

Shaping the Future



SHUTE HARBOUR MARINA PROJECT GEOTECHNICAL SUMMARY

May 2006 Job No. 12276.3

PORT BINNLI PTY LTD



Cardno Ullman & Nolan Geotechnic Pty Ltd

ABN 45 103 205 205 71 Connors Road PO Box 5630 Mackay MC Queensland 4741 Australia **Telephone: 07 4952 5255** Facsimile: 07 4952 5255 International: +61 7 4952 5255 Email: <u>soils@uneng.com.au</u> Web: <u>www.cardno.com.au</u>

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SHUTE HARBOUR MARINA PROJECT

GEOTECHNICAL SUMMARY

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Our Ref 12276.1

Contact Peter Davis



23 May 2006

1. LETTER OF TRANSMITTAL

The Manager Port Binnli Pty Ltd PO Box 1003 SPRING HILL QLD 4004

Dear Jeff

SHUTE HARBOUR MARINA PROJECT GEOTECHNICAL SUMMARY

Further to your recent instructions, we are pleased to present in this report a geotechnical summary of the Shute Harbour Marina project site based upon the data collected by Ullman & Nolan. The report summarises the findings of previous and recent works and notes that sea bed sediments comprise mainly very soft or soft highly plastic clays with a surface covering up to about 1m thick of more sandy / gravelly sediments. The sediments are underlain by weathered volcanics which, over the seaward part of the site, have a thin covering, typically about 1-2m thick, of residual clayey soil.

Figure 3 shows what we believe to be a typical cross section for the project site, perpendicular to the shore line.

Yours faithfully

Peter Davis for Cardno Ullman & Nolan

Cardno Ullman & Nolan Geotechnic Pty Ltd ABN 45 103 205 205

71 Connors Road, Mackay Qld 4740 PO Box 5630, Mackay MC Queensland 4741 Australia **Telephone: 07 4952 5255** Facsimile: 07 4952 5455 International: +61 7 4952 5255 <u>soils@uneng.com.au</u> www.cardno.com.au

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2. SCOPE OF WORK

This report has been commissioned by Mr J Smith of Port Binnli Pty Ltd. We understand that Port Binnli has recently become involved in this project, which hitherto has been managed by Kinsmen Pty Ltd.

The report provides a summary of the geotechnical information recovered for the project site over a period of 30 years or so by the Ullman & Nolan Group, and an overview of the ground conditions as may be relevant to site development.

The following documents provide input to this compilation

- Ullman & Nolan Pty Ltd. *Club Whitsunday Project. Report on Offshore Geotechnical Investigations.* Report to Scotex Pty Ltd dated July 1989.
- Ullman & Nolan Pty Ltd. Shute Harbour Marina. Report on Further Geotechnical Investigation. Report to Kinsmen Pty Ltd dated June 2001.
- Ullman & Nolan Technical Services Pty Ltd. Shute Harbour Marina. Report on Acid Sulphate Soils and Sediment Contaminated Investigation. Report to Shute Harbour Marina Developments Pty Ltd dated January 2005.
- Cardno Ullman & Nolan Pty Ltd. *Shute Harbour Marina Project. Compilation of Geotechnical Information.* Report to Port Binnli Pty Ltd dated 12 April 2006.

Relevant extracts from these reports are appended.

In addition, the findings of recent site specific geotechnical investigation program have been utilised. This recent information has not previously been reported.

Reference should be made also to a compilation report for the nearby Shute Harbour Jetty precinct, viz

• Ullman & Nolan Consulting Pty Ltd. *Shute Harbour Ferry Terminal. Report on Geotechnical Appraisal.* Report to Shift Whitsunday Pty Ltd dated July 2005.

3. GEOMORPHOLOGY, GEOLOGY, SOILS

3.1 Regional Geology

The regional geology for the site is described in the 1:250,000 Geological Series Sheet for Proserpine. The geology of the area is typical of the surrounding Whitsunday area, comprising volcanoclastic sediments interlain with intermediate volcanic flows and minor intrusions. The rocks from part of the Whitsunday Volcanic Province, an early Cretaceous aged sequence.

