CORE LOG SHEET

HOLE No. BH 3

SHEET 1 OF 4

Addition: Client: ROADS AND TRAFFIC AUTHORITY, N.S.W.
Project: FOXGROUND REALIGNMENT - PRINCES HIGHWAY
Location: C. WOODESON'S FARM - FOXGROUND

Position: In "saddle" - see site plan

Surface Elevation: 83.00 approx. Angle from Horizontal: 0.0

Driller: R. BROWNE
Contractor: McDERMOTT

Date Started: 6/11/89
Date Completed: 7/11/89
Logged by: SAC
Date Logged: 6-7/11/89

Big Type: B/40 - L
Mounting: TRUCK
Casing Diameter: HW
Barrel (length): NMLC (5.0m)
Bit: SHALE/DIAMOND

Bit Condition: GOOD

Estimated Strength

In (MPa): 0.3

Spacing (mm):

WEATHERING

Estimated Strength

In (MPa): 1.3

Spacing (mm):

NATURAL FRACTURES

ADDITIONAL DATA

(Joints, partings, seams, fracture or shear zones, veins)

Fracture type, orientation, infilling or coating, shape, roughness, other.

Note: RL's obtained from DMR topographical plan - see site plan

DESRIPTION

ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and moisture, colour, consistency, structure, SOIL TYPE (origin)

GCAGED

&

CASED

2.57

2.57

SANDSTONE, silty yellow, brown, fine grained, very weakly cemented, occasional thin carbonaceous flecks. (BUDGONG SANDSTONE)

possible core loss
included sandstone pebbles

including sandstone pebbles

becoming very silty, very fine grained
including gravel layer (plus core loss)
fine to medium grained, uncemented, dense, sub rounded

including band of silt

Dry, dark brown, sandy SILT (ML)
frangible "TOPSOIL"

becoming light brown with occasional extremely weathered gravel (RESIDUAL)

becoming yellow brown

JT, 45d, CLAY, ROOTS, PR, RF
JT, 10d, CN, FE, PR/FZ
FZ, SILT
JT, sub-VD, PR, RF
FZ, CLAY, HZ
FZ
JT, CN, 10d, IR, RF
FZ, SILT
2 JT, HZ, CN, FE, PR, VR
BP, HZ, CN, PR, RF
BP/FZ, CN, HZ
JT, 20d, CN, FE, IR, RF
JT, 20d, CN, IR, VR
JT, 30d, SILT, PR, RF
blocked off 4.15m
FZ, CN
FZ, CN, HZ
FZ, CN, HZ
FZ, CN

See standard sheets for details of abbreviations & basis of descriptions

LONGMAC ASSOCIATES PTY. LIMITED
3 Eden Street, Crows Nest, N.S.W. 2065
Telephone: (02) 929 0520
CONSULTING GEOLOGICAL ENGINEERS AND GEOLOGISTS

Job No.
AGT5094
HOLE No. BH 3

ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and moisture, colour, consistency, structure, SOIL TYPE (origin)

- included band of gravels, dense, uncemented, fine to medium grained
  - EW

- becoming silty sharp change
  - MW

- SANDSTONE, light grey, fine grained, indurated, very hard, massive.
  - BUDGONG SANDSTONE
  - SW

- included rounded gravels
  - F

- becoming speckled light pink
  - F

- core loss? minor
  - F

Note: RL's obtained from DMR topographical plan - see site plan

ADDITIONAL DATA
- Fracture type, orientation, infilling or coating, shape, roughness, other.
  - FZ, SILT
  - JT, HZ, CN, UN, RF
  - JT, sub-VT, CN, PR, RF
  - JT, HZ, CN, ST, RF
  - FZ, FE, CN
  - 2 JT, FE, CN, HZ, UN, RF
  - FZ, FE
  - JT, HZ, FE, CN, VR
  - JT, HZ, FE, CN, VR
  - JT, 20d, CH, IR, VR
  - 2 JT, 30d, CN, FE, PR, RF
  - JT, 45d, CN, FE, PR, RF
  - JT, 10d
  - JT, 60d, CN, FE, PR, VR
  - JT, 60d, CN, FE, FE, VR
  - FZ, FE
  - JT, HZ, FE, PR, VR
  - 2 JT, 70d, CN, PR, RF
  - 3 JT, 70d, CN, KT, PR, RF
  - JT, HZ, CN, IR, RF
  - JT, CN, ST, RF
  - JT, CN, HZ, PR, RF
<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Casing Diameter (m)</th>
<th>Barrel Length (m)</th>
<th>Casing Material</th>
<th>Casing Type</th>
<th>Drilled Date</th>
<th>Cased Date</th>
<th>Driller</th>
<th>Contractor</th>
<th>Rig Type</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.43</td>
<td>HW</td>
<td>NMLC (3.0m)</td>
<td>TRUCK</td>
<td>B/40 - L</td>
<td>6/11/89</td>
<td>7/11/89</td>
<td>R. BROWNE</td>
<td>McDERMOTT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DESCRIPTION**

