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| | Queensland Government |
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GEOTECHNICAL BOREHOLE LOG

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/8-2014 FINAL 27/09/2018

CRR912

Sheet 1 of 3

BOREHOLE No

REFERENCE No

H13109

| | | | | | | | | VIDULS | REFER FORM F.GEC | /1 01//8-2014 | | | | |
|-------------------------------------------------------------------------|-------------|-----------------|------------------------------|----------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------|------------------------------|-------------------|---------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| PROJE | СТ | <u> </u> | ross | 8 River | Rail | (CRR) Project - Additional Geotechnic | cal Ir | nvesti | gation | | | | | |
| LOCAT | ION | G | ius S | Street | | | | | | | 0 | COORDINATES 501337 | 0 E; 69546 | 42.6 N |
| PROJE | CT No | F | G6 | 470 | | SURFACE RL 8.44m | PLU | INGE 9 | 0° | DATE STAI | RTED 27/06/2018 | GRID DATUM | MGA94 | |
| JOB N | D | _ | | | | HEIGHT DATUM AHD | BEA | RING_ | | DATE COMPL | ETED 28/06/2018 | DRILLEF | Geodrill | |
| DEPTH (m) | R.L. (m) | AUGER CASING | WASH BORING CORE DRILLING | RQD ()% CORE REC% | SAMPLE | MATERIAL DESCRIPTION | ГІТНОГОGY | USCS WEATHERING | INTACT STRENGTH HJJJZZ | DEFECT SPACING | | ADDITIONAL DATA AND TEST RESULTS | | SAMPLES TESTS |
| | 0.84 | | | | AB | Gravelly Sandy CLAY (Fill) Dark grey, dark brown mottled black, moist, firm to stiff. Low plasticity. Fine to coarse grained sand. Fine to medium, sub-angular to subrounded gravel. Rootlets. CLAY (Alluvium) Pale brown, pale red mottled pale grey, moist, firm to stiff. High plasticity. at 1.5m: pale grey and pale red mottled orange, stiff. Sandy CLAY (Alluvium) Pale grey mottle pale red and orange, moist, stiff. Medium plasticity. Fine grained sand. at 3.5m: Very stiff. Trace rootlets and wood. at 4.5m: Pale grey and mottled pale orange at 5.5m: Pale grey. Trace of fine to medium grained gravel, sub- rounded. at 7m: Becoming Clayey Gravelly SAND. Medium to coarse gravel, sub-rounded to rounded. SAND (Alluvium) Grey and brown, wet, very dense, medium to coarse grained. Trace fine to coarse, sub-rounded to sub- angular gravel. Trace fines. | | (CH) (CH) | | | 1.50m-1.95m: CU Tri | МС 16 | MC=31.6% DD= 1.48 t/m3 WD= 1.95 t/m3 4, 5, 9 N=14 4, 7, 12 N=19 4, 9, 13 N=22 27.4% LS= 12% <75μm= 62% 23, 30/145mm 14, 11, 15 N=26 LL=34% PI= 14% <75μm= 29% | U50 SPT SPT SPT SPT SPT SPT |
| - - - - - - - - - - - - - - - | -1.06 | - | | | н | Clayey Sandy GRAVEL (Alluvium) | | (GC) | | - | | | | SPT |
| | -1.56 | | | | I | Continued on next sheet | 1.50 | 1 | IT | | <u> </u> | | | |
| RI | EMAR | KS: | F | A - ai | spl | ey Formation. Standpipe piezoi | met | ter ir | stalled. | | | LOGGED BY | RE//II | EWED BY |
| | | | | | њ., | , | | | | | | ND | | Foley |
| | | | | | | | | | | | | | J. J. | . U.C.Y |

