	上 L l é	NT:	enmeor Cáirns	Port	Authority	COMMEN	CED: 20/12/2000	Page CON	: 3 of	3		
9 1,1 1,0 1,0	DR DC BC DC	JEC ATIC No.: GED	T: Mar N: Ro 421 0 BY: J	lin Je fer to 377 AM	Hy Phase A figure INCLI H DAT CHECKED BY: V DAT	COMPLET VATION (dog): 90 do UM; UM; LAT	(ED: 20/12/2010) ED: 20/12/2010 BEARING (deg): X-COORDINATE: R.L. SURFACE (m):	EQU M	IIPMEI IN [] G Y-(TÒ	NT: DB 1000 NT: DB 1000 N]] DIAMETER COORDINATE: TAL DEPTH (m)	niing 1 (mm): 75mi 1: 25m	m
;	ŧ		per	F I				EI	NGINE	ERING PROPE	ATIES	Γ
Method	Support	Water	Sample Type/Num	Depth] Elevation (MATERIAL DESCRIPTIO AS1726 Soil Group Symbol, soi particle characteristics or fines p secondary and minor compon	N I types, asticity, ents.		Moisture Condition	Consistency/ Relative Density	Test Results	Graphic Log	Denth (m)
					REFER TO PREVIOUS PAGE							
WB	BNON	DRILLING OVER WATER	SPT	-22361	CH Sandy Silty CLAY High plasticity, sand line.	Grøy.			VSt	SPT8H1C, N = 19	0 21m	21
				-35.46 27.80 37.80 37.00 37.00	CH Silty CLAY High plasticity. End of Borehole at 25m.		y/yellow/brown colour.		VSt			23
												26
					: :							21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

	回避	en:Gimeen En:MSOF4	MANG WENT				0a	BO Page	orer e: 1 of		2
	NT JEC No.: GED	Cairns T: Marl N: Ref 421 03 BY: JF	Port in Je er ta 77 7M	Authority tty Phase A Ilgure CHECKED BY:	INCLINATION (c H DATUM: V DATUM: LAT	COMMENCEL COMPLETED deg): 90 deg X-1 R.1	20/12/2000 20/12/2000 BEARING (deg) COORDINATE: SURFACE (m)	CON EQU): M : -1.66m		CTOR: Walker Drilling NT: DB 1000 AN DOIAMETER (mm) COORDINATE: DTAL DEPTH (m): 10.4	: 75m
		bar	Ē					E	GINE	EERING PROPERTIES	
Support	V/ater	Semple Type#vun	B. Depth] Elevation.	MATERIAL D AS1726 Soll Group particle characteristi secondary and m	ESCRIPTION Symbol, soil types, cs or fines plasticity, Inor components.			Moisture Condition	Consistency/ Relative Density	Tesl Results	Graphic Log
			0.00	CH Silty CLAY		Grey celour.			V\$		245
	DRILLING OVER WATER	U50		ringit preseday.					S	VS = 4kPa UBH2A, PP = 0kPa lest o base of U50 sample @ 1.3	1 1 5 5 1 3 5 1 5 1 5 1 5 1 5 1
		U50								UBH2B, PP = 40kPa test on base of U50 sample @ 3m	
		U50	48 49 49 49 49	SP SAND Fina to coarse. CH Silty CLAY High plasticity.		Sand lens, cutb Grey çokur (ret ebove).	igs a grey colour. Imed back to as		L\$	U8H2C, PP = 40kPa test on base of U50 sample ଡ 4.5m	
		5PT	-7.65 6.00	CH Silty CLAY High plasticity.		Moltled graylycl	ow/błówn cołour.		St-VS	SPTBH2A, N ≃ 4 @ 6m	
		РТ								SPT8H28, N = 7 ⊕ &m	
	SI SI	PT _1	2.11							SPTBH2C, N = 14 Ø 10m	6.7.4.4 C





NATA Registered: Geotechnical Testing Specialisti Offices : NSW, QLD, INDONESIA



AUSTRALIAN SOIL TESTING PTY LTD. A.B.N. 79 003 493 623

19 Bermill Street, Rockdale, NSW, 2216 Tel: 9597 5599, 9597 3286 Fax: 9597 3442 Email: austst@blgpond.com

SOIL CLASSIFICATION TEST DATA

Earthtech Laboratories CLIENT:

GHD Marlin Jetty: Phase A Job No. 42-10377 **PROJECT:**

LAB. NO.	BORE HOLE	DEPTH	SAMPLE DESCRIPTION		DRY DENSITY	LIQUID LIMIT	PLASTIC INDEX	LINEAR SHR'KAGE (%)
		(m)		1		2	3	4
24056	UBH 1A	2.00- 2.45	SILTY CLAY: dark-grey, high plasticity, some fine to coarse sand, organic.			87	54	
24057	UBH 1E	14.00- 14.45	SILTY CLAY: mottled brown, yellow & grey, high plasticity, trace of fine sand.			70	46	
		-						
						,		
	NOTE	S TO TE	STING					
l	1.	Test me	thod: AS 1289 2.1.1 - 1992					
	2.	Test Me Preparat Sample	thod: AS 1289 3.1.2 ion: natural state with no sleving. History: natural state as recieved.					
	3.	Test Me Prepara	thod: AS 1289 3.2.1, 3.3.1 tion and sample history as 2.	4: Test Meth Sample histo Mould size: '	od: AS 1289 bry and prep 125, 127, 25	3.4.1 aration es Omm	2.	
	Samp	led by:	Client	Dry state: cr	umbling, cu	ling, linear		
	Job N	o .	061-067					
	Date	Tested:	15.1.01					
form of	01, file (<u>:01, issu</u>	e 4 January 1997					
	. —				6.8	1		6/1/01

NATA Registered: Geotechnical Testing Specialists Offices : NSW, QLD, INDONESIA

_____ 2.2

<u>/ ((01</u>... DATE

SIGNED

T	AUSTRALIAN SOIL TESTING P	TY LTD. A.B.N. 79 003 -	193 623
	19 Bermill Street, Rockdale, NSW, 2216 Tel: 9597 5599, 9597	3286 Fox: 9597 3442	
\bullet	Email: austst@bigpond.com		
Client:	Earthtech Laboratories	Job No:	061-067
Project:	GHD Marlin Jetty:Phase A Job No.42-10377	Sample No:	24056
Sample:	UBH 1A 2.00-2.45m	Date Tested:	15.1.01
Sampled by:	Client	Tested by:	CL
PARTICLE SIZ	E DISTRIBUTION TEST REPORT	AS 1289 3.6.2 - 1	1995



Sample

Description:	SILTY CLAY: dark-;	grey, high plasticity, and, organic.	
Sieve Size (mm)	% Passing	Sieve Size (mm)	% Passing
150.0	5	1.18	99
75.0		0.600	9 9
53.0		0.425	98
37.5		0.300	97
26.5		0.150	90
19.0		0.075	83
13.2		0.050	75
9.5		0.020	68
6.7		0.010	60
4.75		0.005	52
2.36	100	0.002	42
Hydrometer Type:		ASTM 152H	
Dispersant Type:		Sodium Hexametaphosp	ohate
Pretreatment:		nil	
Loss on pretreatment	:	nil c.c.	, 0

Loss on pretreatment:

Remarkas

CE SIGNED 2

.....

16 / 1 / 01 DATE



BMT WBM Boreholes 2014

ASSESS	MICAL SEDI	MENT	CO	REL	CIIG	Direc
CLIENT: PROJECT: AREA: LOGGED BY	Arup/BMT WBM Cairns ShippingDevelopm : S.Taylor WD >	Sheet ent Pro	ject	1 D/ C(C(c(ATE: 1 & October 2013 ORING METHOD: MISTON DCATION: 1 ORE LENGTH (m): 0 · 2 s:	2
0.0	1/m	-	_		much	_
Depth (m) Graphic Log	Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	mud	Sof4		h	Crey, will dorter anonia politis	0+
	ECH U.Z.M.				TRIPLICATE LOCATION CORES CI19 CI19A CI19B	

GE	SESSA	MICAL SEDIN	AENT	CO	RELO	DG	B130		
CLIEN PROJE AREA: LOGG	T: ECT: ED BY:	Arup/BMT WBM Cairns ShippingDevelopme S.Taylor WD =	ent Pro	oject		ATE: / & Oct DRING METHOD: DCATION: DRE LENGTH (m):	Ctober 2013 14 р. Рістал 1 0.80-		
lydrous	Layer:		Subsu	face se	ediments	3:			
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Calour	Subsampling	Field Records/Co	mments		
0 1-	1	typhins mid	U. auf	-	XXX.N	high	Ses.		
0.2	1. 15 . 1. 4	Mind			XXX	C			
03-	1. 1. 1.		Sof	-	X	Nil	and		
0-4-		South loge 0.000	÷.	~	XIX				
2.0	New .		sul.		×.				
0 6	1. 1. 1.	Must				Nit . Some a	conde lare		
07-	110	Much	fin			Safled	0 - 0.5 m		
0-8-					1	QAQC	1		
					11	= 0 - 0	5-5 m		

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG 138 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM 18 October 2013 14:15 CLIENT: DATE: PISTON PROJECT: **Cairns ShippingDevelopment Project** CORING METHOD: AREA: LOCATION: WD= 8.7 m LOGGED BY: S.Taylor CORE LENGTH (m): 0-27-Hydrous Layer: Subsurface sediments: Description Field Records/Comments Graphic Log Subsampling Consistency Depth (m) Colour Texture, colour/mottling, sand and gravel components GRAVIC . SALCES shis Smill ERAMANTS AND FILLAD CRAW US STIFF PACE WERT CLAY 01 BARIC FRAN VIVLY 62 STIFF 027- 120M 03 Smille 0-0.22 2 coming itheraft No fire rediret

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG ASSESSMENTS 140 Sheet 1 of 1 18 October 2013 19:30 Arup/BMT WBM CLIENT: DATE: **Cairns ShippingDevelopment Project** PROJECT: CORING METHOD: AREA: LOCATION: WD= 85m 0.26 m LOGGED BY: S.Taylor CORE LENGTH (m): Subsurface sediments: Hydrous Layer: Description Field Records/Comments Subsampling Graphic Log Consistency E Colour Depth (Texture, colour/mottling, sand and gravel components relin · V Sa Crey X goo FIRM 6.03m 0.1 1 been/grey Some pieces of base/mots STIFF CLAY 02. 2 RON 0.26m One somfle 0-0-26

GEOG	CHEM	ICAL SEDI	MENT	COI 1 of 1	REL	OG	Core ID/No: D 199
CLIENT: PROJEC AREA: LOGGED	A T: C BY: /er:	rup/BMT WBM airns ShippingDevelopm S.Taylor いり /ロ	D/ C(L(C(ediment	ATE: / & C DRING METHOD: DCATION: DRE LENGTH (m): s:	0:15 m		
Depth (m)	Graphic Log	Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/C	Comments
C. C. R.	20000	Grouting				hage r Ange r Almolo	outs to t skells
a stand the stand stand stand stand stands and		EOU OISM				Miltifle Attempts For grin	e core 5 4 suffe ize

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG C146 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM CLIENT: DATE: October 2013 16:00 18 PROJECT: **Cairns ShippingDevelopment Project** CORING METHOD: AREA: LOCATION: 0.25 =10 = 9.7m LOGGED BY: S.Taylor CORE LENGTH (m): Hydrous Layer: Subsurface sediments: Description Field Records/Comments Subsampling Graphic Log Depth (m) Consistency Colour Texture, colour/mottling, sand and gravel components Grovel 00 Alundant shells to 4 an dia 10 0 20 0.1 -Sondy (undely) anots = mut Grovel 10 6.2 15 3 D 0.25 m EOU 03 one smille 0-0.25 multiple care attempts

ASSES	SMENTS	Sheet	1 of 1	L		0147
CLIENT: PROJECT: AREA: LOGGED	Arup/BMT WBM Cairns ShippingDevelopm BY: S.Taylor ω 0 =	ent Pro	oject		ATE: / % O ORING METHOD: DCATION: ORE LENGTH (m):	Ctober 2013 /6 : C-448 0-05
Hydrous Laye	n	Subsu	nace se	aimen	S:	
Depth (m) Granhic Loo	Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/C	Comments
00000	to sound,				Clasts of Shile St Bult / Kight	weathered els
					millifle caining atte	fuiled and

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG 32 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM CLIENT: 19 October 2013 8:10. DATE: PROJECT: **Cairns ShippingDevelopment Project** PISTON CORING METHOD: AREA: LOCATION: WD=12.2m LOGGED BY: S.Taylor CORE LENGTH (m): 0,55 Hydrous Layer: Subsurfage sediments Mud mul Description Field Records/Comments Subsampling Graphic Log Consistency £ Colour Depth (Texture, colour/mottling, sand and gravel components 0.02 Bisturbation = Tam 0.1nut res/g 0.2. City 0.25 03 - 0.35 gren/ gree 0.4-Mund Sundie (grovel) Musi Some shells and 7 4: Suf -0.55-One soufle 0-0.55 pultifle core attempts refusal and from / still line.

