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ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

| BOREHOLE No | <u>BH14</u> |
|--------------|----------------------|
| SHEET | <u>1</u> of <u>7</u> |
| REFERENCE No | <u>H9563</u> |

A. DISSANAYAKE (DISS)

| PROJECT LOCATION | | | | RADE PROJECT - GATEWAY BRIDGE DU | | | | | | [IGATION] DORDINATES 10307.2 E; 167712.0 N |
|--------------------------------|--|-----------------------------|--------|---|-----------|-------------------|--------------------|---------------------------|-------------|--|
| PROJECT N | o_F <u>G</u> 53 | <u>388 _</u> _ | | SURFACE R.L9.03 | | | | | | |
| JOB No | | | | DATUM _AHD | | | | | | |
| (m) (m) HLd30 O -9.00 | 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 |
| - | | | | ESTUARINE SILTY CLAY Grey to dark grey moist to mainly wet very soft. | | | | | | |
| | | | | Partly decomposed plant fragments; high plasticity. | | ОН | | - | | |
| | 8 | | | ALLUVIAL SAND Pale grey to pale brown, wet, very loose. | | | | - | | RW, N<1 |
| -3 | | | | Fine to medium grained sand; some shell fragments. | | SM | | | N | o recovery, sand came in under casing |
| 5 -14.00 | 3 | | | | | | | - · · · | | 1,1,1 N=2 SPT |

measured with respect to a horizontal plane. (c) State of Queensland (Department of Transport and Main Roads) 2020, CC BY 4.0. Please note copyright and limitation of liability notices on attached cover page.



ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

| BOREHOLE No | <u>BH14</u> |
|--------------|--------------|
| SHEET | _2_ of _7_ |
| REFERENCE No | <u>H9563</u> |

GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION PROJECT

LOCATION _PIER 6 - NORTHERN FACE OF THE PILE CAP _____ COORDINATES _10307.2 E; 167712.0 N

| | | | | | SURFACE R.L <u>-9.03</u> | | | DATE START | | | | |
|----|-----------------------|--|----------------------------|------------|--|-----------|---|--------------------------------|---------------------------|-------------|---|-------------|
| BN | 40 | | | · — · | DATUM <u>AHD</u> | | DAT | E COMPLET | ED <u>23/3/</u> | <u>0</u> 5 | DRILLER CAIRNS DRI | I <u>LL</u> |
| | R.L. (m) -14.03 | CASING VASH BORING CORE DRILLING | RQD ()% CORE REC% | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | ISC VEATHERING | INTACT STRENGTH Ü≒rsjöii | DEFECT SPACING (mm) | GRAPHIC LOG | ADDITIONAL DATA AND TEST RESULTS | |
| 5 | <u>-14.03</u> | | 1100 78 | 07 | ALLUVIAL SAND | | - | | | 0 | | + |
| 6 | -14.23 | | | | As above LOW GRADE COAL BLACK MAINLY DULL TO VITREOUS FINE GRAINED THINLY LAMINATED FRAGILE CARBONACEOUS SEDIMENTARY ROCK. MINOR SILTSTONE INTERBEDS. HW : Black, wet very dense silty gravel rapidly grading into very low to low strength rock with depth. Frequent siltstone carbonaceous interbeds up to 100mm. | | SM | | | | 26,30/100 N>50 | |
| 7 | | | (31) | | | | HW | | | | 30/110 N>50 | |
| в | | | | \square | | | | 1 | - | 100 | Coreloss Weathered and broken seam | |
| | | | | | | | | | | | Siltstone interbed Weathered and broken seam Siltstone interbed | |
| | -17.48 | and and | | ALL ST | SILTSTONE | × × | × × | | | 1 | ls(50)=0.40 MPa | |
| | | | | - Un to | FINE GRAINED THINLY LAMINATED SEDIMENTARY ROCK MW : Pale grey to green grey, fine grained, thinly laminated mainly medium strength. | XXXX | X X X X X X X X X X X X X X X X X X X | | | | Is(50)=0.42 MPa Is(50)=0.34 MPa Is(50)=0.34 MPa | |
| 9 | 1 | | | a state of | Defects : Occasional lamination | ***** | × MW | | | | Is(50)=0.30 MPa Is(50)=0.40 MPa | |
| | <u>-18.16</u> | | | | partings<5° (3/0.5m). LOW GRADE COAL MW : Grey to black, highly fractured, broken, weathered and altered along lamination or bedding partings, mainly low to medium strength. Frequent minor siltstone and carbonaceous interbeds up to 100mm. | | MW | | | | | |
| | | | 1 | NIN N | | | MW | | | 1000 | Broken zone | |

measured with respect to a horizontal plane.