| ROJECT NO FG6470 SURFACE RL 8.44m PLUNGE 90° DATE STARTED 27/06/2018 DB NO HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 Image: Started problem ROD Image: Started problem ADDIT Image: Started problem Started problem Started problem ADDIT | BOREHOLE NO Sheet REFERENCE NO DINATES 501337.0 GRID DATUM M DRILLER C TIONAL DATA AND ST RESULTS 2 | 2 of 3 H: E; 695466 MGA94 | 42.6 N |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------|
| For Geotechnical Terms and SYMBOLS REFER FORM F:GEOT 017/8-2014 DJECT Cross River Rail (CRR) Project - Additional Geotechnical Investigation CATION Gus Street Coore DJECT NO FG6470 SURFACE RL 8.44m PLUNGE 90° DATE STARTED 27/06/2018 BNO HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL No CORE K Clayey Sandy GRAVEL (Alluvium) Cort d. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High plasticity clay. Of Street Street DEFECT STRENGTH DEFECT STRENGTH ADDIT STRENGTH | REFERENCE NO DINATES 501337.0 GRID DATUM M DRILLER C TIONAL DATA AND IT RESULTS | E; 695464 MGA94 Geodrill | 42.6 N Samples |
| SYMBOLS REFER FORM F:GEOT 017/8-2014 SYMBOLS REFER FORM F:GEOT 017/8-2014 JECT Cross River Rail (CRR) Project - Additional Geotechnical Investigation Attion Gus Street coore JECT NO FG6470 SURFACE RL 8.44m PLUNGE 90° DATE STARTED 27/06/2018 No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL OPEN PROV OPEN PROV SYMBOLS REFER FORM F:GEOT 017/8-2014 No FG6470 DATE STARTED 27/06/2018 No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL OPEN PROV OPEN PROV | DINATES 501337.0 GRID DATUM DRILLER C TIONAL DATA AND ST RESULTS | E; 695464 MGA94 Geodrill | 42.6 N Samples |
| ATION Gus Street coord JECT No FG6470 SURFACE RL 8.44m PLUNGE 90° DATE STARTED 27/06/2018 No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL: Image: Street bit of the stre | GRID DATUM | MGA94 Geodrill | SAMPLES TESTS |
| IECT No FG6470 SURFACE RL 8.44m PLUNGE 90° DATE STARTED 27/06/2018 No HEIGHT DATUM AHD BEARING ° DATE COMPLETED 28/06/2018 RL (m) No MATERIAL DESCRIPTION No DEFECT STRENGTH DEFECT STRENGTH DEFECT SPACING ADDIT RL (m) NO NATERIAL DESCRIPTION NATERIAL DESCRIPTION NO DEFECT STRENGTH DEFECT STRENGTH DEFECT STRENGTH ADDIT NO NO NATERIAL DESCRIPTION NATERIAL DESCRIPTION NO NO DEFECT STRENGTH DEFECT STRENGTH ADDIT NO NO CORE REC % I Clayey Sandy GRAVEL (Alluvium) Cont'd. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High plasticity clay. I I I | GRID DATUM | MGA94 Geodrill | SAMPLES TESTS |
| NO HEIGHT DATUM AHD BEARING DATE COMPLETED 28/06/2018 R.L. (m) Image: Complete base of the second sec | TIONAL DATA AND ST RESULTS | Geodrill | |
| R.L. (m) Note H = H (m) ROD (1)% (1)% H H MATERIAL DESCRIPTION Kore (1)% INTACT STRENGTH DEFECT STRENGTH DEFECT STRENGTH ADDIT TEST 1 Clayey Sandy GRAVEL (Alluvium) Cont'd. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High plasticity clay. I Clayey Sandy GRAVEL (Alluvium) Cont'd. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I I | TIONAL DATA AND ST RESULTS | 13, 30/140mm | |
| Image: state | AND ST RESULTS | | |
| Image: Series | 2 | | SPT |
| Cont'd. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High plasticity clay. | | 30/140mm | SPI |
| | | | SPT |
| K at 13.0m: Pale brown, moist. With medium to coarse gravel. Trace cobbles, sub-rounded. | | i0, 30/120mm <75μm= 14% | SPT |
| -6.06 Coarse sand. | | 21, 9, 27 N=36 | SPT |
| -7.70 M SILTSTONE (Rip) XW: Recovered as pale grey, moist, hard CLAY with some sub-angular gravel. Interlaminated with coal. | | 15, 30/80mm 30/90mm | SPT |
| -8.70 -9.30 (22) SILTSTONE (Rip) HW: Pale grey to dark grey, fine grained, thinly to medium bedded, (45) Now to medium strength. SILTSTONE (Rip) XW: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with XX: Recovered as pale grey, moist, hard, medium plasticity Clay with | | 50)=0.20 MPa 50)=0.36 MPa | SPT D (17.47) A (17.48) |
| -11.08 sub-angular gravel. | | | |
| SILTSTONE (Rip) | | 50)=0.06 MPa | D (19.77 |
| -11.56 HW: X MW 19.81m-19.85m: HW Band Continued on next sheet | | 50)=0.37 MPa | A (19.78r |
| | 00055 51 | DD //- | |
| | LOGGED BY | | Foley |