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG 37 ASSESSMENTS Sheet 1 of 1 (9 October 2013 08:25 CLIENT: Arup/BMT WBM DATE: PISTON PROJECT: **Cairns ShippingDevelopment Project** CORING METHOD: AREA: LOCATION: WD= 12.1 LOGGED BY: S.Taylor CORE LENGTH (m): 0.95 Hydrous Layer: Subsurface sediments: hund 0.02 1200 m Description Field Records/Comments Graphic Log Consistency Subsampling Depth (m) Colour Texture, colour/mottling, sand and gravel components SPAN WOR SDA ×. STARAGE SAN DY MUD P occurred stell FIRM · 07 0.1comment what to 10 mo FIRM A-SA2104 0.2 PAny 28. Gez 152 SOFT 03 Crey Film 04 sie 0.5 Such confined of the stall program. Crey PArmiss \$ 19 And STIFE 0.4-STIFF 2 soufles 0-0.5 0.5-0.95 E04 095

CLIEN PROJ AREA	IT: ECT: :	Arup/BMT WBM Cairns ShippingDevelopr	ment Pro	ject	DAT COF LOC	E: / Q Oct RING METHOD: CATION:	ober 2013 08 P/570N
Hydrous	SED BY: s Layer:	S.Taylor	Subsur	face se	COF ediments:	RE LENGTH (m):	0.70
	Ø	Ola Brown	-			huse	-
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Co	mments
	1.		FIRM	ĩ	1	Cress	
	1 1 1	(Sandy) Mund	FILM		A	Sund con fie dell f	hoved of
			FIRM		4	loney	
		10 12 10 1			12		
		(moy) mud	FIRM		A	(also	
.5-	1 1 1.1.2	Conety Andy med 0.5-0.6	Film		A Pri	or Grand rize	d alots
	1.1.1.1		FILM		1111	hey	
		1204 070m					
						Very goo very fin stiff mate	d core refused
					-	2 mayles	0-05

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG C22 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM 19 October 201309- 30 DATE: CLIENT: CORING METHOD: PISTON PROJECT: Cairns ShippingDevelopment Project LOCATION: AREA: WD = 10.9 LOGGED BY: S.Taylor CORE LENGTH (m): 1.10-Hydrous Layer: B Subsurface sediments: Mud 0.02 m Description Field Records/Comments Subsampling Graphic Log Consistency <u></u> Colour Depth (Texture, colour/mottling, sand and gravel components mind. Silt B-OZ And ges Monie wind And ges 04 0.5 FIRE Ø. 6 Munine, fentereles 8 Ċ Mud. NET SAMPLED 0 E04 110-

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG C29 ASSESSMENT Sheet 1 of 1 October 2013 /0:30 19 Arup/BMT WBM DATE: CLIENT: PISTON **Cairns ShippingDevelopment Project** CORING METHOD: PROJECT: AREA: LOCATION: WD= 10.2 LOGGED BY: S.Taylor CORE LENGTH (m): 1.07 Hydrous Layer: 0.4m Subsurface sediments: B M Description Field Records/Comments Graphic Log Subsampling Consistency Depth (m) Colour Texture, colour/mottling, sand and gravel components 10.0 FIRM Crez . 62 SOFA Mind 0.4 0.5 06 FIRE 0.6 0.8 Dig 0-8 STIFF NOT SAMPLAA Ø entele 0 Roy 1:07m •1 2 martle 0-0:5 0.5-08

GE	DCHE	MICAL SEDI	VIENT	CO	RELC	DG	Core ID/No: B25
CLIEN PROJE AREA: LOGG	T: ECT: ED BY: Layer:	Arup/BMT WBM Cairns ShippingDevelopme S.Taylor	D · S	ject	DA CC LC CC ediments	ATE: / 9 Octo DRING METHOD: DCATION: DRE LENGTH (m):	ober 2013 09:45 アリックシン
Depth (m)	Graphic Log	Description Texture, colour/motiling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Co	mments
U.)-	1. 1. 1. 1. 1.	Mud ty said	Soft-		1 ANIN	Part .	yez
02	X	CLAY	STIFE		11/11	-0.2 Oronge	
					and an all and a set of a set		



CLIEN	T: ECT:	Arup/BMT WBM Cairns ShippingDevelopm	Sheet 1 ent Proj	ect		G October 2013 15 DD: PISTON
LOGG	ED BY:	S.Taylor WD =	9-6		CORE LENGTH	(m): 1.20m
Hydrous	Layer:	104 Brown	Subsurfa	ace sec	diments:	
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Build Reco	ords/Comments
		+ - MWD	Yor.	- 1	-1-	shown
0.2-	1. 1. B		Socr			e organe det
• t •	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	mad				Gez, nome
0.6-	1 1 5 6 1		Sore			ferneris
0.8-	1 1 1	much	Gue		A	Cay
1.0	1. 1		20 F]		4	
14	1 1 1	Arnol	FIFM		Not	SAMPLAD
1.2	(x			-		
and a star					200	~ 015 1.0

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG C99 ASSESSMENTS Sheet 1 of 1 19 October 2013 15:30 Arup/BMT WBM CLIENT: DATE: CORING METHOD: PISTON PROJECT: **Cairns ShippingDevelopment Project** AREA: LOCATION: WD = 9.7 LOGGED BY: S.Taylor CORE LENGTH (m): 1.20. Hydrous Layer. Subsurface sediments: Mud Ment , angonic Del. 0.03. Description Field Records/Comments Graphic Log Subsampling Consistency Depth (m) Colour Texture, colour/mottling, sand and gravel components angen en ve Sull Brown The Light of 224 02. Soll 0.4 0.5 06 Kin mit, dark let exille Must 0.8. Ó 8 Friend NOT SAMPLED Ind 0 Stilf NOT SAMPLED 1.1. mind how Lut C. 1.2 EOH 1.20m 2 SAMPLES 0-05 0.5-0.8

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG ASSESSMENTS C121 Sheet 1 of 1 October 2013 /6:00 CLIENT: Arup/BMT WBM DATE: 19 **Cairns ShippingDevelopment Project** PROJECT: PISTON CORING METHOD: AREA: LOCATION: WD=10.4 LOGGED BY: S.Taylor CORE LENGTH (m): 1.06 Hydrous Layer: Subsurface sediments: mul hon und Description Field Records/Comments Graphic Log Subsampling Depth (m) Consistency Colour Texture, colour/mottling, sand and gravel components Bron Mugh har gos tright ses ment 0 2-04 05 Light gos with 0.6-0.8-NOT SAMPERD But 1 1.06- EOH 1.0 STIFF WXI 12 2 mples 0 - 0.5 05-08

GE	SSESSA	MICAL SED	IMENT	CO	REL	OG	F156		
ROJ	IT: ECT: : SED BY: s Laver	Arup/BMT WBM Cairns ShippingDevelopn S.Taylor	nent Pro	Sheet 1 of 1 1 / 3 6 DATE: / 9 October 2013 nt Project CORING METHOD: LOCATION: 1 Deft (m): 0 - 05					
yurous	s cayer.		Subsu	lace s	eumen	15.			
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Calour	Subsampling	Field Records/Co	mments		
0:0.	000000000	(Sundy, muddy) GRAVice		1	1/1/1/	verthed Al schooden, in racks, in said (e mot m <10%)		
0.10-		E04 005				S /	Lil		
						Cove atte	to to		
			-			collect gr Some ung orange	ntill day		
						monda	growed		
1									
les and									

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG 8108 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM CLIENT: DATE: October 2013 08:// 20 PISTON PROJECT: **Cairns ShippingDevelopment Project** CORING METHOD: AREA: LOCATION: WD 11.1m LOGGED BY: S.Taylor CORE LENGTH (m): 1-20-Hydrous Layer: Subsurface sediments: 0-0.4 Description Field Records/Comments Bo-1 Consistency Subsampling Depth (m) Colour Graphic I Texture, colour/mottling, sand and gravel components gens Ste 5.2 alle . Fim Amonic putile gnic instand, the 04 In 0.5 0.6 0.02 Venilles 0.6 - 0.9m har gez 6.6 Frie 10.02 1-0 ō. have grey Mud in 1.1 1.2 E04 120 3 roufles 0-0.5 0.5-1.0 1.0 - 1.20 milliple core attempts

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG 650 ASSESSMENTS Sheet 1 of 1 CLIENT: Arup/BMT WBM October 2013 09 :4 DATE: 20 PROJECT: Cairns ShippingDevelopment Project PISTON CORING METHOD: AREA: LOCATION: WD = 10.7 CORE LENGTH (m): 1-30. LOGGED BY: S.Taylor Hydrous Layer: Subsurface sediments: 0.05 Brown Kyllions Description Field Records/Comments Subsampling Consistency Graphic Log Ê Colour my Depth (Texture, colour/mottling, sand and gravel components VSoft Bron 5.05 Sult get ge Musl of 0.2 STATA wer 20.02 And and and 0.4 0.5 Soft gues 0.6-Mid Sidty - fine roomd Sull - 8ь hit years the and geer/gers 0 F. 1.2 NOT SAMPLED E04 1:30m 1.4. 3 Saufles 0-0.5 0.5 - 1.00 1.00 - 1.20

GEOCHEMICAL Core ID/No: SEDIMENT CORE LOG C53 ASSESSMENTS Sheet 1 of 1 October 2013 (0:(0 CLIENT: Arup/BMT WBM DATE: 20 **Cairns ShippingDevelopment Project** PROJECT: CORING METHOD: AREA: LOCATION: WA=10.9 LOGGED BY: S.Taylor CORE LENGTH (m): 1.10 Hydrous Layer: 0.08 mond Subsurface sediments: nul Description Field Records/Comments Graphic Log Subsampling Consistency Ê Colour Depth (Texture, colour/mottling, sand and gravel components Man v. Sola ß Soft 02 Light gen hil mand Solt 6.4 05 Soft hight very morrise, festules mad nil sand 0.6. Soft 0.8. Mind wit mid 0.9 NOT SAMPLES 1.02 Kin E04 1.10m 1.2 2 SAMPLKS 0-0.5 0.5-0.9

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG B54 ASSESSMENTS Sheet 1 of 1 20 October 2013 /0:30 CLIENT: Arup/BMT WBM DATE: PISTON PROJECT: **Cairns ShippingDevelopment Project** CORING METHOD: AREA: LOCATION: WD=11.2 110 LOGGED BY: S.Taylor CORE LENGTH (m): Hydrous Layer: Subsurface sediments: 0.1~ Description Field Records/Comments Subsampling Graphic Log Consistency Ê Colour Depth Texture, colour/mottling, sand and gravel components Bron bythous Light ses Fift Mud Suff 02 Sup 04 0.5 mp 0-6mul Soff. OK But grey Almdant verida .0 1-0 timp ROY 1.10m 3 Smifles 0-05 05-10 1.0 - 110 QAac 2 = B54 0-05

ASSESS	MICAL SEDI	MENT	COP	KE L	UG	4160			
ASSESS	ober 2013 /6 + c r								
PROJECT: Cairns ShippingDevelopme			nt Project CORING METHOD: PISTO. LOCATION:						
LOGGED BY	: S.Taylor WP =	10.1		C	ORE LENGTH (m):	0.04			
lydrous Layer:		Subsur	tace se	eaimen	its:				
	Description	-	-	D	Field Records/Co	mments			
Depth (m) Graphic Log	Texture, colour/mottling, sand and gravel components	Consistenc	Colour	Subsamplin					
0°	5 Sonty ginel	SOM			horrs restlet	more seeks			
XX	CLAY	- U. 4420	-	-	Yellow				
0.05	E04 0.04			1					
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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG ASSESSMENTS K167 Sheet 1 of 1 20 October 2013 /6:21 CLIENT: Arup/BMT WBM DATE: PROJECT: Cairns ShippingDevelopment Project CORING METHOD: AREA: LOCATION: WD = 8.8 LOGGED BY: S.Taylor 0.25 CORE LENGTH (m): Subsurface sediments: Hydrous Layer. Field Records/Comments Description Subsampling Consistency Graphic Log Ē Colour Depth Texture, colour/mottling, sand and gravel components Shells and muth with, 0.00 ty, malon Film 91 FIRM orconiand and 0.1 CLAYEY prices SILT PIECKS OF BARK OF LOODS SILTY 70 0.00m conc. STIFF 0.2 LAY FOY 0.25m 0.3 Suffed 0-025m 12), ¥ 4

ASSESSIV	1EN1	Sheet	1 of 1	P		1180
CLIENT: PROJECT: AREA: LOGGED BY:	Arup/BMT WBM Cairns ShippingDevelopme S.Taylor	ent Pro	ject	D. Ci Li Ci	ATE: 210 ORING METHOD: OCATION: ORE LENGTH (m):	ctober 2013 10.15
ydrous Layer:		Subsur	face se	ediment	ts:	
Depth (m) Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/C	omments
2000 2000 2000	CLAY FRACMANTS	STIFF			Some two fellow/ang	e and green
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GEOCHE	MICAL SEDIN	IENT	COF	RELC	G	Core ID/No:
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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG ASSESSMENTS 1167 Sheet 1 of 1 7/ October 2013 0 9 . . . Arup/BMT WBM DATE: CLIENT: PROJECT: Cairns ShippingDevelopment Project CORING METHOD: LOCATION: AREA: WP = 112 LOGGED BY: S.Taylor CORE LENGTH (m): 0-20. Subsurface sediments: Hydrous Layer: Description Field Records/Comments Subsampling Graphic Log Consistency Ē Colour Depth (Texture, colour/mottling, sand and gravel components o - c. o/~ Mud diss of it Block, more 0-1 00 0.2 Deflicte ad reference toloritany samples QAQC 3

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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG 61 185 ASSESSMENTS Sheet 1 of 1_ Arup/BMT WBM DATE: 2 October 2013 14:50 CLIENT: CORING METHOD: U. BROCORK PROJECT: Cairns ShippingDevelopment Project LOCATION: AREA: WD = 6.6 2.9 LOGGED BY: S.Taylor CORE LENGTH (m): Subsurface sediments: Hydrous Layer: Field Records/Comments Description Subsampling Graphic Log Consistency Depth (m) Colour Texture, colour/mottling, sand and gravel components Greek 0. 02-0. 22 25 4 C Ein 0.5 0.51 0.6 Fr Sull QAQC4 =0-25 QAQC5-0.5-1: 10 U 4 1-2 pri-CA/ 1.4 Souflis 1.5 (Sulty day - 0.5 Shil 1.0 -15 15-20 20-25 25-29

