# ENGINEERING BOREHOLE LOG

Queensland Government

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/6-2010

BOREHOLE No **BH406**
SHEET 1 of 3
REFERENCE No **H11494**

PROJECT Townsville Ring Road Section 4
LOCATION Geaney Lane Overpass COORDINATES 464708.1 E; 7871691.0 N
PROJECT No FG6020 SURFACE R.L. 13.22m PLUNGE DATE STARTED 23/4/13 GRID DATUM GDA 94
JOB No 268/10M/5 HEIGHT DATUM AHD BEARING DATE COMPLETED 29/4/13 DRILLER Cairns Drilling

| DEPTH (m) | R.L. (m) | CASING / OTHER / WASH BORING / CORE DRILLING | RQD ( )% CORE REC % | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | USC | WEATHERING | INTACT STRENGTH (EH VH H M L VL EL) | DEFECT SPACING (mm) (20 60 200 600 2000) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES | TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 13.22 | | | | **Engineered Road Base and Fill** | | | | | | | Non Destructive Digging Techniques Used. | | |
| 1 | | | | | | | | | | | | | | |
| | 11.72 | | | | **Clayey SAND**<br>Pale brown to brown, moist, dense to very dense.<br>Medium to coarse grained sand. | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| | | | | C | | | (SC) | | | | | 12,19,20<br>N=39 | SPT | |
| 3 | | | | | | | | | | | | | | |
| | | | | D | Trace gravel, angular. | | | | | | | 17,30/100<br>N>50 | SPT | |
| 4 | 9.22 | | | | **Silty SAND**<br>Brown, moist, very dense.<br>Fine to medium grained sand. | | | | | | | | | |
| | | | | E | | | | | | | | 28,30/75<br>N>50 | SPT | |
| 5 | | | | | | | (SM) | | | | | | | |
| 6 | | | | F | | | | | | | | 18,29,30/125<br>N>50 | SPT | |
| 7 | 6.22 | | | | **Clayey SAND**<br>Pale brown to brown, moist, dense to mainly very dense.<br>Medium to coarse grained sand. | | | | | | | | | |
| | | | | G | | | | | | | | 18,30/130<br>N>50 | SPT | |
| 8 | | | | | | | (SC) | | | | | | | |
| 9 | | | | H | | | | | | | | 12,21,30<br>N>50 | SPT | |
| 10 | | | | | | | | | | | | | | |

REMARKS

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SHEET 2 of 3
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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10 | 3.22 | | | | **Clayey SAND (Cont'd)** | | | | | | | | | |
| | | | | J | Becoming dense. | | | | | | | 13,23,23 N=46 | | SPT |
| 11 | | | | | | | | | | | | | | |
| 12 | | | | K | Becoming very dense & iron stained. | | | | | | | 11,21,30/140 N>50 | | SPT |
| 13 | | | | | | | | | | | | | | |
| 14 | | | | L | Becoming medium dense to dense. | | (SC) | | | | | 7,13,17 N=30 | | SPT |
| 15 | | | | M | Becoming medium to coarse grained sand. | | | | | | | 10,15,18 N=33 | | SPT |
| 16 | | | | | | | | | | | | | | |
| 17 | | | | N | Becoming fine to medium grained & very dense sand. | | | | | | | 20,28,30/120 N>50 | | SPT |
| 18 | -4.98 | | | P | | | | | | | | Rockroller Technique Used. 28,30/140 N>50 | | SPT |
| | | | | | **VOLCANIC BRECCIA** **Pyroclastic rock consisting of angular fragments embedded in a finer grained matrix.** **XW:** Generally exhibits the engineering properties of a red, pink brown to yellow brown to grey, slightly moist, Clayey Sand. Some fine grained gravel. | | XW | | | | | | | |
| 19 | -6.28 | | (32) | Q | **MW:** Red, pink brown, medium to coarse grained, massive, low to medium strength. | | MW | | | | | 30/30 N>50 Is(50) = 0.17MPa | | SPT |
| 20 | | | | | | | | | | | | | | |

REMARKS

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QLD_DMR_LIB_01A.GLB Log A_ENGINEERING BOREHOLE LOG W LITHOLOGY TOWNSVILLE RING ROAD 4 GEANEY LANE.GPJ <<DrawingFile>> Datgel CPT Tool gINt Add-In 17/10/2013 11:47

# ENGINEERING BOREHOLE LOG

Queensland Government

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SHEET 3 of 3
REFERENCE No **H11494**