A. DISSANAYAKE (DISS)

| | Â | R | | | nsland nment | | | | | ring Dle | | | BOREHOLE N | o | |
|-----------------------------|---|----------|--------------------------|--------|--|--|--|----------------|-----------------|-------------------------|---------------|-----------------|---|--|---------|
| | U | <u>.</u> | Departm Main I | ent of | | | FOR GEOT SYMBOLS REFI | ECHN ER FOR | ICAL RM F:0 | TERMS AND GEOT 017/2 |) -2004 | | REFERENCE | | |
| PROJ LOCA | | | | | RADE PROJECT | | | | | | | | | | |
| | | | | | | | <u>-9.03</u> | | | | | | | UM _SETP | |
| JOB N | | | | | | | _AHD | | | | | | | | |
| DEPTH (m) | R.L. (m) | BORING | RQD ()% | | | MATERI | AL | GY | RING | INTACT STRENGTH | DEFE SPACI | CT NG 0) | | NAL DATA | |
| | -19.03 | 528 | CORE REC % | SAMPLE | | DESCRIPT | FION | гітногоду | USC | STRENGTH | 8888 | 2000 CRAPHIC | | ND ÆSULTS | SAMPLES |
| | <u>-19.03</u> <u>-19.50</u> <u>-19.93</u> | | 89 (55) 87 (33) | 5 | LOW GRADE CO MW : (As above Gradually chang depth. Defects : Numer <10° (5/m). SANDSTONE FINE GRAINED : MAINLY THNILY SEDIMENTARY SW : Pale grey to thinly laminated occasionally high LOW GRADE CO MW : Grey to bla weathered along partings, low to r Frequent minor s 50mm. Defects : - Frequent broke <600mm. - Lamination pai |). ing into sa rous lamina SLIGHTLY / LAMINAT ROCK brown fine mainly med h strength. DAL ack, highly g lamination mainly med silfstone in en & weath | Addition partings MASSIVE TO TED grained mainly dium to fractured and n/bedding dium strength. terbeds up to | | n ≤ MW SW | | | | UCS=28.5MPa; MC=2.2% WD=2528N/m ² Broken and weathe Coreloss | | 0 |
| 3- 1 | <u>-21,41</u> | | <u>100</u> (98) | | SILTSTONE FINE GRAINED SEDIMENTARY SW : grey to dar laminated mainly More carbonace rockmass exhibit properties below Defects : - Mainly drilling partings <30° (3- - Occasional joi - Occasional bro | THINLY LA ROCK k grey, fine y medium t ous in the ts some sa / 14.75m. induced la -6/m). nts @ 65° | MINATED e grained, thinly to high strength. upper area; andstone mination (1/3m) | **** | sw | | | | Broken and weather UCS=13.1MPa; MC=3.6% WD=2360N/m ² Pressuremeter Test 3 @ 12.70m Broken zone. Broken zone | Is(50)=0.26 MPa Is(50)=0.49 MPa Is(50)=0.59 MPa Is(50)=0.73 MPa Is(50)=0.27 MPa Is(50)=0.61 MPa | x |
| BOREHOLE WITH LITHOLOGY MEE | -24.03 | | | | | | | ***** | | | | | Pressuremeter Test 2 @ 14.45m | Is(50)=0.83 MPa Is(50)=0.54 MPa Is(50)=0.57 MPa Is(50)=0.45 MPa | |

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets, Defect angles have been measured with respect to a horizontal plane. ____