Geological faults are generally NW-SE trending, with the closest known one being the submarine Molle Fault, some 5km to the east of the site. The University of Queensland reports the hazard assessment of earthquakes associated with faults such as this is difficult, primarily because of the paucity of historical seismic data and a sparse seismic network. Due to the cessation of the University of Queensland monitoring program, application of advanced forecasting or predictive methods is not possible. As a result, information is provided by:



- Queensland University Advanced Centre for Earthquake Studies, giving locations of earthquake epicentres and their magnitudes, and values of acceleration coefficients; and
- AS 1170.4 Earthquake loads Figure 2.3(g), acceleration coefficients.

It can be determined from this information that, while an earthquake risk exists for the Shute Harbour area, the hazard is small.

Changes to relative sea and land levels have resulted in the area becoming drowned during the Tertiary Period. Overlying the basement rock at and below the shoreline are recent to Holocene aged marine sediments. These are typically soft, dark grey, medium plasticity silty clays with shells and coral fragments.

The geology of the area to be affected is shown in Figure 1

3.2 Local Geology

The bedrock of the Shute Harbour peninsular consists of the Whitsunday Volcanics of Lower Cretaceous age (S.E. Bryan et al (1997)). This large scale volcanic unit has been folded into a large open syncline which plunges south or south-south west at a low to moderate angle. Bedrock typically consists of rhyolite, andesite, and a sequence of very similar lava flows. In some areas, the lava flows have been intruded by steeply dipping dykes. Bedrock is typically red-brown to blue-grey in colour, often porphyritic with small white anhedral phenocrysts of plagioclase. The lava is typically highly fractured, with fractures only a few centimetres apart. Flow structure is common. The andesite and rhyolite are less fractured. Fractures are usually irregular and random.

Recently published data described the rock comprising the cut batters to the Shute Harbour car park as older Triassic rhyolitic basement material.

Weathering varies from highly to moderately weathered, to slightly weathered or fresh. Where dykes are present, these are often extremely to highly weathered, 1m to 3m wide, and steeply inclined.

3.3 Topography & Geomorphology

The general topography of the site is characterised by a steep, east west trending rocky hillslope above high water mark, a narrow wave-cut platform, and beach and sea bed below high water mark. Shute Harbour Road follows the foreshore, having been constructed on a cut to fill earthworks bench at a level of between about relative level (RL) 5 metres and RL 7 metres AHD.

The rocky hillslope is up to about 35m high at the northwestern boundary of the site, but continues rising within the adjacent National Park to the north. The northeast boundary is also hillside, but only about 25m high. Again the land continues rising to the north within the National Park. In some parts, notably the lower slopes, residual and colluvial soils to about 2m maximum thickness exist.

The centre section of the northern boundary is lower lying. Two adjacent alluvial lined gulleys at about RL 5 metres AHD are located at the toe of the hillslope, immediately to the north of Shute Harbour Road.



The dominant rocks at the site have been classified as acid and intermediate pyroclastic flows of the Airlie Volcanics. The Airlie Volcanics were deposited in fresh water in the Permian Period and have subsequently been folded into a large, open syncline, which plunges south or south southwest at a low to moderate angle. Dips are moderate to low on the western limb and steeper on the eastern limb, nearer to the site.

Flow banded rhyolite is the dominant rock type observed in the road cuttings at the site. Localised folding of beds is also evident. A number of microdiorite (dolerite) dykes are recorded on the geological sheet, which strike approximately north south. These are clearly visible as relatively narrow (about 1m, but up to 5m wide) deeply weathered, subvertical zones within the flow banded rhyolite.

