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ENGINEERING BOREHOLE LOG

| BOREHOLE No | <u>_BH305</u> |
|--------------|----------------------|
| SHEET | <u>1</u> of <u>4</u> |
| REFERENCE No | <u>11483</u> |

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

| PRO | DJECT | Townsville Ring Road Section 4 | | | | | | | | | | |
|--|-------------|---|----------------------------|--------|--|-----------|-----|--------------------|---------------------------|---|--|------------------|
| LOC | CATION | | | | | | | | | OORDINATES <u>464709.1 E; 7871543.1</u> | <u>N</u> | |
| PRO | DJECT No | _FG60 | 020 | | SURFACE R.L. <u>12.11m</u> PLUNGE | | | DATE S | STARTED | 30/4/ | 13 GRID DATUM | |
| JOE | 8 No | 268/1 | 1 <u>0M/5</u> | | HEIGHT DATUM _ <u>AHD</u> BEARING | | | DATE CON | | <u>1/5/</u> 1 | 3 DRILLER <u>Saxon Drilling</u> | |
| o DEPTH (m) | R.L. (m) | AUGER CASING WASH BORING CORE DRILLING | RQD ()% CORE REC% | SAMPLE | MATERIAL DESCRIPTION | ГІТНОГОСУ | USC | INTACT STRENGTH | DEFECT SPACING (mm) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES TESTS |
| - | 12.11 | | RLC // | | Silty SAND(TOPSOIL) | <u></u> | | | | | | |
| - - - - - - - - - - - - - - | 11.81 | | | A | Brown, moist, loose. Fine grained.Some tree roots. Silty SAND Brown, moist, loose. Fine grained. | | | | | | 3,2,3 N=5 | SPT |
| 311:55 | | | | в | Becoming medium dense. | | (SM |) | | | 3,3,9 №=12 | SPT - |
| [ool gINt Add-In 17/10/2013 | | | | С | Becoming medium to coarse grained sand, loose. Colour change to grey brown. Becoming dense to very dense. | | | | | | 3,8,29 N=37 | SPT |
| CPTT | 8.51 | | | D | | | | | | | | SPT 1 |
| :K.GPJ < <drawingfile>> Datgel</drawingfile> | | | | E | Sandy SILT Brown, moist, hard. Low plasticity. Fine grained sand. | | | | | | N>50 21,30/120MM N>50 | SPT - |
| OWNSVILLE RING ROAD 4 STONY CREE | | | | F | Sand content increasing, becoming silty sand in parts. Becoming fine to medium grained sand. Occasional coarse gravel particles. Trace of fine gravel. | | (ML | | | | 15,27,30/140mm N>50 | SPT - |
| aud. DMR_LIB_01A.GLB_Log_A_ENGINEERING.BOREHOLE.LOG.WLITHOLOGY_TOWNSVILLE RING.ROAD.4.STONY CREEK.GPJ_ Cutation of the state of th | | | | G | Grading into silty sand with depth. | | | | | | 19,27,30/130mm N>50 | SPT |
| DDMR_LIB_01A.GLB_L0g_A_ENGINE | 3.61 | | | н | Silty SAND Brown to grey, moist, mainly dense to very dense. Medium to coarse grained sand. (See over) | | (SM |) | | | 16,18,24 N=42 | SPT |
| | | | | | | | 1 | | | I | LOGGED BY | 1 |
| l | REMARKS | ن ف · | | | | | · | · — — — — | | | JA | |



ENGINEERING BOREHOLE LOG

| BOREHOLE No | <u>_BH305_</u> _ |
|--------------|----------------------|
| SHEET | <u>2</u> of <u>4</u> |
| REFERENCE No | <u>11483</u> |

JA

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

| PROJECT Townsville Ring Road Section 4 | | | | | | | | | |
|---|--|--|--------------|-------------------|--------------------|---------------------------|----------------|--|------------------|
| LOCATION | <u>Stony Creek B</u> | ridge | | | | | COC | ORDINATES 464709.1 E; 7871543. | . <u>1 N</u> |
| PROJECT N | lo <u>FG6020</u> | SURFACE R.L <u>12.11m</u> P | LUNGE | | DATE S | TARTED - | <u>30/4/13</u> | 3 GRID DATUM GDA 94 | |
| JOB No | _268/10M/5 | HEIGHT DATUM <u></u> BI | EARING | | DATE COM | IPLETED _ | <u>1/5/13</u> | DRILLER Saxon Drilling | g |
| (E) HLABO | ADD SUBJECT | | ГІТНОГОGY | ISC VEATHERING | INTACT STRENGTH | DEFECT SPACING (mm) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | SAMPLES TESTS |
| 10 2.1 | 1ຊຽ≳ວ kec% ວັ | Silty SAND | | | | | | 10 17 02 | |
| - - - - - - - - - - 11 - - - - - - - - | | (Cont'd): | | | | | | 12,17,23 N=40 | |
| | | × | | | | | | 14,20,28 N=48 | |
| | | Silt content increasing, becoming in parts. Sand becoming fine grained. | ; sandy silt | (SM | | | | 11,23,27 N=50 | SPT |
| | | И | | | | | | 11,15,24 N=39 | SPT |
| | | Medium to coarse grained sand. | | | | | | 12,17,25 N=42 | SPT |
| | | Pale brown, moist, hard. | | (ML) | | | | 10,14,21 N=35 | |
| 91- 16 91- 16 91- 16 91- 16 91- 17 91- 17 91- 17 91- 17 91- 18 91- 18 91- 19 91- 19 91- 19 91- 19 91- 20 91- 20 | | VOLCANIC BRECCIA Pyroclastic rock consisting of au fragments embedded in a finer g matrix. XW: Exhibits the engineering pro of red, grey, pink, very dense, mo sand. | prained [+] | xw | | | | 30/100mm N>50 | |
| REMAR | | | | | | | | LOGGED BY | |



