MEDIUM	COARSE	FINE	COARSE

U.S. STANDARD SIEVE SIZES



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	14337-TP05	0.50 - 0.60	4	70	26	5.3	0.8	SP

Project: 0201-00-14337

Date Tested: 00/03/16

BY: JEP

Tested in accordance with ASTM D422 unless otherwise noted.

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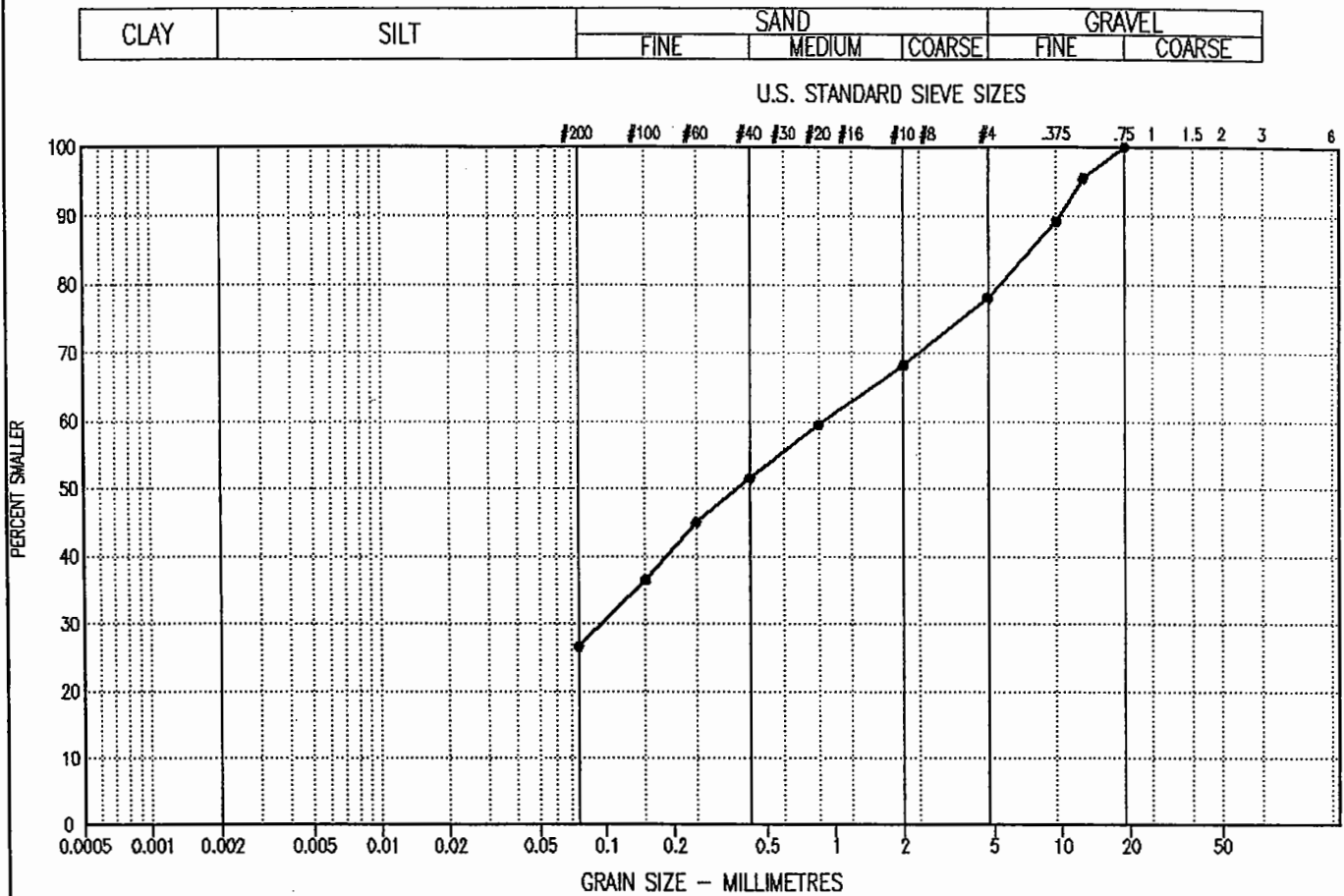
GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP08
SIMA ROAD LIGHT INDUSTRIAL SUBDIVISION	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
WHITEHORSE, YUKON	UTM ZONE: 8 N6722360 E498940	ELEVATION:

SAMPLE TYPE GRAB NO RECOVERY

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(m)
							10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	80	
							TEMPERATURE																				
							-1 3 7 11																				
						PLASTIC M.C. LIQUID																					
						10 20 30 40																					
0.0					LABRADOR TEA GROUND COVER OVER ORGANIC ROOT MAT																		0.0				
					SAND (TILL) - silty, gravelly, cobbles and boulders throughout, seasonally frozen to 1.6 m, damp below frost, olive brown																						
1.0																											
2.0					- large boulders below 2.0 m, very difficult to excavate																		-2.0				
3.0					- sandier with depth																						
4.0					END OF TESTPIT @ 4.0 m																		-4.0				

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP	COMPLETION DEPTH: 4 m
	REVIEWED BY: JRT	COMPLETE: 00/04/10

PARTICLE SIZE -- ANALYSIS OF SOILS



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●	14337-TP08	1.50 - 1.60	27	51	22	-	-	

Project: 0201-00-14337

Date Tested: 00/04/11

BY: JEP

Tested in accordance with ASTM D422 unless otherwise noted.

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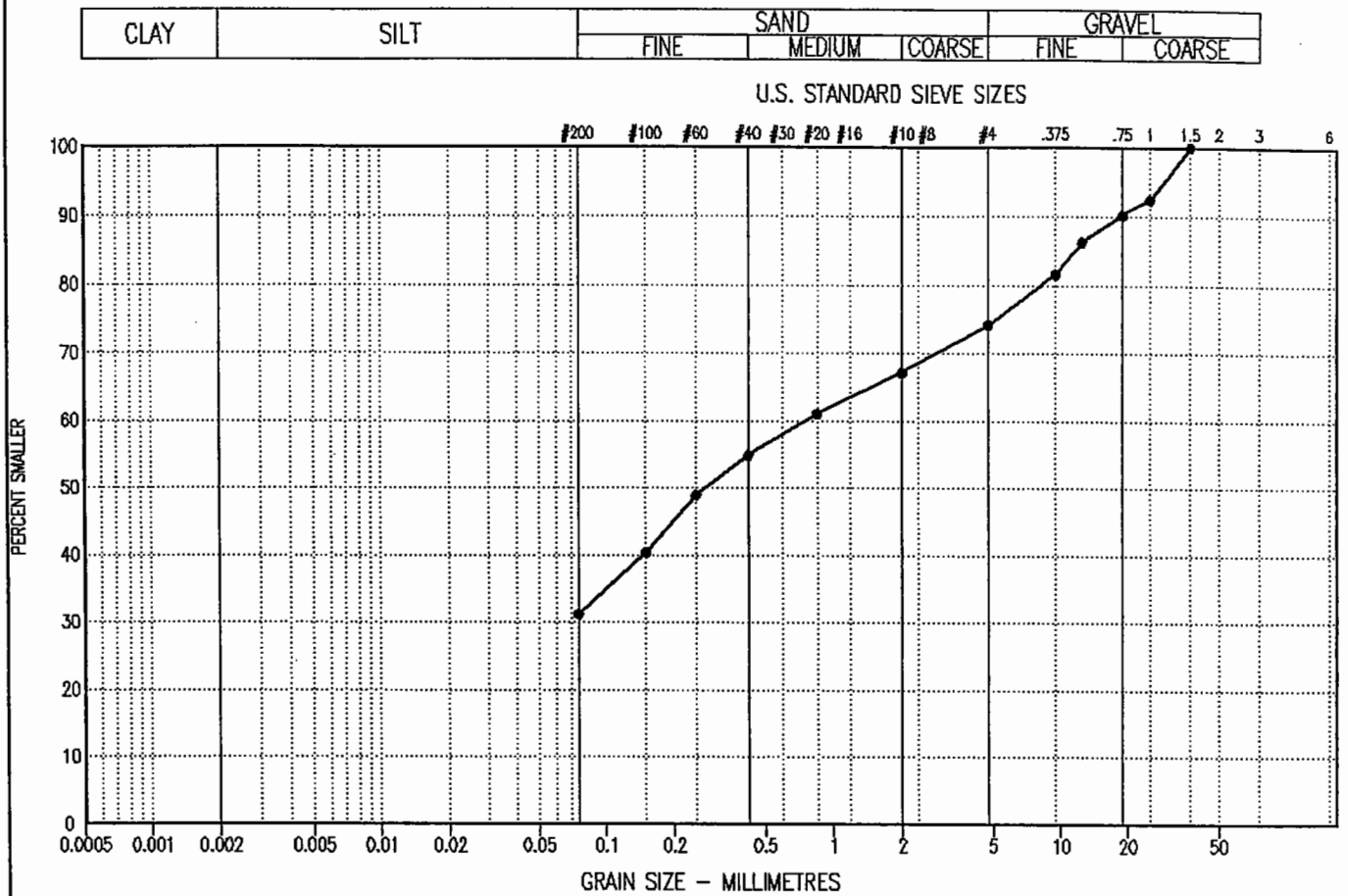
GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP09
SIMA ROAD LIGHT INDUSTRIAL SUBDIVISION	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
WHITEHORSE, YUKON	UTM ZONE: 8 N6722700 E498800	ELEVATION:

SAMPLE TYPE GRAB NO RECOVERY

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				PERCENT SAND				PERCENT SILT OR FINES				PERCENT CLAY				ELEVATION(m)
					PLASTIC	M.C.	LIQUID	10	20	30	40	20	40	60	80	20	40	60	80	20	40	60	80	20	40	60	
0.0					LABRADOR TEA GROUND COVER OVER ORGANIC ROOT MAT																				0.0		
					SAND (TILL) - silty, gravelly, cobbles and boulders throughout, seasonally frozen to 1.6 m, damp below frost, olive brown																						
1.0																											
2.0					- sandier below 1.7 m - percometer installed to 1.8 m. Percolation rate of 9 min/25 mm measured on April 11/00. Test results based on two repetitions and one hour presoak																					-2.0	
3.0																											
4.0					END OF TESTPIT @ 4.0 m																				-4.0		

EBA Engineering Consultants Ltd. Whitehorse, Yukon	LOGGED BY: MCP REVIEWED BY: JRT	COMPLETION DEPTH: 4 m COMPLETE: 00/04/10
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PARTICLE SIZE - ANALYSIS OF SOILS



SYMBOL	BOREHOLE NUMBER	DEPTH (m)	DESCRIPTION			Cu	Cc	U.S.C
			CLAY & SILT %	SAND %	GRAVEL %			
●—●	14337-TP09	2.50 - 2.60	31	43	26	-	-	

Project: 0201-00-14337

Date Tested: 00/04/11

BY: JEP

Tested in accordance with ASTM D422 unless otherwise noted.

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GEOTECHNICAL EVALUATION	CLIENT: INUKSHUK PLANNING AND DEVELOPMENT	TEST PIT NO: 14337-TP10
SIMA ROAD LIGHT INDUSTRIAL SUBDIVISION	EXCAVATOR: CAT 225 TRACKED BACKHOE	PROJECT NO: 0201-00-14337
WHITEHORSE, YUKON	UTM ZONE: 8 N6722850 E499160	ELEVATION:

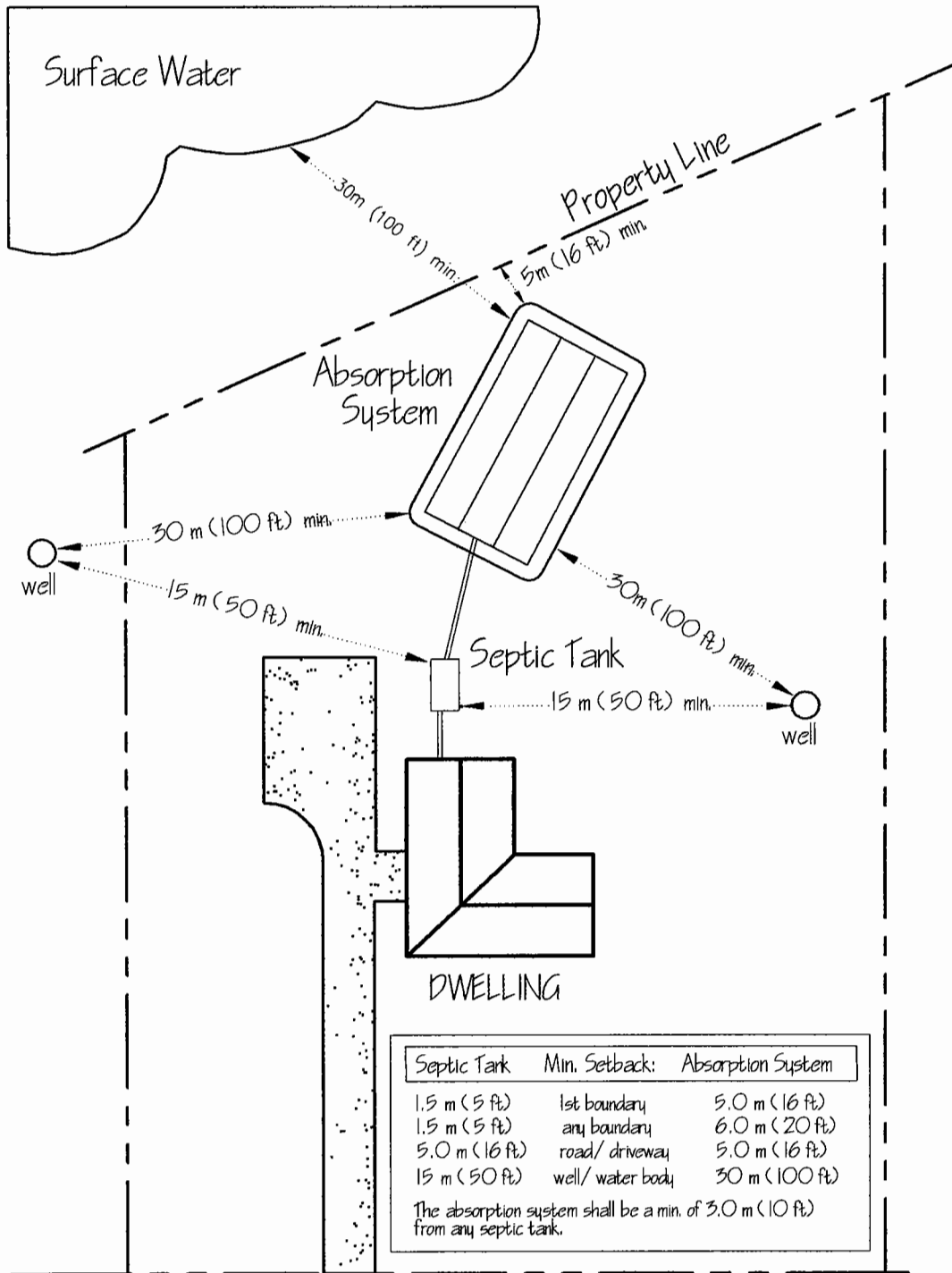
SAMPLE TYPE GRAB NO RECOVERY

Depth(m)	SAMPLE TYPE	RUN NO	USC	SOIL SYMBOL	SOIL DESCRIPTION		STANDARD PENETRATION				PERCENT GRAVEL				ELEVATION(m)				
					TEMPERATURE		10	20	30	40	20	40	60	80		20	40	60	80
0.0					LABRADOR TEA GROUND COVER OVER ORGANIC ROOT MAT														
					SAND (TILL) - silty, gravelly, cobbles and boulders throughout, seasonally frozen, olive brown														
					BEDROCK (BASALT) - competent by 0.9 m; refusal														
1.0					END OF TESTPIT @ 0.9 m														
2.0																			
3.0																			
4.0																			

EBA Engineering Consultants Ltd.	LOGGED BY: MCP	COMPLETION DEPTH: 0.9 m
Whitehorse, Yukon	REVIEWED BY: JRT	COMPLETE: 00/04/10

APPENDIX B

ON-SITE SEWAGE DISPOSAL INFORMATION



Septic Tank	Min. Setback:	Absorption System
1.5 m (5 ft)	1st boundary	5.0 m (16 ft)
1.5 m (5 ft)	any boundary	6.0 m (20 ft)
5.0 m (16 ft)	road/ driveway	5.0 m (16 ft)
15 m (50 ft)	well/ water body	30 m (100 ft)

The absorption system shall be a min. of 3.0 m (10 ft) from any septic tank.