The predominantly fine grained nature of the marine sediments reflects the depositional environment of the Shute Bay Inlet. A slightly coarser grained material occurs for a thickness of less than about 1m over the sea bed over part of the site, predominantly the western half. This has likely resulted from a 'sorting' process where wave and tide action has washed out the finer grained clays and silts. Coarser material have also been deposited nearer the high water mark with cobbles and gravel forming a beach like shore which supports mangrove. The finer grained silts and clays generally occur below low water tide level and increase in depth to more than 10m towards the centre of the bay.

Four principal terrain units are present at this site, being

- Steep hillslopes;
- Alluvial and colluvial deposists north of Shute Harbour Road;
- Beach sediments; and
- Marine sediments (muds).

Despite the hard and resistant nature of the rocky hillslopes and the vegetation cover of low open woodland to open eucalypt forest, the combination of relatively steep slopes and fractured nature of the rock exposures is conducive to the formation of landslips and rock slides. This is the principal land forming feature in this geomorphology. As a result, colluvium on the lower footslopes is common, with the beach deposits typically being of colluvial origin. This colluvium is then reworked and broken down further by tidal action.

The rate of landform change in this land based topography as a result of erosion is variable, depending principally upon the incidence of prolonged wet weather, which exacerbates both instability and the erosion process.

The alluvial and marine sediments are likewise subject to erosion during high rainfall events and storm activity.



3.4 Soils

The soil cover is generally very thin on the hill slopes, typically less than 0.6m. The soils typically consist of pale brown-grey sandy gravels or gravely sands with some clay and silt. They are either non-plastic or of low plasticity. The soils derive from weathering of bedrock and in may places are covered by a thin veneer of angular scree. Some of this scree has accumulated at the bottom of the slopes and, together with coral, sand , gravel and mud, now forms the beach / storm deposit shown on the typical cross section (Figure 3).

Below about RL -1 AHD, the common soil type is very soft or soft highly plastic silty clay. In the upper levels it commonly contains gravel and sand sized coral and shell pieces. In other instances, the gravel comprises andesite and rhyolite, no doubt slopewash or scree from the adjacent hillsides. Coral boulders within the soft clay are not uncommon.

The surface soils overlying the soft clay tend to comprise more sandy and gravely material. In some but not all areas, this surface soil can contain very little fines and be up to 3m thick. But more commonly it is between about 0.2m and 0.5m thick.

For purposes of site characterisation, it is reasonable to assume that the stratigraphy within the reclamation area may be typified by

0.0m – 1.5m Gravelly clayey sand. Gravel and sand components are fine to coarse grained and comprise principally shell and coral debris. The fines are medium to high plasticity and comprise some 20 – 50% of the total material. Occasional cobbles and boulders of coral to 300mm size.
 1.5m – 4.0m Gravelly sandy clay. Gravel and sand components are fine to coarse grained and comprise principally shell and coral debris. The fines are medium to high plasticity and components are fine to coarse grained and comprise principally shell and coral debris. The fines are medium to high plasticity and

comprise some 50 - 70% of the total material. Cobbles and boulders of coral to 600 mm size

are common. Towards the shoreward edge of the reclamation area, the gravel component includes

angular rock fragments, being slopewash from the fringing hillsides.

Within the marina basin, it would be prudent to assume that dredge materials will comprise a combination of gravelly clayey sand (top \approx 1.7m over the western part of the site) and silt / clay (elsewhere).



3.5 Hillside

A 1993 seismic survey undertaken for Ullman & Nolan Pty Ltd by Velseis Pty Ltd indicated that weathered rock within the top 5 to 14m (but typical 8 to 10m) had a seismic velocity less than 2,000 m/s. Knowledge of local geology would suggest that this upper horizon comprises distinctly and more weathered flow banded rhyolite with a number of deeply weathered, sub-vertical microdiorite dykes.

At depth, the rock is the same type but less weathered.

It is understood that the current development proposal does not extend into the adjacent hillside, north of Shute Harbour Road hence no further comment on hillside ground conditions is offered in this geotechnical summary.

3.6 Typical Cross Section

The attached Figure 2 shows the location of a typical cross section through the project site, perpendicular to the shoreline. The cross section is shown in Figure 3.

