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# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND  
SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No **BH148**  
SHEET **1** of **2**  
REFERENCE No **12089**

PROJECT Mackay Ring Road Geotechnical Investigation - Stage 1  
LOCATION QR North Coast Rail Overpass Abutment A; CH: 9936m; COORDINATES 721578.6 E; 7662245.7 N  
PROJECT No FG6184 SURFACE R.L. 10.42m PLUNGE \_\_\_\_\_ DATE STARTED 22/10/14 GRID DATUM GDA 94 /MGA Zone 55  
JOB No \_\_\_\_\_ HEIGHT DATUM AHD BEARING \_\_\_\_\_ DATE COMPLETED 22/10/14 DRILLER Saxon Drilling

| DEPTH (m) | R.L. (m) | AUGER CASING WASH BORING CORE DRILLING | RQD ( ) % | CORE REC % | SAMPLE | MATERIAL DESCRIPTION  | LITHOLOGY | USC WEATHERING | INTACT STRENGTH | DEFECT SPACING (mm) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES TESTS |
|-----------|----------|--|-----------|------------|--------|---|-----------|----------------|-----------------|---------------------|-------------|----------------------------------|---------------|
| 0         | 10.42    |  |           |            |        | <b>Silty CLAY (TOPSOIL)</b><br>Dark brown, moist, soft to firm. High plasticity. Some roots.                        | (CH)      |                |                 |                     |             |                                  |               |
| 1         |          |  |           |            | A      |   |           |                |                 |                     |             | 2,3,4<br>N=7                     | SPT           |
| 1.60      | 8.82     |  |           |            |        | <b>Clayey SAND (ALLUVIUM)</b><br>Brown, moist to wet, medium dense. Fine to coarse grained sand. Trace fine gravel. | (SC)      |                |                 |                     |             |                                  |               |
| 2         |          |  |           |            | B      |   |           |                |                 |                     |             | 4,8,12<br>N=20                   | SPT           |
| 3         |          |  |           |            | C      |   |           |                |                 |                     |             | 6,6,5<br>N=11                    | SPT           |
| 4         |          |  |           |            | D      |   |           |                |                 |                     |             | 3,6,8<br>N=14                    | SPT           |
| 4.50      | 5.92     |  |           |            |        | <b>Silty CLAY (ALLUVIUM)</b><br>Dark grey, moist, stiff to very stiff. High plasticity.                             | (CH)      |                |                 |                     |             |                                  |               |
| 5         |          |  |           |            | E      |   |           |                |                 |                     |             | 4,6,9<br>N=15                    | SPT           |
| 6         |          |  |           |            | F      |   |           |                |                 |                     |             | 4,5,8<br>N=13                    | SPT           |
| 7         |          |  |           |            | G      | 7.00m: Colour change to pale grey-cream. Becoming Sandy CLAY.   |           |                |                 |                     |             | 5,8,12<br>N=20                   | SPT           |
| 7.50      | 2.92     |  |           |            |        | <b>Clayey SAND (ALLUVIUM)</b><br>Pale grey-cream, moist, dense. Fine to medium grained sand.                        | (SC)      |                |                 |                     |             |                                  |               |
| 8         |          |  |           |            | H      |   |           |                |                 |                     |             | 9,17,23<br>N=40                  | SPT           |
| 9         |          |  |           |            | J      |   |           |                |                 |                     |             | 13,17,23<br>N=40                 | SPT           |
| 9.45      | 0.97     |  |           |            |        | <b>Silty CLAY (ALLUVIUM)</b>  | (CH)      |                |                 |                     |             |                                  |               |
| 10        |          |  |           |            |        |   |           |                |                 |                     |             |                                  |               |

REMARKS Kgwu - Wundaru Granodiorite;

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MS

# ENGINEERING BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND  
SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No **BH148**  
SHEET **2** of **2**  
REFERENCE No **12089**

PROJECT Mackay Ring Road Geotechnical Investigation - Stage 1  
LOCATION QR North Coast Rail Overpass Abutment A; CH: 9936m; COORDINATES 721578.6 E; 7662245.7 N  
PROJECT No FG6184 SURFACE R.L. 10.42m PLUNGE \_\_\_\_\_ DATE STARTED 22/10/14 GRID DATUM GDA 94 /MGA Zone 55  
JOB No \_\_\_\_\_ HEIGHT DATUM AHD BEARING \_\_\_\_\_ DATE COMPLETED 22/10/14 DRILLER Saxon Drilling

