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GEOTECHNICAL LOG OF NON-CORE DRILLHOLE

Borehole No: BH106

Sheet No: 1 OF 2

Project No: 3003659

Client: QDTMR

Project: Smith Olsen Detailed Design Geotech Investigation **Co-ordinates System:** UTM Zone 56

Feature: **Eastings:** 535171.3m E

Location: Refer Location Plan **Northings:** 6906946.4m S

Surface RL (m): 40.78

Angle from Horz: 90

Direction: n/a

| DRILLING | | | | | | | TESTING | | | | SUBSTANCE | | | | | |
|----------|---------|------|------|-------|--------|-----------------------|----------|------|----------------------|-------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|--------------------|----|
| Method | Support | Rate | Rate | Water | Sample | Depth (m) | Depth/RL | Type | Sample or Field Test | Graphic Log | USC Symbol | Description | Moisture | Consistency/Density | Other Observations | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| ATC | | | | | SPT | 40.78 40.63 | | S | 14,24,24 N=48 | | GM | ASPHALT Silty GRAVEL: Dense to very dense, medium gravel, grey silt, dry, road base, fill. | D | D | | |
| | | | | | | 0.90 39.88 7.10 | | | | | CH | Silty CLAY: Hard, medium to high plasticity, pale brown and yellow, some angular gravel, moist, possible subgrade fill or insitu weathered/residual rock. Refer to Geotechnical Log of Cored Drillhole | M | H | | |
| | | | | | | 1 | | | | | | | | | | |
| | | | | | | 2 | | | | | | | | | | |
| | | | | | | 3 | | | | | | | | | | |
| | | | | | | 4 | | | | | | | | | | |
| | | | | | | 5 | | | | | | | | | | |
| | | | | | | 6 | | | | | | | | | | |
| | | | | | | 7 | | | | | | | | | | |
| | | | | | | 8 | | | | | | | | | | |
| | | | | | | 9 | | | | | | | | | | |

Notes (Instrumentation etc):

Contractor: GeoDrill

Commenced: 19/07/11

Logged By: ME/BD

Equipment: Hydropower Scout

Completed: 19/07/11

Checked By: AR

Basis of description and details of abbreviations are given on explanatory notes

SMEC GOLD COAST BOREHOLE NON CORE LOG I:\PROJECTS\3003659\005_OPERATIONS\DD15_GEOTECHNICAL\INVESTIGATIONS\GINT FILES\SMITH - OLSEN BOREHOLES (CURRENT).GPJ 18/11/11



GEOTECHNICAL INVESTIGATIONS LOG

Borehole No: BH106

Sheet No: 2 OF 2

Project No: 3003659

Client: QDTMR

Project: Smith Olsen Detailed Design Geotech Investigation **Co-ordinates System:** UTM Zone 56

Feature: **E:** 535171.3

Location: Refer Location Plan **N:** 6906946.4

Surface RL (m): 40.78

Angle from Horz: 90

Direction: n/a

| DRILLING | | | | | SUBSTANCE | | | | | | | TEST | | DEFECTS | | | | | | | | | | | | | | | | | | | | | | |
|----------|-------|-------|-------|------|-----------|----------|-------------|-------------------------------------------------------------------------------------------------------------------------|------------|----|----|------|--------------------|---------|----|------|--------|-----------------------|-------|-------------|----|----|----|----|----|-----|-----|------|----|----|----|--|--|--|--|--|
| Method | Water | TCR % | RQD % | Lift | Depth (m) | Depth/RL | Graphic Log | Description | Weathering | | | | Estimated Strength | | | Type | Result | Fracture Spacing (mm) | Depth | Description | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | ROCK TYPE, mineralogy, grain size, colour, fabric, etc. | EW | HW | MW | SW | FS | FR | EL | VL | L | M | H | VH | EH | 12 | 13 | 20 | 40 | 100 | 300 | 1000 | 14 | 15 | 16 | | | | | |
| | | | | | | | | Refer to Geotechnical log of Non-cored Drillhole | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 1 | | Start Coring at 1.10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 100 | 33 | 1.4 | | 1.10 | | METASILTSTONE: Grey with iron staining, medium strength, moderately weathered, possible boulder in fill. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 1.40 | | CORE LOSS (1.40m to 2.30m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 30 | 0 | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 2.30 | | SAND: Loose, fine to coarse grained, grading coarse with depth. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 2.57 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 2.7 | | 3 | | GRAVEL: Fine to coarse (angular Metasiltstone/Metasandstone), possible fall in some pieces of plaster from casing seal. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0 | 0 | | | 3 | | CORE LOSS (2.70m to 4.17m) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 4.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 63 | 15 | | | 4 | | METASILTSTONE: Grey-brown, fractured, medium strength, moderately weathered to highly weathered. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 4.17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 36.61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 4.7 | | Medium strength to high strength. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 100 | 0 | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 5.1 | | Hole discontinued at 5.10m | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Notes (Instrumentation etc):