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| DEPTH (m) | R.L. (m) | CASING / OTHER / WASH BORING / CORE DRILLING | RQD ( )% / CORE REC % | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | USC / WEATHERING | INTACT STRENGTH (EH VH H M L VL EL) | DEFECT SPACING (mm) (20 60 200 600 2000) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES | TESTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | -6.78 | | | | | | | | | | | | |
| | -7.03 | | | | **VOLCANIC BRECCIA**<br>**MW: (Cont'd)** | | MW | | | | | | |
| | | | | | **HW:** Red, pink brown, grey, medium to coarse grained, massive, very low to low strength. | | HW | | | | | | |
| | | | | | XW zones with very low strength up to 30cm. | | XW | | | | | | |
| 21 | | | 100<br>(28) | | Defects:<br>Broken throughout, clayey infilled joints.<br>Defect spacing: Close | | HW | | | | | | |
| | | | | | | | XW | | | | | | |
| | -8.63 | | | | | | HW | | | | ~~Is(50) = 1.12MPa~~ | | o |
| 22 | | | | | **MW:** Red, pink brown, yellow, medium to coarse grained, massive, mainly medium strength. Some HW patches with very low to low strength. | | | | | | Is(50) = 0.49MPa | | o |
| | | | | | Defects:<br>- Joints @ 20°-30° (2/m)<br>- Joints @ 40°-50° (5/m)<br>- Joints @ 60°-70° (2/m) | | MW | | | | Is(50) = 0.45MPa | | o |
| 23 | | | 100 | | - Irregular joints (3/m) | | | | | | Is(50) = 0.62MPa | | o |
| | | | (8) | | Defects are generally planar to irregular, rough, open, clay infilled.<br>Defect spacing: Close to mainly medium. | | HW | | | | Is(50) = 1.03MPa | | o |
| 24 | | | | | | | | | | | Is(50) = 0.39MPa | | o |
| | | | 100 | | | | MW | | | | | | |
| 25 | | | (0) | | | | | | | | | | |
| | | | 93 | | | | | | | | | | |
| 26 | -12.78 | | (0) | | | | HW | | | | | | |
| | | | | | **ANDESITE: Fine grained, intermediate extrusive igneous rock.**<br>**MW:**Dark brown, fine grained, massive, low strength. | | MW | | | | | | |
| | | | 93 | | Defects:<br>- Joints @ 20°-30° (5/m)<br>- Joints @ 50°-60° (5/m) | | | | | | | | |
| 27 | | | (72) | | Defects are generally planar, rough, iron stained, open.<br>Defect spacing: Close to medium. | | | | | | | | |
| | -14.08 | | | | **SW:** Dark grey to black, fine grained, massive, high to very high strength. | | SW | | | | Is(50) = 1.81MPa<br>UCS=111 MPa | | o |
| 28 | | | | | Defects:<br>- Joints @ 45° (1/m)<br>- Joints @ 60° - 70°(1/m) | | | | | | Is(50) = 1.90MPa | | o |
| | -15.28 | | 100 | | Defects are generally planar, rough, iron stained, open.<br>Defect spacing: Mainly wide. | | | | | | | | |
| 29 | | | | | Borehole terminated at 28.5m | | | | | | | | |
| 30 | | | | | | | | | | | | | |

QLD_DMR_LIB_01A.GLB Log A_ENGINEERING BOREHOLE LOG W LITHOLOGY TOWNSVILLE RING ROAD 4 GEANEY LANE.GPJ <<DrawingFile>> Datgel CPT Tool gINt Add-In 17/10/2013 11:47

REMARKS

LOGGED BY
VP

**CORE PHOTO LOG**

DEPARTMENT OF TRANSPORT & MAIN ROADS
Geotechnical Branch
35 Butterfield Street, HERSTON Qld 4006
Phone 07 3066 3336

Queensland Government
Department of Transport and Main Roads

| | | | |
|---|---|---|---|
| Project Name | **Townsville Ring Road Section 4** | | |
| Project No | FG 6020 | Date | 29/04/13 |
| Borehole No | BH 406 | TMR H No | 11494 |
| Location | Geaney Lane Overpass | Start Depth (m) | 19.50 |
| Detail | Pier 2 (Left) | Finish Depth (m) | 28.50 |
| Chainage | | Submitted By | MS |
| Remarks | | | |



**GEOT043/1**