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BOREHOLE No	<u>BH102</u>
SHEET	_ <u>1_</u> of _ <u>5</u> _
REFERENCE No	<u>11461</u>

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

	DJECT				Road Section 4								
					<u>Dverpass</u> SURFACE R.L. <u>14.79m</u> UUNGE							<u>7716.2 E; 7866465.9</u>	
JOB					HEIGHT DATUM <u>AHD</u> BEARING							ER <u>Cairns Drilling</u>	
DEPTH (m)	R.L. (m)	R I BORING DRILLING	RQD ()% CORE	SAMPLE	MATERIAL			INTACT STRENGTH	DEFECT		ADDITION AN TEST RE	AL DATA D	SAMPLES TESTS
0	14.79	₹\$ö	REC %	SP	Silty SAND (TOPSOIL)		i Sis			5			S ⊨
	14.49				Pale brown, moist, loose. Fine grained.			<u> </u>				<u>LL=35%</u> PI=19.4%	
- - - - - - - -	13.29			A	Sandy CLAY Pale brown, grey, moist, very stiff. Low plasticity. Trace gravel.		(CL)					LS=10.2% 4,9,11 N=20	SPT
113 11:45 	10.23			В	Clayey SAND Pale brown / pale grey, dry, very dense. Fine grained sand. Some gravel.		(SC)		• ·		— — <u>2</u> 0,30/75,HB N>50	SPT -
7/10/20	12.29					- 44	1			 _		LL=34.4% ———————————————————————————————————	-
T ToolgINt Add-In 1				С	Sandy CLAY Pale grey, brown, moist, hard. Low to medium plasticity. Some white medium gravel.							LS=9.4% 14,26,30/60 N>50	SPT -
<pre>cDrawingFile>> Datgel CP</pre>				D								30/150 N>50	SPT -
94 KALYNDA PARADE.GPJ <- 				E	High content of silt.		(CL- CI)					26,30/90 N>50	SPT -
HOLOGY TOWNSVILLE RING ROA				F								LL=35% PI=11.2% LS=7.8% 27,30/75 N>50	SPT -
ING BOREHOLE LOG WLIT 8 8	6.79			G	Relatively high content of fine to medium grained sand.							21,30/115 N>50	SPT _
ald. DMR_LIB_01A.GLB_Log_A_ENGINEERING_BOREHOLE_LOG_WLITHOLOGY_TOWNSVILLE_RING_ROAD_4 KALYNDA PARADE.GPJ_ <col< td=""><td></td><td></td><td></td><td>Н</td><td>Pale grey, brown, moist, very stiff to hard. Low plasticity. Some clay. Trace fine gravel.</td><td></td><td>(ML)</td><td></td><td></td><td></td><td></td><td>5,8,10 N=18</td><td>SPT -</td></col<>				Н	Pale grey, brown, moist, very stiff to hard. Low plasticity. Some clay. Trace fine gravel.		(ML)					5,8,10 N=18	SPT -
	REMARK		I			<u></u>						LOGGED BY	
1												VP	