-24.03

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PROJECT

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION

BOREHOLE No __<u>4_</u> of __7__ SHEET

___<u>H9563</u>___ REFERENCE No

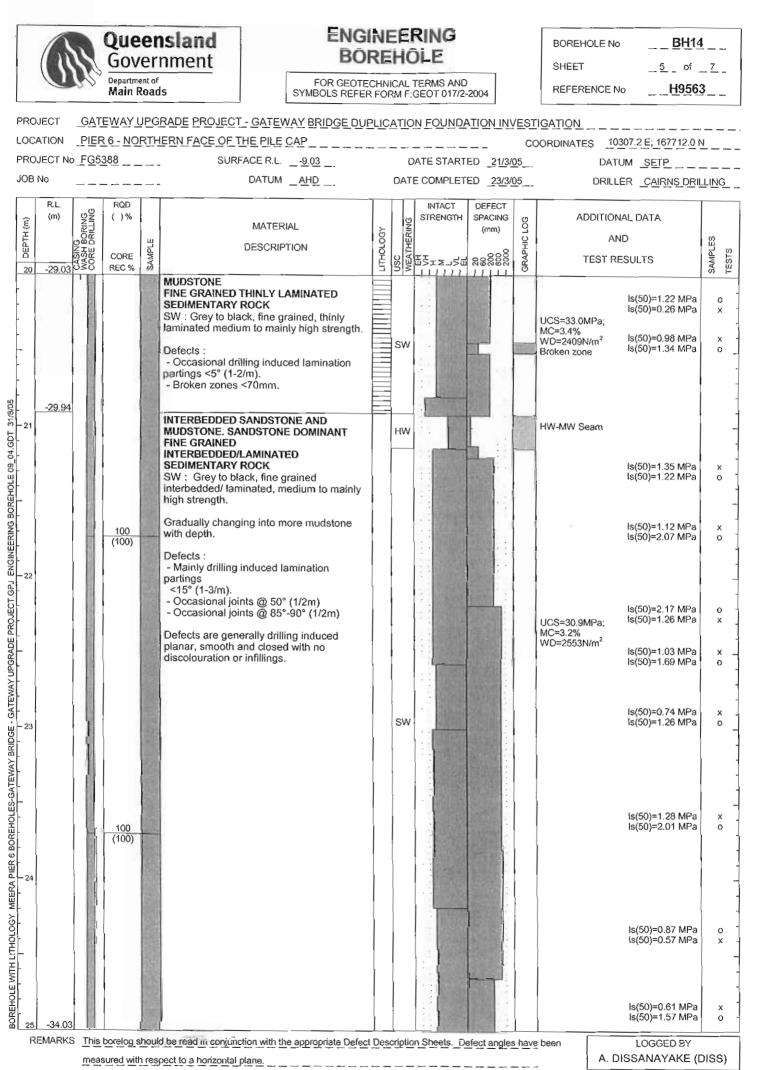
| LOCA | | PLER | <u>86 - NO</u> | RTH | ERN FACE OF THE PILE CAP | | | | | | | | 0307.2 E; 167712.0 I | N |
|--|-----------------------|-------------------------------------|---------------------|--------------------|--|---------------------------------------|-----------------|---------------------------|-----------------|---------------------------|-------------|---|--|-------------------|
| | | _ <u>FG53</u> | 388 | | | | | | | ED <u>21/3</u> | | | UM <u>SETP</u> | |
| JOB N | | | | | DATUM <u>AHD</u> | | DAT | ECC | MPLET | ED <u>23/3</u> | /05 | DRIL | | |
| DEPTH (m) | R.L. (m) -24.03 | ASING ASH BORING ORE DRILLING | RQD ()% CORE | SAMPLE | MATERIAL DESCRIPTION | LITHOLOGY | SC EATHERING | | ITACT RENGTH | DEFECT SPACING (mm) | GRAPHIC LOG | А | NAL DATA ND RESULTS | SAMPLES TESTS |
| 15 | -24.03 | ŭ≩ŭ | REC % | S | SILTSTONE | | USC | Li. | | 1111 | 5 | | | SAI |
| 02 | | | <u>100</u> (93) | | SW : (As above) | · · · · · · · · · · · · · · · · · · · | | | | | | UCS=10.7MPa; MC=3.0% WD=2445N/m ² | ls(50)=0.95 MPa ls(50)=0.39 MPa ls(50)=1.19 MPa ls(50)=0.44 MPa | 0 - X - X - |
| LE 09_04.GDT 31/8 | | | | | | ***** | sw | | | | | | ls(50)=0.41 MPa ls(50)=1.05 MPa | x - 0 |
| | | | | | | ****** | | | | | | - | ls(50)=2.05 MPa is(50)=0.58 MPa | × - |
| GATEWAY UPORADE PROJECT.GPJ ENGINEERING BOREHOLE 09_04.GDT 31/8/05 | <u>-26.06</u> | | | Aller Shielder and | SANDSTONE FINE GRAINED SLIGHTLY MASSIVE TO MAINLY THINLY LAMINATED SEDIMENTARY ROCK SW : Pale grey to grey fine grained mainly thinly faminated mainly medium to high | ***** | sw | | | | | UCS=20.60MPa; MC=2.2% WD=2441N/m ² | ls(50)=0.17 MPa ls(50)=0.14 MPa ls(50)=0.50 MPa ls(50)=0.48 MPa ls(50)=0.48 MPa | 0 - X - X - |
| | -26.88 | | | Contraction of the | Intersed Decision and the second seco | | | Contraction of the second | | | | Broken zone | Is(50)=1.00 MPa Is(50)=1.20 MPa Is(50)=0.34 MPa | x - x - x - |
| ATEWAY BRIDGE | | | | | SW : Grey to dark grey, fine grained interbedded/laminated, medium to mainly high strength. Defects : - Drilling induced lamination partings<10° (2/m). | | sw | | | | | Pressuremeter Test 1 @ 18.2m | ls(50)=0.82 MPa ls(50)=1.27 MPa ls(50)=0.51 MPa | 0 - 0 - |
| PIER 6 BOREHOLES-C | -27.54 | | 100 (87) | | - Occasional joints @ 50° (1/m). SANDSTONE FINE GRAINED SLIGHTLY MAINLY LAMINATED SEDIMENTARY ROCK SW : Pale grey to white fine grained mainly laminated mainly high strength. Defects : Genrally rare. | | | | | | | | ls(50)=0.31 MPa | × _ |
| BOREHOLE WITH LITHOLOGY MEERA PIER & BOREHOLES-GATEWAY BRIDGE. | | | | State State State | Occasional drilling induced lamination partings <10° (1-2/m). | | | | | | | UCS=49.9MPa; MC=2.4% WD=2585N/m ² | ls(50)=0.27 MPa ls(50)=1.31 MPa ls(50)=1.84 MPa ls(50)=2.46 MPa ls(50)=2.11 MPa ls(50)=1.35 MPa | x o o y |
| | -28.88 | | | the states | MUDSTONE SW : (Next page) | | sw | | | | | Weathered and br | oken seam | - |

REMARKS This borelog should be read in conjunction with the appropriate Defect Description Sheets. Defect angles have been measured with respect to a horizontal plane.

