LOT 9 (#353) CANNING HIGHWAY, COMO

GEOTECHNICAL INVESTIGATION REPORT

CLIENT:
Department of Housing

PROJECT:
Lot 9 (#353) Canning Hwy, Como

DATE:
7 October 2013

WA GEOTECHNICS REF:
WA045-doh-002 (r001-a)
Date: 7 October 2013

Department of Housing
Level 1/ 99 Plain Street
EAST PERTH WA 6004

Attention: Mr Danny Majoski

Dear Sir,

RE: LOT 9 (#353) CANNING HWY, COMO
GEOTECHNICAL INVESTIGATION REPORT

WA Geotechnics Pty Ltd is pleased to provide this report on a geotechnical investigation carried out at the above site.

If you have any questions related to the report or we can be of further assistance, please do not hesitate to contact the undersigned.

For and on behalf of
WA GEOTECHNICS PTY LTD

SIMON CIGULEV
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SECTION 1.0 - INTRODUCTION

WA Geotechnics Pty Ltd was commissioned by Danny Majoski on behalf of the Department of Housing (the client) in an email on 2 October 2013 to perform a geotechnical investigation at Lot 9 (#353) Canning Hwy, Como and to classify the residential site in accordance with the definitions provided in Australian Standard AS2870.

The proposed residential development is only applicable to one or two storey residential buildings on the site.
SECTION 2.0 - FIELDWORK

Fieldwork for the geotechnical site investigation was carried out on 5 October 2013 and consisted:

- Walkover and description of the site.
- Excavation of two test holes using a 75mm diameter hand auger at selected locations on the site to a maximum excavated depth of 2.5 m.
- Perth Sand Penetrometer (PSP) testing from the surface level to a depth of 1.05 m alongside each test hole location. Blow counts were recorded every 150 mm test depth interval.

The fieldwork was carried out by a geotechnical engineer from WA Geotechnics Pty Ltd. The test holes were backfilled with the excavated spoil.

Test locations have been located by topographical features and from the existing lot boundary and recorded on a site plan. The Site Description Sheet with test locations is presented in Figure 1.

Hand Auger logs, together with explanation sheets defining terms and symbols used in their preparation are presented in Appendix A.
SECTION 3.0 - SUBSURFACE CONDITIONS/PROFILE

The 2004 Perth Groundwater Atlas published by Water and Rivers Commission (Reference [v]) indicates the site is situated in an area that comprises Tamala Sand overlying Tamala Limestone. The soil profile encountered within the test holes was fairly consistent, comprising the following profile:

<table>
<thead>
<tr>
<th>Layer Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FILL SAND/ TOPSOIL SAND</td>
<td>Fine to medium grained, grey in colour with trace to some organics. The sand was generally loose to medium dense. This layer ranged from the surface to 0.2 m depth below ground level; and overlaid</td>
</tr>
<tr>
<td>FILL SAND</td>
<td>Fine to medium grained, pale grey/yellow in colour with trace of organics. The sand was typically loose to medium dense, becoming medium dense with depth. This layer ranged from 0.2 m to 1.0 m depth below ground level; and overlaid</td>
</tr>
<tr>
<td>TAMALA SAND</td>
<td>Fine to medium grained, pale grey/white becoming pale yellow then orange with depth. The sand was typically medium dense. This layer ranged from 0.2 m to the maximum excavated depth of 2.5 m below ground level.</td>
</tr>
</tbody>
</table>

The test holes excavated on the site achieved the target depth of 2.5 m.

3.1 PERTH SAND PENETROMETER TESTING

PSP tests performed alongside each hand auger hole indicated generally medium dense sand conditions (see Appendix B) within the site. Loose sand conditions were encountered at hand auger HA1 from the surface to 0.6 m depth. Assessment of relative sand density of the subsurface profile was performed and recorded on each hand auger log.

3.2 GROUNDWATER

Groundwater was not encountered (at the time of fieldwork) at the hand auger holes excavated on the site. The 2004 Perth Groundwater Atlas published by Water and Rivers Commission (used in conjunction with the latest information on their website (Reference [v & vi]) indicates the latest maximum probable groundwater elevation at the lowest area in the site is 1.6 m AHD (Australian Height Datum) or approximately 18.9 m depth below the natural surface. The natural ground level at the lowest area within the site is reported to be 20.5 m AHD. This indicates the groundwater elevation in the site is below the published maximum probable groundwater elevation for the site. It must be noted that groundwater levels are subject to variations due to the effects of rainfall, temperature and local drainage.

