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|  |   | <b>FINAL</b> 02/03/2018  |
|--|---|--|
|  | GEOTECHNICAL  | BOREHOLE No CRR735   |
| 🕺 🖉 Queensland   | BOREHOLE LOG  | Sheet 1 of 2   |
| Government   | FOR GEOTECHNICAL TERMS AND<br>SYMBOLS REFER FORM F:GEOT 017/8-2014                | REFERENCE No <b>H12961</b>   |
| ROJECT Cross River Rail CRR2017 - Additional Geotechnic  | al Investigation  |  |
| QR land (Mayne Yard)   |   | COORDINATES 503751.1 E; 6964658.8 N  |
| ROJECT NO FG6470 SURFACE RL 4.46m  | PLUNGE 90° DATE STARTED 26/10/  | 2017 GRID DATUM MGA94  |
| DB NO HEIGHT DATUM AHD   | BEARING ° DATE COMPLETED 26/01/   | 2017 DRILLER Geodrill  |
|  |   | ADDITIONAL DATA  |
| Image: Construction Image: Construction   Imag | Solution INTACT DEFECT   STRENGTH STRENGTH   STRENGTH SPACING   Strength Strength | AND AND IS IN AN |
| COBBLES with Gravel and Sandy  |   |  |
| Clay (Fill)  | between tak   | 1: Auger sample MC=18.4%<br>en between Non<br>rrilling Trenches.<br>15 BULK  |
| 2.26 medium grained sand, sub angul<br><u>2</u> 2.26 Medium plasticity.<br><u>2</u> 2.26 Dark brown, moist, firm. High<br>plasticity.  | ar.   | 3, 2, 2<br>N=4 SPT   |
| 1.96   Clayey SAND (Residual)     Clayey SAND (Residual)   Orange brown, moist, very dense     Fine to coarse grained sand, sub   angular. Medium plasticity clay.     TUFF (Rif)   SW: Brown and pale brown-grey, fine to medium grained gravel siz clasts within fine grained matrix, massive, high to very high streng     -4   -Js: 0°-5° (6-8/m), Un/Ro, OP, Cn-  | ed <b>HW</b><br>th. <b>W</b>  | Is(50)=0.90 MPa<br>Is(50)=0.65 MPa<br>A (3.12m)  |
| 5  | SW H M  | I: XW Is(50)=0.14 MPa<br>Is(50)=0.86 MPa<br>UCS=31.50 MPa<br>E=2.47 GPa<br>V= 0.126<br>Is(50)=0.67 MPa<br>Is(50)=2.30 MPa<br>A (4.93m)   |
| 6  | нин   | Is(50)=5.10 MPa<br>Is(50)=6.30 MPa<br>A (5.93m)  |
| 7  | ⇒ 6.31m-6.33n   | Is(50)=4.10 MPa<br>Is(50)=0.59 MPa<br>A (6.42m)  |
| 8<br>100<br>(92)<br>9  | у,<br>В₩У — — — — — — — — — — — — — — — — — — —                                   | Is(50)=0.37 MPa<br>Is(50)=3.20 MPa<br>UCS=60.40 MPa<br>E=11.4 GPa<br>Is(50)=3.80 MPa<br>Is(50)=0.44 MPa  |
| -5.54  |   | Is(50)=2.20 MPa D (9.85m)<br>Is(50)=2.20 MPa A (9.86m)   |
| Continued on next sheet<br>REMARKS: Rif - Brisbane Tuff  |   |  |
|  |   | LOGGED BY REVIEWED BY  |
|  | TMR GEOTECHNICAL BOREHOLE LOG - CREATED WITH HOLEBASE SI                          | SB S. Foley  |