- ROCK TYPE: BUDGONG SANDSTONE, as above.
- CORE LOSS: 0.12m.

**WEATHERING**

- Estimated Strength (MPa): 40
- Spacing (mm):
  - Vertical: 100
  - Horizontal: 100

**NATURAL FRACTURES**

- JT, sub-VT, CN, PR, RF
- FZ, CN

**ADDITIONAL DATA**

- Fracture type, orientation, infilling or coating, shape, roughness, other.

**Note:** RL's obtained from DMR topographical plan - see site plan

See standard sheets for details of abbreviations & basis of descriptions

LONGMAC ASSOCIATES PTY. LIMITED
3 Eden Street, Crows Nest, N.S.W. 2065
Telephone: (02) 992 0520
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.: AGT5094
HOLE No. BH 3

Position: In "saddle" - see site plan
Surface Elevation: 83.00 approx. Angle from Horizontal: 90.0

Rig Type: B/40 - L
Mounting: TRUCK
Contractor: McDermott
Driller: R. Browne

Casing Diameter: HW
Barrel (length): NMLC (3.0m)
Bit: SHALE/DIAMONDBit Condition: GOOD

Date Started: 6/11/89
Date Completed: 7/11/89
Logged by: SAC
Date Logged: 6-7/11/89

DESCRIPTION

ROCK TYPE, colour, grain size, structure
(texture, mineral composition, hardness,
alteration, cementation, etc. as applicable)
and
moisture, colour, consistency,
structure, SOIL TYPE (origin)

NATURAL FRACTURES

ADDITIONAL DATA
(joints, partings, seams, fracture or shear zones, veins)

Fracture type, orientation, infilling or coating, shape, roughness, other.

Note: RL's obtained from DMR topographical plan - see site plan

BUDGONG SANDSTONE, as above.

END OF BORE AT 19.00m in SANDSTONE.

See standard sheets for details of abbreviations & basis of descriptions

LONGMAC ASSOCIATES PTY. LIMITED
3 Eden Street, Crows Nest, N.S.W. 2065
Telephone: (02) 929 0520
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

AGT5094
HOLE No. BH 4

Client: ROADS AND TRAFFIC AUTHORITY, N.S.W.
Project: FOXGROUND REALIGNMENT - PRINCES HIGHWAY
Location: C. WOODESON'S FARM - FOXGROUND

Surface Elevation: 80.00 approx. Angle from Horizontal: 90.0

Rig Type: B/40 - L
Mounting: TRUCK
Contractor: McDERMOTT
Driller: R. BROWNE

Casing Diameter: HW
Barrel (length): NMLC (3.0m)
Bit: SHALE/DIAMONDBit Condition: GOOD

Date Started: 7/11/89
Date Completed: 7/11/89
Logged by: SAC
Date Logged: 7/11/89

DESCRIPTION

ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and moisture, colour, consistency, structure, SOIL TYPE (origin)

0.20
Moist, dark brown, organic TOPSOIL - SILT

0.40
Moist, brownish red, stiff, clayey SILT (MH) with occasional fine gravels

0.50
sandstone, silty, orange brown, included cobble

0.75
weathered sandstone?

1.00

1.00
SANDSTONE, silty, orange brown, fine grained, highly fractured, with some clay (BUDGONG SANDSTONE)

NATURAL FRACTURES

Estimated Strength of 15MPa
Spacing (mm)

ADDITIONAL DATA

(joints, partings, seams, fracture or shear zones, veins)

Note: RL's obtained from DMR topographical plan - see site plan

Fracture type, orientation, infilling or coating, shape, roughness, other.