3.3 ACID SULPHATE SOILS

The 2004 Perth Groundwater Atlas published by Water and Rivers Commission (used in conjunction with the latest information on their website) (Reference [v]) indicates moderate to low risk of ASS (acid sulphate soil) or PASS (potential acid sulphate soil) occurring greater than 3.0 m from the soil surface that could be disturbed by land development activities in the site.
SECTION 4.0 - DISCUSSION

4.1 SITE CLASSIFICATION

Australian Standard 2870 provides a system of site classification for residential slabs and footing design as follows:

Table 4.1: - Classification Based on Site Reactivity

<table>
<thead>
<tr>
<th>Class</th>
<th>Foundation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Most sand and rock sites with little or no ground movement from moisture changes</td>
</tr>
<tr>
<td>S</td>
<td>Slightly reactive clay sites, which may experience only slight ground movement from moisture changes</td>
</tr>
<tr>
<td>M</td>
<td>Moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes</td>
</tr>
<tr>
<td>H1</td>
<td>Highly reactive clay site, which may experience high ground movement from moisture changes</td>
</tr>
<tr>
<td>H2</td>
<td>Highly reactive clay site, which may experience very high ground movement from moisture changes</td>
</tr>
<tr>
<td>E</td>
<td>Extremely reactive sites, which may experience extreme ground movement from moisture changes</td>
</tr>
</tbody>
</table>

Classification of Other Sites

Sites with inadequate bearing strength or where ground movement may be significantly affected by factors other than reactive soil movements due to normal moisture conditions shall be classified as Class P. Class P sites include soft or unstable foundations such as soft clay or silt or loose sands, landslip, mine subsidence, collapsing soils and soils subject to erosion, reactive sites subject to abnormal moisture conditions and sites that cannot be classified in accordance with Clause 2.1.2 of AS 2870 – 2011.

The above system is only applicable to one or two storey residential buildings or other structures of similar loadings.

The site is typically underlain by medium dense uncemented Tamala Sand. Based on the soil / rock profile encountered in the test holes excavated, the site is assigned a site classification of A in accordance with the definitions provided in Australian Standard AS2870 and subject to good building practice. Builders/owners should check compaction of the building site before construction.

4.2 EARTHWORKS

Earthworks should be carried out in accordance with AS3798, “Guidelines on Earthworks for Commercial and Residential developments”.

The topsoil sand should be removed and replaced with clean fill sand. If clayey material or iron cemented sand, colloquially termed “Coffee Rock” are encountered within the development area, they are not suitable for use as structural fill. The natural uncemented
sand and fill sand intersected on this site, except topsoil sand, is suitable for use as structural fill. Imported fill, if used, should comprise free draining sand with no more than 5% passing a 75µm sieve, and free of organic matter and other deleterious materials.

The natural sand and/or clean fill sand on the base of footings and within the development site should be compacted to achieve a minimum density index of 70% (96% of maximum dry density of modified compaction) for the upper, near surface metre. The level of compaction should be achieved to a depth of at least 0.9 m below underside of footings and at least extended 2.0 m past the building envelope. Typically for Perth sands a minimum of 8 blows for the test depth interval 150 mm to 450 mm is required to achieve the minimum relative compaction of 96% of maximum dry density (modified compaction). To allow for depth effects, this implies that PSP blow counts should not be less than 10 blows for the test interval 450 mm to 750 mm, and not less than 13 blows for the test interval 750 mm to 1050 mm. Actual PSP values required as an indication of adequate compaction should be assessed by means of establishing an on-site correlation between PSP value and relative density for each sand type i.e. fill sand, natural sand.

Care should be taken when compacting in the vicinity of existing buildings or structures.

4.3 EXCAVATIONS

Excavations across site should be achieved using standard earthmoving equipment. Excavations for construction of shallow footings on the site are expected to be less than 0.7 m deep other than where deep cut or fill is being removed (e.g. service trenches). Short term unsupported slopes should be constructed no steeper than 2H:1V for sand provided no vehicle, equipment or stockpiled material encroaches any closer than 1.0m to the crest of the slope and provided the slope is above the water table. Such slopes may be unstable in the long term if the soil profile is dry.