TMR GEOTECHNICAL BOREHOLE LOG - CREATED WITH HOLEBASE SI

| | | | | | | | | | | | | | FINAL 2 | 7/09/2018 |
|---------------------|-------------|----------------------------------------|-----------------------|----------|---------------------------------------------------------------------------|------------|-----------------------------------------|--------------------|-----------------------------------|------------------|---------------------|---------------------|-----------------------------------------|-----------------------------------------|
| | 1 | ie. | 6 - 10 - 1 | | | | | GE | OTECHN | NICAL | Γ | BOREHOLE No | CF | RR912 |
| A. | | | Qu | e | ensland ernment | | | BO | REHOLE | LOG | | Sh | eet 3 of 3 | |
| K | S | KI - | Go | Ve | ernment | | SY | | GEOTECHNICAL T REFER FORM F:GI | | | REFERENCE No | Н | 13109 |
| PROJECT | | Cros | s River | Rail | J (CRR) Project - Additional G | ieotechnio | cal II | nvesti | gation | | | | | |
| LOCATION | N | Gus | Street | | | | | | | | | coordinates 50133 | 7.0 E; 69546 | 42.6 N |
| PROJECT | No | FG6 | 470 | | SURFACE RL 8.44r | n | PLU | jnge 9 | 0° | DATE STA | | GRID DATU | M MGA94 | |
| JOB No | | | | | HEIGHT DATUM AHD | | BEA | RING ° | | DATE COMPL | ETED 28/06/2018 | B DRILLE | R Geodrill | |
| | | | RQD | | | | | 0 | | | | ADDITIONAL DATA | | |
| | R.L. (m) | CASING WASH BORING CORE DRILLING | () % CORE REC % | SAMPLE | MATERIAL DESCRIPTIO | О | LITHOLOGY | USCS WEATHERING | INTACT STRENGTH | | | AND TEST RESULTS | | SAMPLES TESTS |
| -1 | 1.64 | 080 | | | SILTSTONE (Rip) | | XX | HW | | c | | | Is(50)=0.41 MPa | D (20.15m)_ |
| 1 | 2.04 | | 100 (87) | | HW: Cont'd. Grey, fine grai thinly bedded, very low to | | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | | M | EC | 20.44m-20.48m: XW | V CI | Is(50)=2.80 MPa | A (20.17m) |
| - - - - 21 | | | (67) | | s <mark>trength.</mark> SILTSTONE (Rip) MW: Grey, to dark grey, fir | ne | * * * * * * * * * * * * * * * * * * * * | | | C | | | UCS=28.10 MPa E=1.69 GPa v= 0.055 | (20.62m) _ |
| | | | 100 | | grained, thinly bedded, me strength. | | × × × × × × | SW | | м | | | Is(50)=0.26 MPa Is(50)=0.73 MPa | – D (21.20m) <u>–</u> A (21.22m)– |
| - | | | 100 (5) | | SILTSTONE (Rip) SW: Grey to dark grey, fine | grained | | | MH | | | | | - |
| 1 | 3.40 | | | | thinly to medium bedded, to high strength. | | × × × × × × | | | M | | | | - |
| | | | | | BP: 0-15, (4-8/m), Pl-Un/F | lo-Sm, Tl- | × × × × × × | мw | | | — 22.41m-22.43m: XW | 10 | | - |
| | | | | | ΦP, Cn, trace Cly Vr SILTSTONE (Rip) |] | *** | нw | | | 22.410-22.4300.740 | | | |
| 23 | | | | | MW: Grey and dark grey, f grained, thinly to medium | | (X X X X X X X X X X X X X X X X X X X | HW SW XW | | | | | Is(50)=0.22 MPa | D (23.07m)_ |
| | | | 100 | | medium to high strength. Interbedded carbonaceous | s layers | ~ × × × | SW HW | H | м | | | Is(50)=0.22 MPa Is(50)=1.90 MPa | A (23.08m) |
| | | | (31) | | throughout. -BP: 0-15, (2-5/m), Pl-Un/S | m, OP, Ct | | -xw MW | | | | | | |
| 24 | | | | | Cn or Coal | , - , | ** | нw | H | c | | | | - |
| | | | | | | | ** | SW | MH | c | 🖵 24.33m-24.36m: XW | / Cly | Is(50)=0.16 MPa Is(50)=1.60 MPa | – D (24.20m)– A (24.21m)– |
| - | | | | | | | × × × × × × | мw | M | VC | | | | |
| 25 | | | | | | | × × × × × × × × × × × × × × × × × × × | HW | | M | 24.98m-25.03m: XW | / Cly, BZ | UCS=14.10 MPa E=1.67 GPa v= 0.035 | (24.90m) |
| - - 1 | 7.23 | | 100 | | | | × × × × × × × × | SW MW | н | | 25.40m-25.47m: HV | V Band | | |
| - - 26 | | | | | Borehole completed at 25 | .6/m | | | - | + | | | | - |
| | | | | | | | | | - | + | | | | - |
| | | | | | | | | | - | <u> </u> | | | | |
| - 27 | | | | | | | | | - | + | | | | |
| - | | | | | | | | | - | + | | | | - |
| | | | | 1 | | | | | - | + | | | | |
| - 28 | | | | 1 | | | | | | + | | | | |
| | | | | 1 | | | | | - | ŧ | | | | - |
| | | | | 1 | | | | | - | <u> </u> | | | | - |
| 29 | | | | 1 | | | | | - | + | | | | |
| | | | | 1 | | | | | - | + | | | | |
| | | | | | | | | | | <u> </u> | | | | - |
| | | | | | | | | | - | + | | | | - |
| | 100 | <u> </u> | Din A | <u> </u> | N Formation Ctaral | | m - | toria | vetallad | | | | | |
| KEN | лакк | 5: I | kip - A | spl | ey Formation. Standpip | pe piezo | me | ter ir | istalled. | | | LOGGED BY | | EWED BY |
| | | | | | | TMR | FOTEC | HNICAL BO | DREHOLE LOG - CREATED | WITH HOLEBASE SI | | ND | 5. | Foley |