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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG B41 ASSESSMENTS Sheet 1 of 1 27 October 2013 08:15 Arup/BMT WBM DATE: CLIENT: PROJECT: Cairns ShippingDevelopment Project CORING METHOD: AREA: LOCATION: WD = 10.4 1.40m LOGGED BY: S.Taylor CORE LENGTH (m): Subsurface sediments: Hydrous Layer: Kylows, know Mul Field Records/Comments Description Graphic Log Consistency Subsampling Ē Colour Depth (Texture, colour/mottling, sand and gravel components Visit onir, hom. Gen Rund Sup 0.2 0.0 Mid mid 0.5 Sup 0.6 Dur gez 08 NOT SAMPLES 0. Sup Mind mind 1.2 14 1204 1.4-TRIPCICATE LOCATION BGI QAQC6 = B41 0-0.5 QAQL7 = B4 0.5-0.4 B414 B414 B41B



Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG ASSESSMENT 127 Sheet 1 of 1 October 2013 09 50 DATE: 27 Arup/BMT WBM CLIENT: Viliscore CORING METHOD: PROJECT: Cairns ShippingDevelopment Project within Such LOCATION: AREA: 1.700 WD = 9.7m LOGGED BY: S.Taylor CORE LENGTH (m): Subsurface sediments: Hydrous Layer: Field Records/Comments Description Subsampling Graphic Log Consistency E Colour Depth Texture, colour/mottling, sand and gravel components Su 2 med SulA 015 02 Fin still 0.4 0.5 0 6 Stall 0-6-G 1.0 Sul 2 1.4: Pale yes 0 1.6. Eur 1.7 m -10 1.0 -17

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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG ASSESSMENT 169 Sheet 1 of 1 DATE: October 2013 Arup/BMT WBM 3 14:46 CLIENT: **Cairns ShippingDevelopment Project** CORING METHOD: PROJECT: LOCATION: AREA: WD = 4.6m 1.02 CORE LENGTH (m): LOGGED BY: S.Taylor Subsurface sediments: Hydrous Layer: Description Field Records/Comments Subsampling Boy Consistency Ê Colour Graphic L Texture, colour/mottling, sand and Depth gravel components and della al A Sondy groved 5 hut gez Ant gez Pale gez to gez. 02 ty 0.4 06 Stl 0.8-1204 1.02 m

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG I 172 ASSESSMENTS Sheet 1 of 1 2 3 October 2013 /6:00 DATE: CLIENT: Arup/BMT WBM CORING METHOD: **Cairns ShippingDevelopment Project** PROJECT: LOCATION: 370103 | 81279 04 AREA: WD =10.3 CORE LENGTH (m): LOGGED BY: S.Taylor 1.06 -Subsurface sediments: Hydrous Laver: Field Records/Comments Description Subsampling Consistency Graphic Log Depth (m) Colour Texture, colour/mottling, sand and gravel components Sift hund Black 02 in 64 Bland Soft 0.6 Much Sull Bh 0.5. WET SAMPLED & 1.0 sil XXXX CLA E04 1.06m 2 NEU ADDITIONAL SAMPLINC LOCATION.





Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG BIOF ASSESSMENTS Sheet 1 of 1 20 October 2013 09:00 DATE: CLIENT: Arup/BMT WBM piston Cairns ShippingDevelopment Project CORING METHOD: PROJECT: LOCATION: AREA: 0.95 11.3 CORE LENGTH (m): LOGGED BY: S.Taylor Subsurface sediments: Hydrous Layer: Field Records/Comments Description Subsampling Consistency Graphic Log Depth (m) Colour Texture, colour/mottling, sand and gravel components Glebs and rock forgenets Gerry 30 0.00 silf 0.05 South putel Much to much 62-Soft 0.4 Ceny Nund Sulf 0.5 0-6 Much 0.8 Tin Dar gen EOH 0.95m ۰Ö miltifle core attempts 2 somples 0-0.5 0.5-0.95

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Appendix D Core Logs – Supplementary SAP

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18-540	ROY 1.6m	still	4	3 mills 0-015

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ASSESS	MENTS	Sheet	1 of 1			- 119
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ASSESSI	MENTS	Sheet	Lof 1	00	C12]
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iyarous	Layer.		Jubau	1000 30	Junionio.		
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escription Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Con	iments
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GE	DCHE	MICAL SEDI	MENT	CO	RELO	DG	GISS
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lydrous	Layer:	All and a second second	Subsu	face s	ediments	52	
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/C	comments.
	X	Sets day	V.		1.1.1	age as	y of med
						Suffe (did int infiil	0.05 include and)

Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG 167 ASSESSMENTS Sheet 1 of 1 1 May 2014 DATE: Arup/BMT WBM CLIENT: + PISTON T GRAB PROJECT: Cairns ShippingDevelopment Project CORING METHOD: LOCATION: AREA: 0.11 LOGGED BY: S.Taylor CORE LENGTH (m): Subsurface sediments: Hydrous Layer: Field Records/Comments Description Graphic Log Consistency Subsampling Ē Colour Depth (Texture, colour/mottling, sand and gravel components Block, anonic Brown spind lye mend Sull moderated and the moderated sitty day Dringe pute que St/1 E04 0.11 clas mille 0.05 -0.11 book soufle 0-001 hon much our ronder pelite Much sonfle 0.01-0.08 th n QARCG 0-0.08 = 0-0.08 (gut)

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drous	Layer:	3.Taylor	Subsur	face se	dimente	s:	0.03
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drous Layer:		Subsur	face se	diments	4	
Depth (m) Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colaur	Subsampling	Field Records/Co	omments
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CLIEN	5E33/V	Arup/BMT WBM	Sheet	1 of 1	DA	TE: 4 May 2014					
PROJE	CT:	Cairns ShippingDevelopm	ent Project CORING METHOD:								
LOGG	ED BY:	S.Taylor			co	RE LENGTH (m): 1-10 m					
Hydrous	Layer:		Subsur	face se	ediments	6					
Depth (m)	Graphic Log	Description Texture, colour/mottling, sand and gravel components	Consistency	Colour	Subsampling	Field Records/Comments					
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Core ID/No: GEOCHEMICAL SEDIMENT CORE LOG 180 ASSESSMENTS Sheet 1 of 1 Arup/BMT WBM CLIENT: DATE: 9- May 2014 PROJECT: Cairns ShippingDevelopment Project CORING METHOD: LOCATION: AREA: CORE LENGTH (m): LOGGED BY: S.Taylor 0-12 Hydrous Layer: Subsurface sediments: Field Records/Comments Description Subsampling Graphic Log Consistency Depth (m) Colour Texture, colour/mottling, sand and gravel components 3 AA Nel S. Delites 0.0 silt se/pole 0.06 0.06 Silf. 1204 D.12 Cart one safle monce



APPENDIX B

Appendix B1- Golder 2016 Boreholes Appendix B2 – Golder 2016 Grab Sampling



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH1

CHAINAGE: 14435.0 m OFFSET: -85.8 m COORDS: 370622.9 m E 8129970.7 m N MGA94 56 SURFACE RL: -6.37 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 4.45 m

			Dril	ling		Sampling			Field Material Desc	riptio	on		
	METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
		L		0 1 	-6.37 0.20 -6.57 0.60 -6.97	BH1-001 DS 0.00-0.30 m BH1-002 U75 1.00-1.45 m PP=440,450,480kPa Sv=139kPa		CH	Silty CLAY high plasticity, pale orange brown and grey, trace organics in surfaced layer grey with pale orange brown becoming yellow brown with grey, trace fine to medium grained sand	í	St VSt		- - -
	WB			2	<u>1.80</u> -8.17 <u>2.30</u> -8.67	BH1-003 U75 2.50-2.95 m PP=330,350,320kPa Sv=95kPa		 SP 	Silty SAND fine to coarse grained, pale brown and pale grey becoming pale grey, fine grained sand, with stiff silty CLAY pockets		L - MD		-
		М		3 - - 4	-9.37	BH1-004 U75 4.00-4.43 m PP=320,300,250kPa		CH	Silty CLAY high plasticity, pale grey with pale brown		St		-
2016 17:53 8.30.004 Datgel Tools				5	-10.82	3v=9/kPa HV s _v =74 kPa s _i =27 kPa			END OF BOREHOLE @ 4.45 m				
CH LOGS.GPJ < <drawingfile>> 01/09/2</drawingfile>				6 - 7 - -									-
CORED FULL PAGE 1546223 GEOTEC				8									- - - -
GAP 8_10.0LIB.GLB Log GAP NON-(- - - 10	T geot	his report of borehole echnical purposes only information only	must be /, withou nd do no	read i it atter ot nece	n conjunction with accompanying notes and abbreviations. npt to assess possible contamination. Any references to po essarily indicate the presence or absence of soil or groundw	It has tentia	s been Il cont contar	n prepared for tamination are for nination. GAP gINT FN. F01 RL	a.3
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LOCATION: Trinity Inlet, Cairns

1546223

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH2

CHAINAGE: 15536.0 m OFFSET: -57.6 m COORDS: 371145.7 m E 8130959.9 m N MGA94 56 SURFACE RL: -8.07 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 2.50 m

			Dril	ling		Sampling				Field Material Descript	tion	
	METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
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				-				×				
				-	1.00			×				-
	⊢│			1	-9.07					trace shells		-
	-	L		-				<u>×</u> ×			ľ	
				-		BH2-001 U75 1.50-2.00 m		× — —×				
				2—		Sv=15kPa		× —				
				-				×				
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B.GLB				- 10								
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AP 8					geot	information only a	y, w ind o	do not	nece	pt to assess possible contamination. Any references to potent ssarily indicate the presence or absence of soil or groundwater	conta	mination are for GAP gINT FN. F01a
U												NL5



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH3

CHAINAGE: 15872.0 m OFFSET: -46.7 m COORDS: 371319.0 m E 8131246.4 m N MGA94 56 SURFACE RL: -7.50 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 4.50 m

Drilling						Field Material Description							
	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
	PENETRATION RESISTANCE	WATER	HLdend D D	<u>DEPTH</u> -7.50 -11.20 -12.00	SAMPLE OR FIELD TEST BH3-001 U75 0.00-0.50 m PP=8,10,12kPa SV=12kPa BH3-002 U75 0.50-1.00 m PP=10,15,10kPa SV=11kPa BH3-003 U75 1.50-2.00 m PP=40,42,40kPa SV=23kPa BH3-006 U75 2.50-2.50 m PP=38,30,38kPa SV=18kPa BH3-006 U75 2.50-3.00 m PP=15,20,20kPa SV=19kPa BH3-007 U75 3.00-3.50 m PP=20,40,33kPa SV=17kPa BH3-008 U75 3.50-4.00 m PP=20,40,33kPa SV=83kPa			Employee	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	s Consistency	STRUCTURE AND ADDITIONAL OBSERVATIONS	
				T geot	his report of borehole echnical purposes only information only a	must t y, with nd do	be re out a not r	ad ir attem	n conjunction with accompanying notes and abbreviations. I pt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	t has entia iter c	s beer I cont ontar	n prepared for tamination are for mination. GAP gINT FN. F0 F)1a RL3
				Alticity Haddon Alticity I Alticity I I I	Altic Signed Line DEPTH Image: Signed Line Image: Signed Line Image: Signe Line Image: Signe Line	SAMPLE OR FIELD TEST FIELD TEST DEPTH PP=8, 10, 12kPa SV=12kPa BH3-002 U75 0.00-10 m PP=8, 10, 12kPa SV=11kPa BH3-003 U75 1.00-15 0 m PP=20, 15, 20kPa SV=11kPa BH3-003 U75 1.00-15 0 m PP=20, 15, 20kPa SV=11kPa BH3-005 U75 1.50-20 m PP=30, 30, 38kPa SV=11kPa BH3-005 U75 2.50-3.00 m PP=30, 30, 38kPa SV=19kPa BH3-005 U75 3.00-350 m PP=30, 30, 300 M DY5 3.00-350 m PP=20, 40, 33kPa SV=19kPa BH3-006 U75 3.00-30, 00, 400 kPa SV=19kPa BH3-007 U75 3.00-30, 00, 400 m PP=30, 03, 30, 40 m PP=30, 03, 30, 40 m PP=40, 12, 12, 10 m PP=40,	21 21 <td< td=""><td>21 × 53 × 1 Field TEST 0 -7.50 91 × 53 × 0 -7.50 BH3-001 × × 91 × 53 × 0 -7.50 BH3-001 × × × 91 × 53 × 0 -7.50 BH3-001 × × × × 91 × 50.50-100 m ×<td>1 T 1 0 -7.50 BH3-001 0 -7.50 BH3-002 0 -7.50 BH3-005 0 -7.50 BH3-005 0 -7.50 BH3-005 0 -7.50 Ser-16NPa -7.50 Se</td><td>Sector and the sector of boother must be read in conjunction with accompanying notes and abbreviators I. 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LOCATION: Trinity Inlet, Cairns

1546223

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH5

CHAINAGE: 17864.0 m OFFSET: -44.7 m COORDS: 372289.7 m E 8132985.9 m N MGA94 56 SURFACE RL: -1.65 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 7.25 m