While it is said that this cross section is typical, it is presented in the centre of the site where Shute Harbour Road is on fill. In other parts of the site, the road is in cut, but the profile seaward of the shoreline remains similar to that shown.

4. EXCAVATIONS AND FILLING

Conventional dredge excavation of the marine sediments is expected to prove effective but will have the usual disadvantage of providing reclamation fill of 'slurry' consistency. Problems of low shear strength and high settlement potential result, but may possibly be mitigated by careful selection of material for dredging.

Dredge excavation of the underlying weathered rock is unlikely to prove successful.

The quantum of post-construction settlement of fill will vary across the site as ground conditions and fill conditions vary. Our earlier evaluations have indicated a potential for 50 to 200mm post-construction settlement within the insitu sediments. This may now increase if the reclamation and revetment are to be moved seaward. Post-construction settlement within the hydraulically placed fill material may be considerably more than this.

5. **REVETMENTS**

Revetments may take the form of either sheet piling or conventional earth / rock embankments. It is understood that sheet piling with tie backs is the preferred revetment system.



5.1 Sheet Piling

Our recent experience with sheet pile revetments for a nearby project suggests that sheet piles will need to be either cantilevered from their penetration into residual soils and weathered rock, for which driving conditions will be relatively hard or provided with tie backs.

It is unlikely that tied sheet piling can be used with passive deadman restraint in the reclamation filling. Design experience suggests that adequate stability will not be achieved using this method. It is likely that tie backs will need to be restrained by raker piles.

5.2 Rock Revetments

Conventional earth / rock revetments will prove a viable option provided the revetment embankment displaces much of the marine mud over which it is constructed.

The stability of rock revetments will be dependent on

- The height of revetment,
- The face slope of the revetment,
- The characteristics of the fill material behind the revetment,
- The method of construction of the revetment,
- The presence of weak marine sediments beneath the toe of the revetment,
- The proximity of the toe of the revetment to the dredge batter.

Revetment design will need to take these factors into account.

6. ACID SULFATE SOILS AND SEDIMENT CONTAMINATION

The likely presence and distribution of acid sulfate soils and sediment contamination has been addressed by the January 2005 report. The report notes that the need to manage acid sulfate soils is unlikely on account of the excess acid neutralising capacity of the marine sediments. This will, however, need to be checked by monitoring during excavation and a management plan be available in the event that the acid neutralising capacity is found to be insufficient.

The presence of TBT has been noted, albeit in localised areas. A management strategy will be required.