This form is intended for the detailed description of discontinuities and defects as measured in outcrop by line mapping, or as they occur downhole in drilled rock core. The descriptions and abbreviations used shall be in accordance with Australian Standard AS1726-1993 Geotechnical site investigations and TMR Geotechnical Terms and Symbols Form F:GEOT017/8.

| Project Na | me | Cross Rive | r Rail - Stag | ge 2 | | Project No | FG6470 | | |
|--------------|------------|--------------|---------------|-----------|-----------|------------|-----------------|--------------------|-----------|
| Site ID / Bo | rehole No. | CRR912 | | | | Surface RL | 8.45 | | |
| Geologist | | N.DEWAR | | | | Date | 29/06/2018 | } | |
| | | | | | | Page | 1 | of | 4 |
| Traverse | Туре | Dip ° / Dip | Planarity | Roughness | Roughness | Aperture | Infilling | Zones ¹ | Other |
| Chainage; | | Direction °; | | | Class | | | | |
| or | LP / | or | | | | CD / | Cn / | SZ / | |
| Down hole | BP / | Angle ° from | Stp / | Ro / | I to IX | OP / | St / | CZ / | |
| depth | FP / | horizontal | Un / | Sm / | | FL / | Vr / | HFZ / | |
| (rock core) | J etc. | (rock core) | PI | SI | | TI | Ct ¹ | AZ | |
| 17.16 | BP | 10° | Un | Sm | | OP | CN | | |
| 17.19 | BP | 0° | PI | Sm | | OP | CN | | |
| 17.22 | BP | 10° | PI | Sm | | OP | CN | | |
| 17.24 | BP | 0° | PI | Sm | | OP | CN | | |
| 17.26 | BP | 0° | Un | Sm | | OP | CN | | |
| 17.27 | BP | 0° | Un | Sm | | OP | CN | | |
| 17.28 | BP | 0° | Un | Sm | | OP | CN | | |
| 17.31 | BP | 5° | Un | Sm | | OP | CN | | |
| 17.32 | BP | 5° | Un | Sm | | DIS | CN | | |
| 17.37-17.4 | | | | | | | | FZ(DRILL?) | CLAY |
| 17.40 | Sm | 10° | Un | Sm | | OP | Ct | | COAL(15mm |
| 17.41 | BP | 0-15° | Un | Sm | | CD | Vr | | COAL(1mm) |
| 17.43 | BP | 0° | PI | | | CD | | | |
| 17.46 | BP | 10° | Un | Sm | | OP | CN | | |
| 17.47 | BP | 0° | PI | Sm | | CD | Vr | | COAL(1mm) |
| 17.56 | BP | 0° | Un | Ro | | OP/DIS | CN | | |
| 17.59 | BP | 0° | Un | Sm | | OP/DIS | Ct | | COAL(2mm) |
| 17.61-17.67 | J | 80-90° | Un | Sm | | TI/CD | CN | | |
| 17.66 | J | 70° | Un | Sm | | TI/CD | CN | | |
| 17.67 | BP | 5° | PI | Sm | | TI/CD | Ct/Vr | | COAL(2mm) |
| 17.72 | BP | 10° | Un | Sm | | OP | Vr | | CLAY |
| 17.77 | BP | 5° | PI | Sm | | OP | Ct | | CLAY |
| 17.77-18.82 | SILTSTONE | HIGHLY | FRACTURED |) | | | | HFZ | |
| 18.82 | BP | 0 | PI | Sm | | OP | Vr | | CLAY |
| 18.87-19.01 | SILTSTONE | HIGHLY | FRACTURED |) | | | | HFZ | |
| 19.06 | BP | 5° | Un | Sm | | OP | CN | | |
| 19.07 | BP | 5° | Un | Sm | | OP | Vr | | |
| 19.07-19.66 | SILTSTONE | HIGHLY | FRACTURED |) | | | | HFZ | |
| 19.70 | BP | 0° | PI | Sm | | OP | Vr | | CLAY |
| 19.7-19.75 | | | | | | | | HFZ | |
| 19.75 | BP | 0° | PI | Sm | | OP | CN | | |