SHEET: 1 OF 1 DRILL RIG: Han Jin D & B CONTRACTOR: Geo Investigate DATE: 10/8/16 LOGGED: GZL DATE: 16/8/16 CHECKED: MSC

	Drilling					Sampling	Field Material Description					
	METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
0.0LB.GLB Log GAP NON-CORED FULL PAGE 1546223 GEOTECH LOGS/GPJ < <drawingfile>> 01/09/2016 17:53 8.30.004 Datgei Tools</drawingfile>	Id				-8.90	U75 3.00-3.45 m PP=5.7.10kPa Sv=7kPa			Silly CLAY high plasticity, grey, trace fine grained sand and shells		vs vs	n prepared for
GAP 8_					geot	information only and	do not	nece	אין ויס assess possible contamination. Any references to pol ssarily indicate the presence or absence of soil or groundwa	ater o	ai con contai	mination. GAP gINT FN. F01a RL3



LOCATION: Trinity Inlet, Cairns

1546223

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH7

CHAINAGE: 19894.0 m OFFSET: -53.5 m COORDS: 372826.8 m E 8133968.5 m N MGA94 56 SURFACE RL: -3.14 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 7.20 m





LOCATION: Trinity Inlet, Cairns

1546223

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH8

CHAINAGE: 19435.0 m OFFSET: -52.6 m COORDS: 373046.9 m E 8134361.9 m N MGA94 56 SURFACE RL: -3.43 m DATUM: LAT INCLINATION: -90° HOLE DEPTH: 9.45 m





1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH1A

COORDS: 370622.9 m E 8129970.7 m N MGA94 56 SURFACE RL: -6.44 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 4.45 m

	Drilling			ling		Sampling	Field Material Description					n	
UCHTION .	DENETRATION	RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
		L		0 1 	-6.44 0.20 -6.64 0.60 -7.04	0.00-0.25 m		* × × × × × × × × ×	СН	Silty CLAY high plasticity, pale orange brown and grey, trace organics in surfaced layer/ grey with pale orange brown becoming yellow brown with grey, trace fine to medium grained sand		St VSt	
aw.				2	-8.24 2.30 -8.74	2.70-2.95 m		* * * * * *	SP	Silty SAND fine to coarse grained, pale brown and pale grey becoming pale grey, fine grained sand, with stiff silty CLAY pockets		L - MD	
		м		3	<u>3.00</u> -9.44				СН	Silty CLAY high plasticity, pale grey with pale brown		St	-
.og GAP NON-CORED FULL PAGE 1546223 LOGS - ASS.GPJ < <drawingfile>> 16/08/2016 16:51 8.30.004 Datgel Tools</drawingfile>					-10.89					END OF BOREHOLE @ 4.45 m			
GAP 8_10.0 LIB.GLB				10	T geote	his report of borehole r echnical purposes only information only ar	mus /, wi nd c	st be re ithout a do not	ead ir atterr nece	n conjunction with accompanying notes and abbreviations. I pt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	t has entia iter c	beer I cont ontar	n prepared for tamination are for nination. GAP gINT FN. F01a RL3



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH2A

COORDS: 371145.7 m E 8130959.9 m N MGA94 56 SURFACE RL: -7.92 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 2.50 m

		Dri	liing		Sampling				Field Material Desc	riptio	on	
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			-0	-7.92	0.00-0.25 m	·× -	(CH	Silty CLAY			
			-				-×		high plasticity, grey, trace organics			
			-	-	0.25-0.50 m	×	_					
			-	-	0.50-0.75 m							
			-	-	0.75-1.00 m		 _×					
			1—	1.00	1.00.1.25 m	. .				-		
⊢			-	-6.92	1.00-1.25 m		_×_		trace shells			
۵			-	-	1.25-1.50 m	<u> </u>	×				8	
			-	-	1.50-1.75 m	× -						
			-	-	1.75-2.00 m		_×					
			2—	-	0.00.0.05 m	×	-×					
			-	-	2.00-2.25 11	×						
			-	-	2.25-2.50 m		×					
			-	-10.42		-×			END OF BOREHOLE @ 2.50 m	К		
			-	-								
			3 —	-							Y -	
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			-	-								
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			4 —	-								-
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5			-									
0.05.5			-	-								
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07/90			-									
101			-	-								
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Buiwa			-									
No.			7 —									-
2			-									
1001			-	-								
- 25			-									
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77040			8-									-
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Т. Ч			-	1								
r z			9—									
2 Z												
PD D												
r n												
8.GL			10-									
0.0 L1				Т	his report of borehole r	nust be	e rea	ad ir	n conjunction with accompanying notes and abbreviations.	lt ha	s bee	n prepared for
π α				geot	echnical purposes only	, witho	ut at	ttem	not to assess possible contamination. Any references to pol	entia	al con	tamination are for mination GAP gINT FN. F01a
₹5					internation only al	iu uu fi		508	שמווע אינועמנב גוב איבשבוועב טו מטשבוועב טו געוו טו U U UIUUW	101	Jointd	RLS



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH3A

COORDS: 371319.0 m E 8131246.4 m N MGA94 56 SURFACE RL: -7.48 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 4.50 m

	Drilling					Sampling	Field Material Description						
МЕТНОП	PENETRATION	RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
L PAGE 1546223 LOGS - ASS.GPJ < <drawingfile>> 16/08/2016 16:51 8.30.004 Datgel Tools</drawingfile>			WATER	HLGO HLGO - - - - - - - - - - - - -	DEPTH RL -7.48 -11.18 -11.98	SAMPLE OR FIELD TEST 0.25-0.50 m 0.25-0.50 m 0.50-0.75 m 0.75-1.00 m 1.00-1.25 m 1.25-1.50 m 1.25-1.50 m 2.50-2.75 m 2.50-2.75 m 2.50-2.75 m 3.00-3.25 m 3.25-3.50 m 3.75-4.00 m 4.00-4.25 m		TO ROCE SAMBOL	SOIL/ROCK MATERIAL DESCRIPTION		S F - S CONSISTENCY S DENSITY	STRUCTURE AND OBSERVATIONS	
0.0 LIB.GLB Log GAP NON-CORED FUL				9 - - 10	T	his report of borehole m	ust be r	ead ii	n conjunction with accompanying notes and abbreviations.	thas	sbeer	-	
GAP 8_1(geot	echnical purposes only, information only and	without I do not	atten nece	npt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	entia iter c	l cont ontar	amination are for nination. GAP gINT FN. F01a RL3	



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH5A

COORDS: 3728973.0 m E 8132985.9 m N MGA94 56 SURFACE RL: -1.65 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 7.25 m

			Drii	ling		Sampling			Field Material Desci	iptio	on	
	MEIHOU	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
CORED FULL PAGE 1546223 LOGS - ASS.GPJ < <drawingfile>> 16/08/2016 16:51 8.30.004 Datgel Tools</drawingfile>		PENETRATION RESISTANCE RESISTANCE	WATER	HL4 1	<u>DEPTH</u> -1.65	SAMPLE OR FIELD TEST Instant 0.000-025 m 0.25-0.50 m 0.50-0.75 m 0.75-1.00 m 1.00-1.25 m 1.125-1.50 m 1.25-1.50 m 1.25-1.50 m 1.25-1.50 m 1.50-1.75 m 1.25-2.00 m 2.00-2.25 m 2.50-2.75 m 2.50-2.75 m 1.25-3.50 m 3.00-3.25 m 3.50-3.75 m 3.50-3.75 m 3.75-4.00 m 4.00-4.25 m 4.25-4.50 m 4.25-4.50 m 5.00-5.25 m 5.50-5.75 m 5.00-5.25 m 5.50-5.75 m 5.50-5.75 m 5.50-5.75 m 6.25-6.50 m 6.25-6.50 m 6.25-6.50 m 6.25-6.50 m 6.25-6.50 m		H USCS SYMBO	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	s SA	STRUCTURE AND ADDITIONAL OBSERVATIONS
GAP 8_10.0LIB.GLB Log GAP NON-C				- - - 10	T geot	his report of borehole m echnical purposes only, information only and	ust be re without I do not	ead ii atten nece	n conjunction with accompanying notes and abbreviations. I npt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	t has entia	s bee Il con contar	n prepared for tamination are for mination. GAP gINT FN. F01a RL3



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH7A

COORDS: 372826.8 m E 8133968.5 m N MGA94 56 SURFACE RL: -3.14 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 7.20 m

	Drilling			Sampling			Field Material Desc	riptio	on			
		RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
F				0	-3.14	0.00-0.25 m	× —	СН	Silty CLAY			
				_		0.25-0.50 m	—_> 		high plasticity, grey, trace shells			
				-		0.50-0.75 m						
				-		0.75-1.00 m	<u> </u>					
				1 —		1.00-1.25 m	×					-
				_		1.25-1.50 m	×					
				-		1.50-1.75 m						-
				-		1.75-2.00 m	/					-
				2		2.00-2.25 m	— 					
				-		2.25-2.50 m	>					-
				-		2.50-2.75 m	$\stackrel{\sim}{\longrightarrow}$			К		-
				-		2.75-3.00 m	<u> </u>					-
				3		3.00-3.25 m	_×					-
				-		3.25-3.50 m	* —					-
ż		L		-		3.50-3.75 m	×				VS	-
				4		3.75-4.00 m	×					-
				-		4.00-4.25 m	×					-
				-		4.25-4.50 m	$\hat{-}$					
				_		4.50-4.75 m	<u>×</u>					
Tools				5—		4.75-5.00 m	<u> </u>					-
Datgel				-		5.25-5.50 m	× —					
0.004				-		5.50-5.75 m	×					-
1 8.30				-		5.75-6.00 m	×					
16 16:5				6 —		6.00-6.25 m						-
/08/20				-		6.25-6.50 m						-
>> 16				-		6.50-6.75 m	××					-
vingFile				-		6.75-7.00 m	<u>*</u> — ×					
< <drav< td=""><td></td><td></td><td></td><td>7 —</td><td></td><td>7.00-7.20 m</td><td>× —,</td><td></td><td></td><td></td><td></td><td>-</td></drav<>				7 —		7.00-7.20 m	× —,					-
GPJ		_			-10.34				END OF BOREHOLE @ 7.20 m			
s-ASS				-								
3 LOG				-								-
54622				8—								-
AGE 1				_								
ULL P.				-								
RED F				-								-
ON-CO				9								-
SAP N(-								.
, Log				-								.
B.GLB				- 10 —								
10.0 LI					T	his report of borehole mu	ust be n	ead in	n conjunction with accompanying notes and abbreviations.	It ha	s bee	n prepared for
SAP 8					geot	information only and	do not	nece	ssarily indicate the presence or absence of soil or groundwa	ater o	contar	mination. GAP gINT FN. F01a
~												TLU TIL



1546223

LOCATION: Trinity Inlet, Cairns

JOB NO:

PRELIMINARY REPORT OF BOREHOLE: BH8A

COORDS: 373046.9 m E 8134361.9 m N MGA94 56 SURFACE RL: -3.43 m DATUM: CD INCLINATION: -90° HOLE DEPTH: 9.45 m

	Drilling			Sampling			Field Material Desc	riptio	on		
METHOD	PENETRATION	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0	-3.43	0.00-0.25 m	× —	СН	Silty CLAY			
			-		0.25-0.50 m	—; ;	4	high plasticity, grey, trace shells and fine grakined sand			
			-		0.50-0.75 m	<u>~</u> _;	<				
			_		0.75-1.00 m	<u>×</u>					
			1 —	-	1.00-1.25 m	~					-
			-		1.25 1.50 m	× 7	-				
			-		1.23-1.30 m		<				
			-		1.50-1.75 m	<u> </u>					
			2		1.75-2.00 m	× —	2				
			-	-	2.00-2.25 m	<u>×</u>					
			-	-	2.25-2.50 m	 *					
			-		2.50-2.75 m	— —;			K		
			-		2.75-3.00 m	<u>~</u>	<				
∣⊢			3	3.20	3.00-3.25 m	<u>× </u>	<				
Ē			-	-6.63	3.25-3.50 m	<u>*</u>		increasing content of shells		05	
			-		3.50-3.75 m	—_; ;					
			-		3.75-4.00 m	,	4				
			4		4.00-4.25 m	`	4				-
			_		4.25-4.50 m	×;					
			-		4.50-4.75 m	×					
s			-	-	4.75-5.00 m	^ 					
			5—	-	5.00-5.25 m	; ;	4				-
+ Lat			_		5.25-5.50 m	<u>^</u> ;	<				
-00.0c			-	5.50 -8.93	5.50-5.75 m	<u>×</u> ;	-	trace organics at 5.5 to 6.5m			
0			-	-	5.75-6.00 m	<u>*</u>					
			6 —		6.00-6.25 m	×					-
1000			-		6.25-6.50 m						
	-		-								-
- B			-			×;					
			7 —			×					-
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800			-			<u> </u>	<				
MB			8 —			<u> </u>				s	-
5					Ť	_×;	<				
			-			× —					
			_			<u>×</u>					
			9—		9.00-9.25 m	;	<				-
			-		9 25-9 45 m	\rightarrow	1				
5	-	$\left \right $	-	-12.88		×		END OF BOREHOLE @ 9.45 m	-	+	
E G			_								
			10 —								
10.01				T	his report of borehole n echnical purposes only	nust be r	ead i atten	n conjunction with accompanying notes and abbreviations. I	t has entia	s bee al con	n prepared for tamination are for
				3000	information only an	d do not	nece	essarily indicate the presence or absence of soil or groundwa	iter c	contai	mination. GAP gINT FN. F01a RL3
-											