ENGINEERING BOREHOLE LOG

| BOREHOLE No | <u>BH305</u> |
|--------------|----------------------|
| SHEET | <u>3</u> of <u>4</u> |
| REFERENCE No | <u>11483</u> |

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

| PROJECT | Townsville Ring Road Section 4 | | | | | | | | | | |
|--|---|--------|---|-----------------------|--------------|--------------------|--|-------------|-------------------|-------------------|------------------|
| LOCATION | | | | | | | | | | 09.1 E; 7871543. | |
| | | | SURFACE R.L. <u>12.11m</u> PLUNGE | | | | | | GRID DATUM | | |
| JOB No | | | | | | | | 1/5/1 | | Saxon Drilling | <u> </u> |
| R.L. (m) | ADA AUGER CASSING CASSING CASSING CORE DRILLING Second Sec | | | | 0 | INTACT STRENGTH | DEFECT SPACING | g | ADDITIONAL | DATA | |
| DEPTH (m) | G BORI DRILL | щ | MATERIAL | -OGY | TERIN | | (mm) | IIC LC | AND | | ES |
| DE | CORE CORE CORE REC % | SAMPLE | DESCRIPTION | ГІТНОГОСУ | USC WEATI | STRENGTH | 00000000000000000000000000000000000000 | GRAPHIC LOG | TEST RES | ULTS | SAMPLES TESTS |
| 20 -7.89 | 40×0 REC % | | VOLCANIC BRECCIA | +- | 1 | | | | | | - |
| | | | XW (Cont'd): | + + + | | | | | | 30/40mm | - |
| - | | Q | | [+] | HW | | | | | N>50 | SPT - |
| -8.89 | | | | + | | | | ļ | | | |
| | (0) | | HW: Red brown with pink, medium to coarse grained, massive, low to medium | + + | | | | | ls | s(50) = 0.11MPa | 0 |
| | | | strength. | [+] | | | | | | | |
| E | 88 | _ | Defects: - Joint @ 20°-30° (6/m) | + + + | - | • • • | | | le | s(50) = 0.28MPa | 0 |
| - 22 10 | | | - Broken throughout | [+] | нw | | | | | s(50) – 0.2014F a | - |
| 113 11:8 | | | Defect surfaces are generally irregular, rough, open or tight, clay infilled. | + + + | | | | | | | |
| 7/10/20 | (0) | — | | [+] | | | | | ls | s(50) = 0.62MPa | 0 |
| 두 왕 -10.89 | 100 | | | + | | | | <u> </u> | Broken Zone — — — | | |
| | (0) 100 | | MW: Brown red and pink, medium to coarse grained, massive, mainly medium to |] + + | | | | | | s(50) = 0.72MPa | 0 |
| | (0) | | high strength. | [+] | | | | | | | - |
| Datgel (| 100 | | Defects: - Broken zones throughout <300mm | + + + | 1 | | | | | | |
| <u>^</u> 24 | (16) | | - Joint @ 10°-30° (5-6/m) - Joint @ 50°-60° (3-4/m) | [+] | | | | | ls | s(50) = 0.39MPa | 0 _ - |
| Trawing | 100 | | - Joint @ 80°-90° (2/m) | + + + | | | | | | s(50) = 0.34MPa | 0 |
| 2- | (0) | | Defect surfaces are generally planar or irregular, rough, open or tight, clay infilled. | [+] | | | | | | ,(cc) c.c d | |
| 9 - | | | | [+ + + | | | | | | | |
| | 100 (40) | — | | - + | | · · · · · | | | Broken Zone | | |
| D 4 STC | | | | + | | · · · | | | ls | s(50) = 0.43MPa | |
| G R OA | | | | - - + | | | | | l | s(50) = 1.51MPa | 0 |
| | | | | [+] | | | | | | (| |
| | | | | + + + | мw | | | | ls | s(50) = 1.06MPa | 0 |
| 24 TO | 100 | | | [+] | | | | | | | |
| 00 10 10 10 27 | (43) | \geq | | + + + | - | | | | | | - |
| | | | | [+] | | | | | ls | s(50) = 1.22MPa | 0 |
| | | | | + + + | | · · · | | | | | |
| | | | | [+] | | | | | ls | s(50) = 0.67MPa | 0 |
| | | | | + | | · · · | · · · · | | | | |
| GINEE | | | | + + + | 1 | | | | | (50) 5 5 5 5 5 | |
| | 95 | | | [+] | 1 | | | | | s(50) = 0.58MPa | 0 |
| о́ в29 | (18) | | | + + + | 4 | | | | Broken Zone | | |
| 01A.G | | | | [+] | | | | | l Is | s(50) = 0.26MPa | 0 |
| | | | | + + + | - | | | | | | |
| 010_DMR_LUB_011AGIB LUB_011AGIB LUB_01AGIB LUB_01AGIB LUB_01AGIB LUB_01AGIB LUB_01AGIB <td>100</td> <td></td> <td>(See over)</td> <td>[+ [+]</td> <td></td> <td></td> <td></td> <td></td> <td>Broken Zone</td> <td></td> <td></td> | 100 | | (See over) | [+ [+] | | | | | Broken Zone | | |
| REMARK | | | | | · | | | ' | _ | LOGGED BY | |
| | | | | | | | | | _ | JA | |