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)



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| Project Nan | ne | Cross Rive | er Rail - Stag | je 2 | Project No | FG6470 | | |
|--------------|------------|------------|----------------|------|------------|------------|-----|-----------|
| Site ID / Bo | rehole No. | CRR912 | | | Surface R | 8.45 | | |
| Geologist | | N.DEWAR | | | Date | 29/06/2018 | 1 | |
| - | | | | | Page | 2 | of | 4 |
| 19.76 | J | 80° | Un | Sm | DIS | CN | | |
| 19.81 | BP | 5° | Un | Sm | OP | CN | | |
| 19.81-19.85 | | | | | | | HFZ | |
| 19.85 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 19.91 | BP | 10° | Stp | Sm | OP | Vr | | CLAY |
| 19.92 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 19.94 | BP | 5° | PI | Sm | OP | Vr | | CLAY |
| 19.98 | BP | 0° | PI | Sm | OP | CN | | |
| 20.01 | BP | 0° | PI | Sm | OP | CN | | |
| 20.10 | BP | 0° | PI | SM | OP | CN | | |
| 20.24 | BP | 0° | Un | | CD | | | |
| 20.32-20.42 | J | 80-90° | Un | Sm | OP | CN | | |
| 20.36 | BP | 0° | Un | Sm | OP | CN | | |
| 20.41 | BP | 10° | Stp | Sm | OP | CN | | |
| 20.43 | BP | 0° | PI | Sm | OP | CN | | |
| 20.75-20.83 | J | 55° | PI | Sm | OP | CN | | |
| 20.77 | BP | 0° | Un | Sm | OP | CN | | |
| 20.81 | BP | 0° | PI | Sm | OP | CN | | |
| 20.83 | BP | 0° | PI | Sm | OP | CN | | |
| 20.85 | SM/BP | 0° | Un | | CD | Vr | | QZ? |
| 21.02 | BP | 0° | Un | Sm | DIS | Ct | | COAL(1mm |
| 21.26 | BP | 0° | Un | Sm | OP | CN | | |
| 21.52 | BP | 5° | Un | Sm | OP | CN | | |
| 21.53 | BP | 10° | Un | Sm | OP | CN | | |
| 21.53-21.55 | | | | | | | HFZ | |
| 21.55 | BP | 10° | Un | Sm | OP | CN | | |
| 21.57 | BP | 5° | Un | Sm | OP | CN | | |
| 21.60 | BP | 0° | PI | Sm | OP | CN | | |
| 21.69 | BP | 0° | PI | Sm | OP | CN | | |
| 21.85 | BP | 0° | Un | Sm | OP | CN | | |
| 21.88 | BP | 5° | PI | Sm | OP | CN | | |
| 21.88 | BP | 0° | PI | Sm | OP | Vr | | COAL? |
| 21.90 | BP | 0° | PI | Sm | OP | Vr | | COAL? |
| 21.97 | BP | 0° | Un | Ro | OP | Ct | | COAL(5mm) |
| 22.21 | BP | 10° | PI | Sm | OP | Ct | | COAL(1mm) |
| 22.23 | BP/SM | 10° | PI | Sm | OP | Ct | 1 | COAL(5mm) |
| 22.36 | BP/SM | 10° | Un | Sm | OP | Ct | | COAL(4mm) |

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)



This form is intended for the detailed description of discontinuities and defects as measured in outcrop by line mapping, or as they occur downhole in drilled rock core. The descriptions and abbreviations used shall be in accordance with Australian Standard AS1726-1993 Geotechnical site investigations and TMR Geotechnical Terms and Symbols Form F:GEOT017/8.