1.48

1.45

FZ, CLAY, FE

FZ, CLAY, FE

FZ, CLAY. FE

Remnant coarse sands in wash water

2.70

2.70

CORE LOSS 1.22m.

FZ, FE, CLAY

FZ, FE, CLAY

CLAY

4.10

4.10

CORE LOSS 1.40m.

FZ, CN, FE

See standard sheets for details of abbreviations & basis of descriptions

LONGMAC ASSOCIATES PTY. LIMITED
3 Eden Street, Crows Nest, N.S.W. 2065
Telephone: (02) 929 0520
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.
AGT5094
HOLE No. BH 4

NATURAL FRACKES

ADDITIONAL DATA
(joints, partings, seams, fracture or shear zones, veins)
Fracture type, orientation, infilling or coating, shape, roughness, other.

FZ, FE, CLAY
FZ, FE
FZ, CLAY, FE
JT, HZ, CN, IR, VR
2 JT, HZ, CN, FE, PR, VR

FZ, FE, CN
JT, 20d, FE, CN, PR, VR

JT, 20d, FE, CN, PR, VR
JT, 60d, FE, CN, PR, VR
FZ, FE, SILT

JT, 10d, CN, GRAVEL, IR, RF

Note: RL's obtained from DMR
topographic plan
- see site plan

See standard sheets for
details of abbreviations & basis of descriptions

LONGMAC ASSOCIATES PTY. LIMITED
5 Eden Street, Crows Nest, N.S.W. 2065
Telephone: (02) 929 0520
CONSULTING GEOTECHNICAL ENGINEERS AND GEOLOGISTS

Job No.
AGT5094
Client: ROADS AND TRAFFIC AUTHORITY, N.S.W.
Project: FOXGROUND REALIGNMENT - PRINCES HIGHWAY
Location: C. WOODESON'S FARM - FOXGROUND

Position: Upslope & south of farmhouse
Surface Elevation: 60.00 approx. Angle from Horizontal: 90.0

Rig Type: B/40 - L
Mounting: TRUCK
Casing Diameter: HW
Barrel (length): NMLC (3.0m)
Date Started: 7/11/89
Date Completed: 7/11/89
Date Logged: 7/11/89

Driller: R. BROWNE
Contractor: McDERMOTT

HOLE No. BH 4

NATURAL FRACTURES

- Fracture type, orientation, infilling or coating, shape, roughness, other.

ADDITIONAL DATA
(joints, partings, seams, fracture or shear zones, veins)

- FZ, FE, 20d, PR
- FZ, FE, 20d, PR
- FZ, FE, 20d, PR
- JT/FZ, 30d, PR, FE, SAND

Note: RL's obtained from DMR topographical plan - see site plan

DESCRIPTION

- ROCK TYPE, colour, grain size, structure (texture, mineral composition, hardness, alteration, cementation, etc. as applicable) and moisture, colour, consistency, structure, SOIL TYPE (origin)