Sampling SAMPLE OR FIELD TEST SAMPLE OR FIELD TEST SAMPLE OR FIELD TEST Sampling SAMPLE OR FIELD TEST Sampling SAMPLE OR FIELD TEST Sampling SAMPLE OR FIELD TEST Sampling	PIT DEPTH: 0 BUCKET TYPE	90 m E: Clam Shell Field Material Descript GOIL/ROCK MATERIAL DESCRIPTION Fise grained, grey, trace clay, with some shell trace organics w high plasticity, grey, trace organics (mangroves) & d fine to coarse grained sand lenses/seams <100mm M DISCONTINUED @ 0.90 m DEPTH		SV=6-5kPa
Sampling SAMPLE OR FIELD TEST Image: Constraint of the second seco	BUCKET TYPE	E: Clam Shell Field Material Descript GOIL/ROCK MATERIAL DESCRIPTION Segrained, grey, trace clay, with some shell trace organics high plasticity, grey, trace organics (mangroves) & d fine to coarse grained sand lenses/seams <100mm M DISCONTINUED @ 0.90 m DEPTH		CKED: DATE: STRUCTURE AND ADDITIONAL OBSERVATIONS SV=6-5kPa
Sampling SAMPLE OR FIELD TEST O H U U U U U U U U U U U U U U U U U U	SM Sitty SAND fine to coar fragments, CI- CH Sitty CLAY medium to interbedde thick	Field Material Description	W-W-W-W-W-W-W-W-W-W-W-W-W-W-W-W-W-W-W-	STRUCTURE AND ADDITIONAL OBSERVATIONS
3S1-A1 x 0.00-0.25 m x 3S1-A2 x 0.25-0.50 m x 3S1-A5 x 0.30-0.75 m x SS1-A3 x 0.50-0.75 m x SS1-A4 x 0.75-0.90 m x	SM Silty SAND fine to coar fragments, CH Silty CLAY CH medium to interbedde thick TEST PIT I TARGET D	Pise grained, grey, trace clay, with some shell trace organics v high plasticity, grey, trace organics (mangroves) & d fine to coarse grained sand lenses/seams <100mm M DISCONTINUED @ 0.90 m DEPTH	W VL	SV=6-5kPa
	TEST PIT [TARGET D	DISCONTINUED @ 0.90 m JEPTH		
	s report of test pit must be re inicial purposes only, without	s report of test pit must be read in conjunction nical purposes only, without attempt to assest	s report of test pit must be read in conjunction with accompanying notes and abbreviations. It h	s report of test pit must be read in conjunction with accompanying notes and abbreviations. It has beer nical purposes only, without attempt to assess possible contamination. Any references to potential cor information only and do not necessarily indicate the presence or absence of soil or groundwater conta

	(G	olde	er				PRELIMINARY REPO	R	ГО	F TEST PIT: GS	2
	CL	LIENT	Г:	Ass Flanag	OCI an Con	ates sulting Group			CO SUI	ORDS: 370079.3 m E 8127780.4 m N MGA94 56 RFACE RL: -9.18 m DATUM: AHD		Shee Maci	ET: 1 OF 1 HINE: Hitachi CX500	
	PR LO JO	ROJE CAT	ECT: TON: D:	CSDP Cairns 15462	- Revise Shippin 23	ed EIS Ig Channel			PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell		CON ^T LOGO	TRACTOR: Ports North GED: JJP DATE: 19/8/1 CKED: DATE:	6
F			Even	votion		Compling				Field Motorial Doo	orinti	0.0	-	
	METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	<i>DEPTH</i> RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION			STRUCTURE AND ADDITIONAL OBSERVATIONS	
	EX	L		0.0 - - 0.5 - -	-9.18	GS-10 0.00-0.45 m PP=0kPa GS-A1 0.00-0.25 m GS-A2 0.25-0.50 m GS-A3 0.50-0.90 m			CI- CH	Silty CLAY medium to high plasticity, dark grey, trace shells fragments and organics	w	VS	SV=0.3-0.6kPa	- - - - -
0.0 LB.GLB Log GAP NON-CORED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ < <drawingfile>> 24/08/2016 15:33 8.30.004 DatgelTools</drawingfile>					-10.08	This report of test pit r	mus	x t be re	and in	TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH	It has	been	prepared for	
GAP 8_10.0					geot	This report of test pit r echnical purposes onl information only a	nus ly, w and	t be re /ithout do not	ad in atten nece	conjunction with accompanying notes and abbreviations. npt to assess possible contamination. Any references to p assarily indicate the presence or absence of soil or groundy	It has otentia vater	been al con contar	prepared for tamination are for nination. GAP gINT FN	I. F01e RL3

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PROJECT: CSDP - Revised EIS

GAP 8_10.0 LIB.GLB Log GAP NON-CORED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ <<DrawingFile>> 24/08/2016 15:33 8.30.004 Datget Tools

CLIENT: Flanagan Consulting Group

PRELIMINARY REPORT OF TEST PIT: GS3

COORDS: 370502.5 m E 8128207.9 m N MGA94 56 SURFACE RL: -8.43 m DATUM: AHD

SHEET: 1 OF 1 MACHINE: Hitachi CX500 CONTRACTOR: Ports North DATE: 19/8/16

LC JC	CAT	ion: D:	Cairns 15462	Shippir 23	ng Channel	PIT DEPTH: 0.60 m BUCKET TYPE: Clam Shell					LOGGED: JJP DATE: 19/8/16 CHECKED: DATE:			
		Ivca	vation		Sampling				Field Material Desc	rintic	'n			
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
	L		0.0 - -	-8.43	GS3-A1 0.00-0.25 m GS3-T0 0.10-0.55 m		* * * * *	SM	Silty SAND fine to coarse grained, grey, trace clay, with some shell fragments, trace organics	w	VL		-	
Ä	м-н		-	-8.68	GS3-A2 0.25-0.50 m		*	CI- CH	Sitty CLAY medium to high plasticity, grey, trace organics (mangrove matter)	M -	s	PP=30-45kPa Sv=22kPa		
			0.5—	0.50 -8.93	GS3-A3 0.50-0.60 m		×		grey, pale brown		St - VSt	PP=90-110kPa Sv=>43kPa		
				-9.03					TEST PIT DISCONTINUED @ 0.60 m REFUSAL					
				geot	This report of test pit n echnical purposes only information only a	nust y, w nd o	t be rea ithout a do not	ad in atten nece	conjunction with accompanying notes and abbreviations. It npt to assess possible contamination. Any references to pot ssarily indicate the presence or absence of soil or groundwa	has entia ater c	been I cont ontan	prepared for amination are for nination. GAP gINT FN. FC)1e	

			G	olde	er				PRELIMINARY REPO	R1	ГО	F TEST PIT: GS4				
C	CLIEN	T:	Flanag	ocla gan Con	sulting Group			CO SUI	ORDS: 370421.4 m E 8128437.1 m N MGA94 56 RFACE RL: -9.05 m DATUM: AHD		SHEE	T: 1 OF 1 HINE: Hitachi CX500				
F	PROJI OCA OB N	ECT: FION: O:	CSDP Cairns 15462	- Revise Shippin 23	ed EIS Ig Channel			PIT BU(DEPTH: 0.50 m CKET TYPE: Clam Shell			IRACTOR: Ports North GED: JJP DATE: 19/8/16 CKED: DATE:				
F		Even	vation		Sampling		[Field Material Dec							
METHOD	EXCAVATION	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION			STRUCTURE AND ADDITIONAL OBSERVATIONS				
EX	L		0.0	-9.05 0.40 -9.45	DS1 0.00-0.40 m GS4-A1 0.00-0.40 m GS4-A2 0.40-0.50 m		× ×	SW SM	SAND fine to coarse grained, brown, with some shell fragments Silty SAND fine to coarse grained, grey, trace (CI-CH) clay, with some shell	w	VL					
				-9.55	GS4-DS2 0.40-0.50 m				fragments, trace organics (mangrove matter) TEST PIT DISCONTINUED @ 0.50 m EXCAVATION COLLAPSE				-			
			- - - 1.5	-									·			
/2016 15:33 8.30.004 Datgel Tools			- - 2.0— - -	-									· · · ·			
ITS.GPJ < <drawingfile>> 24/08</drawingfile>			- 2.5 — - -	-									- - -			
NGE 1546223 GEOTECH TEST F					\mathcal{S}								- - -			
SLB LOG GAP NON-CORED FULL PA													- - - -			
GAP 8_10.0 LIB.(<u> </u>	4.0-	geot	This report of test pit echnical purposes or information only	mus nly, w and o	t be re ithout do not	ad in atten	I conjunction with accompanying notes and abbreviations. I npt to assess possible contamination. Any references to po assarily indicate the presence or absence of soil or groundw	t has tentia ater o	been al cont contan	prepared for amination are for nination. GAP gINT FN. F0 R	1 1 2 1 2 1 3			

Cairns Shipping 1546223	g Channel Sampling SAMPLE OR FIELD TEST GS5-A1 0.00-0.20 m GS5-DS1 0.00-0.20 m GS5-A2 0.20-0.30 m GS5-BD 0.20-0.30 m		PIT BUC BUC NBOL NBOL SS NBOL	DEPTH: 0.30 m CKET TYPE: Clam Shell Field Material Desc SOIL/ROCK MATERIAL DESCRIPTION Silty SAND fine to coarse grained, grey, with some shell and coral fragments (40%), trace fine to medium grained gravel, deleteneous material (waste products) Silty CLAY orange brown and grey, trace fine to coarse grained sand and shell fragments TEST PIT DISCONTINUED @ 0.30 m REFUSAL		NOGC COHEC CONSISTENCY NO DENSITY NO NO DENSITY NO DENO	GED: JJP DATE: 19/8/16 CKED: DATE: STRUCTURE AND ADDITIONAL OBSERVATIONS SEDIMENT Inferred sediment deposit Sv=15-22kPa
ation <u>F (3)</u> <u>DEPTH</u> <u>DEPTH</u> <u>COD</u> -6.08 -6.28 -6.38 0.5 - - - - - - - - - - - - -	Sampling SAMPLE OR FIELD TEST Image: Constraint of the second seco		H H R R R R R R R R R R R R R R R R R R	Field Material Desc SOIL/ROCK MATERIAL DESCRIPTION Silty SAND fine to coarse grained, grey, with some shell and coral fragments (40%), trace fine to medium grained gravel, deleteneous material (waste products) Silty CLAY orange brown and grey, trace fine to coarse grained sand and shell fragments TEST PIT DISCONTINUED @ 0.30 m REFUSAL	MOISTURE MOISTURE	HIGH CONSISTENCY A CONST A CONSISTENCY A CON	STRUCTURE AND ADDITIONAL OBSERVATIONS
L (vi vi v	SAMPLE OR FIELD TEST	X X X X X X X X X X X X X X X X X X X	고고 800L	SOIL/ROCK MATERIAL DESCRIPTION Silty SAND fine to coarse grained, grey, with some shell and coral fragments (40%), trace fine to medium grained gravel, deleteneous material (waste products) Silty CLAY orange brown and grey, trace fine to coarse grained sand and shell fragments TEST PIT DISCONTINUED @ 0.30 m REFUSAL		S S DENSITENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS SEDIMENT Inferred sediment deposit Sv=15-22kPa
-0.0 -6.08 - - -6.28 - -6.38 - - - - - - - - - - - - - - - - - - -	GS5-A1 0.00-0.20 m GS5-DS1 0.00-0.20 m GS5-A2 0.20-0.30 m GS5-BD 0.20-0.30 m		SM CI- CH	Silty SAND fine to coarse grained, grey, with some shell and coral fragments (40%), trace fine to medium grained gravel, deleteneous material (waste products) Silty CLAY orange brown and grey, trace fine to coarse grained sand and shell fragments TEST PIT DISCONTINUED @ 0.30 m REFUSAL	W W	VL S-F	SEDIMENT Inferred sediment deposit Sv=15-22kPa
-6.38 - - - - - 1.0 - - - - - - - - - - - - - - - - - - -	0.20-0.30 m (0.20-0.30 m			orange brown and grey, trace tine to coarse grained sand and shell fragments TEST PIT DISCONTINUED @ 0.30 m REFUSAL			
1.5							
2.5							
3.5	2						
2 2 3 3 4	.0	0 	0 	0 0 0 0 0 0 0 0 0 0 0 0 0 0	This report of test pit must be read in conjunction with accompanying notes and abbreviations. If geotechnical purposes only, without attempt to assess possible contamination. Any references to position only and do not necessarily indicate the presence or absence of soil or groundwith accompanying notes and abbreviations.	This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has geotechnical purposes only, without attempt to assess possible contamination. Any references to potentic information only and do not necessarily indicate the presence or absence of soil or groundwater or the presence or absence or a	This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been geotechnical purposes only, without attempt to assess possible contamination. Any references to potential containformation only and do not necessarily indicate the presence or absence of soil or groundwater contain