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| 10 <  |  |                                     |                   |          |  | FINAL 02/03/2018   |
|---|--|-------------------------------------|-------------------|----------|--|--|
| Covernment     Interaction  | 1. 20  |                                     | GEOTE             | CHNICAL  | BOREHOLE No                            | CRR735   |
| Covernment     Interaction  |  | 🔊 Queensland                        | BOREF             | IOLE LOG | Sheet                                  | 2 of 2   |
| District     Cross Miner Aud (1942/01/- Additional Secretorizal Investigation     Secretorizal Investigat  | 12   | 😰 Government                        |                   |          | REFERENCE No                           | H12961   |
| Statu:     Oblight (Mayur Varie)     Conserue (2017): 1.1 r, 664400.4 N       Dark model     Statu:     Statu:     Conserue (2017): 1.1 r, 664400.4 N       Num     International ABD     Avairant *     Dark model     Conserue (2017): 1.1 r, 664400.4 N       Num     International ABD     Avairant *     Dark model     Conserue (2017): 1.1 r, 664400.4 N       Num     International ABD     Avairant *     Dark model     Conserue (2017): 1.1 r, 664400.4 N       International ABD     Avairant *     Dark model     Conserue (2017): 1.1 r, 664400.4 N       International ABD     Avairant *     Dark model     Conserue (2017): 1.1 r, 664400.4 N       International ABD     International ABD     International ABD     International ABD     Conserue (2017): 1.1 r, 664400.4 N       International ABD     International ABD     International ABD     International ABD     International ABD     International ABD       International ABD     International ABD     International ABD     International ABD     International ABD     International ABD       International ABD     International ABD     International ABD     International ABD     Internatinternational ABD     International ABD   | POISCE   | Cross Divor Pail CPP2017 Additional |                   |          |  |  |
| Distribution     Endel 20<br>(model)     Distribution     Distristribution     Distribution     Distr   |  |                                     |                   |          | COORDINATES 503751 1                   | E: 6964658 8 N   |
| DEN     INDERT DOLVALID     DUNING     DUNING <thduning< th="">     DUNING     <thdun< td=""><td></td><td></td><td>4.46m PILINGE 90°</td><td></td><td></td><td></td></thdun<></thduning<>   |  |                                     | 4.46m PILINGE 90° |          |  |  |
| Image: Second diagonal di diagonal di diagonal di diagonal diagonal diagonal diagonal di |  |                                     |                   |          |  |  |
| RURATION:     RUF - Brisbane Tuff     TUFF (Rf)<br>SW:     RUF - Brisbane Tuff     RUF  |  |                                     |                   |          |  |  |
| 11   11   100   11.0m   11.0m     12   100   100   100   11.0m     13   100   100   100   100     14   100   100   100   100     15   100   100   100   100     16   100   100   100   100     16   100   100   100   100     16   100   100   100   100     16   100   100   100   100   100     16   100   100   100   100   100   100     16   100   100   100   100   100   100   100     16   100  | R.L.<br>(m)  |                                     |                   |          | ADDITIONAL DATA<br>AND<br>TEST RESULTS | SAMPLES<br>TESTS   |
| 13   14   15   15   16   17   16   17   16   17 <td< td=""><td>- 11</td><td>TUFF (Rif)<br/>SW: Cont'd.</td><td></td><td></td><td></td><td></td></td<>   | - 11   | TUFF (Rif)<br>SW: Cont'd.           |                   |          |  |  |
| 14   14 <td< td=""><td>- 12 -7.54</td><td>Borehole complete</td><td>d at 12.00m</td><td>=</td><td></td><td><sup>50)=3.40 MPa</sup> D (11.90m<u>)</u><br/>A (11.91m)</td></td<>  | - 12 -7.54   | Borehole complete                   | d at 12.00m       | =        |  | <sup>50)=3.40 MPa</sup> D (11.90m <u>)</u><br>A (11.91m) |
| SB S. Foley   | - 13<br>- 14<br>- 15<br>- 15<br>- 16<br>- 17<br>- 18<br>- 18<br>- 19 |                                     |                   |          |  |  |
| SB S. Foley   |  |                                     |                   |          |  |  |
|   | REMAR  | KS: Rit - Brisbane Tuff             |                   |          |  | REVIEWED BY  |
|   |  |                                     |                   |          | SB                                     | S. Foley   |

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CORE PHOTO LOG DEPARTMENT OF TRANSPORT AND MAIN ROADS GEOTECHNICAL SECTION



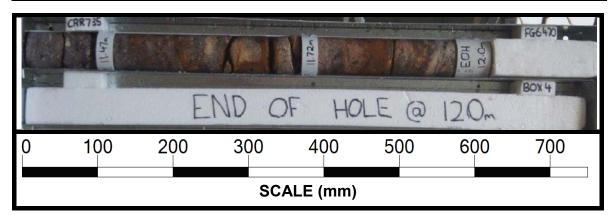
| Project Name | Project Name Cross River Rail CRR2017 – Geotechnical Investigation |                  |            |  |  |  |  |  |  |  |
|--------------|--|------------------|------------|--|--|--|--|--|--|--|
| Project No.  | FG6470   | Date             | 26/10/2017 |  |  |  |  |  |  |  |
| Borehole No. | CRR735   | Reference No.    | H12961     |  |  |  |  |  |  |  |
| Location     | QR land (Mayne Yard)   | Start Depth (m)  | 2.50       |  |  |  |  |  |  |  |
| Submitted By | M. de Gee  | Finish Depth (m) | 12.00      |  |  |  |  |  |  |  |