- iron stained, highly fractured band

- included fine to medium rounded gravels in sandstone matrix, well cemented

END OF BORE AT 11.32m in SANDSTONE.
Reference 2
<table>
<thead>
<tr>
<th>Groundwater Work Request No. (ID No.)</th>
<th>Co-ordinates</th>
<th>Soil Description</th>
<th>Depth to Rock (m)</th>
<th>Rock Type</th>
<th>Depth of Borehole (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW028682 (ID 2)</td>
<td>E – 301030, N – 6156155</td>
<td>N/A</td>
<td>0.00</td>
<td>Shale and Shaley Sand Basalt (Decomposed and Highly Waethered)</td>
<td>21.30</td>
</tr>
<tr>
<td>GW053557 (ID 3)</td>
<td>E – 301109, N – 6156134</td>
<td>Clay</td>
<td>5.00</td>
<td>Basalt Sandstone (Red and Grey)</td>
<td>36.00</td>
</tr>
<tr>
<td>GW029768 (ID 4)</td>
<td>E – 301070, N – 6155965</td>
<td>Soil Sandy Silt Clay (Wet) and Clay (Stones)</td>
<td>8.22</td>
<td>Basalt (Broken) Basalt</td>
<td>15.20</td>
</tr>
<tr>
<td>GW010912 (ID 7)</td>
<td>E – 301385, N – 6155380</td>
<td>Clay Clay (Stones) Clay (Decomposed)</td>
<td>5.48</td>
<td>Stones Volcanic Rock Marine Sandstone Volcanic Rock (Red)</td>
<td>18.20</td>
</tr>
<tr>
<td>GW031922 (ID 8)</td>
<td>E – 300575, N – 6155425</td>
<td>Clay (Grey and Gravel)</td>
<td>10.05</td>
<td>Blue Metal (Fractured and Decomposed) Basalt (Fractured and Grey)</td>
<td>46.30</td>
</tr>
<tr>
<td>GW037390 (ID 9)</td>
<td>E – 300730, N – 6155220</td>
<td>Soil Clay (Dark Plastic, Green and gravel)</td>
<td>10.36</td>
<td>Basalt (Gravel, Fractured and Grey) Boulders Tuff (Pink soft and grey)</td>
<td>38.70</td>
</tr>
<tr>
<td>GW029766 (ID 10)</td>
<td>E – 300670, N – 6155085</td>
<td>Soil (Black) Sandy Clay</td>
<td>12.80</td>
<td>Sandstone (Pink Tuffaceous) Basalt (Decomposed, Fractured and Grey)</td>
<td>35.10</td>
</tr>
<tr>
<td>Groundwater Work Request No. (ID No.)</td>
<td>Co-ordinates</td>
<td>Soil Description</td>
<td>Depth to Rock (m)</td>
<td>Rock Type</td>
<td>Depth of Borehole (m)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------</td>
<td>----------------------</td>
</tr>
<tr>
<td>GW029767 (ID 11)</td>
<td>E – 300570</td>
<td></td>
<td>N/A</td>
<td>Tuff (Red)</td>
<td>14.60</td>
</tr>
<tr>
<td></td>
<td>N – 6155005</td>
<td>Sand (Fine and Grey Oozy Fossils)</td>
<td></td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clay (Sand, Black)</td>
<td></td>
<td>Shale (Grey)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gravel (Coarse)</td>
<td></td>
<td>Basalt (Fractured)</td>
<td></td>
</tr>
<tr>
<td>GW072973 (ID 23)</td>
<td>E – 299606</td>
<td>Clay (Brown)</td>
<td>0.50</td>
<td>Siltstone (Brown)</td>
<td>36.00</td>
</tr>
<tr>
<td></td>
<td>N – 6153195</td>
<td></td>
<td></td>
<td>Shale (Grey)</td>
<td></td>
</tr>
<tr>
<td>GW028843 (ID 25)</td>
<td>E – 299031</td>
<td>Soil</td>
<td>8.83</td>
<td>Basalt (Fractured)</td>
<td>50.00</td>
</tr>
<tr>
<td></td>
<td>N – 6153238</td>
<td>Clay (Gravel)</td>
<td></td>
<td>Tuff (Red Basalt Bands and White Red Grey)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gravel</td>
<td></td>
<td>Blue Metal</td>
<td>71.00</td>
</tr>
<tr>
<td>GW050217 (ID 27)</td>
<td>E – 398670</td>
<td>Dirt</td>
<td>9.00</td>
<td>Shale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N – 6153665</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GW029638 (ID 33)</td>
<td>E – 296400</td>
<td>Topsoil</td>
<td>1.37</td>
<td>Shale (Decomposed, Grey Sandy)</td>
<td>30.50</td>
</tr>
<tr>
<td></td>
<td>N – 6152825</td>
<td>Boulders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GW019378 (ID 37)</td>
<td>E – 297790</td>
<td>Soil</td>
<td>6.71</td>
<td>Rock (Grey and Hard)</td>
<td>20.10</td>
</tr>
<tr>
<td></td>
<td>N – 6152275</td>
<td>Clay (Gravel)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GW060641 (ID 46)</td>
<td>E – 298940</td>