ENGINEERING BOREHOLE LOG

| BOREHOLE No | <u>_BH305_</u> _ |
|--------------|----------------------|
| SHEET | <u>4</u> of <u>4</u> |
| REFERENCE No | <u>11483</u> |

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

| PROJECT | | | | Road Section 4 | | | | | | | |
|------------------|---------------------------------|----------------|--------|-----------------------------------|-----------|---|------|--|-------------------|--|--------|
| LOCATION | | <u>y Creek</u> | | | | | | | | COORDINATES <u>464709.1 E; 7871543.1 N</u> | |
| | | | | SURFACE R.L. <u>12.11m</u> PLUNGE | | | | | | | |
| JOB No | 268/ | 10 <u>M/5</u> | | HEIGHT DATUM <u>AHD</u> BEARING | | | | DATE COMPLETED | <u> 1/5/</u> ′ | DRILLER Saxon Drilling | |
| R.L. | <u>"</u> 0 | RQD | | | | | | INTACT DEFECT STRENGTH SPACING | | ADDITIONAL DATA | |
| Ê ^(m) | R JG I BORING DRILLING | ()% | | MATERIAL | 5 | | RING | (mm) | rog ' | | |
| DEPTH (m) | ER NG BBO R | | ЪГЕ | DESCRIPTION | OLOC | | E | | - ZUUU U | AND SI AND TEST RESULTS | s S |
| □ 30 -17.89 | | CORE REC % | SAMPLE | | ГІТНОГОСУ | | WEA | STRENGTH SPACIN (mm) | GRA | TEST RESULTS | TESTS |
| | | | | VOLCANIC BRECCIA MW (Cont'd): | + | - | | | | ls(50) = 1.09MPa | 0 |
| - | | | | | | - | | | | | |
| - r | | | | | [+ | | ЛW | | - | | |
| - 31 | | | | | [+ | - | | | | ls(50) = 0.92MPa UCS=21.8MPa | 0 |
| - 19.04 | | 100 | _ | Borehole terminated at 31.15m | + | - | | | | + | |
| - | | | | Borenole terminated at 31.15m | | | | | | | |
| - r | | | | | | | | | | | |
| - 32 | | | | | | | | <u> </u> | | | |
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| REMARK | s | | | | | | | | | LOGGED BY | |

CORE PHOTO LOG

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



Department of Transport and Main Roads

| Project Name | Townsville Ring Road Section 4 | | |
|--|--|---|--|
| Project No | FG 6020 | Date | 01/05/13 |
| Borehole No | BH 305 | TMR H No | 11483 |
| Location | Stony Creek Bridge | Start Depth (m) | 21.00 |
| Detail | Pier 2 (Right) | Finish Depth (m) | 31.15 |
| Chainage | | Submitted By | MS |
| Remarks | | | |
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CORE PHOTO LOG

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



Department of Transport and Main Roads

| Project Name | Townsville Ring Road Section 4 | | |
|--------------|--------------------------------|------------------|----------|
| Project No | FG 6020 | Date | 01/05/13 |
| Borehole No | BH 305 | TMR H No | 11483 |
| Location | Stony Creek Bridge | Start Depth (m) | 21.00 |
| Detail | Pier 2 (Right) | Finish Depth (m) | 31.15 |
| Chainage | - (34) | Submitted By | MS |
| Remarks | | , | |
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| 0 100 | | 500 600 | 700 |
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