CL	CLIENT: Flanagan Consulting Group PROJECT: CSDP - Revised EIS LOCATION: Cairns Shipping Channel JOB NO: 1546223							CO SUI	ORDS: 370866.7 m E 8130495.1 m N MGA94 56 RFACE RL: -8.52 m DATUM: AHD	SHEET: 1 OF 1 MACHINE: Hitachi CX500 CONTRACTOR: Ports North LOGGED: JJP DATE: 19/8/16 CHECKED: DATE:				
JC								BUG	CKET TYPE: Clam Shell					
		Exca	vation		Sampling				Field Material Desc	riptic	on			
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STR A OBS	UCTURE AND DDITIONAL SERVATIONS	
×	м		-0.0	-8.52	GS6-A1 0.00-0.25 m GS6-T0 0.00-0.45 m GS6-A2		×	CI- CH	Silty CLAY medium to high plasticity, grey, trace organics (mangrove matter), with some fine to coarse grained sand and shell fragments on surface (i.e sea bed floor) ~<30mm thick)	M -	VS - S	PP=10-25kPa Sv=6kPa		
ш	н		- 0.5 —	0.12	0.25-0.50 m					W	S - F	PP=30-45kPa SV=21-25kPa		
			- - 1.0—	-9.12					TEST PIT DISCONTINUED @ 0.60 m REFUSAL					
			- - - 1.5 - -											
			- - 2.0 - - - -											
			2.5											
			3.0		\mathbf{x}									
			- 3.5 — - -											
			4.0—	goot	This report of test p	bit mus	t be re	ad in	conjunction with accompanying notes and abbreviations. It	has	been	prepared for		

(G	olde	er ates			CO	PRELIMINARY REPO	RT		F TEST PIT: GS7		
С		Г:	Flanag	an Con	sulting Group			SUI	RFACE RL: -10.61 m DATUM: AHD	Ì	MACH	HINE: Hitachi CX500		
PI L(ROJE	:CT: TON:	CSDP Cairns	- Revise Shippin	ea EIS Ig Channel			PIT	DEPTH: 0.75 m	CONTRACTOR: Ports North LOGGED: JJP DATE: 17/8/16				
J	OB NO):	15462	23	1			BU	CKET TYPE: Clam Shell		CHEC	CKED: DATE:		
\vdash		Exca	vation		Sampling			7	Field Material Desc	riptio	on ≻			
METHOD	EXCAVATION	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBC	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENC DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
			-0.0	-10.61 0.10	GS7-A1 0.00-0.25 m			ML- MH	Clayey SILT grey brown, low to high liquid limit	w		Sv=0.6-3kPa		
EX	L		-	0.45	GS7-5D 0.00-0.75 m GS7-70 0.00-0.45 m GS7-A2 0.25-0.50 m GS7-T1 0.30-0.75 m		*	CI- CH	Silty CLAY medium to high plasticity, dark grey, trace fine to medium grained sand (seams/lenses) and shell fragments		vs			
	м-н	_	0.5	-11.06	GS7-A3 0.50-0.75 m		× ^ × _^ ×^ ×^		grey, sand (seams/lenses) less prominent		F - St	Sv=12-22kPa		
				-11.36					TEST PIT DISCONTINUED @ 0.75 m REFUSAL					
atgel Tools			- 1.5 - - -	-										
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EOTECH TEST PITS.GPJ < <drawi< td=""><td></td><td></td><td>- - 3.0 —</td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></drawi<>			- - 3.0 —		0									
AP NON-CORED FULL PAGE 1546223 G					2									
GAP 8_10.0LIB.GLB Log G/			- - 4.0—	geot	This report of test pit n echnical purposes only information only a	nust y, w nd o	t be re ithout do not	ad in atten nece	conjunction with accompanying notes and abbreviations. It npt to assess possible contamination. Any references to pol ssarily indicate the presence or absence of soil or groundwa	has tentia	been I cont ontan	prepared for amination are for nination. GAP gINT FN. F01e RL;		

LIENT: ROJECT:	Flanagan Co CSDP - Revis	nsulting Group		CO SU	ORDS: 371383.2 m E 8131348.6 m N MGA94 56 RFACE RL: -6.12 m DATUM: AHD	SHEET: 1 OF 1 MACHINE: Hitachi CX500 CONTRACTOR: Ports North LOGGED: JJP DATE: 17/8/16 CHECKED: DATE:				
OCATION: OB NO:	Cairns Shippi 1546223	ng Channel		PIT BU	⁻ DEPTH: 0.90 m CKET TYPE: Clam Shell					
Exca	vation	Sampling			Field Material D	Descriptio	า			
EXCAVATION RESISTANCE WATER	DEPTH (metres) RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
L-M	0.0 -6.12 - 0.20 - 6.32 	GS8-A1 0.00-0.25 m GS8-BD 0.00-0.90 m GS8-T0 0.00-0.45 m GS8-T1 0.20-0.65 m GS8-A2 0.25-0.50 m GS8-A3 0.50-0.75 m			Clayey SILT grey brown, low to high liquid limit Silty CLAY grey and brown grey, trace fine to medium grained sand (seams/lenses), shell fragments and organics	w	VS Sv=12-18k	(Pa		
	-7.02 1.0	0.75-0.90 m		<u>-×</u>	TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH					
	- 1.5 — - - 2.0 —									
	2.5									
	3.0	S								
	3.5									

Golder									PRELIMINARY REPORT OF TEST PIT: GS9							
0		ENT		Flanag	OCI: an Con	ates sulting Group			CO SUI	ORDS: 371847.2 m E 8132098.6 m N MGA94 56 RFACE RL: -8.84 m DATUM: AHD		Shee Maci	ET: 1 OF 1 HINE: Hitachi CX500			
F	PROJECT: CSDP - Revised EIS LOCATION: Cairns Shipping Channel JOB NO: 1546223								PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell		CONTRACTOR: Ports North LOGGED: JJP DATE: 19/8/16 CHECKED: DATE:				
F			Type	vation		Sampling				Field Material Do	crinti	00	-	_		
\vdash			Exca	valion		Sampling	Т		Ъ		scripu	bn ≿				
METHOD		RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBC	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE		STRUCTURE AND ADDITIONAL OBSERVATIONS			
				-0.0	-8.84	GS9-A1 0.00-0.25 m			ML- MH	Clayey SILT grey, with some interbedded fine to course grained sand seams/zones <200mm thick and shell fragments, low to high liquid liquit eQL trace organize			Potential sediment deposit Sv=1.2-2kPa			
×	<			-		GS9-T0 0.20-0.65 m GS9-A2 0.25-0.50 m				nquiù innit, day is Ci, trace organics	W	VS				
		-		0.5		GS9-A3 0.50-0.75 m								-		
				-	-9.74	GS9-A4 0.75-0.90 m		^ × ×						-		
				1.0—	-3.14					TARGET DEPTH				-		
				-												
				1.5— -										-		
Datgel Tools				-												
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DTECH TEST PIT				- 3.0—		0										
GE 1546223 GE				-										-		
ORED FULL PA				- 3.5—												
Log GAP NON-C				-												
0.0 LIB.GLB				4.0-		This report of test nit	mus	t be re	ad in	conjunction with accompanying notes and abbreviations	Ithas	been	prepared for			
GAP 8_1(geot	echnical purposes on information only	nly, w and	<i>i</i> ithout do not	atten nece	npt to assess possible contamination. Any references to p assarily indicate the presence or absence of soil or ground	ootentia water o	al con contar	nation are for mination. GAP gINT FN. F0 R	1e L3		

Golder

PROJECT: CSDP - Revised EIS

LOCATION: Cairns Shipping Channel

Flanagan Consulting Group

CLIENT:

GAP 8_10.0 LIB.GLB Log GAP NON-CORED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ <<DrawingFile>> 24/08/2016 15:34 8.30.004 Datget Tools

PRELIMINARY REPORT OF TEST PIT: GS10

COORDS: 372114.8 m E 8132671.2 m N MGA94 56 SURFACE RL: -2.65 m DATUM: AHD

SHEET: 1 OF 1 MACHINE: Hitachi CX500 CONTRACTOR: Ports North LOGGED: JJP DATE: 17/8/16

PIT DEPTH: 0.75 m

JC	IOB NO: 1546223								BUCKET TYPE: Clam Shell CHECKED: DATE:							
	l	Exca	vation		Sampling		Field Material Description									
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS				
			0.0 -	-2.65	GS10-A1 0.00-0.30 m GS10-DS1 0.00-0.30 m			SW	SAND fine to coarse grained, brown, with some shell fragments (30%)			-				
EX	L		- 0.5	0.30	GS10-A2 0.30-0.75 m GS10-DS2 0.30-0.75 m	× × × ×	× × × ×	SM	Silty SAND fine to coarse grained, dark grey and grey, with some shell fragments (20%)	w	VL					
				-3.40		· î			TEST PIT DISCONTINUED @ 0.75 m							
			- 1.0 — - -	-					REFUSAL							
			- 1.5 — - -													
			2.0									-				
					0							-				
			-													
	1		4.0—	geot	This report of test pit n echnical purposes only information only a	ust b , with nd do	be rea nout a	ad in atterr nece	conjunction with accompanying notes and abbreviations. Into assess possible contamination. Any references to por ssarily indicate the presence or absence of soil or groundw	t has tentia ater c	been Il cont contar	prepared for amination are for nination. GAP gINT FN. F01e				
CL PF	LIENT ROJE	T: ECT:	Flanag CSDP	an Con	sulting Group ed EIS			CO(SUF	ORDS: 372403.7 m E 8133083.0 m N MGA94 56 RFACE RL: -9.59 m DATUM: AHD	SHE MAC CON	ET: 1 OF 1 HINE: Hitachi TRACTOR: P	CX500 orts North				
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LC JO	DCAT	TON: D:	Cairns 154622	Shippin 23	g Channel			PIT BU(DEPTH: 0.90 m CKET TYPE [:] Clam Shell	LOG CHE	ged: JJP Cked [.]	DATE: 18/8/16 DATE:				
		Exca	vation		Sampling				Field Material Desc	ription						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY	S	IRUCTURE AND ADDITIONAL BSERVATIONS				
EX	L		-0.0 	-9.59	GS11-A1 0.00-0.25 m GS11-T0 0.00-0.45 m GS11-A2 0.25-0.50 m GS11-A3 0.50-0.75 m GS11-A4 0.75-0.90 m			ML- MH	Clayey SILT grey and dark grey, low to high liquid limit, matrix comprises interbedded seams/zones of organic matter, dark grey to black <200mm thick	W VS	Sv=0.3-0.6kPa Potential desin	ient deposit				
			2.0													
			3.0		2											

CLIENT: Flanagan C PROJECT: CSDP - Re LOCATION: Cairns Shir	ler jates onsulting Group <i>r</i> ised EIS ping Channel	COORDS: 372687. SURFACE RL: -4.6 PIT DEPTH: 0.90 m	ELIMINARY REPOR 9 m E 8133585.8 m N MGA94 56 8 m DATUM: AHD	SHEE MACI CON	TEST F ET: 1 OF 1 HINE: Hitachi C> TRACTOR: Ports GED: JJP	2500 S North DATE: 17/8/16
JOB NO: 1546223		BUCKET TYPE: Cla	am Shell	CHE	CKED:	DATE:
Excavation	Sampling		Field Material Desci	ription		
METHOD EXCAVATION RESISTANCE WATER DEPTH (metres)	SAMPLE OR FIELD TEST	ILIOS SYMBOL USCS SYMBOL	ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRI AI OBS	JCTURE AND DDITIONAL SERVATIONS
Щ L 0.5	8 GS12-A1 9 0.00-0.25 m 8 GS12-BD 0.00-0.90 m GS12-DS1 0.00-0.10 m GS12-T0 0.00-0.45 m GS12-A2 0.25-0.50 m GS12-A3 0.50-0.75 m GS12-A4 0.75-0.90 m	ML- MH Clayey SILT pale grey brown, liquid limit 2 ± Cl 3 ± Silty CLAY ORG/ dark grey to black seams/zones, (m 4 ± - 4 ±	trace shell fragments and organics, low to high ANIC , comprises interbedded organic rich angrove matter)	w vs	SEDIMENT Sv<0.3kPa Sv<0.6kPa	
	8	TEST PIT DISCO TARGET DEPTH	NTINUED @ 0.90 m			

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(7		G	olde	er				PRELIMINARY REPOR	R T	OF	TEST	PIT: GS13
			I	LSS(ates			CO	ORDS: 372663.9 m E 8133664.7 m N MGA94 56		SHEE	T: 1 OF 1	28500
F	PRO	JEC	CT:	CSDP	- Revise	ed EIS			501	RFACE RL: -4.10 M DATUM: AHD		CON	TRACTOR: Po	orts North
L	.OC	ATIO	:NC	Cairns 154622	Shippin 23	g Channel			PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell		LOG(CHE(GED: JJP CKED:	DATE: 17/8/16 DATE:
		E	xcav	ation		Sampling				Field Material Desc	riptio	on		
METHOD	EXCAVATION	RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	Sample or Field test	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	ST	RUCTURE AND ADDITIONAL BSERVATIONS
RED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ < <drawingfile>> 24/082016 15:34 8.30.004 Datgel Tools HMF-</drawingfile>		M	W		-5.00	GS13-A1 0.00-0.25 m GSB BD 0.00-0.90 m GS13-T0 0.20-0.65 m GS13-A2 0.25-0.50 m GS13-A3 0.50-0.75 m GS13-A4 0.75-0.90 m	REC		5 · · · · · · · · · · · · · · · · · · ·	Silly CLAY medium to high plasticity, grey, trace interbedded fine to medium grained sand lenses and shell fragments	M-W	VS VS	Sv=6-9kPa	
LIB.GLB Log GAP NON-C														
GAP 8_10.0					geot	This report of test pit echnical purposes or information only	musi nly, w and o	t be re ithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. I hpt to assess possible contamination. Any references to po ssarily indicate the presence or absence of soil or groundw	t has tentia ater c	been al con contai	prepared for tamination are nination.	for GAP gINT FN. F01 RL