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__<u>BH14</u>



| | | 2 | | | n sland nment | | | | | ring Dle | | | | No | |
|--|-----------------------|-----------------------|----------------------------|--|--|---------------------|---|---------------|---------------|-------------------------------------|---------------------|----------|--|--|-----------------------------|
| | U | 50 | Departm Main H | | | | FOR GEOTI SYMBOLS REFE | ECHN R FOI | ICAL RM F: | TERMS AND GEOT 017/2- | 2004 | | REFERENCE | | - |
| LOC | | | <u> 8 - NO</u> | RTH | | HE PILE ACE R.L. | | | C | | ED <u>21/3/</u> | CC 05 | DORDINATES <u>1</u> DA | 0307.2 E; 167712.0 I TUM _SETP LER _CAIRNS DRII | |
| DEPTH (m) | R.L. (m) -34.03 | BORING | RQD ()% CORE REC% | SAMPLE | | MATER | IAL | гітногоду | | NTACT STRENGTH มีรี่ธร_วรีนี่ | DEFECT | | ADDITIC | NAL DATA | SAMPLES |
| - | -34.03 | | | 05 | INTERBEDDED S MUDSTONE. SA SW : (As above) | NDSTON | | | | | | 9 | UCS=37.9MPa; MC=3.0% WD=2454N/m ² | ls(50)=1.45 MPa ls(50)=0.42 MPa ls(50)=2.36 MPa ls(50)=0.59 MPa | × 0 × 0 × 1 1 1 |
| SDT 31/8/05 | | Section 101 | | and the second second | Gradually grading depth. | g into mu | dstone with | | | | | | | ls(50)≏0.74 MPa | |
| 10 BOREHOLE 09 04.0 | | | <u>100</u> (100) | La statistica de la statis | | | | | | | | | | ls(50)=0.48 MPa ls(50)=2.79 MPa | - x - o - |
| ECT.GPJ ENGINEERIN | | | | | | | | | sw | | | | | ls(50)=0.29 MPa ls(50)=0.25 MPa ls(50)=2.00 MPa | 0 X 0 |
| ATEWAY UPGRADE PROJ | | | | | | | | | | | | | | ls(50)=0.62 MPa ls(50)=1.61 MPa | x - 0 - |
| 5 - 28 - 28 | | | 2 | State of | | | | | | | | | UCS=27.5; | ls(50)=3.06 MPa ls(50)=1.19 MPa | 0 X |
| ES-GATEWA | -37.43 | 1 | | | MUDSTONE FINE GRAINED 1 | | AMINATED | | | | | | MC=3.5% WD≂2453N/m ² | ls(50)=0.50 MPa ls(50)=1.60 MPa | x - 0 _ |
| ERA PIER 6 BOREHOI | | | | and the second | SEDIMENTARY I SW : Dark grey to laminated mediu with depth. | o black, fi | ne grained, thinly ing high strength | | | | | | | ls(50)=0.32 MPa ls(50)=3.36 MPa | × - |
| BOREHOLE WITH LITHOLOGY MEERA PIER 6 BOREHOLES-GATEWAY BRIDGE - GATEWAY UPGRADE PROJECT.GPJ ENGINEERING BOREHOLE 09 04.GDT 3/1805 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | | and the second second | 100 (100) | and the second | | | | | sw | | | | | Is(50)=0.71 MPa Is(50)=0.96 MPa | 0 - X - |
| | -39.03 | This | | | | | | | | | | | | ls(50)=2.93 MPa ls(50)=1.09 MPa | 0 |
| 7 | EMARKS | | | | be read in conjunct | | appropriate Defec | Desc | olign | n Sheets. De | tect angles | have | | LOGGED BY DISSANAYAKE (D | NSS) |

| Queensland |
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| Government |
| Department of Main Roads |

ENGINEERING BOREHOLE

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/2-2004

BOREHOLE No _____ BH14 _<u>7</u>_ of _<u>7</u>_ SHEET __<u>H9563</u>___ REFERENCE No

GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION INVESTIGATION PROJECT

LOCATION PIER 6 - NORTHERN FACE OF THE PILE CAP PROJECT No FG5388 _ _ _

JOB No

 SURFACE R.L.
 -9.03
 DATE STARTED
 21/3/05
 DATUM
 SETP

 DATUM
 AHD
 DATE COMPLETED
 23/3/05
 DRILLER
 CAIRNS DRILLING

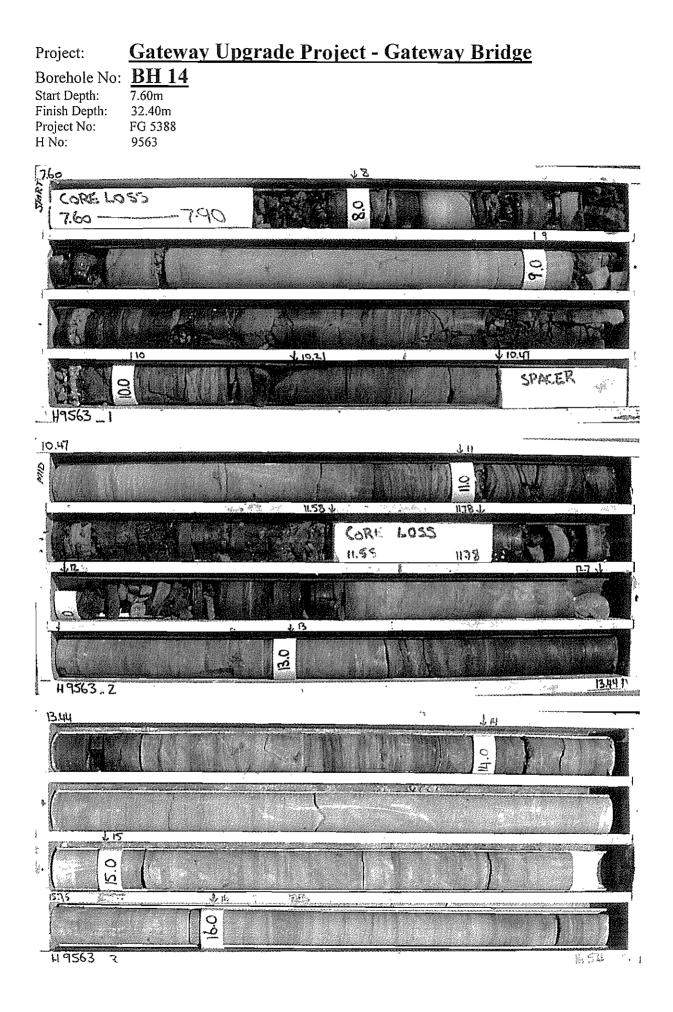
A. DISSANAYAKE (DISS)