During winter months, slopes may become unstable due to the saturation of soils. Support for excavations in excess of 1.2 m vertical height will be required. Should dewatering be required, the effect of dewatering on nearby structures should be considered.

4.4 DRAINAGE AND STORMWATER RUNOFF

It is recommended that the footing base should be at least 1.2 m above the annual average maximum groundwater level (AAMGL).

The non-cohesive natural and fill sand encountered on this site is free draining and suitable for onsite disposal of water.

Storm water runoff from buildings should be disposed of via local authority drainage system if possible. If the use of soakwells is unavoidable, then they should be located at least 2.0 m away from buildings. Consideration could be given to a “mixed” system in some areas
whereby the runoff from short/high intensity rainfall events is accommodated via soakwells and an overflow to the Council drainage system is provided for longer duration events.

For and on behalf of
WA GEOTECHNICS PTY LTD

SIMON CIGULEV
MIEAust, Member No. 2727537
SECTION 5.0 - STANDARDS AND REFERENCES

(i) AS 1726, Geotechnical Site Investigations
(ii) AS 2870, Australian Standard for residential slabs and footings
(iii) AS 3798, Australian Standard for Earthworks for Residential and Commercial Developments
(iv) AS 1289, Methods of Testing Soils for Engineering Purposes
(v) Perth Groundwater Atlas (2nd edition, 2004), by Department of Environment, Government of Western Australia
(vi) www.wrc.wa.gov.au/infocentre/atlas, Website, Department of Environment, Government of Western Australia
SECTION 6.0 - INFORMATION ABOUT YOUR REPORT

This report presents the results of a geotechnical investigation prepared for the purpose of this commission. The data and advice provided herein relate only to the project and structures described herein and must be reviewed by a competent geotechnical engineer before being used for any other purpose. WA Geotechnics accepts no responsibility for other use of the data.

Where drill hole or test pit logs, cone tests, laboratory tests, geophysical tests and similar work have been performed and recorded by others the data is included and used in the form provided by others. The responsibility for the accuracy of such data remains with the issuing authority, not with WA Geotechnics.

The advice tendered in this report is based on information obtained from the investigation location’s test points and sample points and is not warranted in respect to the conditions that may be encountered across the site at other than these locations. It is emphasised that the actual characteristics of the subsurface materials may vary significantly between adjacent test points and sample intervals and at all locations other than where observations, explorations and investigations have been made. Subsurface conditions, including groundwater levels and contaminant concentrations can change in a limited time. This should be borne in mind when assessing the data.

It should be noted that because of the inherent uncertainties in subsurface evaluations, changed or unanticipated subsurface conditions may occur that could affect total project cost and / or execution. WA Geotechnics does not accept responsibility for the consequences of significant variances in the conditions and the requirements for execution of the work.

The subsurface and surface earthworks, excavations and foundations should be examined by a suitably qualified and experienced Engineer who shall judge whether the revealed conditions accord with both the assumptions in this report and / or the design of the works. If they do not accord, the Engineer shall modify advice in this report and / or design of the works to accord with the circumstances that are revealed.

An understanding of the geotechnical site conditions depends on the integration of many pieces of information, some regional, some site specific, some structure specific and some experienced based. Hence this report should not be altered, amended or abbreviated, issued in part and issued incomplete in any way without prior checking and approval by WA Geotechnics. WA Geotechnics accepts no responsibility for any circumstances, which arise from the issue of the report, which has been modified in any way as outlined above.
FIGURE 1
Site Description and Test Locations

<table>
<thead>
<tr>
<th>Client:</th>
<th>Department of Housing</th>
<th>Job No:</th>
<th>WA045-doh-002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project:</td>
<td>Site Classification</td>
<td>Date Tested:</td>
<td>5 Oct 2013</td>
</tr>
<tr>
<td>Location:</td>
<td>Lot 9 (#353) Canning Hwy, Como</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SITE DESCRIPTION**

**Topography:**
- General: Undulating.
- Local: Flat to gentle slope.

**Drainage:**
- Good.

**Groundwater Noted:**
- Not encountered.

**Vegetation:**
- Mainly cleared site. Some large tree stumps on the site.

**Fill Encountered:**
- Yes at HA2 to 1.0 m depth.

**Adjacent Structures:**
- ~30 y/o one storey brick and tile units; >70 y/o one storey brick and tile house.

**Movement Noted:**
- No.

**Boundary Conditions:**
- None.

**Fall Across Site:**
- ~1 m southeast.

**Fall Across Building Area:**
- ~1 m southeast.

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**SITE SKETCH (NOT TO SCALE)**