BOREHOLE No	<u>_BH102</u>
SHEET	_2_ of _5_
REFERENCE No	<u>11461</u>

VP

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

					Road Section 4						
											OORDINATES 467716.2 E; 7866465.9 N
					SURFACE R.L. <u>14.79m</u> PLUNGE						
JOB	No	_268/	<u>10M/5</u>		HEIGHT DATUM <u>AHD</u> BEARING _			DATE COMP	PLETED _	<u>19/3/</u>	13DRILLER <u>Cairns Drilling</u>
(m)	R.L. (m)	AUGER WASH BORING CORE DRILLING	RQD ()%		MATERIAL	7	BNI		DEFECT SPACING (mm)	DOG	ADDITIONAL DATA
DEPTH (m)				Ľ ا	DESCRIPTION	ГІТНОГОGY	THERING		0	GRAPHIC LOG	AND SURVICE SU
	4 70	NASH	CORE REC %	SAMPLE		HEI-	USC WEA ⁻	₽₽∓≈⊐₽₽		GRAF	TEST RESULTS
10	4.79		REC %	0,	Sandy SILT (Cont'd)		<u> _ ></u>				
-								: : : : : : : ; ‡			LL=42%
E								: : : : : : : 			PI=16.2%
E				J			:				LS=11% 9,17,27 SPT
-11]				N=44
-								: : : : : :]			
E							1				
E							:				
-							-				
- 12 - 12											4,11,17 SPT
/2013				K							4,11,17 N=28 SPT
Datgel CPT Tool gINt Add-In 17/10/2013 11:45											
dd-In							(ML)	: : : : : : ‡			
4 13 −13							1				
Tool								· · · · · · ·]			
							1	1:::::‡			LL=41.6% PI=21.6%
Datge				L				: : : : : : ‡			LS=12.4%
Â.				_							11,20,30 SPT N=50
< <drawingfile>> [1 1 1 1 1 1 1</drawingfile>								I · · · · · · · · · · · · · · · · · · ·			
<pre>CLay</pre>											
P Las											
ADE.0							:				
AR - 12							1	1 : : : : : : : : : : : : : : : : : : :			
XND/				М							12,25,28 N>50 SPT
4 KAL	-0.71				High content of sand.		<u> </u>		· · · · · ·		
t oad					Silty SAND Pale grey, brown, moist, medium dense.						
					Fine to coarse grained. Low clay content.			· · · · · · · <u>-</u>			
INSNI											
MOT L							(SM)	· · · · · · · ·]			9.11.13
<u>_06</u>				N				· · · · · · ·]			9,11,13 N=24 SPT
어버 17 - 17					-						
							1	:::::+			
EHOI	-3.01							<u> </u>	· · · · · ·		└─────────────────────────────────────
18 18					Clayey SAND Grey, brown, moist, very dense.			: : : : : : : : : : : : : : : : : : :			
ERIN				Р	Fine to coarse grained sand. Trace gravel.		1				15,24,30/130 N>50 SPT
GINE								::::::			
A_EN											
							(SC)	: : : : : : : : +			
								: : : : : :]			
B_01/											
					1						16,28,30/140 SPT
DLD DMR_LIB_01A.GLB_LOg_A_ENGNEERING_BOREHOLE.LOG_WLITHOLOGY_TOWNSVILLE RING_ROAD 4 KALYNDA PARADE.GPU 				Q							N>50 SPT -
					1	<u></u>	1			L	
F	REMARKS	5				· — —					LOGGED BY



BOREHOLE No	<u>_BH102</u>
SHEET	<u>3</u> of <u>5</u>
REFERENCE No	<u>11461</u>

VP

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

PRO					Road Section 4					
										OORDINATES 467716.2 E; 7866465.9 N
					SURFACE R.L. <u>14.79m</u> PLUNGE					
JOB	No	268/	<u>10M/5</u>					DATE COMPLETED	19/3/	13 DRILLER <u>Cairns Drilling</u>
DEPTH (m)	R.L. (m)	H BORING E DRILLING	RQD ()%		MATERIAL	βGY	RING	INTACT DEFECT STRENGTH SPACING (mm) 표풍포로그국교 유영원왕원	C LOG	ADDITIONAL DATA AND ຜູ
DEPI		SE N N N N N N N N N N N N N N N N N N N	CORE	SAMPLE	DESCRIPTION	ГІТНОГОСУ	C	588800 LLII	GRAPHIC LO	AND SI
_20	-5.21	8≱8	REC %	AS .		5	SIR		- B	E SA
					Silty SAND Pale grey, pale brown, moist, dense. Fine to medium grained sand. Some clay.					
-21										10,14,16
-				R						N=30 SPT
/10/2013 11:45 							(SM)			
d-In 17				s				1::::::		11,13,19 N=32 SPT
Tool gINt Ad							•			
A PARADE.GPJ < <drawingfile>> Datgel CPT</drawingfile>	-10.31			т	Becoming fine to coarse grained.					12,19,23 N=42 SPT
					Silty CLAY Pale greyish brown to pale brownish grey,			: : : : : : <u>+</u> : : : : : :		
D4KA					moist, hard. Medium plasticity.					MC = 18%
G ROA				U						PI=24.8%
DLOGY TOWNSVILLE RING										LS=13.6% 14,26,30/120 N>50
				V	Some fine to medium grained sand.					19,30/100 N>50 SPT
ald DMR LIB 01A GLB Log A_ENGINEERING BOREHOLE LOG WLITHOLOGY TOWNSVILLE RING ROAD 4 KALYNDA PARADE.GPJ <				w			(CI)			10,22,30 N>50 SPT
	REMARKS	 ``			1		1	Lk	1	LOGGED BY
1										VP