7. LIMITATIONS

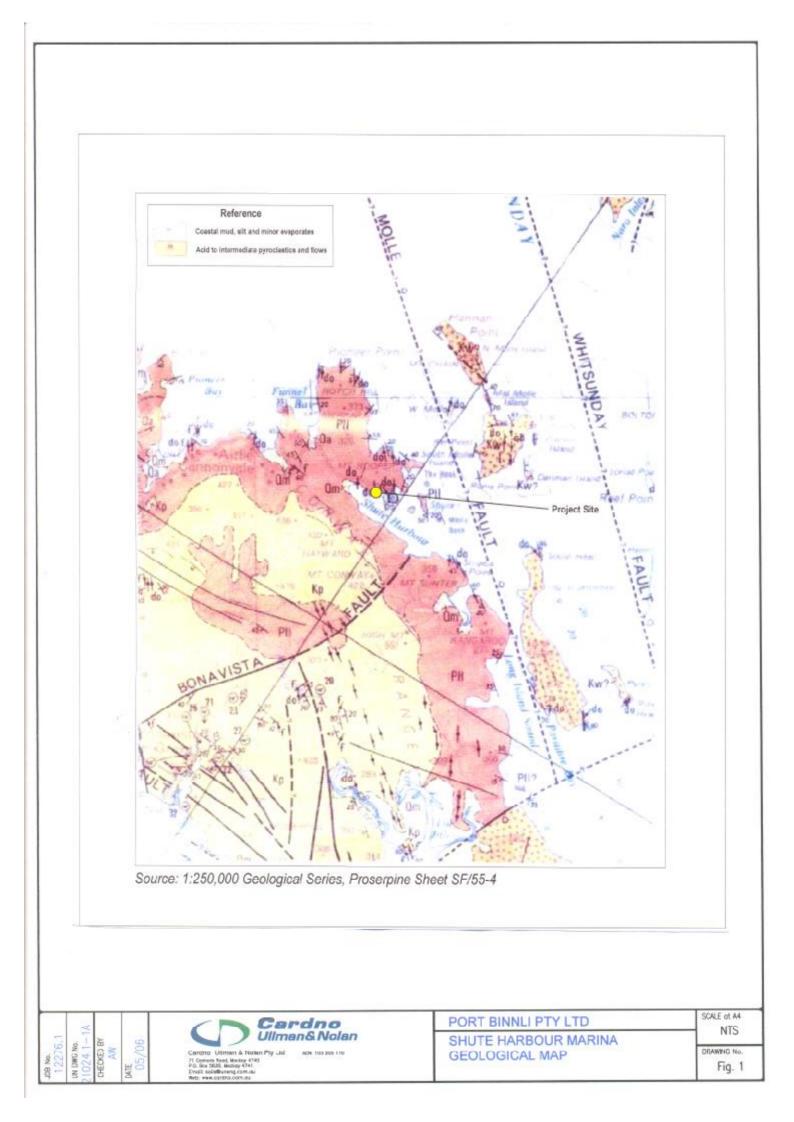
As noted in Section 2.0 of this report, the information contained herein is a summary of data recovered by Ullman & Nolan and others for this site. Reference is also made to a compilation report prepared by Ullman & Nolan for Shift Whitsunday Pty Ltd for the Shute Harbour Jetty precinct.

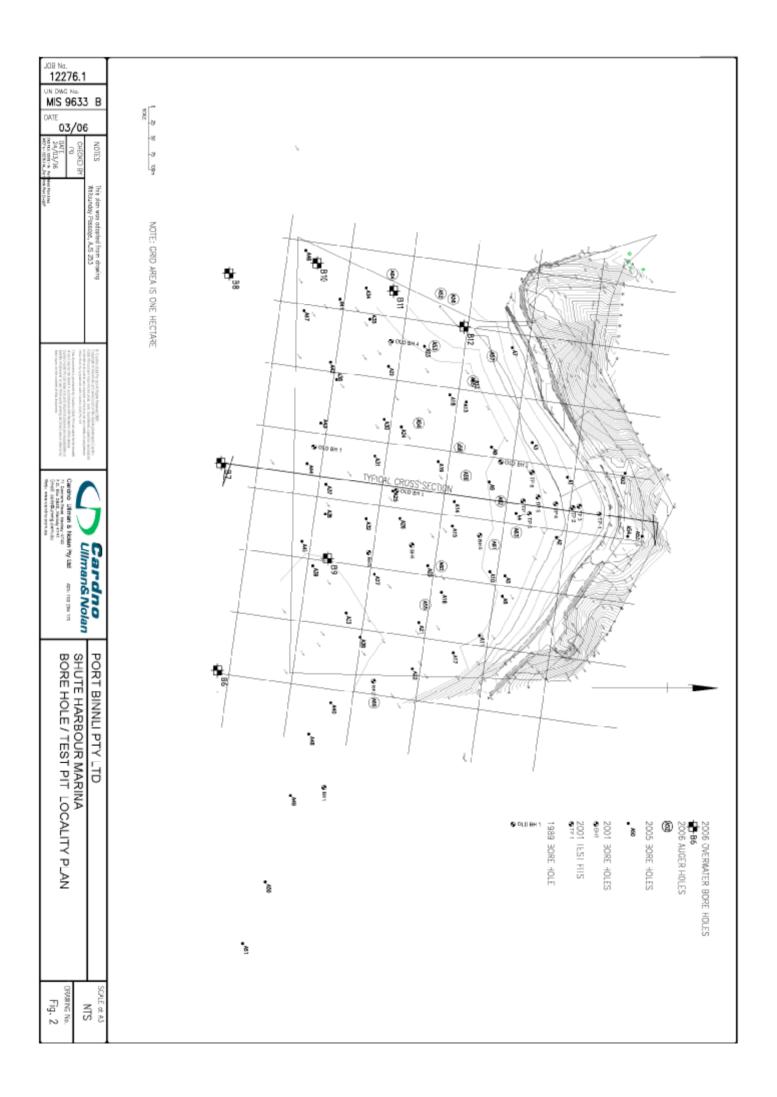
While every effort has been made to portray the geotechnical characteristics of the subject site in a representative manner, it needs to be recognised that geotechnical investigations are still under way and have not yet provided the geotechnical parameters required for design.