CORE PHOTO LOG DEPARTMENT OF TRANSPORT AND MAIN ROADS GEOTECHNICAL SECTION



| Project Name | Cross River Rail CRR2017 – Geotechnical Investigation |                  |            |  |  |  |  |  |  |
|--------------|---|------------------|------------|--|--|--|--|--|--|
| Project No.  | FG6470  | Date             | 26/10/2017 |  |  |  |  |  |  |
| Borehole No. | CRR735  | Reference No.    | H12961     |  |  |  |  |  |  |
| Location     | QR land (Mayne Yard)                                  | Start Depth (m)  | 2.50       |  |  |  |  |  |  |
| Submitted By | M. de Gee   | Finish Depth (m) | 12.00      |  |  |  |  |  |  |



## **Detailed Discontinuity Description Log**



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 Nam   | roject Name Cross River Rail Project No. FG6470 |              |           |           |           |                 |                 |                    |       |
|---------------|---|--------------|-----------|-----------|-----------|-----------------|-----------------|--------------------|-------|
| Site ID / Bor | rehole No.                                      | CRR735       |           |           |           | Surface RL 4.46 |                 |                    |       |
| Geologist     |   | S.B.         |           |           |           | Date 26/10/2017 |                 |                    |       |
|               |   |              |           |           |           | Page            | 1               | of                 | 3     |
| Traverse      | Туре  | Dip ° / Dip  | Planarity | Roughness | Roughness | Aperture        | Infilling       | Zones <sup>1</sup> | Other |
| Chainage;     |   | Direction °; |           |           | Class     |                 |                 |                    |       |
| or            | LP /  | or           |           |           |           | CD /            | Cn /            | SZ /               |       |
| Down hole     | BP /  | Angle ° from | Stp /     | Ro /      | I to IX   | OP /            | St /            | <b>CZ</b> /        |       |
| depth         | FP /  | horizontal   | Un /      | Sm /      |           | FL /            | Vr /            | HFZ /              |       |
| (rock core)   | J etc.  | (rock core)  | PI        | SI        |           | ті              | Ct <sup>1</sup> | AZ                 |       |
| 2.56          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 2.61          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 2.64          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 2.66          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 2.97          | J   | 5            | Un        | Ro        | IV        | OP              | St              |                    |       |
| 3.31          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 3.45          | J   | 5            | Un        | Ro        | IV        | CD              | St              |                    |       |
| 3.71          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 3.72          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 3.74          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 3.76-3.78     |   |              |           |           |           |                 |                 | CZ                 |       |
| 3.81          | J   | 0-10         | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 3.82          | J   | 0-10         | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 3.93          | J   | 10           | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 4.12          | J   | 0-10         |           |           |           | CD              | St              |                    |       |
| 4.135         | J   | 0-10         | Un        | Ro        | IV        | OP              |                 |                    |       |
| 4.16          | J   | 0-10         | Un        |           |           | CD              |                 |                    |       |
| 4.18-4.20     | J   | 0-10         | Un        | Ro        | IV        | CD              | Ct              | CZ                 |       |
| 4.33-4.38     | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 4.84-4.85     | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 5.04          | J   | 0-10         | Un        | Ro        | IV        | CD              | St              |                    |       |
| 5.07          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 5.555         | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 5.56          | J   | 0-10         | Un        | Ro        | IV        | OP              | St              |                    |       |
| 5.61          | J   | 15           | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 5.63          | J   | 0-10         | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 5.82          | J   | 10           | Un        | Ro        | IV        | OP              | St              |                    |       |
| 6.13          | J   | 20           | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 6.18          | J   | 15           | Un        | Ro        | IV        | OP              | Cn              |                    |       |
| 6.53          | J   | 30           | Un        | Ro        | IV        | OP              | Cn              |                    |       |

*Note:* 1. Describe zones and coatings in terms of composition and thickness (mm) *F:GEOT 533/9 – 2014* 