ENGINEERING BOREHOLE LOG

BOREHOLE No	<u>_BH102</u>
SHEET	4 of5
REFERENCE No	<u>11461</u>

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

PRO	JECT	<u>_</u>	<u>own</u>	<u>sville</u> R	ing F	Road Section 4							• •
LOC	ATION	<u>_</u> K	<u>alyn</u>	da Para	ade (<u> </u>					CC	DORDINATES <u>467716.2 E; 7866465.9 N</u>	<u>v </u>
PRO	JECT No	F	<u>G60</u>	20		SURFACE R.L. <u>14.79m</u> PLUNGE			DAT	E STARTED	15/3/	13 GRID DATUM <u>GDA 94</u>	
JOB	No	_2(<u> 58/1</u>	<u>0M/5</u>		HEIGHT DATUM <u>AHD</u> BEARING			DATE C	OMPLETED	19/3/	DRILLER <u>Cairns Drilling</u>	
DEPTH (m)	R.L. (m)	UGER ASH BORING		RQD ()% CORE	SAMPLE	MATERIAL DESCRIPTION	ГІТНОГОСУ	SC /EATHERING	INTACT STRENG		GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES TESTS
30	-15.21	≥⊳		REC %	Ś	Silty CLAY (Cont'd)		∣⊃∣≤ 1			0		
- - - - - - - 31 - - -					×	Trace to minor sand.						12,15,24 N=39 LL=39% PI=19,2%	SPT
JN1 Add-In 17/10/2013 11:45 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					Y	Some orange mottling.						LS=11.4% 17,30/120 N>50	SPT
<pre><<drawingfile>> Datgel CPT Tool g </drawingfile></pre>					Z	Some dark grey mottling.		(CI)				N>30	SPT -
QLD_DMR_LIB_01A.GLB Log_A_ENGINEERING BOREHOLE LOG WLITHOLOGY TOWNSVILLE RING ROAD 4 KALYNDA PARADE.GFJ <					AA	Becoming pale yellow / grey						MC = 22.2% LL=36% PI=17.2% LS=8.8% 8,15.20 N=35	SPT
	04.04				AB							13,19,30/110 N>50	SPT
	<u>-21.61</u> -22.71					GRANITE Medium to coarse grained, intrusive igneous rock of felsic composition. XW: Generally exhibits engineering properties of a pale grey, yellow, moist, very dense Clayey Silt.		xw				10/0	
RING BOREHOLE				(33)	AC	MW: Pale red, pink, medium to coarse grained, massive, medium to high strength. Defects: - Joint at 25° (2/m) - Joint at 40° (2/m)		-			[N>50	
3LB Log A_ENGINEE				100		- Joint at subvertical (2/m) Defects are generally medium to widely spaced, planar or irregular, tight or open, rough and weathered.		MW				Is(50) = 0.36MPa UCS = 2.33 MPa Is(50) = 0.26MPa Is(50) = 2.22MPa Is(50) = 0.42MPa	0 0 0
	-24.46			(-•)		SW: Red, pink to grey, brown, medium to coarse grained, massive, generally high to very high strength. Some medium & extemely high strength zones.		sw				ls(50) = 0.56MPa UCS = 20.8 MPa	0
	EMARKS	3										LOGGED BY VP	



BOREHOLE No	<u>_BH102</u>
SHEET	<u>5</u> of <u>5</u>
REFERENCE No	<u>11461</u>

VP

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

PROJEC	т	<u></u>	w <u>nsville</u> [Ring	Road Section 4			· ·								
LOCATIO	NC	<u>Kal</u>	<u>ynda Pa</u>	rade	<u>Overpass</u>							СС	OORDINATE	s <u>467716</u>	6.2 E; 7866465.9	<u>9 N</u>
PROJEC	CT No	<u>_FG</u>	6020		SURFACE R.L.	<u>14.79m</u>	PLUNGE			DATE S	TARTED	15/3/	<u>13</u> GR	RID DATUM	<u>GDA 94</u>	
JOB No		<u>268</u>	<u>3/10M/5</u>		HEIGHT DATUM	<u>AHD</u>	BEARING			DATE COM	IPLETED	19/3/	<u>13</u>	DRILLER	Cairns Drilling	L
II (II)	L. m) 25.21 <	AUGER WASH BORING CORE DRILLING	RQD ()% CORE REC%			/ATERIAL SCRIPTIO		ГІТНОГОСУ	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG		DDITIONAL I AND TEST RESU		SAMPLES TESTS
					SW: (Cont'd) Defects: - Joint at 25° (2/m)			[+]	sw					ls(50) = 8.87MPa	0
D_DMR_LIB_01AGUB_LOG_A_ENGINEERING BOREHOLE_LOG WLITHOLOGY TOWNSVILLE RING ROAD 4 KALYNDA PARADE.GPU < ChamingFiles- Daget CPT Tool girt address 1145 	5.71		100		- Joint at 25° (2/m) - Joint at 60° (2/m) Defects are general planar or irregular, c and weathered. Borehole terminated	close, or t	ight, rough									
ಠ <u>50</u> REM	ARKS	s			· 							·		L	_OGGED 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 Rin	g Road Sectio	on 4			
Project No	FG 6020	<u> </u>		Date	19/03/1	3
Borehole No	BH 102			TMR H No	11461	
Location	Kalynda Parade	e Overpass		Start Depth (m		
Detail	Abutment A (Le			Finish Depth (
Chainage				Submitted By	BW	
Remarks					l	
BHIOZ	Diag Spin-Dry	Nen Yenow Red	Maganta Vinta	24 Blage		155
						150
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0 100	0 200	300 SCALE		500 6	00 700	