# BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**RTBH23**

SHEET 1 OF 4

| | | | |
|---|---|---|---|
| Client: | **Department of Transport and Main Roads** | Date Commenced: | **8/3/10** |
| Project: | **Gold Coast Rapid Transit** | Date Completed: | **9/3/10** |
| Borehole Location: | **Gold Coast Highway, Ch: 30535.3** | Recorded By: | **DS** |
| Project Number: | **2161016A** | Log Checked By: | LMcK |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | **Drillpower Hydrapower Scout** | Hole Angle: | **90°** | Surface RL: | **4.02 m AHD*** |
| Borehole Diameter: | **75 mm** | Bearing: | **---** | Co-ords: | **E 85734.46 N 59627.54 GCCC Grid*** |

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD* / DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD) | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| TC | C | | 0.10 | | D | | | **TOPSOIL (SAND with CLAY):** fine grained, grey-brown. | M | | | TOPSOIL |
| | | | | | | | | **FILL (Gravelly SAND):** fine grained, brown, fine to coarse grained, angular gravel. | | | | FILL |
| | | | 0.80 | | D | | | **FILL (SAND with GRAVEL):** fine grained, grey-brown, fine to coarse grained gravel. | | | | |
| | | | 3 1 | | D | | | ... 1.1 m: no gravel. | | | | |
| | | | | SPT 2,5,5 N=10 | SPT | | | | | | | |
| | | | 2 2 | | | | | | | | | |
| | | | 1 3 | SPT 1,1,2 N=3 | SPT | | | | | | | |
| | | | 3.30 | | | | SP | **SAND:** fine grained, pale brown. | | | | BEACH SEDIMENTS |
| | | 8/3/2010 | 0 4 | | | | | | W | | | |
| | | | | SPT 0,0,3 N=3 | SPT | | | ... 4.8 m: colour change to brown and grey. | | | | |
| | | | -1 5 | | | | | | | | | |
| | | | 5.20 | | | | SW | **SAND:** fine grained, grey, trace organics. | | | | ESTUARINE SEDIMENTS |
| WB | | | -2 6 | SPT 1,2,5 N=7 | SPT | | | | | | | |
| | | | -3 7 | | | | | ... 6.9 m: organic rich clay layers. | | | | |
| | | | | SPT 5,9,12 N=21 | SPT | | | ... 7.7 m: coarse grained sand layer 50mm thick. | | | | |
| | | | -4 8 | | | | | | | | | |
| | | | -5 9 | SPT 3,0,0 N=0 | SPT | | | | | | | SPT: on third blow hammer fell 350mm |
| | | | 9.80 | | | | | **SAND:** fine grained, brown, abundant shells. | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

Parsons Brinckerhoff Australia Pty Ltd. Version 5.1 ENGINEERING BOREHOLE LOG GCRT_BOREHOLES.GPJ GEOTECH_24-2-2006.GDT 25/5/10

# BOREHOLE ENGINEERING LOG

BOREHOLE NO.
**RTBH23**
SHEET 2 OF 4

| | | | |
|---|---|---|---|
| Client: | Department of Transport and Main Roads | Date Commenced: | 8/3/10 |
| Project: | Gold Coast Rapid Transit | Date Completed: | 9/3/10 |
| Borehole Location: | Gold Coast Highway, Ch: 30535.3 | Recorded By: | DS |
| Project Number: | 2161016A | Log Checked By: | LMK |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | Drillpower Hydrapower Scout | Hole Angle: | 90° | Surface RL: | 4.02 m AHD* |
| Borehole Diameter: | 75 mm | Bearing: | --- | Co-ords: | E 85734.46 N 59627.54 GCCC Grid* |

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD* | DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY VS S F ST VST H / FB VL L MD D VD | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| WB | | | -7 | 11 | SPT 15,30 /140mm | SPT | | | **SAND:** fine grained, brown, abundant shells. *(continued)* ... 10.2 m: abundance of white shells. | W | | | Coffee rock (?) |
| | | | | 11.20 | | | | SC | **Interlayered SAND and SAND with CLAY:** fine grained sand, brown, fine grained sand with clay, high plasticity, dark grey. | | | | |
| | | | -8 | 12 | SPT 5,10,13 N=23 | SPT | | | | | | | |
| | | | -9 | 13 | | | | | | | | | |
| | | | | | SPT 3,6,11 N=17 | SPT | | | | | | | |
| | | | -10 | 14 | | | | | | | | | |
| | | | | 14.80 | | | | SW | **SAND:** fine grained, grey-white. | | | | |
| | | | -11 | 15 | | | | | ... 15.2 m - 15.5 m: trace quartz gravel, fine grained. | | | | |
| | | | -12 | 16 | | | | | | | | | |
| | | | | | SPT 18,25,30 /130mm | SPT | | | | | | | |
| | | | -13 | 17 | | | | | ... 17.7 m: wood fragments. | | | | |
| | | | | 17.90 | | | | | | | | | |
| | | | -14 | 18 | | | | CH | **CLAY:** medium plasticity, grey-brown and black in parts, trace fine grained quartz gravel. | | | | RESIDUAL SOIL |
| | | | -15 | 19 | | | | | | | | | |
| | | | | 19.20 | | | | | **META-SILTSTONE:** grey-brown and dark grey, extremely weathered, extremely low strength with quartz veins <5mm thick. | | | | WEATHERED ROCK |
| | | | | | SPT 30 /145mm | SPT | | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

Parsons Brinckerhoff Australia Pty Ltd. Version 5.1 ENGINEERING BOREHOLE LOG GCRT_BOREHOLES.GPJ GEOTECH_24-2-2006.GDT 25/5/10

# BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**RTBH23**

SHEET 3 OF 4

| | | | |
|---|---|---|---|
| Client: | **Department of Transport and Main Roads** | Date Commenced: | **8/3/10** |
| Project: | **Gold Coast Rapid Transit** | Date Completed: | **9/3/10** |
| Borehole Location: | **Gold Coast Highway, Ch: 30535.3** | Recorded By: | **DS** |
| Project Number: | **2161016A** | Log Checked By: | LMK |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | **Drillpower Hydrapower Scout** | Hole Angle: | **90°** | Surface RL: | **4.02 m AHD*** |
| Borehole Diameter: | **75 mm** | Bearing: | **---** | Co-ords: | **E 85734.46 N 59627.54 GCCC Grid*** |

| Borehole Information | | | | | | Field Material Description | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| METHOD | SUPPORT | WATER | RL(m) AHD* | DEPTH(m) | FIELD TEST | SAMPLE | GRAPHIC LOG | USC SYMBOL | SOIL/ROCK MATERIAL FIELD DESCRIPTION | MOISTURE | RELATIVE DENSITY / CONSISTENCY<br>VS S F ST VST H<br>FB VL L MD D VD | HAND PENETROMETER (kPa) | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| WB | | | -17 | 21 | SPT 10,18,21 N=39 | SPT | | | **META-SILTSTONE:** grey-brown and dark grey, extremely weathered, extremely low strength with quartz veins <5mm thick. *(continued)*<br>... 20.4 m: dark grey, thinly laminated. | W | | | |
| | | | -18 | 22 | | | | | | | | | |
| | | | | | SPT 20,30 /100mm | SPT | | | | | | | |
| | | | -19 | 23 | | | | | | | | | |
| | | | -20 | 24 | SPT 18,30 /120mm | SPT | | | | | | | |
| | | | -21 | 25 | | | | | | | | | |
| | | | -22 | 26 | | | | | REFER TO CORED BOREHOLE LOG | | | | |
| | | | -23 | 27 | | | | | | | | | |
| | | | -24 | 28 | | | | | | | | | |
| | | | -25 | 29 | | | | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

# CORED BOREHOLE ENGINEERING LOG

BOREHOLE NO.

**RTBH23**

SHEET 4 OF 4

| | | | |
|---|---|---|---|
| Client: | **Department of Transport and Main Roads** | Date Commenced: | **8/3/10** |
| Project: | **Gold Coast Rapid Transit** | Date Completed: | **9/3/10** |
| Borehole Location: | **Gold Coast Highway, Ch: 30535.3** | Recorded By: | **DS** |
| Project Number: | **2161016A** | Log Checked By: | LMK |

| | | | | | |
|---|---|---|---|---|---|
| Drill Model/Mounting: | **Drillpower Hydrapower Scout** | Hole Angle: | **90°** | Surface RL: | **4.02 m AHD*** |
| Borehole Diameter: | **75 mm** | Bearing: | **---** | Co-ords: | **E 85734.46 N 59627.54 GCCC Grid*** |

| Borehole Information | | | | | | | Field Material Description | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| METHOD | SUPPORT | WATER | CORE RECOVERY | RQD | RL(m) AHD* / DEPTH(m) | GRAPHIC LOG | SOIL/ROCK MATERIAL FIELD DESCRIPTION | WEATHERING | INFERRED STRENGTH Is(50) MPa: EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10, EH | AVERAGE DEFECT SPACING mm: 10, 30, 100, 300, 1000, 3000 | STRUCTURE AND ADDITIONAL OBSERVATIONS |
| | | | | | 17 / 21 | | | | | | |
| | | | | | 18 / 22 | | | | | | |
| | | | | | 19 / 23 | | | | | | |
| | | | | | 20 / 24 | | | | | | |
| | | | | | 21 / 25 | | | | | | |
| | | | | | 22 / 26 | | COMMENCE CORING AT 26 m | | | | |
| NMLC | | | 100 | 12 | 22 / 26 | | **META-SILTSTONE:** thinly laminated: dark grey with pale green-grey. | XW-HW | | | 26 m - 26.67 m: Non intact core<br>26.67 m - 26.9 m: 4 x DB<br>26.9 m - 26.95 m: J, 45°, P, R, clean<br>27.0 m - 27.15 m: Non intact core<br>27.27 m - 27.5 m: Non intact core |
| | | | | | 23 / 27 | | | | | | |
| | | | | | | | END OF BOREHOLE AT 27.50 m | | | | Limit of Investigation<br>* Horizontal and vertical data determined by Ground Survey |
| | | | | | 24 / 28 | | | | | | |
| | | | | | 25 / 29 | | | | | | |

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

Parsons Brinckerhoff Australia Pty Ltd. Version 5.1 ENGINEERING CORED BOREHOLE LOG GCRT_BOREHOLES.GPJ GEOTECH_24-2-2006.GDT 25/5/10

# REPORT OF PHOTOGRAPHS

PARSONS BRINCKERHOFF

**Borehole number: RTBH23**

Sheet 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| Client: | Department of Transport and Main Roads | Coordinates: | E 85734.46 N 59627.54 | Depth range: | 26.0 m – 27.5 m |
| Project: | Gold Coast Rapid Transit | Surface RL: | 4.02 m AHD | Inclined length: | – |
| Borehole location: | Ch: 30536.5 | Hole angle: | 90 ° | Drill model/mounting: | Hydrapower Scout |
| Project number: | 2161016A | Bearing: | – | Borehole diameter: | 75 mm |