| | | |
|------------------------------------|----------------------------|-------------------------|
| Contractor: GeoDrill | Commented: 19/07/11 | Logged By: ME/BD |
| Equipment: Hydropower Scout | Completed: 19/07/11 | Checked By: AR |

Basis of description and details of abbreviations are given on explanatory notes



Grey Scale



Colour Scale



| | | | |
|-----------------|---------------------|--------------|------|
| Borehole Number | | BH106 | |
| Box | 1 | of | 1 |
| Depth | 1.1m | to | 5.1m |
| Project | Smith St & Olsen Av | | |
| Number | 3003659 | | |
| Client | QDTMR | | |



NOTES RELATING TO GEOTECHNICAL REPORTS AND SITE INVESTIGATION LOGS

GEOTECHNICAL REPORTS AND SITE INVESTIGATION LOGS

Geotechnical reports/logs are prepared by qualified personnel on the information supplied or obtained and are based on current engineering standards of interpretation and analysis.

Information may be gained from limited subsurface testing, surface observations, previous work, and is supplemented by knowledge of the local geology and experience of the range of properties that may exhibited by the materials present. For this reason, geotechnical reports should be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Where the report/log has been prepared for a specific purpose (e.g. design of a three-storey building), the information and interpretation may not be appropriate if the design is changed (e.g. a twenty-storey building). In such cases, the report/log and the sufficiency of the existing work should be reviewed by SMEC in the light of the new proposal.

Every care is taken with the report/log content; however, it is not always possible to anticipate or assume responsibility for the following conditions:

- Unexpected variations in ground conditions. The potential for this depends on the amount of investigative work undertaken.
- Changes in policy or interpretation by statutory authorities
- The actions of contractors responding to commercial pressures

If these occur, SMEC would be pleased to resolve the matter through further investigation, analysis or advice.

UNFORESEEN CONDITIONS

Should conditions encountered on site differ markedly from those anticipated from the information contained in the report/log, SMEC should be notified immediately. Early identification of site anomalies generally results in any problems being more readily resolved and allows re-interpretation and assessment of the implications for future work.

SUBSURFACE INFORMATION

Logs of a borehole, recovered core, test pit, excavated face, or cone penetration test are an engineering and/or geological interpretation of the subsurface conditions. The reliability of the logged information depends on the drilling/testing method, sampling/observation spacing's and the ground conditions. It is not always possible or economic to obtain continuous high-quality data. It should also be recognised that the volume of material observed or tested is only a fraction of the total subsurface profile.

Interpretation of subsurface information and application to design and construction must take into consideration the spacing of the test locations, the frequency of observations and testing, and the possibility that geological boundaries may vary between observation points.

Groundwater observations and measurements outside of specially designed and constructed piezometers should be treated with care for the following reasons:

- In low permeability soils groundwater may not seep into an excavation or bore in the short time it is left open.
- A localised perched water table may not represent the true water table.
- Groundwater levels vary according to rainfall events or season.
- Some drilling and testing procedures mask or prevent groundwater inflow.

The installation of piezometers and long-term monitoring of groundwater levels may be required to adequately identify groundwater conditions.