| Project Nar | ne | Cross Rive | r Rail - Stag | e 2 | Project No | FG6470 | | |
|--------------|------------|------------|---------------|--------|------------|-----------|------------|-----------|
| Site ID / Bo | rehole No. | CRR912 | | | Surface RL | 8.45 | | |
| Geologist | | N.DEWAR | | | Date | 29/06/201 | 8 | |
| | | | | | Page | 3 | of | 4 |
| 22.37 | BP/SM | 10° | PI | Sm | OP | Ct | | COAL(2mm) |
| 22.52 | BP/SM | 5° | Un | Sm | OP | Ct | | COAL(2mm) |
| 22.52-22.54 | | | | | | | HFZ | |
| 22.54 | BP | 10° | PI | Sm | OP | CN | | |
| 22.58 | BP | 10° | Un | Sm | OP | Vr | | CLAY&COAI |
| 22.60 | BP | 5° | PI | Sm | OP | Ct | | COAL(9mm) |
| 22.62 | BP | 0° | Un | Sm | OP | CN | | |
| 22.62-22.65 | | | | | | | HFZ | |
| 22.65 | BP | 0° | PI | Sm | OP | CN | | |
| 22.68 | BP | 10° | Un | Sm | OP | Ct | | CLAY |
| 22.69 | J | 20° | Stp | Sm | OP | CN | | |
| 22.69-22.77 | | | | | | | HFZ | |
| 22.77 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 22.91 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 22.91-22.92 | | | | | | | HFZ | |
| 22.98 | BP/SM | 0° | Un | Sm | OP | Ct | | COAL(30mm |
| 23.02 | BP/SM | 10° | PI | Sm | CD | Ct | | COAL(3mm) |
| 23.05 | BP | 0-10° | Un | Sm | OP | Ct | | COAL(3mm) |
| 23.20-23.24 | LOCALIZED | DESICATION | UPON | DRYING | | | | |
| 23.37 | J | 0° | Un | Sm | OP | CN | | |
| 23.44 | DRILL | INDUCED | FRACTURE | | | | | |
| 23.44-23.5 | | | | | | | HFZ | |
| 23.51 | BP | 80° | PI | Sm | OP | CN | | |
| 23.55 | BP | 5° | Un | Sm | OP | CN | | |
| 23.59 | BP | 10° | PI | Sm | OP | CN | | |
| 23.59-23.66 | | | | | | | HFZ(COAL) | |
| 23.66 | BP | 5° | PI | Sm | OP | Vr | | COAL |
| 23.68 | BP | 10° | Stp | Sm | OP | CN | | |
| 23.68-23.71 | | | | | | | HFZ | |
| 23.71 | J | 40° | Un | Sm | OP | CN | | |
| 23.78 | BP | 0° | PI | Sm | OP | CN | | |
| 23.84 | BP | 10° | PI | Sm | OP | CN | | |
| 23.90 | BP | 0° | Stp | Sm | OP | Vr | | CLAY |
| 23.93 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 23.93-23.97 | | | | | | | HFZ(COAL) | |
| 23.97 | BP | 156 | PI | Sm | OP | Vr | . , | COAL |
| 23.99 | J | 10° | Stp | Sm | OP | CN/Vr | trace COAL | |

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)



This form is intended for the detailed description of discontinuities and defects as measured in outcrop by line mapping, or as they occur downhole in drilled rock core. The descriptions and abbreviations used shall be in accordance with Australian Standard AS1726-1993 Geotechnical site investigations and TMR Geotechnical Terms and Symbols Form F:GEOT017/8.

| Project Nan | ne | Cross Rive | r Rail - Stag | ge 2 | Project No | FG6470 | | |
|--------------|------------|------------|---------------|------|------------|------------|-----------|-----------|
| Site ID / Bo | rehole No. | CRR912 | | | Surface R | 8.45 | | |
| Geologist | | N.DEWAR | | | Date | 29/06/2018 | 1 | |
| - | | 1 | | | Page | 4 | of | 4 |
| 24.00 | J | 80° | Stp | Sm | OP | CN | | |
| 24.03 | BP | 0° | PI | Sm | OP | CN | | |
| 24.05 | BP/SM | 0° | PI | | OP | Ct | | COAL(2mm |
| 24.11 | BP | 0-5° | PI | Sm | OP | CN | | |
| 24.14 | BP | 10° | Un | Sm | OP | CN | | |
| 24.26 | BP | 10° | Un | Sm | OP | CN | | |
| 24.33-24.36 | CLAY | XW | ROCK | | | | | |
| 24.34 | BP | 0° | PI | Sm | OP | Ct | | CLAY(28mm |
| 24.41 | BP | 0° | Un | Sm | CD | CN | | |
| 24.43 | BP | 5° | Un | Sm | | Ct | COAL/CL | AY(5mm) |
| 24.55 | BP | 5° | Un | Sm | OP | CN | | |
| 24.58 | BP | 5° | PI | Sm | OP | Ct | | COAL(2mm |
| 24.60 | BP | 0° | Un | - | CD/TI | CN | | |
| 24.71 | BP | 0° | Un | Sm | OP | Vr | | CLAY |
| 25-25.03 | | 10° | | | | | HFZ(COAL) | COAL |
| 25.04 | BP | 0° | PI | Sm | OP | CN | | |
| 25.05 | BP | 85° | Un | Sm | TI | CN | | |
| 25.08-25.13 | J | 60° | Un | Sm | OP | CN | | |
| 25.08-25.16 | XW | ROCK | CLAY | SEAM | | | | |
| 25.16 | BP | 0° | PI | Sm | OP | CN | | |
| 25.17 | J | 90° | Un | Sm | OP | CN | | |
| 25.18 | BP | 0° | PI | Sm | OP | CN | | |
| 25.18-22.25 | XW | ROCK | CLAY | SEAM | | | | |
| 25.25-25.52 | J | 80-90° | Un | Sm | OP | CN | | |
| 25.28 | BP | 0° | Stp | Sm | OP | Ct | | COAL(3mm |
| 25.31 | J | 40° | Stp | Sm | OP | CN | | |
| 25.39 | J | 20° | Un | Sm | OP | CN | | |
| 25.39-25.45 | | HFZ | COAL | BAMP | | | HFZ | COAL |
| 25.52 | BP | 0° | PI | Sm | OP | CN/trace | Vr | COAL |
| 25.52-25.6 | | | | | | | FZ | |
| 25.60 | BP | 10° | PI | SM | OP | CN | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Note: 1. Describe zones and coatings in terms of composition and thickness (mm)