| | Т | R.L. | | RQD | | | | 1 | | 1 | | | |
|------------|-----|-----------------------|---------------------------------|---------------|--|--|----------|---------|--------------------|--|-------------|---|------------------|
| | | K.L. (m) -39.03 | υg | ()% | | | | 0 | INTACT STRENGTH | DEFECT | 0 | ADDITIONAL DATA | |
| DEPTH (m) | | | SILLI | | | MATERIAL | 5 | | | (mm) | ğ | | |
| EPT | | | 0 8 0 8 0 8 0 | | Ъ | DESCRIPTION | 5 N | ŭ 21 | | | 물 | AND | FES |
| 3 | | 20.02 | CAS VAS COR | CORE REC % | SAMPLE | | LTHOLOGY | USC. | STRENGTH | 888888 | GRAPHIC LOG | TEST RESULTS | SAMPLES TESTS |
| | | -39.03 | 111 | 1120 70 | | MUDSTONE | | 1212 | | <u> </u> | 0 | · · · · · · · · · · · · · · · · · · · | S F |
| F | Ì | | 100 | | | SW : (As above). | | | F.S. 22 | (Oracle) | | | |
| Ì | | | | | 6.13 | Defects : Generally rare. | | | 1000 | Same a | | | |
| Ĩ | | | | | 243 | Occasional drilling induced lamination | | | 20-22 | 5 5 5 | | | |
| Ĺ | | | | | 124 | partings <10 ° (1/1-2m). - Occasional joints @ 75° (1/2m) | = | | | 533 | | | |
| L | | | | | 组 | - Occasionarjoints @ 75 (1/2m) | | | Statistics. | Water P | | | |
| - | | | | | 245 | Defects are generally drilling induced | | | And Links | 2192 | | ls(50)=1.27 MP ls(50)=2.68 MP | a x |
| Ļ | | | | | | plannar, smooth and closed with no discolouration or infillings. | | | | A HELL | | Is(50)=2.68 MP | 3 O |
| 8/02 - | | | | | | sissistication of minings. | | | 122 200 | Teres (| | | l |
| 5-3 | 1 | | | | R | | | 1 | | | | | |
| 5 | | | | | 101 | | | | 1111EEU | 1- | | ls(50)=1.05 MP UCS=43.90MPa; ls(50)=0.20 MP | a x |
| 8- | | | 8 | | QU. | | | sw | | NEGLA: | | UCS=43.90MPa; ls(50)=0.20 MP MC=2.4% | 0 |
| ű- | | | | | They a | | = | | | and the second | | WD=2547kN/m ² Is(50)=1.21 MP Is(50)=2.39 MP | x |
| 탉 | | | | | 140 | | | 1 | | 1200 | | Is(50)=2.39 MP | 0 |
| 影는 | | | | | 500 | | | | T DE CAL | The state | | | |
| | | | | | 18 | | | | Service and | BLE ST | | | |
| 5[| | | | | 1 | | | | C. Martin | 1 | | Is(50)=3.21 MP Is(50)=1.09 MP | 0 |
| | | | | | 10 | | | 1 | 1.50 | ALC: N | | ls(50)=1.09 MP | a x |
| -3 | 2 | | 1 | | 1 | | \equiv | | Institu | and a state of the | 1.13 | 1 | |
| Ş. | | | | | - Bi | | | | | | | • | |
| 2 | | | | | Contraction of the local division of the loc | | | | | Bar | l | | 1 |
| <u>-</u> | | | | | | | = | ĺ | | R. Belle | | Is(50)=1.30 MP | x |
| | + | -41.43 | | 100 | | Parchala terminated at 20.4 | | | | Barry . | | ls(50)≂1.30 MP ls(50) <u></u> =3.47 MP | |
| 計 | | | | | | Borehole terminated at 32.4m | ĺ | | - | | | | |
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| | κEl | WARKS | This | borelog s | hould | t be read in conjunction with the appropriate Defect | Desc | criptic | n Sheets. De | efect angles | have | e been LOGGED BY | |

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measured with respect to a horizontal plane.

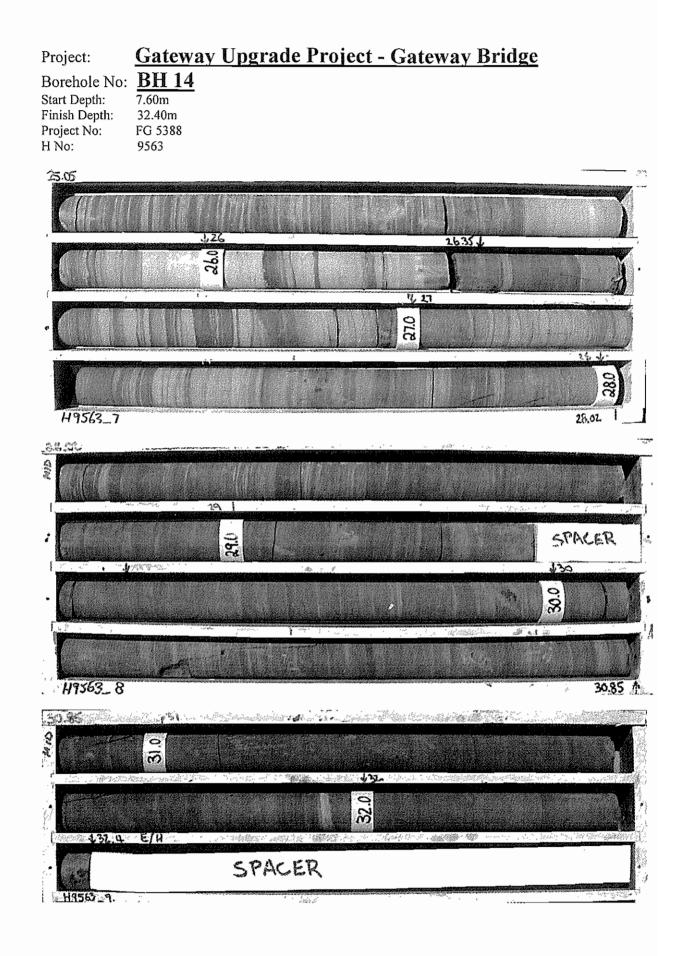
_



Project: Gateway Upgrade Project - Gateway Bridge

| Borehole No: | <u>BH 14</u> |
|---------------|--------------|
| Start Depth: | 7.60m |
| Finish Depth: | 32.40m |
| Project No: | FG 5388 |
| H No: | 9563 |