LCXCR.DX: Constrained DTCF11:001 COCRET: LSP DATE: DATE: DATE: LCXCR.DX: LCXCR.DX: Source TYPE: Source TYPE: Cocret: LSP DATE: DATE: LCXCR.DX: LCXCR.DX: Source TYPE: Source TYPE: Source TYPE: Cocret: LSP Source TYPE:	CLIENT: PROJECT:	Gol Asso Flanagan CSDP - R	der ciates Consulting Group evised EIS		CO SUI	ORDS: 372941.1 m E 8134039.7 m N MGA94 56 RFACE RL: -11.03 m DATUM: AHD	SHE MAC	ET: 1 OF 1 HINE: Hitachi CX500	GS14
Texas Sequence Sequence Sequence Field Material Description STRUCTURE AND SCHEMANDISS Image: Sequence of the s	LOCATION:	Cairns Sh	ipping Channel		PIT	DEPTH: 0.90 m	LOG	GED: JJP DA	ATE: 18/8/16
Eventual Company Company <th>JOB NO.</th> <th>vation</th> <th>Sampling</th> <th></th> <th>ВО</th> <th>ERET TTPE. Galli Sileli</th> <th>cription</th> <th>CRED. Dr</th> <th>ΥΙ<u></u>.</th>	JOB NO.	vation	Sampling		ВО	ERET TTPE. Galli Sileli	cription	CRED. Dr	ΥΙ <u></u> .
Image: Constraint of the second sec	METHOD EXCAVATION RESISTANCE WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY	STRUCTUR ADDITIO OBSERVA	re and Nal Tions
			RL 0.00-0.25 m GS14-A1 0.00-0.45 m GS14-A2 0.25-0.50 m GS14-A3 0.50-0.75 m 1.93			Clayey SILT/Silty CLAY grey, tow to high liquid limit, medium plasticity, with trace organic lenses	× 000	Sv=0.6 - 1.2kPa potential sediment deposit	
		4.0							

			G	olde	er ates			CO	DRDS: 373208.7 m E 8134520.6 m N MGA94 56	RT (T: GS15
PF		CT:	CSDP	- Revis	ed EIS			SUF	TRUE KL IU. / 3 III DATUM: AMD		CON	TRACTOR: Ports No	orth
LC	DCAT	'ION:):	Cairns 15462	Shippir 23	ig Channel			PIT BUC	DEPTH: 0.90 m CKET TYPE: Clam Shell	l	LOGO CHEO	GED: JJP CKED:	DATE: 18/8/16 DATE:
		Exca	vation		Sampling				Field Material Des	criptio	on		
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	<i>DEPTH</i> RL	Sample or Field test	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUC ADDI OBSER	TURE AND TIONAL VATIONS
			-0.0	-10.75	GS15-A1 0.00-0.25 m GS15-T0 0.00-0.45 m		* × ×	ML- MH	Clayey SILT/Silty CLAY grey and dark grey, low to high liquid limit	w	vs	Sv=2-3kPa potential sedimentary	deposit
EX	L		- 0.5 -	<u>0.40</u> -11.15	0.25-0.50 m GS15-T1 0.40-0.85 m GS15-A3 0.50-0.75 m			CI- CH	Silty CLAY grey, trace organics	M- W	S	PP=20-35kPa Sv=12-19kPa	
			- 1.0	-11.65	0.75-0.90 m		×		TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH				
ols			- - 1.5 - -	-									
:4/08/2016 15:34 8.30.004 Datgel To			- 2.0	-									
EST PITS.GPJ < <drawingfile>> 2</drawingfile>			2.5	-									
ULL PAGE 1946223 GEUIEUN			3.0		X								
B.GLB LOG GAP NUN-CUKEU FL			3.5										-
GAP 8_10.0LI				geot	This report of test pit echnical purposes or information only	mus nly, w and	t be re vithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. npt to assess possible contamination. Any references to p ssarily indicate the presence or absence of soil or ground	It has otentia water c	been al cont contar	prepared for tamination are for nination.	GAP gINT FN. F01e RL3

C PI	LIEN	T: ECT:	Ass Flanag CSDP	an Cons	sulting Group ed EIS		CO SU	ORDS: 373436.4 m E 8134932.4 m N MGA94 56 RFACE RL: -10.47 m DATUM: AHD	SH MA CO	EET: 1 OF 1 CHINE: Hitachi NTRACTOR: P	CX500 orts North
L(J(DCA [.] DB N	fion: O:	Cairns 15462	Shippin 23	g Channel		PIT BU	⁻ DEPTH: 0.90 m CKET TYPE: Clam Shell	LO CH	gged: JJP Ecked:	DATE: 18/8/16 DATE:
		Exca	vation		Sampling			Field Material De	scription		
METHOD	EXCAVATION	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY	DENSITY O	TRUCTURE AND ADDITIONAL BSERVATIONS
				0.80 -11.27 -11.37	GS16-A1 0.00-0.25 m GS16-T0 0.00-0.45 m GS16-A2 0.25-0.50 m GS16-A3 0.50-0.75 m GS16-A4 0.75-0.90 m GS16-DS1 0.80-0.90 m			Clayey SILT low to high liquid limit, grey with dark grey organic rich lenses		S S S PP=100-125kF	Pa
			- - - 4.0								

ſ

CL		r: CT:	G ASS Flanag CSDP	olde ocia gan Con - Revise	er ates sulting Group ed EIS			COO	PRELIMINARY REPOR DRDS: 373710.8 m E 8135431.1 m N MGA94 56 RFACE RL: -9.56 m DATUM: AHD	RT	OF SHEE MACH	TEST PIT: GS17 TI: 1 OF 1 HINE: Hitachi CX500 IRACTOR: Ports North
LC		ION:	Cairns	Shippin	g Channel			PIT	DEPTH: 0.90 m SKET TYPE: Clam Shell		LOGO	GED: JJP DATE: 18/8/16
		Exca	vation	20	Sampling			000	Field Material Des	criptio	on	
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	H		0.0	-9.56 -0.70 -10.26 -10.46	GS17-A1 0.00-0.25 m GS17-T0 0.00-0.45 m GS17-A2 0.25-0.50 m GS17-A3 0.50-0.75 m GS17-BDS1 0.70-0.90 m GS17-T01 0.70-0.90 m GS17-A4 0.75-0.90 m			CI- CH	Clayey SILT/Silty CLAY grey, trace shell fragments and organics, high liquid limit Silty CLAY brown and grey brown, trace cement nodules, inferred calcareous, (fine to medium grained gravel size) TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH	W M-W	VS St	Sv=0.6-1.2kPa potential sedimentary deposit PP=70-100kPa Sv>42kPa PP at 0.9m - 160-170kPa
JP NON-CORED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ < <crawingfile>> 2408/2016 15:48 330004 Datget 1008</crawingfile>												
GAP 8_10.0 LIB.GLB L			4.0	geot	This report of test pit echnical purposes or information only	musi nly, w and o	t be re <i>i</i> ithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. to assess possible contamination. Any references to p ssarily indicate the presence or absence of soil or –	It has otentia water c	been al cont contar	prepared for amination are for nination. GAP gINT FN. F01 RL

CL PR	IENT	: СТ:	ASS Flanag CSDP	DCI an Con - Revise	attes sulting Group ed EIS			CO(SUF	DRDS: 373936.6 m E 8135840.9 m N MGA94 56 RFACE RL: -9.25 m DATUM: AHD	S M C	SHEE MACH CONT	T: 1 OF 1 HNE: Hitachi 0 RACTOR: Po	CX500 rts North
lo Jo	CAT	ION: D:	Cairns 15462	Shippin 23	g Channel			PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell	L	.OGC	BED: JJP KED:	DATE: 18/8/16 DATE:
	6	Exca	vation		Sampling				Field Material De	escriptio	n		
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STI	RUCTURE AND ADDITIONAL 3SERVATIONS
			0.0 	-9.25	GS18-A1 0.00-0.25 m		× × ×	MH / CI	Clayey SILT/Silty CLAY grey, trace fine to medium grained sand lenses and shell fragments, high liquid limit			Sv=0.6-1.2kPa potential sedime	entary deposit
EX	L		- - 0.5	<u>0.40</u> -9.65	GS18-A2 0.25-0.50 m GS18-T0 0.45-0.90 m GS18-A3 0.50-0.75 m			CI- CH	Silty CLAY medium to high plasticity, grey, trace shell fragments and organics	w	vs	Sv=3kPa	
			-	0.85 -10.10 -10.15	GS18-A4 0.75-0.90 m		× × 		pale grey brown to grey TEST PIT DISCONTINUED @ 0.90 m		<u>S - F</u>	PP=30kPa	
			- 2.5 - - - - 2.0										
			3.5 										
			4.0—									proposed for	

(CI			Gass	olde ocia	er ates			COO	DRDS: 374441.3 m E 8136731.6 m N MGA94 56 REACE RL: -9.58 m DATUM: AHD	RL	OF SHEE	TEST P	IT: GS19
PF	ROJE	CT:	CSDP	- Revise	ed EIS			50			CON	TRACTOR: Ports	North
JC	DCAT	iON: D:	Cairns 15462	Snippin 23	ig Channel			PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell		CHE	SED: JJP	DATE: 18/8/16 DATE:
		Exca	vation		Sampling				Field Material Des	cripti	on		
METHOD	EXCAVATION	WATER	DEPTH (metres)	<i>DEPTH</i> RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE		STRU AD OBSI	ICTURE AND DITIONAL ERVATIONS
			0.0	-9.58	GS19-A1 0.00-0.25 m GS19-T0 0.00-0.45 m GS19-A2 0.25-0.50 m		× × × ×	MH / CI	Clayey SILT/Silty CLAY grey, trace fine to medium grained sand lenses and shell fragments			Sv=0.6kPa potential sedimenta	ary deposit
EX	L		- 0.5 -	<u>0.45</u> -10.03	GS19-A3 0.50-0.75 m			CI- CH	Silty CLAY medium to high plasticity, grey	- w	VS	Sv=1.2-2kPa	
			-		GS19-A4 0.75-0.90 m								
			1.0 — - - -	-10.48					TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH				
u4 Datgei Loois			1.5 — - - 2.0 —										
ingFile>> 24/08/2016 15:34 8.30.0			- - - 2.5—										
EOLECH LEST FLIS.GFJ AND an					0								
0 GAP NUN-WUKEN FULL FAGE 1949223 0			3.5		2								
			4.0—	geot	This report of test pit echnical purposes or information only	must nly, w and o	: be re ithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. opt to assess possible contamination. Any references to po ssarily indicate the presence or absence of soil or groundw	It has otentia vater	been al con contai	prepared for tamination are for nination.	GAP gINT FN. F01e RL

(7		G	olde	er				PRELIMINARY REPOR	T	OF	TEST PI	T: GS20
				Flanad	ocia an Con	ates sulting Group			CO SUF	ORDS: 374931.2 m E 8137643.8 m N MGA94 56 RFACE RL: -8.59 m DATUM: AHD		SHEE MACI	ET: 1 OF 1 HINE: Hitachi CX50	00
F	PRC	DJE	CT:	CSDP	- Revise	ed EIS						CON	TRACTOR: Ports N	lorth
L	LOC JOB	CATI 8 NO	ION:	Cairns 154622	Shippin 23	g Channel			PIT BU(DEPTH: 0.90 m CKET TYPE: Clam Shell		LOG(CHE(GED: JJP CKED:	DATE: 18/8/16 DATE:
F		E	xca	/ation		Sampling				Field Material Desc	riptio	on	-	
ИЕТНОВ	EXCAVATION	RESISTANCE	NATER	DEPTH metres)	DEPTH	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC -OG	JSCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	STRUC ADD OBSEI	TURE AND ITIONAL RVATIONS
			_	-0.0	-8.59	GS20-A1 0.00-0.25 m GS20-T0 0.00-0.45 m			MH / CI	Clayey SILT/Silty CLAY grey to dark grey, with some fine to medium grained sand lenses, trace shell fragments and organics			Sv=0.9-2.0kPa potential sedimentar	/ deposit
Ĕ	í l	L		- 0.5		GS20-A2 0.25-0.50 m		┥╻┝╻╹× ┶╻┶╻┝	-		w	vs		-
				_	<u>0.60</u> -9.19	GS20-A3 0.50-0.75 m GS20-A4			CI- CH	Silty CLAY medium to high plasticity, grey, trace shell fragments and organics				
_				1.0 —	-9.49	0.75-0.90 m		^ 		TEST PIT DISCONTINUED @ 0.90 m TARGET DEPTH				
				-										-
Tools				1.5										-
15:34 8.30.004 Datgel				 2.0 										-
awingFile>> 24/08/2016				_ 2.5—										-
TEST PITS.GPJ < <dr< td=""><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></dr<>				-										
1546223 GEOTECH				3.0 —		X								-
N-CORED FULL PAGE				- 3.5 —		6								-
B.GLB Log GAP NO														-
GAP 8_10.0L				-	geot	This report of test pit echnical purposes on information only a	musi Ily, w and o	t be re ithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. It pt to assess possible contamination. Any references to pol ssarily indicate the presence or absence of soil or groundwa	t has tentia ater c	been al con contai	prepared for tamination are for nination.	GAP gINT FN. F01e RL3

PROJECT: CSDP - Revised EIS

LOCATION: Cairns Shipping Channel

Flanagan Consulting Group

CLIENT:

GAP 8_10.0 LIB.GLB Log GAP NON-CORED FULL PAGE 1546223 GEOTECH TEST PITS.GPJ <<DrawingFile>> 24,082016 15:34 8.30.004 Datgel Tools

PRELIMINARY REPORT OF TEST PIT: GS21

COORDS: 371819.0 m E 8132112.8 m N MGA94 56 SURFACE RL: -2.54 m DATUM: AHD

SHEET: 1 OF 1 MACHINE: Hitachi CX500 CONTRACTOR: Ports North LOGGED: JJP DATE: 22/8/16