| | | | | | _ | | FINAL 27/09/2 | |
|-----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------|----------------|-----------------------|-----------------|--|
| F. W. | 緬 | | STANDPIPE PIE | ZOMETE | R | BOREHOLE No | CRR912 | |
| NX NX | | Queensland | INSTALLATIO | ON LOG | | Sheet | : 1 of 3 | |
| B | <u>N</u> | Government | FOR GEOTECHNICAL T SYMBOLS REFER FORM F:G | | | PIEZOMETER No | CRR912 | |
| ECT | | Cross River Rail (CRR) Project - Additional Geotech | nnical Investigation | | L | | | |
| TION | - | Gus Street | | | (| coordinates 501337.0 | E; 6954642.6 N | |
| ECT No | - | FG6470 SURFACE RL 8.44m | plunge 90° | DATE STAR | TED 27/06/2018 | 2018 GRID DATUM MGA94 | | |
| 10 | - | HEIGHT DATUM AHD | BEARING | DATE COMPLE | TED 28/06/2018 | DRILLER | Geodrill | |
| | ~ | | § | | | onstruction Deta | | |
| R.L (m | | MATERIAL DESCRIPTION | Depth (m) /RL (AHD) | 50mm PVC (Stick Up | | Backfil | Details | |
| 7.94 | 4 | Gravelly Sandy CLAY (Fill) Dark grey, dark brown mottled black, moist, firr stiff. Low plasticity. Fine to coarse grained sand. to medium, sub-angular to subrounded gravel. Rootlets. CLAY (Alluvium) Pale brown, pale red mottled pale grey, moist, f to stiff. High plasticity. <u>at 1.5m: pale grey and pale</u> red mottled orange, st | Fine | | | Grout: Cement | / Bentonite mix | |
| 6.44 | 1 | Sandy CLAY (Alluvium) Pale grey mottle pale red and orange, moist, sti Medium plasticity. Fine grained sand. | 2.00m / 6.44 AHD | | | Benton | ite plug | |
| | | at 3.5m: Very stiff. Trace rootlets and wood. | 3.00m / 5.44 AHD | | | | | |
| | | at 5.5m: Pale brown, hard. at 5.9m: Pale grey. Trace of fine to medium graine gravel, sub-rounded. | d | | | | | |
| 0.84 | 4 | at 7m: Becoming Clayey Gravelly SAND. Medium coarse gravel, sub-rounded to rounded. | to | | | | | |
| | | SAND (Alluvium) Grey and brown, wet, very dense, medium to co grained. Trace fine to coarse, sub-rounded to su angular gravel. Trace fines. | | | | | | |
| -1.0 | | Clayey Sandy GRAVEL (Alluvium) | | | | | | |
| | | Continued on next sheet | | | | | | |
| EMA | RKS | 5: Rip - Aspley Formation. Standpipe piezometer | installed. | | | LOGGED BY | REVIEWED | |
| | | | | | | ND | S. Foley | |