1

ROAD SYSTEM AND ENGINEERING Geotechnical Branch 35 Butterfield Street HERSTON Q 4006 Phone: (07) 38343035 Fax: (07) 38343011



Department of Main Roads

DEFECT DESCRIPTIONS

BOREHOLE NO : BH14

| SHEET | ; | 1 of 4 |
|-----------|------|--------|
| REFERENCE | NO : | H9563 |

OF ENGINEERING BORELOGS (CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981))

GATEWAY UPGRADE PROJECT – GATEWAY BRIDGE DUPLICATION FOUNDATION

| | IN VESTIONIO. | | | |
|--------------|----------------|---------------------------|--------------|---------------------------|
| LOCATION : | PIER 6 – NORTH | IERN FACE OF THE PILE CAP | | |
| PROJECT NO : | FG5388 | SURFACE R.L : -9.03 | DRILLER | : CAIRNS DRILLING PTY LTD |
| JOB NO : | | DATUM : AHD | DATE DRILLED | : 21 - 23/3/05 |

| DEPTH | DEFECT TYPE | DIP | PLANARITY | ROUGHNESS | APERTURE | WALL ALTERATION | OTHER |
|-------------|----------------|------|-----------|-----------|------------|--------------------|---|
| 7.60-7.90 | | - | - | - | in. | Cn | Core loss |
| 7.90-8.0 | WS | | - | - | 0 | | Со |
| 8.0-8.10 | BZ | | - | - | - | 419.00 | Parallel to LP |
| 8.15-8.21 | WS | | - | - | - | | I. C. |
| 8.21-8.45 | BZ | - | - | - | 0 | | |
| 8.66 | LP | <5° | Р | S | Т | Cn | DI |
| 8.85 | LP | <5° | Р | S | Т | Cn | DI |
| 9.06 | LP | <5° | Р | S | С | Cn | - |
| 9.06-9.45 | WS | - | Р | - | 0 | | - |
| 9.70-9.95 | BZ | - | | - | 0 | | Parallel to LP |
| 10.19 | BZ | - | - | - | С | | - |
| 10.28 | LP | <10° | Р | S | 0 | Cn | - |
| 10.42 | LP | <10° | Ir | R | 0 | Cn | - |
| 10.71 | LP | 10° | Р | R | С | Cn | DI ? |
| 10.81 | LP | 10° | Р | R | С | Cn | DI ? |
| 10.89 | LP | 10° | Р | R | C | Cn | - |
| 11.03-11.05 | WS | - | Р | - | 0 | | Parallel to LP |
| 11.30-11.58 | WS | - | - | - | 0 | | Parallel to LP, CI |
| 11.55-11.78 | _ | - | - | | . <u>1</u> | - | Coreloss |
| 11.78-12.38 | BZ | - | - | - | 0 | | Parallel to LP |
| 12.85 | LP | <5° | Р | | Т | Cn | - |

Abbreviations

| ROUGHNESS | | , , | WALL ALTERATIONS | | TYPE | | OTHER |
|-----------|--------------|------|--------------------------|-----|-----------------------|----|-------------------------|
| R. | Rough | FeSt | Iron Stained | J | Joint | Р | Partly |
| S | Smooth | W | Weathered | В | Bedding | CL | Carbonaceous lamination |
| SL | Slickensided | SM | Secondary Mineralisation | BP | Bedding Parting | Co | Coal seam |
| | | | | FP | Foliation Parting | In | Incipient |
| | PLANARITY | | APERTURE | LP | Lamination Parting | SI | Sand Infill |
| Р | Planar | С | Closed | SZ | Sheared Zone | Н | Horizonta! |
| St | Stepped | 0 | Open | CZ | Crushed Zone | V | Vertical |
| Ưπ | Undulating | F | Filled | WS | Weathered Seam | CI | Clay Infill |
| Cu | Curved | Т | Tight | BZ | Broken Zone | Cn | Clean |
| ŀr | Irregular | | | HFZ | Highly Fractured Zone | CS | Clay Seam |
| | | | | Fr | Fracture | DI | Drilling Induced |

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

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PROJECT

ROAD SYSTEM AND ENGINEERING Geotechnical Branch 35 Butterfield Street HERSTON Q 4006 Phone: (07) 38343035 Fax: (07) 38343011