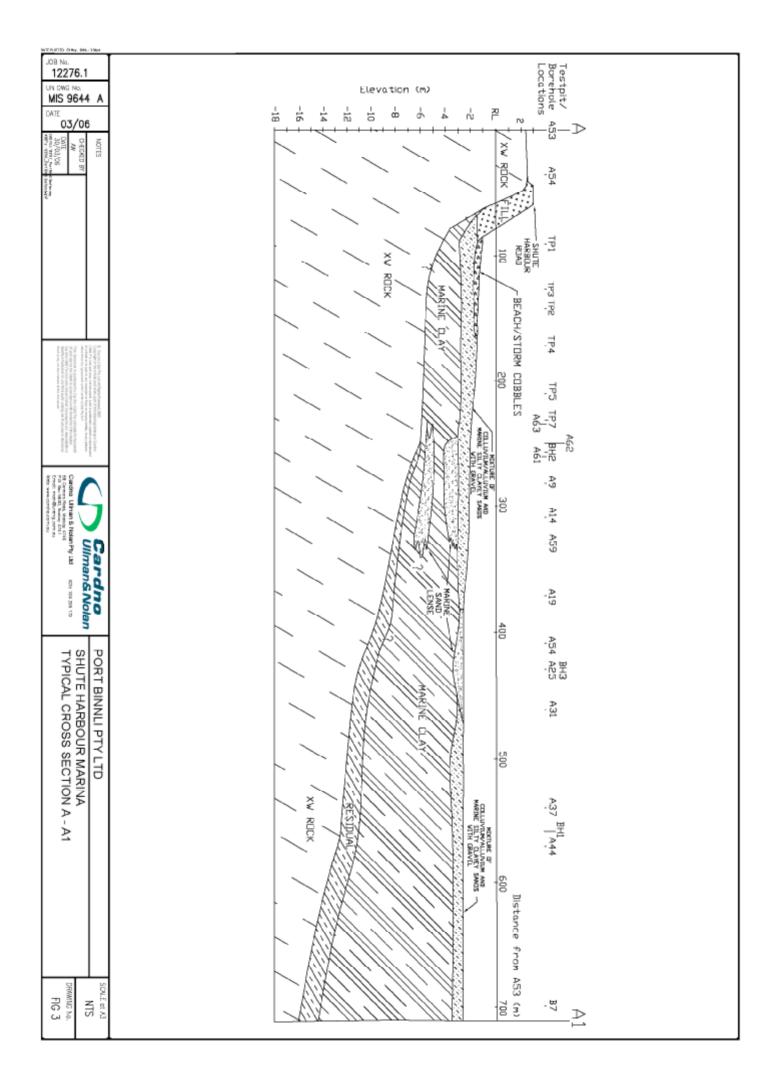


FIGURES

- Figure 1 Geology Map
- Figure 2 Locality Plan
- Figure 3 Typical Cross Section









ATTACHMENT A

Descriptive Logs

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UNG2

Issue 1 Rev 0

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- H hammer
- C core

R rotary air flush

D diamond

UNG2

Issue 1 Rev 0

														(-/1	1/93)	
				_				-				Borehole	No. 2			
				E	BOR	EHOLE	LO	G				Sheet 1	of 1			
Client	Kinsn	nen	Pty L	.td					Dat	e: ation:	21.5.01 Access	Job No: Channel W	est End	10474 N7755172		
Project:	Shute	e Ha	rbou	r Mar	ina					face R.L.:	-0.7m	Datum:	LAT	E686152		
Site:	Shute	e Ha	rbou	г					Sup	ervisor	MS	Chkd:	AW			
Drill Contra	ctor	Ullm	an & I	Nolan	Geotec	hnic	-	rill Mod	el	Jacro 350	Mounting	Barge	Diamete	r 90		
	STRATA	È	E	*	DRIL	LING	TEST	ING ASS			VISUA	L SOIL DESC	RIPTION			
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	Scre	pH _{ox}	Moisture	Consistency						
0.42 1.00 1.80 2.00 2.10	-0.7		SP/ SM	w	c		8.7	5.8	w	Very Loose	with trac	e shells	rey, fine to coarse grained, with silt, e shells LL 15 P75 10 -			
0.42	-1.12		ML			being	8.5	5.8		Very Soft	Silty Cla	ıy; grey, with	fine to me	dium grained		
						SPT t	8.5	6.4			sand MPS 2	LL 35 P75 8	0	-	India	
1.00						ken by rvals (8.3	6.1							limite	
						ples tal	7.9	6.3							Internet	
						h samj at 0.25	7.6	5.9							mul	
1.80	-2.5					n Dept ushed	7.8	0 .1			with inc	reasing shells	s and coral	I	lim	
2.00	-2.8					0.00 to 4.0m Depth samples taken by SPT manually pushed at 0.25m intervals (N<1)	8.1	5.8								