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| | | | | | | | FINAL 27/09/201 | | |
|------------------|----------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|----------------------|-------------------|--|--|
| ال الله ال | 3 | ÀC | | ANDPIPE PI | EZOMETER | BOREHOLE No | CRR912 | | |
| 5 | | | | INSTALLATI | ON LOG | Sheet | 2 of 3 | | |
| K | 災 | | g Government | FOR GEOTECHNICAL SYMBOLS REFER FORM F: | | PIEZOMETER No | CRR912 | | |
| DJECT | | С | ross River Rail (CRR) Project - Additional Geotechnica | l Investigation | | | | | |
| CATION | I | G | jus Street | | | COORDINATES 501337.0 | E; 6954642.6 N | | |
| DJECT N | No | F | G6470 SURFACE RL 8.44m | plunge 90° | DATE STARTED 27/06/2018 | .8 GRID DATUM MGA94 | | | |
| 3 No | | | HEIGHT DATUM AHD B | BEARING | DATE COMPLETED 28/06/2018 | B DRILLER C | Geodrill | | |
| | | ۶Y | | | Standpipe Piezometer C | onstruction Deta | ils | | |
| • | t.L. m) | гітногоду | MATERIAL DESCRIPTION | Depth (m) /RL (AHD) | 50mm PVC Class No. 18 Stick Up = 0.00m | Backfill | Details | | |
| ¹⁵ -7 | 3 <u>.06</u> 5.70 | u se | Clayey Sandy GRAVEL (Alluvium) Cont'd. Grey, brown, pale red, pale orange, and dark grey, wet, very dense. Medium grained gravel, rounded to sub-rounded. Medium to coarse grained sand. High plasticity clay. at 13.0m: Pale brown, moist. With medium to coarse gravel. Trace cobbles, sub-rounded. Gravelly Sandy CLAY (Alluvium) Pale brown, moist hard. Fine to coarse, sub-rounded gravel. Fine to coarse sand. SILTSTONE (Rip) XW: Recovered as pale grey, moist, hard CLAY with some sub-angular gravel. Interlaminated with coal. SILTSTONE (Rip) HW: Pale grey to dark grey, fine grained, thinly to medium bedded, low to medium strength. SILTSTONE (Rip) XW: Recovered as pale grey, moist, hard, medium plasticity Clay with sub-angular gravel. | | | Filter: Washed | / Graded sand | | |
| | 1.08 | | SILTSTONE (Rip) HW: | _ | | | | | |
| | | V V | Continued on next sheet | | | 1 | | | |
| REM | 1ARI | KS: | Rip - Aspley Formation. Standpipe piezometer insta | alled. | | LOGGED BY | REVIEWED B | | |
| | | | | | | ND | S. Foley | | |

| | | _ | | FINAL 27/09/2018 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------|------------------|
| | STANDPIPE PII | EZOMETER | BOREHOLE No | CRR912 |
| Queensland | INSTALLATI | ON LOG | Sheet | 3 of 3 |
| Government | FOR GEOTECHNICAL SYMBOLS REFER FORM F: | | PIEZOMETER No | CRR912 |
| PROJECT Cross River Rail (CRR) Project - Additic | nal Geotechnical Investigation | | | |
| OCATION Gus Street | | | COORDINATES 501337.0 | E; 6954642.6 N |
| PROJECT No FG6470 SURFACE RL | 8.44m plunge 90° | DATE STARTED 27/06/2018 | GRID DATUM | /IGA94 |
| OB No HEIGHT DATUM | AHD BEARING ° | DATE COMPLETED 28/06/2018 | DRILLER C | Geodrill |
| | | Standpipe Piezometer Co | onstruction Deta | ils |
| Image: Big state Image: Big state Imag | ON Depth (m) /RL (AHD) | 50mm PVC Class No. 18 Stick Up = 0.00m | Backfill | Details |
| -11.64 × SILTSTONE (Rip) | | | | |
| HW: Cont'd. Grey, fine grained, thin low to medium strength. SILTSTONE (Rip) WW: Grey, to dark grey, fine grained, medium strength. SILTSTONE (Rip) SW: Grey to dark grey, fine grained, medium bedded, medium to high st -BP: 0-15, (4-8/m), PI-Un/Ro-Sm, TI-PI: 0-15, (2-5/m), PI-Un/Sm, OP, Ct 23 - 24 - 24 - 17.23 | d, thinly bedded, thinly to crength. OP, Cn, trace Cly ed, thinly to crength. uroughout. <u>22.67m / -14.22 AHI</u> | | Top of slo | tted pipe |
| - 26 Borehole completed at 25.6 | 7m | | | |
| - 27 | | | | |
| - 28 | | | | |
| - 29 | | | | |
| · · | | | | |
| REMARKS: Rip - Aspley Formation. Standpipe | piezometer installed. | | LOGGED BY | REVIEWED BY |
| | | | ND | S. Foley |

CORE PHOTO LOG DEPARTMENT OF TRANSPORT AND MAIN ROADS GEOTECHNICAL SECTION



| Project Name | Cross River Rail CRR | 2018 – Geotechnical I | nvestigation |
|--------------|----------------------|-----------------------|--------------|
| Project No. | FG6470 | Date | 27/06/2018 |
| Borehole No. | CRR9012 | Reference No. | H13109 |
| Location | Gus Street | Start Depth (m) | 17.00 |
| Submitted By | J. Armstrong | Finish Depth (m) | 25.67 |