- HA2: ~30y/o Single storey brick & tile Units
- HA1: >70y/o single storey brick & tile house
- Canning Hwy
APPENDIX A

HAND AUGER LOGS
SOIL DESCRIPTION

DEFINITION:
In engineering terms, soil includes every type of uncedmented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL AND SOIL NAME:
Soils are described in accordance with the Unified Soil Classification (UCS) as shown attached.

PARTICLE SIZE DESCRIPTIVE TERMS

<table>
<thead>
<tr>
<th>NAME</th>
<th>SUBDIVISION</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulder</td>
<td></td>
<td>&gt; 200 mm</td>
</tr>
<tr>
<td>Cobble</td>
<td></td>
<td>63 mm to 200 mm</td>
</tr>
<tr>
<td>Gravel</td>
<td>Coarse</td>
<td>20 mm to 63 mm</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>6 mm to 20 mm</td>
</tr>
<tr>
<td></td>
<td>Fine</td>
<td>2.36 mm to 6 mm</td>
</tr>
<tr>
<td>Sand</td>
<td>Coarse</td>
<td>600 μm to 2.36 μm</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>200 μm to 600 μm</td>
</tr>
<tr>
<td></td>
<td>Fine</td>
<td>75 μm to 200 μm</td>
</tr>
</tbody>
</table>

MOISTURE CONDITION
Dry  Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.
Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.
Wet  As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

<table>
<thead>
<tr>
<th>TERM</th>
<th>UNDRAINED STRENGTH Su (kPa)</th>
<th>FIELD GUIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Soft</td>
<td>&lt; 12</td>
<td>A finger can be pushed well into the soil with little effort.</td>
</tr>
<tr>
<td>Soft</td>
<td>12 - 25</td>
<td>A finger can be pushed into the soil to about 25 mm depth.</td>
</tr>
<tr>
<td>Firm</td>
<td>25 - 50</td>
<td>The soil can be indented about 5 mm with the thumb, but not penetrated.</td>
</tr>
<tr>
<td>Stiff</td>
<td>50 - 100</td>
<td>The surface of the soil can be indented with the thumb, but not penetrated.</td>
</tr>
<tr>
<td>Very Stiff</td>
<td>100 - 200</td>
<td>The surface of the soil can be marked but not indented with thumb pressure.</td>
</tr>
<tr>
<td>Hard</td>
<td>&gt; 200</td>
<td>The surface of the soil can be marked only with the thumbnail.</td>
</tr>
<tr>
<td>Friable</td>
<td>-</td>
<td>Crumbles or powders when scraped by thumbnail.</td>
</tr>
</tbody>
</table>

DENSITY OF GRANULAR SOILS

<table>
<thead>
<tr>
<th>TERM</th>
<th>DENSITY INDEX (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>Less than 15</td>
</tr>
<tr>
<td>Loose</td>
<td>15 - 35</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>35 - 65</td>
</tr>
<tr>
<td>Dense</td>
<td>65 - 85</td>
</tr>
<tr>
<td>Very Dense</td>
<td>Greater than 85</td>
</tr>
</tbody>
</table>

MINOR COMPONENTS

<table>
<thead>
<tr>
<th>TERM</th>
<th>ASSESSMENT GUIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace of</td>
<td>Presence just detectable by feel or eye, but soil properties little or different to general properties of primary component.</td>
</tr>
<tr>
<td>With some</td>
<td>Presence easily detected by feel or eye, but soil properties little different to general properties of primary component.</td>
</tr>
</tbody>
</table>

Coarse grained soils: <5%
Fine grained soils: <15%
Fine grained soils: 15% - 30%
### SOIL STRUCTURE

<table>
<thead>
<tr>
<th>ZONING</th>
<th>CEMENTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layers: Continuous across exposure or sample.</td>
<td>Weakly Easily broken up by hand in water.</td>
</tr>
<tr>
<td>Lenses: Discontinuous layers of lenticular shape.</td>
<td>Moderately Effort is required to break up cemented.</td>
</tr>
<tr>
<td>Pockets: Irregular inclusions of different material.</td>
<td>Cemented: the soil by hand in air or water.</td>
</tr>
</tbody>
</table>

### GEOLOGICAL ORIGIN

**Weathered in Place Soils**
- Extremely weathered material
- Residual soil

**Transported Soils**
- Aeolian soil
- Alluvial soil
- Colluvial soil
- Fill
- Lacustrine soil
- Marine soil

Structure and fabric of parent rock visible.
Structure and fabric of parent rock not visible.
Deposited by wind.
Deposited by streams and rivers.
Deposted on slopes (transported down slope by gravity).
Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.
Deposited by lakes.
Deposited in ocean basins, bays, beaches and estuaries.

### SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

**FIELD IDENTIFICATION PROCEDURES**

<table>
<thead>
<tr>
<th>USC</th>
<th>PRIMARY NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW</td>
<td>GRAVEL</td>
</tr>
<tr>
<td>GP</td>
<td>GRAVEL</td>
</tr>
<tr>
<td>GM</td>
<td>SILTY GRAVEL</td>
</tr>
<tr>
<td>GC</td>
<td>CLAYEY GRAVEL</td>
</tr>
<tr>
<td>SW</td>
<td>SAND</td>
</tr>
<tr>
<td>SP</td>
<td>SAND</td>
</tr>
<tr>
<td>SM</td>
<td>SILTY SAND</td>
</tr>
<tr>
<td>SC</td>
<td>CLAYEY SAND</td>
</tr>
</tbody>
</table>

**IDENTIFICATION PROCEDURES ON FRACTIONS < 0.2mm**

- **DRY STRENGTH**: None to low
- **DILATANCY**: Quick to slow
- **TOUGHNESS**: None

<table>
<thead>
<tr>
<th>DRY STRENGTH</th>
<th>DILATANCY</th>
<th>TOUGHNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None to low</td>
<td>Quick to slow</td>
<td>None</td>
</tr>
<tr>
<td>Medium to high</td>
<td>None</td>
<td>Medium</td>
</tr>
<tr>
<td>Low to medium</td>
<td>Slow to very slow</td>
<td>Low</td>
</tr>
<tr>
<td>Low to medium</td>
<td>Slow to very slow</td>
<td>Low to medium</td>
</tr>
<tr>
<td>High</td>
<td>None</td>
<td>Low to medium</td>
</tr>
</tbody>
</table>

**HIGHLY ORGANIC SOILS**

- Readily identified by colour, odour, spongy feel and frequently by fibrous texture.

- Low plasticity – Liquid Limit \( W_L < 35\% \)
- Medium plasticity – \( W_L \) between 35\% and 50\%
- High plasticity – Liquid Limit \( W_L > 50\% \)

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Soil and Rock Description Explanation Sheets
Updated May 2009
Page 2 of 3

Lot 9 (#353) Canning Hwy, Como r001

WA045-doh-002
DEPARTMENT OF HOUSING
LOT 9 (#353) CANNING HWY, COMO
GEOTECHNICAL INVESTIGATION REPORT

7 October 2013
## ROCK DESCRIPTION

The descriptive terms used by WAG are given below. They are broadly consistent with Australian Standard AS1726-1993.

### DEFINITIONS:

**Rock Substance**
- Defect: Rock substance, defect and mass are defined as follows:
  - In engineering terms rock substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms effectively homogenous material, may be isotropic or anisotropic.
  - Discontinuity or break in the continuity of a substance or substances.
- Mass: Any body of material which is not effectively homogenous. It can consist of two or more substances without detects, or one or more substances with one or more defects.

### SUBSTANCE DESCRIPTIVE TERMS:

<table>
<thead>
<tr>
<th>ROCK NAME</th>
<th>PARTICLE SIZE</th>
<th>FABRIC</th>
<th>CLASSIFICATION OF WEATHERING PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple rock names</td>
<td>Grain size terms for sandstone are:</td>
<td>Terms for layering or penetrative fabric (eg. bedding, cleavage etc.):</td>
<td>Term</td>
</tr>
<tr>
<td>Coarse grained</td>
<td>Mainly 0.6mm to 2mm</td>
<td>Massive</td>
<td>Residual Soil RS</td>
</tr>
<tr>
<td>Medium grained</td>
<td>Mainly 0.2mm to 0.6mm</td>
<td>No layering or penetrative fabric.</td>
<td>Extremely</td>
</tr>
<tr>
<td>Fine grained</td>
<td>Mainly 0.06mm (just visible) to 0.2mm</td>
<td>Layering or fabric just visible. Little effect on properties.</td>
<td>Highly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Distinct</td>
<td>Moderately</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Slightly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fresh Rock</td>
</tr>
</tbody>
</table>

Notes on Weathering:

1. AS1726 suggests the term “Distinctly Weathered” (DW) to cover the range of substance weathering conditions between XW and SW. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage of making such a distinction, DW may be used with the definition given in AS1726.

2. Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term “altered” may be substituted for weathering to give the abbreviations AX, HA, MA, SA, and DA.

---

Soil and Rock Description Explanation Sheets
Updated May 2009
Page 3 of 3
**Hand Auger Log**

<table>
<thead>
<tr>
<th>Soil / Rock Description</th>
<th>Depth (metres)</th>
<th>Sample</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.8 m depth...becoming orange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of hand auger hole at 2.5 m depth. Target depth of 2.5 m achieved. Groundwater not encountered.</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- B - Bulk Sample
- D - Disturbed Sample
- U - Undisturbed Tube Sample

**W**
- **w**<sub>p</sub> - Plastic Limit
- **w**<sub>l</sub> - Liquid Limit

**Groundwater Observations:**
- Depth water noted (m)
- Depth to steady level (m)
### Hand Auger Log

**Client:** Department of Housing  
**Project:** Site Classification  
**Location:** Lot 9 (#353) Canning Hwy, Como  
**Date Tested:** 5-Oct-2013  
**Equipment:** 75mm diameter Hand Auger  

<table>
<thead>
<tr>
<th>Soil / Rock Description</th>
<th>Depth (metres)</th>
<th>Sample</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>FILL SAND (SP) - medium dense, fine to medium grained, grey, some organics, moist</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOPSOIL, SAND (SP) - medium dense, fine to medium grained, grey, trace organics, moist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FILL SAND (SP) - medium dense, fine to medium grained, pale grey/yellow, trace organics, moist</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAND (SP) - medium dense, fine to medium grained, orange, moist</td>
<td>3.00</td>
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<tr>
<td></td>
<td>4.00</td>
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</tr>
</tbody>
</table>

End of hand auger hole at 2.5 m depth. Target depth of 2.5 m achieved. Groundwater not encountered.

**Notes:**  
B - Bulk Sample  
D - Disturbed Sample  
U - Undisturbed Tube Sample  

**Test Location:** See Figure 1  
**Test Number:** HA2  
**Job Number:** WA045-doh-002  
**GPS Coordinates:** Not taken  
**Logged By:** CC
APPENDIX B

PSP TEST RESULTS
### Geotechnical Investigation Report

#### Lot 9 (#353) Canning Hwy, Como

<table>
<thead>
<tr>
<th>Test Location</th>
<th>HA1</th>
<th>HA2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ground Level</strong></td>
<td>Surface</td>
<td>Surface</td>
</tr>
<tr>
<td><strong>Test Depth (mm)</strong></td>
<td>1050</td>
<td>1050</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Depth Range</th>
<th>0-150mm</th>
<th>150-300mm</th>
<th>300-450mm</th>
<th>450-600mm</th>
<th>600-750mm</th>
<th>750-900mm</th>
<th>900-1050mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blows/150mm</td>
<td>Set</td>
<td>Set</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>0-150mm</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>150-300mm</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>300-450mm</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>450-600mm</td>
<td>1</td>
<td>2</td>
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<td></td>
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<tr>
<td>600-750mm</td>
<td>2</td>
<td>3</td>
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<td></td>
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</tr>
<tr>
<td>750-900mm</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>900-1050mm</td>
<td>2</td>
<td>2</td>
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<td></td>
</tr>
</tbody>
</table>

**Clients:** Department of Housing  
**Project:** Geotechnical Investigation  
**Location:** Lot 9 (#353) Canning Hwy, Como  
**Soil type:** Fill sand overlying natural sand  
**Soil moisture:** Moist  
**Depth to water:** Not encountered  

**Date:** 5 October 2013  
**Tested by:** SC  
**Hammer mass:** 9kg  
**Hammer drop:** 600mm  
**Penetrometer used:** 0072

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*Lot 9 (#353) Canning Hwy, Como r001*