| DEPTH (m) | R.L. (m) | AUGER CASING WASH BORING CORE DRILLING | RQD (%) | CORE REC % | SAMPLE | MATERIAL DESCRIPTION  | LITHOLOGY | USC WEATHERING | INTACT STRENGTH | DEFECT SPACING (mm) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS    | SAMPLES TESTS |
|-----------|----------|--|---------|------------|--------|---|-----------|----------------|-----------------|---------------------|-------------|-------------------------------------|---------------|
| 10        | 0.42     |  |         |            |        |   |           |                |                 |                     |             |                                     |               |
| 10.90     | -0.48    |  |         |            | K      | <b>Silty CLAY (ALLUVIUM) (Cont'd)</b><br>Grey-brown, moist, very stiff.<br>High plasticity.   | (CH)      |                |                 |                     |             | 6,8,16<br>N=24                      | SPT           |
| 11        |          |  |         |            | L      | <b>Sandy SILT (RESIDUAL)</b><br>Grey-brown, moist to dry, hard.<br>Low plasticity.  | (ML)      |                |                 |                     |             | 10,13,23<br>N=36                    | SPT           |
| 12        |          |  |         |            | M      |   |           |                |                 |                     |             | 23,29,30<br>N=59                    | SPT           |
| 12.80     | -2.38    |  |         |            | N      | <b>GRANODIORITE (Kgwu)</b><br><b>XW:</b> Recovered as grey-brown-white moist to dry, hard Sandy SILT. Low plasticity.   |           |                |                 |                     |             | 29,30/80                            | SPT           |
| 13        |          |  |         |            | P      |   |           |                |                 |                     |             | 30/110                              | SPT           |
| 14        |          |  |         |            | Q      | <b>MICRODIORITE (Kgwu)</b><br><b>XW:</b> Recovered as grey, moist to dry, very dense Silty SAND. Fine to medium grained sand.   |           |                |                 |                     |             | 30/110                              | SPT           |
| 14.90     | -4.48    |  |         |            | (28)   | <b>GRANODIORITE (Kgwu)</b><br><b>HW:</b> Grey-black to white, fine to coarse grained, massive, low to medium strength. Defects:<br>- Js; 40°-50° (3/m); Pl/Ro, FL, Cly;   | HW        |                |                 |                     |             | Is(50) = 0.33MPa                    | D (16.20m)    |
| 15        |          |  |         |            | (0)    | <b>MICRODIORITE (Kgwu)</b><br><b>MW:</b> Black and dark grey, fine grained, massive, low to medium strength. Highly fractured throughout. Defects:<br>- Js; 10°-20° (3/m); Pl-Un/Ro, FL, Cly or CA;<br>- Js; 30° (1/m); Pl-Un/Ro, FL, Cly or CA;<br>- Js; 50°-60° (2/m); Pl-Un/Ro, FL, Cly or CA; | MW        |                |                 |                     |             | 17.20m-17.80m: VN; subvertical, CA. |               |
| 15.80     | -5.38    |  |         |            | 100    |   |           |                |                 |                     |             | Is(50) = 0.29MPa                    | A (18.25m)    |
| 16        |          |  |         |            | (41)   |   |           |                |                 |                     |             | UCS=68.1MPa                         |               |
| 16.60     | -6.18    |  |         |            | 100    | <b>MICRODIORITE (Kgwu)</b><br><b>SW:</b> Black, fine grained, massive, high strength. Thin calcite veins throughout.  | SW        |                |                 |                     |             | Is(50) = 2.89MPa                    | A (19.10m)    |
| 17        |          |  |         |            | (100)  |   |           |                |                 |                     |             | Is(50) = 2.81MPa                    | D (19.45m)    |
| 17.46     | -8.28    |  |         |            | 100    |   |           |                |                 |                     |             |                                     |               |
| 18        |          |  |         |            | 100    | Borehole terminated at 19.46m.  |           |                |                 |                     |             |                                     |               |
| 18.70     | -9.04    |  |         |            |        |   |           |                |                 |                     |             |                                     |               |
| 19        |          |  |         |            |        |   |           |                |                 |                     |             |                                     |               |
| 19.46     |          |  |         |            |        |   |           |                |                 |                     |             |                                     |               |
| 20        |          |  |         |            |        |   |           |                |                 |                     |             |                                     |               |

REMARKS Kgwu - Wundaru Granodiorite;

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# CORE PHOTO LOG

DEPARTMENT OF TRANSPORT & MAIN ROADS  
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Department of  
Transport and Main Roads

|              |                              |                  |          |
|--------------|------------------------------|------------------|----------|
| Project Name | <b>Mackay – Ring Road</b>    |                  |          |
| Project No   | FG6184                       | Date             | 22/10/14 |
| Borehole No  | BH148                        | TMR H No         | 12089    |
| Location     | QR North Coast Rail Overpass | Start Depth (m)  | 15.8     |
| Detail       | Abutment A                   | Finish Depth (m) | 19.46    |
| Chainage     | <b>9936m</b>                 | Submitted By     | J. Lopez |
| Remarks      |                              |                  |          |