# **Detailed Discontinuity Description Log**



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| Project Nar  | ne           | Cross Rive   | r Rail    |           |           | Project No. FG6470                            |                 |                    |       |
|--------------|--------------|--------------|-----------|-----------|-----------|---|-----------------|--------------------|-------|
| Site ID / Bo | rehole No.   | CRR735       |           |           |           | Surface RL     4.46       Date     26/10/2017 |                 |                    |       |
| Geologist    |              | S.B.         |           |           |           |   |                 |                    |       |
|              |              |              |           |           |           | Page  | 2               | of                 | 3     |
| Traverse     | Туре         | Dip ° / Dip  | Planarity | Roughness | Roughness | Aperture                                      | Infilling       | Zones <sup>1</sup> | Other |
| Chainage;    |              | Direction °; |           |           | Class     |   |                 |                    |       |
| or           | LP /         | or           |           |           |           | CD /  | Cn /            | SZ /               |       |
| Down hole    | BP /         | Angle ° from | Stp /     | Ro /      | I to IX   | OP /  | St /            | <b>CZ</b> /        |       |
| depth        | <b>FP</b> /  | horizontal   | Un /      | Sm /      |           | FL /  | Vr /            | HFZ /              |       |
| (rock core)  | J etc.       | (rock core)  | PI        | SI        |           | ТІ  | Ct <sup>1</sup> | AZ                 |       |
| 6.71         | J            | 25           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 6.82         | J            | 30           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 6.93         | J            | 15           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 7.40         | J            | 0-10         | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 7.48         | J            | 30           | Un        | Ro        | IV        | OP  | Ct              |                    |       |
| 7.50         | J            | 30           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 7.60         | J            | 0-10         | Un        | Ro        | IV        | OP  | St              |                    |       |
| 7.65         | J            | 0-10         | Un        | Ro        | IV        | OP  | St              |                    |       |
|              |              |              |           |           |           |   |                 |                    |       |
| 8.10         | J            | 5            | Un        | Ro        | IV        | OP  | St              |                    |       |
| 8.33         | Hardness tes | st break     |           |           |           | -   |                 |                    |       |
| 8.43-8.53    |              |              |           |           |           |   |                 | HFZ                |       |
| 8.65         | J            | 5            | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 8.76         | J            | 45           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 8.84         | DI           |              |           |           |           |   |                 |                    |       |
| 9.18         | J            | 30           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 9.21         | J            | 15           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 9.24         | J            | 15           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 9.78         | J            | 30           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 9.80         | J            | 15           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 10.05        | J            | 45           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 10.39        | J            | 20           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 10.82        | J            | 15           | Un        |           |           | CD  |                 |                    |       |
| 10.85        | J            | 30           | Un        |           |           | CD  |                 |                    |       |
| 10.88        | J            | 15           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 10.90        | J            | 15           | Un        | Ro        | IV        | OP  | St              |                    |       |
| 11.30        | J            | 20           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 11.44        | J            | 15           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 11.65        | J            | 30           | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 11.70        | J            | 0-10         | Un        | Ro        | IV        | OP  | Cn              |                    |       |
| 11.72        | DI           |              |           |           |           |   |                 |                    |       |

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

F:GEOT 533/9 - 2014

# **Detailed Discontinuity Description Log**



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| Project Nam   | ne        | Cross River Rail Project No. FG6470 |           |           |           |            |                 |                    |       |  |
|---------------|-----------|-------------------------------------|-----------|-----------|-----------|------------|-----------------|--------------------|-------|--|
| Site ID / Bor | ehole No. | CRR735                              |           |           |           | Surface RL | 4.46            | 4.46               |       |  |
| Geologist     |           | S.B.                                |           |           |           | Date       | 26/10/2017      | 26/10/2017         |       |  |
|               |           |                                     |           |           |           | Page       | 3 of 3          |                    |       |  |
| Traverse      | Туре      | Dip ° / Dip                         | Planarity | Roughness | Roughness | Aperture   | Infilling       | Zones <sup>1</sup> | 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        |           | ті         | Ct <sup>1</sup> | AZ                 |       |  |
| 11.87         | J         | 0-10                                | Un        | Ro        | IV        | OP         | Cn              |                    |       |  |

*Note:* 1. Describe zones and coatings in terms of composition and thickness (mm) *F:GEOT 533/9 – 2014*