LΡ

LP

LP

J

16.69

16.76

16.90

16.95

0°

 0°

0°

65°

P

P

P

P



DEFECT DESCRIPTIONS

| BOREHOLE NO : | BH14 |
|----------------|--------|
| SHEET : | 2 of 4 |
| REFERENCE NO : | H9563 |
| | |

OF ENGINEERING BORELOGS (CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH

| | | | | ISRM | SUGGESTED METHODS (1 | (981)] | REFERENCE NO : | H9563 |
|-------------|-------------|-------------|----------------------|---------------|----------------------|-------------|--------------------|-----------------|
| PROJECT | | | VAY UPGR TIGATION | ADE PROJECT - | - GATEWAY BR | IDGE DUPLIC | ATION FOUNDAT | TION |
| LOCATION | | | | RN FACE OF TH | HE PILE CAP | | | |
| PROJECT N | O: F | G5388 | 3 5 | SURFACE R.L : | -9.03 | DRILLER | : CAIRNS D | RILLING PTY LTD |
| JOB NO | : | | I | DATUM : | AHD | DATE DRILI | LED : 21 - 23/3/05 | |
| DEPTH | DEFI TYI | | DIP | PLANARITY | ROUGHNESS | APERTURE | WALL ALTERATION | OTHER |
| 13.14-13.21 | BZ | <u>z</u> | - | Ir | S | 0 | | Parallel to LP |
| 13.40 | LF | | <5° | Р | S | C | Cn | |
| 13.44-13.56 | BZ | Z I | - | Р | ~ | C | | Parallel to LP |
| 13.70-14.90 | Fr | | 60°~90° | Cu | - | С | Cn | ~ |
| 13.94 | LF |) | 10° | Р | S | С | Cn | 2 |
| 14.06 | LF |) | <10° | Ir | R | 0 | Cn | CL |
| 14.10 | LF | 5 | <10° | Cu | R | С | Cn | CL |
| 14.13 | LF | > | <10° | Р | S | С | Cn | DI ? |
| 14.55 | Fi | ÷ | - | St | R | С | Cn | DI ? |
| 15.04 | LI |) | 30° | St | - | 0 | Cn | - |
| 15.05 | LI | | 10° | Р | S | С | Cn | DI ? |
| 15.06 | LI | > | 30° | Р | S | С | Cn | - |
| 15.33 | LI |) | <10° | Р | S | С | Cn | DI |
| 15.50 | LI | > | <10° | Р | S | C | Cn | DI |
| 15.97 | LI | > | 0° | Р | S | С | Cn | DĬ |
| 16.44 | LI | > | <10° | P | S | C | Cn | - |
| 16.59 | Lł | > | 0° | Р | S | С | Cn | DI ? |
| | | | | | | | | |

R Abbreviations

S

S

S

С

Ο

С

C

Cn

Cn

Cn

Cn

| ROUGHNESS | | | WALL ALTERATIONS | | ТУРЕ | | OTHER |
|-----------|--------------|----------|--------------------------|-----|-----------------------|----|-------------------------|
| R | Rough | FeSt | Iron Stained | J | Joint | Р | Partly |
| S | Smooth | W | Weathered | В | Bedding | CL | Carbonaceous lamination |
| SL | Slickensided | SM | Secondary Mineralisation | BP | Bedding Parting | Со | Coal seam |
| | | | | FP | Foliation Parting | In | Incipient |
| PLANARITY | | APERTURE | | LP | Lamination Parting | SI | Sand Infill |
| Р | Planar | С | Closed | SZ | Sheared Zone | Н | Horizontal |
| St | Stepped | 0 | Open | CZ | Crushed Zone | V | Vertical |
| Un | Undulating | F | Filled | WS | Weathered Seam | CI | Clay Infill |
| Cu | Curved | т | Tight | BZ | Broken Zone | Cn | Clean |
| Ir | Irregular | | | HFZ | Highly Fractured Zone | CS | Clay Seam |
| | | | | Fr | Fracture | DI | Drilling Induced |

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.

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ROAD SYSTEM AND ENGINEERING Geotechnical Branch 35 Butterfield Street HERSTON Q 4006 Phone: (07) 38343035 Fax: (07) 38343011



Department of Main Roads

DEFECT DESCRIPTIONS

OF ENGINEERING BORELOGS

SHEET 3 of 4 : REFERENCE NO : H9563

BOREHOLE NO : BH14

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981)]

GATEWAY UPGRADE PROJECT - GATEWAY BRIDGE DUPLICATION FOUNDATION

| PROJECT : | GATEWAY UPG INVESTIGATION | | GATEWAY BRI | DGE DUPLICATIO | N FOUNDATION |
|--------------|------------------------------|----------------|-------------|----------------|-------------------------|
| LOCATION : | PIER 6 – NORTH | ERN FACE OF TH | E PILE CAP | | |
| PROJECT NO : | FG5388 | SURFACE R.L : | -9.03 | DRILLER | CAIRNS DRILLING PTY LTD |
| JOB NO : | | DATUM : | AHD | DATE DRILLED | : 21-23/3/05 |

| DEPTH | DEFECT TYPE | DIP | PLANARITY | ROUGHNESS | APERTURE | WALL ALTERATION | OTHER |
|-------------|----------------|---------|-----------|-----------|----------|--------------------|-----------------|
| 17.03 | BP | 0° | Р | S | С | Cn | BP |
| 17.30 | LP | 10° | Р | R | С | Cn | DI |
| 17.38 | LP | 10° | Ir | R | С | Cn | DI |
| 17.56 | LP | 0° | Ir | R | С | Cn | DI |
| 17.75-17.78 | BZ | | - | R | 0 | | CL |
| 17.95 | LP | 10° | P | S | С | Cn | CL |
| 18.20 | LP | 0° | Р | R | С | Cn | CL |
| 18.32 | l | 50° | Р | S | Т | Cn | DI |
| 19.05 | LP | <10° | Ir | R | С | Cn | DI ? |
| 19.10 | LP | <10° | Ir | R | С | Cn | DI ? |
| 19.61 | LP | 25° | Р | S | С | Cn | CL |
| 19.85-19.88 | BZ | <10° | Р | R | 0 | Cn | Parallel to LP |
| 20.08 | LP | <5° | Р | S | C | Cn | - |
| 20.44-20.51 | BZ | 15° | Ir | R | 0 | Cn | Parallel to LP |
| 20.83 | LP | <5° | P | R | С | Cn | - |
| 20.92-21.14 | WS | - | - | - | W | - | High plastic CI |
| 21.22 | LP | <5° | P | R | С | Cn | CI |
| 21.75 | LP | 10° | Ir | R | С | Cn | CL |
| 22.12 | LP | 10° | Iv | R | С | Cn | _ |
| 22.70 | LP | 10° | Р | S | С | Cn | DĬ |
| 22.70-23.60 | J | 85°-90° | Cu | - | Т | Cn | CV |
| 23.70 | LP | 15° | Р | S | С | Cn | DI |