<td>Clay (Overburden)</td>
<td>7.00</td>
<td>Basalt (Red)</td>
<td>27.00</td>
</tr>
<tr>
<td></td>
<td>N – 6152065</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater Work Request No. (ID No.)</td>
<td>Co-ordinates</td>
<td>Soil Description</td>
<td>Depth to Rock (m)</td>
<td>Rock Type</td>
<td>Depth of Borehole (m)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>--------------------</td>
<td>-----------------------------------</td>
<td>-------------------</td>
<td>-----------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>GW015223 (ID 59)</td>
<td>E – 296620</td>
<td>Soil Clay (Black, Yellow and Stones)</td>
<td>7.92</td>
<td>Rock (Decomposed)</td>
<td>15.20</td>
</tr>
<tr>
<td></td>
<td>N – 6151780</td>
<td></td>
<td></td>
<td>Volcanic Rock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shale (Black)</td>
<td></td>
</tr>
<tr>
<td>GW031365 (ID 77)</td>
<td>E – 295805</td>
<td>Clay (Topsoil and Gravel)</td>
<td>14.32</td>
<td>Rock (Decomposed)</td>
<td>25.90</td>
</tr>
<tr>
<td></td>
<td>N – 6150485</td>
<td></td>
<td></td>
<td>Tuff (Grey Sandy)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pebbles (Small Conglomerated)</td>
<td></td>
</tr>
<tr>
<td>GW045655 (ID 84)</td>
<td>E – 292725</td>
<td>Soil Clay (Red White)</td>
<td>18.29</td>
<td>Shale (Decomposed and Grey Sandy Medium)</td>
<td>38.10</td>
</tr>
<tr>
<td></td>
<td>N – 6149550</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GW012997 (ID 85)</td>
<td>E – 292625</td>
<td>Clay (Sticky)</td>
<td>10.66</td>
<td>Shale</td>
<td>31.40</td>
</tr>
<tr>
<td></td>
<td>N – 6149515</td>
<td></td>
<td></td>
<td>Basalt (Green and Fractured)</td>
<td></td>
</tr>
<tr>
<td>GW051054 (ID 86)</td>
<td>E – 292354</td>
<td>Soil Clay</td>
<td>11.00</td>
<td>Shale</td>
<td>53.00</td>
</tr>
<tr>
<td></td>
<td>N – 6149431</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GW031987 (ID 87)</td>
<td>E – 292300</td>
<td>Topsoil Clay (Red and White)</td>
<td>12.49</td>
<td>Shale (Black)</td>
<td>103.60</td>
</tr>
<tr>
<td></td>
<td>N – 6149500</td>
<td></td>
<td></td>
<td>Basalt (Grey and Green and Black)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Quartz Bands</td>
<td></td>
</tr>
<tr>
<td>GW017029 (ID 88)</td>
<td>E – 292165</td>
<td>Soil Clay (Yellow and White and Pink Red)</td>
<td>11.79</td>
<td>Shale (Black and Hard and Grey)</td>
<td>50.30</td>
</tr>
<tr>
<td></td>
<td>N – 6149460</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater Work Request No. (ID No.)</td>
<td>Co-ordinates</td>
<td>Soil Description</td>
<td>Depth to Rock (m)</td>
<td>Rock Type</td>
<td>Depth of Borehole (m)</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------------------</td>
<td>------------------------------------------------------------</td>
<td>-------------------</td>
<td>----------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>GW018852 (ID 89)</td>
<td>E – 292165 N – 6149225</td>
<td>Topsoil&lt;br&gt;Clay(Red White and Gravel)</td>
<td>10.97</td>
<td>Shale (Dark Sandy and Green Soft)</td>
<td>43.00</td>
</tr>
<tr>
<td>GW015286 (ID 121)</td>
<td>E – 288000 N – 6149050</td>
<td>Loam (Sandy)&lt;br&gt;Clay (Stones and Yellow and Black)</td>
<td>8.53</td>
<td>Shale (Black and Hard)</td>
<td>25.90</td>
</tr>
<tr>
<td>GW105299 (ID 126)</td>
<td>E – 286159 N – 6146899</td>
<td>Unconsolidated Alluvial, River Rock and Boulders&lt;br&gt;Gravel (Coarse)</td>
<td>11.00</td>
<td>Shale&lt;br&gt;Siltstone</td>
<td>199.00</td>
</tr>
<tr>
<td>GW023690 (ID 129)</td>
<td>E – 286115 N – 6145625</td>
<td>Clay</td>
<td>2.43</td>
<td>Shale (Seams and Grey and Sandy)</td>
<td>16.80</td>
</tr>
<tr>
<td>GW011600 (ID 131)</td>
<td>E – 283505 N – 6144760</td>
<td>Clay</td>
<td>8.83</td>
<td>Shale (Dark and Light and Solid)</td>
<td>36.50</td>
</tr>
</tbody>
</table>