EBA Engineering Consultants Ltd.

PROJECT

WHITEHORSE COPPER - SIMA ROAD
AREA DEVELOPMENT - WHITEHORSE, YUKON

CLIENT

**LORIMER
& Associates**
Consulting Engineers

TITLE

MINIMUM SETBACK REQUIREMENTS
FOR ON-SITE SEWAGE DISPOSAL SYSTEMS

DATE FEB. 2003

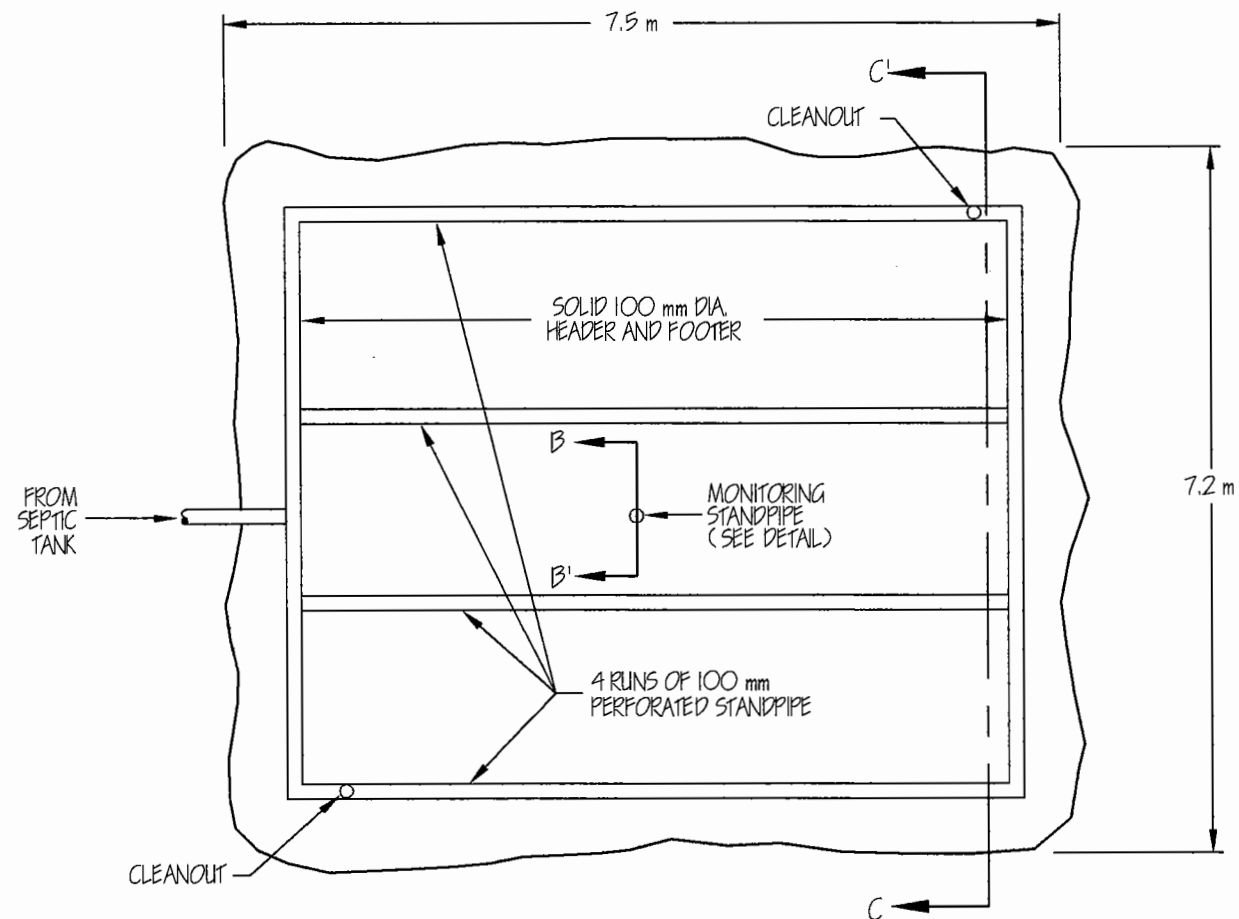
DWN. JSB

CHKD. MCP

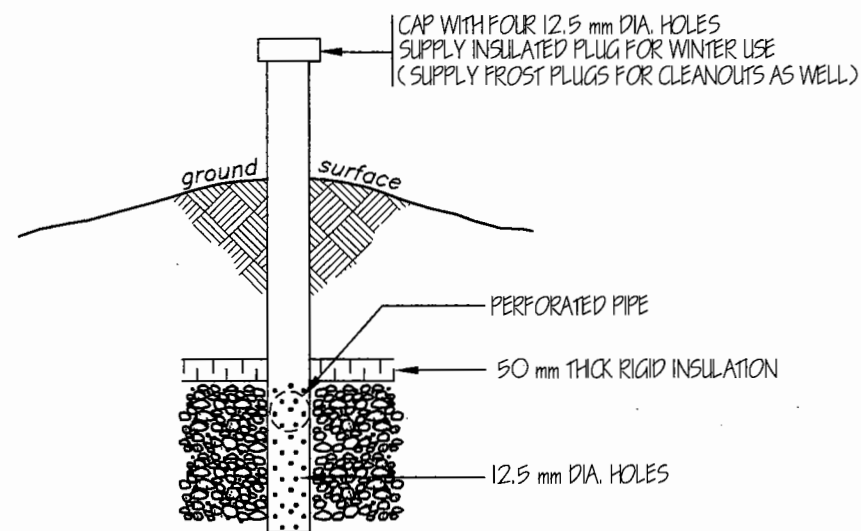
FILE NO. 0201-01-15236

DRWG. FIGURE 2

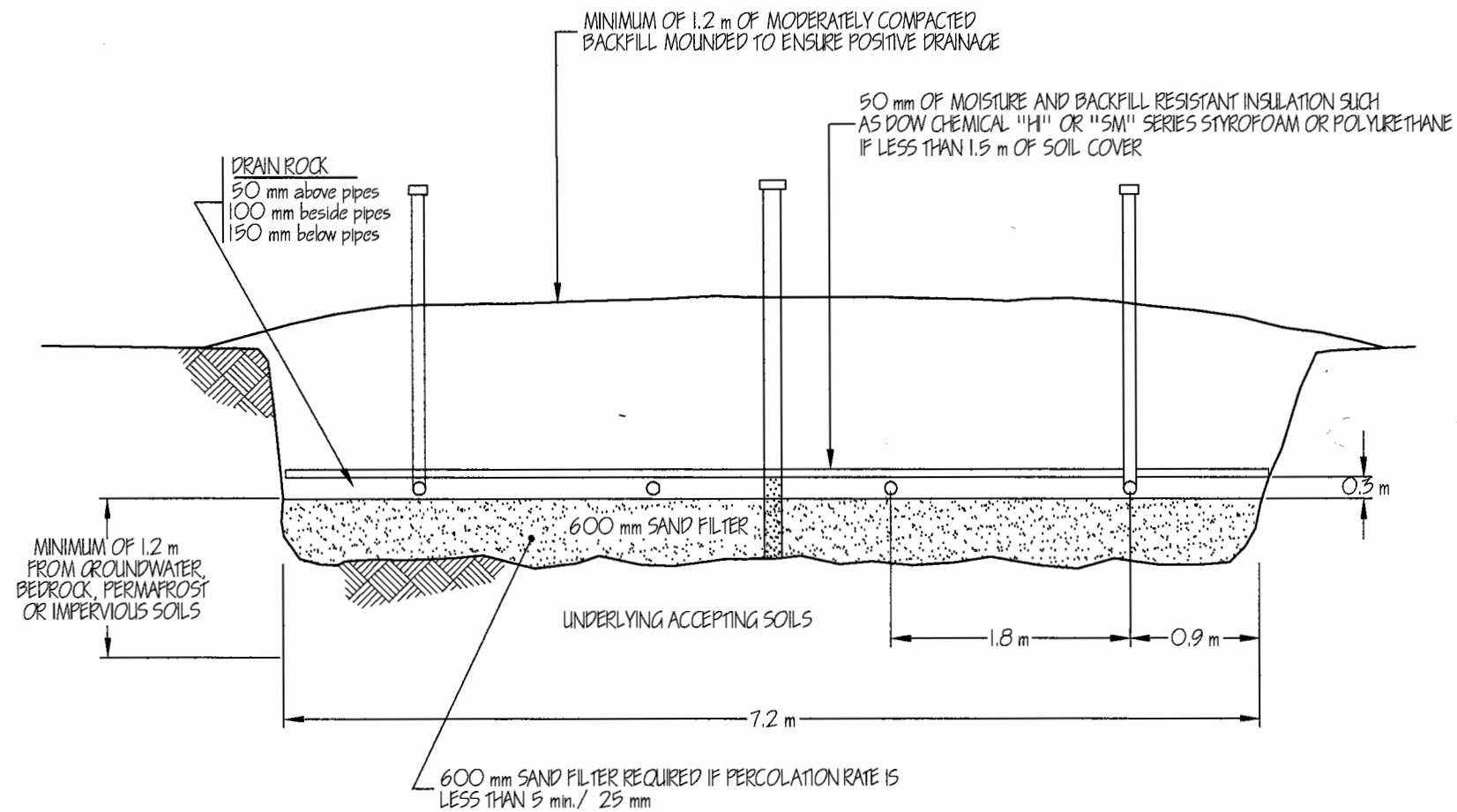
APPENDIX C
TERRAIN RISK MAP



PLAN VIEW