PIT DEPTH: 0.50 m

JO	B NC):	154622	23				BUG	CKET TYPE: Clam Shell		CHEC	CKED: DATE:
	E	Exca	vation		Sampling				Field Material Desc	ripti	on	
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L		0.0 	-2.54 0.25	BH4-A1 0.00-0.25 m BH4-DS1 0.00-0.25 m			SW	SAND fine to coarse grained, brown, with some shell fragments ~40%	w	VL	-
			- - 0.5	-3.04	0.25-0.50 m BH4-DS2 0.25-0.50 m		^ × × × ×	5111	Silty SAND fine to coarse grained, grey, with some shell fragments ~20%, trace clay lenses			
			-						TARGET DEPTH/EXCAVATION COLLAPSE			
			- - 1.0—									
			-									
			- 1.5—									-
			-									
			2.0									
			- - 2.5 <i>-</i>									
			-									
			- 3.0 <i>—</i>		0							-
			-									
			- 3.5 —									
			-									
			4.0 —									
				geot	This report of test pit n echnical purposes only information only a	nusi /, w nd (t be rea /ithout do not	ad in atterr nece	conjunction with accompanying notes and abbreviations. I pt to assess possible contamination. Any references to po ssarily indicate the presence or absence of soil or groundw	t has tentia ater o	been Il cont contar	prepared for tamination are for nination. GAP gINT FN. F01e
									,			RL3



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	Golder ssociates	USEI	D ON E	METHOD OF SOIL DESCRIPTION BOREHOLE AND TEST PIT REPORTS				
	FILL			CLAY (CL, CI or CH)				
00000	GRAVEL (GP or G	W)		$\frac{\frac{M_{L}}{M_{L}}}{\frac{M_{L}}{M_{L}}}$ ORGANIC SOILS (OL or OH or Pt)				
	SAND (SP or SW)							
	SILT (ML or MH)							
Combinatio	ns of these basic s	mbols may be used	to indicate	e mixed materials such as sandy clay.				
CLASSIFICATION AND INFERRED STRATIGRAPHY Soil and Rock is classified and described in Reports of Boreholes and Test Pits using the preferred method given in AS1726 – 1993, (Amdt1 – 1994 and Amdt2 – 1994), Appendix A. The material properties are assessed in the field by visual/tactile methods.								
	Particle S	ize	Plasticity Properties					
Major Divi	sion Sub Division	Particle Size	40					
В	OULDERS	> 200 mm		сн				
	COBBLES	63 to 200 mm	30	CL CI High plasticity clay				
	Coarse	20 to 63 mm	(%)	clay clay				
GRAVEL	Medium	6.0 to 20 mm	ude»					
	Fine	2.0 to 6.0 mm	it 20	OH or MH High liquid limit				
	Coarse	0.6 to 2.0 mm	astic	1 silt				
SAND	Medium	0.2 to 0.6 mm	<u>≓</u> ¹⁰	OL or ML Low liquid				
	Fine	0.075 to 0.2 mm	-	CL/ML Clay/Silt Iimit silt OL or ML - Low liquid limit silt				
SILT 0.002 to 0.075 mm		0						
CLAY < 0.0		< 0.002 mm		Liquid Limit (%)				

MOISTURE CONDITION

Symbol D Term Description

AS1726 - 1993

D	Dry	Sands and gravels are free flowing. Clays & Silts may be brittle or friable and powdery.
М	Moist	Soils are darker than in the dry condition & may feel cool. Sands and gravels tend to cohere.
W	Wet	Soils exude free water. Sands and gravels tend to cohere.

CONSISTENCY AND DENSITY				AS1726 - 1993				
Symbol	Term	Undrained Shear Strength		Symbol	Term	Density Index %	SPT "N" #	
VS	Very Soft	0 to 12 kPa		VL	Very Loose	Less than 15	0 to 4	
S	Soft	12 to 25 kPa		L	Loose	15 to 35	4 to 10	
F	Firm	25 to 50 kPa		MD	Medium Dense	35 to 65	10 to 30	
St	Stiff	50 to 100 kPa		D	Dense	65 to 85	30 to 50	
VSt	Very Stiff	100 to 200 kPa		VD	Very Dense	Above 85	Above 50	
Н	Hard	Above 200 kPa						
In the absence of test results, consistency and density may be assessed from correlations with the observed behaviour of the material. # SPT correlations are not stated in AS1726 – 1993, and may be subject to corrections for overburden pressure and equipment type.								

Go	lder ociates		EXPLANATION OF NOTES, ABBREVIATIONS & TERMS USED ON BOREHOLE AND TEST PIT REPORTS					
DRILLING/E	XCAVATION METHO	D						
AS*	Auger Screwing	RD	Rotary blade o	r drag bit	NQ	Diamond Core - 47 mm		
AD*	Auger Drilling	RT	Rotary Tricone	bit	NMLC	Diamond Core - 52 mm		
*V	V-Bit	RAB	Rotary Air Blas	st	HQ	Diamond Core - 63 mm		
*т			Reverse Circulation		HMLC	Diamond Core – 63mm		
ЧΔ	Hand Auger	PT	Push Tuha	ation	BH	Tractor Mounted Backhoe		
		СТ	Cable Teel Die		EY	Tracked Hydraulic Excavator		
	Diatuba Carina					Existing Execution		
	Machhoro or Pailor		Non doctructiv	o diaging		Existing Excavation		
			NON-destructiv	e digging	HAND	Excavated by Harld Methods		
	ON/EXCAVATION RE		nossible with litt	le effort from t	he equinment u	bea		
- N4	Medium registeres	Every stien /ns			with moderate of	fort from the equipment used		
M	High resistance	. Excavation/pc	ssible at an acc	eptable rate w	vith moderate er	fort from the equipment used.		
п	effort from the equip	ment.		penetration is	s possible at a si	low rate and requires significant		
R	Refusal or Practica digging implement o	I Refusal. No f r machine.	urther progress	possible withc	out the risk of da	mage or unacceptable wear to the		
These asses excavation of	sments are subjective r drilling tools, and the	and are depend experience of t	dent on many fa he operator.	ctors including	g the equipment	power, weight, condition of		
WATER								
¥	Water level	at date shown		\triangleleft	Partial water los	S		
\triangleright	Water inflow	I	Complete water loss					
GROUNDWA OBSERVED	ATER NOT	The observation surface seepage	on of groundwate ge or cave in of t	er, whether pr he borehole/t	resent or not, w est pit.	as not possible due to drilling water,		
GROUNDWA ENCOUNTE	ATER NOT RED	The borehole/t less permeable for a longer pe	est pit was dry s e strata. Inflow riod.	soon after exc may have bee	avation. Howeven observed had	ver, groundwater could be present in d the borehole/test pit been left open		
SAMPI ING	AND TESTING							
SPT	Standar	d Penetration T	est to AS1289 6	3 1-2004				
4,7,11 N=1 30/80mm RW	8 4,7,11 = Where p Penetra	Blows per 150 practical refusal tion occurred ur	mm. N = Blow occurs, the blow nder the rod weig	s per 300mm s and penetra tonly	penetration follo ation for that inte	owing 150mm seating erval are reported		
HW HB	Penetra Hamme	tion occurred ur r double bounci	nder the hamme ng on anvil	r and rod weig	ght only			
DS	Disturbe	ed sample						
BDS	Bulk dis	turbed sample						
G	Gas Sa	mple						
W	Water S	ample						
FP	Field pe	rmeability test c	over section note	d				
	Fleiu va Dhotoio	ne snear lest ex	pressed as unc	orrected shea	r strengtn ($s_v = p$	beak value, sr = residual value)		
PM	Pressur	emeter test ove	r section noted	1				
PP	Pressuremeter test over section noted							
U63	Thin wa	lled tube sample	e - number indic	ates nominal s	sample diameter	r in millimetres		
WPT	Water p	ressure tests						
DCP	Dynami	c cone penetrat	ion test					
CPT	CPT Static cone penetration test							
CPTu Static cone penetration test with pore pressure (u) measurement								
Ranking of Visually Observable Contamination and Odour (for specific soil contamination assessment projects)								
R = 0	No visible evi	dence of contar	nination	R = A	No non-natura	al odours identified		
R = 1	Slight eviden	ce of visible con	tamination	R = B	Slight non-nat	ural odours identified		
R = 2	Visible contar	mination		R = C	Moderate non	-natural odours identified		
R = 3	R = 3 Significant visible contamination R = D Strong non-natural odours identified					atural odours identified		
ROCK CORE RECOVERY								
ICR = Tota	al Core Recovery (%)	SC	R = Solid Core	Recovery (%)	RC	QD = Rock Quality Designation (%)		
= Length of	core recovered	$= \sum$ Leng	th of cylindrical c	ore recovered	$\times 100 = \sum_{n=1}^{\infty}$	Axial lengths of core $> 100 \text{ mm} \times 100$		
Lengtr			Length of core	run		Length of core run		

Golder

TERMS FOR ROCK MATERIAL STRENGTH & WEATHERING AND ABBREVIATIONS FOR DEFECT DESCRIPTIONS

STRENGTH

Oncenterin			
Symbol	Term	Point Load Index, Is ₍₅₀₎ (MPa)	Field Guide
EL	Extremely Low	< 0.03	Easily remoulded by hand to a material with soil properties.
VL	Very Low	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30 mm can be broken by finger pressure.
L	Low	0.1 to 0.3	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
М	Medium	0.3 to 1	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.
Н	High	1 to 3	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken with pick with a single firm blow; rock rings under hammer.
VH	Very High	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

ROCK STRENGTH TEST RESULTS

Point Load Strength Index, I_s(50), Axial test (MPa)

Point Load Strength Index, I_s(50), Diametral test (MPa)

Relationship between $I_s(50)$ and UCS (unconfined compressive strength) will vary with rock type and strength, and should be determined on a site-specific basis. UCS is typically 10 to 30 x $I_s(50)$, but can be as low as 5.

ROCK M	ATERIAL W	EATHERING							
Symbol		Term		Field Guide					
RS		Residual Soil	Soil subst but th	Soil developed on extremely weathered rock; the mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly transported.					
EW		Extremely Weathered	Rock disint	Rock is weathered to such an extent that it has soil properties - i.e. it either disintegrates or can be remoulded, in water.					
HW		Distingth	Rock disco	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by					
DW	MW	Weathered	pores Weat typica	pores. In some environments it is convenient to subdivide into Highly Weathered and Moderately Weathered, with the degree of alteration typically less for MW.					
SW		Slightly Weathered	Rock to free	Rock is slightly discoloured but shows little or no change of strength relative to fresh rock.					
FR		Fresh	Rock	Rock shows no sign of decomposition or staining.					
ABBREV	ATIONS FO	OR DEFECT TYPES	AND DES	CRIPTIONS					
Defect Type		Coating	or Infilling	Roughnes	SS				
В	Bedding	parting	Cn	Clean	ŠI	Slickensided			
Х	Foliation		Sn	Stain	Sm	Smooth			
С	Contact		Vr	Veneer	Ro	Rough			
L	Cleavage	;	Ct	Coating or Infill					
J	Joint		Planarit	ty					
SS/SZ	Sheared seam/zone (Fault)		PI	Planar	Vertical Boreholes – The dip				
CS/CZ	Crushed seam/zone (Fault)		Un	Undulating	(inclination from horizontal) of the				
DS/DZ	DS/DZ Decomposed seam/zone		St	Stepped	defect is given.				
IS/IZ	IS/IZ Infilled seam/zone				Inclined E	Boreholes – The inclination is			
S	Schistocity				measured	as the acute angle to the			
V Vein				core axis.	-				





Figure 1: Photograph presenting material conditions at GS1 at 0 to 0.9 m depth.



Figure 2: Photograph presenting material conditions at GS2 at 0 to 0.9 m depth.



Figure 3: Photograph presenting material conditions at GS3 at 0 to 0.6 m depth







Figure 4: Photograph presenting material conditions at GS4 at 0 to 0.5 m depth Type picture title here.



Figure 5: Photograph presenting material conditions at GS5 at 0 to 0.3 m depth



Figure 6: Photograph presenting material conditions at GS6 at 0 to 0.6 m depth







Figure 7: Photograph presenting material conditions at GS7 at 0 to 0.75 m depth



Figure 8: Photograph presenting material conditions at GS8 at 0 to 0.9 m depth



Figure 9: Photograph presenting material conditions at GS9 at 0 to 0.9 m depth







Figure 10: Photograph presenting material conditions at GS10 at 0 to 0.75 m depth



Figure 11: Photograph presenting material conditions at GS11 at 0 to 0.9 m depth



Figure 12: Photograph presenting material conditions at GS12 at 0 to 0.9 m depth







Figure 13: Photograph presenting material conditions at GS13 at 0 to 0.9 m depth



Figure 14: Photograph presenting material conditions at GS14 at 0 to 0.9 m depth



Figure 15: Photograph presenting material conditions at GS15 at 0 to 0.9 m depth







Figure 16: Photograph presenting material conditions at GS16 at 0 to 0.9 m depth. Bottom left: very soft clayey SILT sediment deposit. Bottom right: underlying stiff clay deposit.



Figure 17: Photograph presenting material conditions at GS17 at 0 to 0.9 m depth. Bottom left: photograph showing very soft clayey SILT sediment deposit overlying stiff clay deposit.







Figure 18: Photograph presenting material conditions at GS18 at 0 to 0.9 m depth



Figure 19: Photograph presenting material conditions at GS19 at 0 to 0.9 m depth



Figure 20: Photograph presenting material conditions at GS20 at 0 to 0.9 m depth