Abbreviations

| | ROUGHNESS | | WALL ALTERATIONS | | TYPE | | OTHER |
|----|--------------|------|--------------------------|-----|-----------------------|----|-------------------------|
| R | Rough | FeSt | Iron Stained | 3 | Joint | Р | Partly |
| S | Smooth | W | Weathered | В | Bedding | CL | Carbonaceous lamination |
| SL | Slickensided | SM | Secondary Mineralisation | BP | Bedding Parting | Co | Coal seam |
| | | | | FP | Foliation Parting | Ín | Incipient |
| | PLANARITY | | APERTURE | LP | Lamination Parting | SI | Sand Infill |
| Р | Planar | С | Closed | SZ | Sheared Zone | Н | Horizontal |
| St | Stepped | 0 | Open | CZ | Crushed Zone | Cv | Calcite Vein |
| Un | Undulating | F | Filled | WS | Weathered Seam | Сĩ | Clay Infill |
| Cu | Curved | T | Tight | BZ | Broken Zone | Cn | Clean |
| Ir | Irregular | | | HFZ | Highly Fractured Zone | CS | Clay Seam |
| | | | | Fr | Fracture | DI | Drilling Induced |

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.



Department of Main Roads

DEFECT DESCRIPTIONS **OF ENGINEERING BORELOGS** BOREHOLE NO : **BH14** SHEET

4 of 4

H9563

[CHARACTERISATION OF DEFECTS ARE IN ACCORDANCE WITH ISRM SUGGESTED METHODS (1981)] REFERENCE NO:

GATEWAY UPGRADE PROJECT -- GATEWAY BRIDGE DUPLICATION FOUNDATION PROJECT **INVESTIGATION**

LOCATION :

PIER 6 - NORTHERN FACE OF THE PILE CAP

| PROJECT N | O : FG5388 | 3 5 | SURFACE R.L : | -9.03 | DRILLER | : CAIRNS DR | ILLING PTY LTD |
|-------------|----------------|---------|---------------|-----------|------------|--------------------|----------------|
| JOB NO | : | I | DATUM : | AHD | DATE DRILI | LED : 21 - 23/3/05 | |
| DEPTH | DEFECT TYPE | DIP | PLANARITY | ROUGHNESS | APERTURE | WALL ALTERATION | OTHER |
| 24.67 | LP | <10° | Р | S | С | Cn | DI |
| 24.60-24.85 | J | 85°-90° | Cu | R | Т | Cn | - |
| 25.30 | LP | <10° | Р | S | С | Cn | DI |
| 25.55 | LP | <10° | Р | S | С | Cn | DI |
| 25.85 | LP | <10° | Р | S | С | Cn | - |
| 26.22 | LP | 10° | Р | S | С | Cn | DI |
| 26.33 | LP | 10° | Р | S | С | Cn | DI |
| 26.90 | LP | 10° | Р | S | С | Cn | Dl |
| 26.95 | LP | 10° | Р | S | С | Cn | DI |
| 27.78 | LP | 10° | Р | S | С | Cn | DI |
| 27.82 | J | 50° | Р | - | Т | Cn | |
| 27.92 | l | 50° | Р | - | Т | Cn | - |
| 28.06 | LP | <10° | Р | S | С | Cn | Di |
| 28.33 | LP | <10° | Р | S | С | Cn | DI |
| 28.67 | LP | <10° | Р | S | Т | Cn | DI |
| 29.0 | J | 50° | Р | - | Т | Cn | - |
| 29.05 | LP | 15° | Р | S | C | Cn | DI |
| 29.27 | LP | <10° | Р | S | C | Cn | DI |
| 30.07 | LP | <10° | Р | S | С | Cn | DI |
| 30.25-30.45 | J | 75° | St | R | С | Cn | - |
| 31.07 | LP | <10° | Р | S | С | Cn | DI |

Abbreviations

| | ROUGHNESS | | WALL ALTERATIONS | 1 | ТҮРЕ | | OTHER |
|----|--------------|------|--------------------------|-----|-----------------------|----|-------------------------|
| R | Rough | FeSt | fron Stained | J | Joint | Р | Partly |
| S | Smooth | W | Weathered | В | Bedding | CL | Carbonaceous lamination |
| SL | Slickensided | SM | Secondary Mineralisation | BP | Bedding Parting | Co | Coal seam |
| | _ | | | FP | Foliation Parting | In | Incipient |
| | PLANARITY | | APERTURE | LP | Lamination Parting | SI | Sand Infill |
| Р | Planar | С | Closed | SZ | Sheared Zone | H | Horizontal |
| St | Stepped | 0 | Open | CZ | Crushed Zone | CV | Calcite Vein |
| Un | Undulating | F | Filled | WS | Weathered Seam | CI | Clay Infill |
| Cu | Curved | Т | Tight | BZ | Broken Zone | Cn | Clean |
| ŀr | Irregular | | | HFZ | Highly Fractured Zone | CS | Clay Seam |
| | | | | Fr | Fracture | DI | Drilling Induced |

NOTE: This sheet should be read in conjunction with appropriate Engineering Borelog. Defect angles were measured with respect to horizontal plane.