ABSORPTION BED SYSTEM
(not to scale)



SECTION B'-B
MONITORING STANDPIPE DETAILS
(not to scale)



SECTION C-C'
ABSORPTION BED SYSTEM
(not to scale)

* DESIGN IS BASED UPON A THREE BEDROOM RESIDENCE AND A SOIL PERCOLATION RATE OF 5 ml./25 mm. OR LESS

				PROJECT WHITEHORSE COPPER - SIMA ROAD AREA DEVELOPMENT - WHITEHORSE, YUKON	
CLIENT 				TITLE TYPICAL ABSORPTION BED SYSTEM INSTALLATION DETAILS	
DATE	FEB. 2003	DWN.	JSB	CHKD.	MCP
				FILE NO.	0201-01-15236
				FIGURE 3	

PROJECT
WHITEHORSE COPPER

CLIENT
Yukon
Community Services
Community Development Branch

- LEGEND
- COUNTRY RESIDENTIAL LOTS (MIN. 1 HA)
 - PARKS (DEVELOPED)
 - EXISTING LOTS (RESIDENTIAL, INDUSTRIAL, INSTITUTIONAL)
 - MT-SIMA SERVICE INDUSTRIAL
 - AREA RESERVED FOR MINING
 - RECLAIMED TAILINGS
 - COMMUNITY RESERVE/BUFFER/ENVIRONMENTAL RESERVE
 - TKFN LAND CLAIM
 - SCHOOL
 - PROPOSED ROADS (30 TO 25 M ROW)
 - PROPOSED TRAILS
 - POTENTIAL RAILWAY LINK c/w TRACKS
 - EBA TESTPIT LOCATIONS

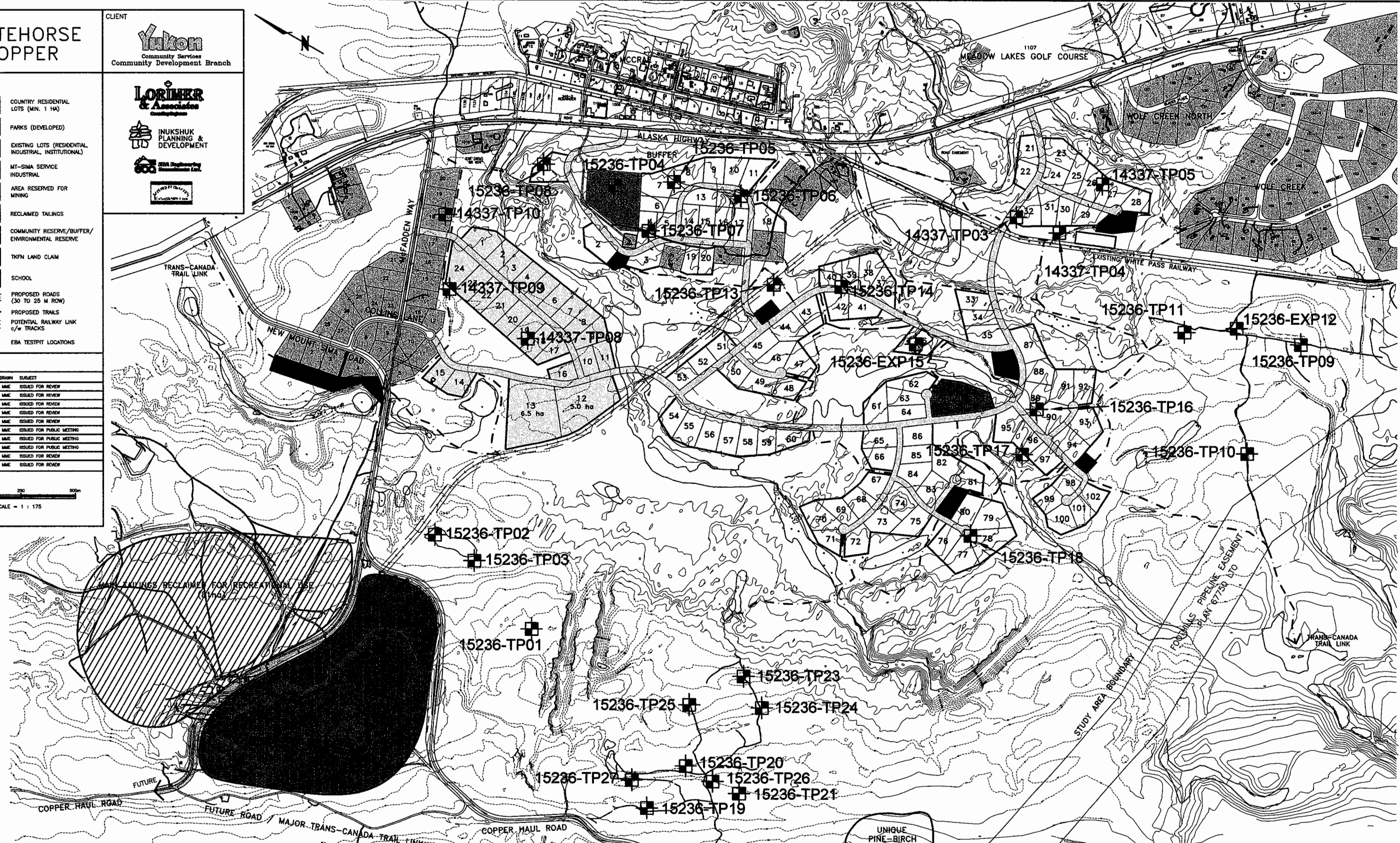
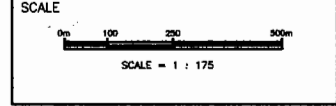
LORIMER & Associates
Consulting Engineers

INUKSHUK PLANNING & DEVELOPMENT

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REVISIONS

NO.	DATE	ENG.	DRAWN	SUBJECT
1	25.04	DR/BL	MAC	ISSUED FOR REVIEW
2	02.05	DR/BL	MAC	ISSUED FOR REVIEW
3	09.05	DR/BL	MAC	ISSUED FOR REVIEW
4	16.05	DR/BL	MAC	ISSUED FOR REVIEW
5	22.05	DR/BL	MAC	ISSUED FOR REVIEW
6	18.06	DR/BL	MAC	ISSUED FOR PUBLIC MEETING
7	17.09	DR	MAC	ISSUED FOR PUBLIC MEETING
8	04.12	DR	MAC	ISSUED FOR PUBLIC MEETING
9	18.01	DR	MAC	ISSUED FOR REVIEW
10	18.02	DR	MAC	ISSUED FOR REVIEW



				PROJECT WHITEHORSE COPPER - SIMA ROAD AREA DEVELOPMENT - WHITEHORSE, YUKON	
CLIENT LORIMER & Associates Consulting Engineers				TITLE SITE PLAN SHOWING TESTPIT LOCATIONS	
DATE	FEB. 2003	DWN.	JSB	CHKD.	MCP
FILE NO.	0201-01-15236	DRWG.	FIGURE 1		