2.10	-2.0		SM			0.00 r man	8.3	5.5		Soft	Silty San shell	nd; grey, fine	to mediun	n grained, witi		
						From	8.4	5.5				LL 25 P75	35			
							8.3	5.6								
2.90	-3.6		ML				8.3	5.6		Very Soft	Clayey S sand, wi	Silt; grey.with	h fine to co	arse grained		
								5.3				LL 35 P75	80		mulu	
Ŀ							8.1	5.2							- Inde	
							7.7	5.2							mul	
4.00	4.00 -4.7						8.1	5.5			Boreho	ple complete a	it 4.0m dep	pth		
METHOD			BIT		s	UPPORT	SAM	PLING			MOISTURE		VISUAL	DESCRIPTIC	N	
A auger W washbo	re		R rol B bla			C casing Vi mud		disturbea n mm	d sam	iple & size	D dry M mois		MPS ma LL Liqui	aximum partic id Limit	le size	
P percussio			VVE		ľ			turbed s	ample	9	W we			passing 75um	sieve	
H hammer	r		T TC	bit			N Sta	ndard P	enetr	ation	The second					

C core

R rotary air flush

D diamond

Test & Result

PP Pocket Penetrometer Value

UNG2 Issue 1 Rev 0

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														(-/11/	93)
												Borehole	No. 3		
				E	BOR	EHOLE	LO	G							
												Sheet 1	of 1		
Client:	Kinsr	nen	Pty L	.td					Dat	e: ation:	21.5.01 Basin Sta	Job No:	, E 775511,	10474.1 N685958	
Project:	Shute	e Ha	rbou	r Mari	na					face R.L.:	-0.8m	Datum:	LAT		
Site:	Shute	e Ha	rbou	r					Sup	ervisor	MS	Chkd:	AW		
Drill Contra	ctor	Ullm	an & I	Nolan (Geotec	hnic	0	rill Mode	el	Jacro 350	Mounting	Barge	Diameter	90	
8	STRATA	<u> </u>	_		DRIL	LING	TEST				VISUA	AL SOIL DESC	CRIPTION		
			ation	Bit				ASS		ncy					
Ē			iji i	s bo	t	Bild	Scre	ening	Inre	ister					
Depth (m)	R.L	ē	Classification	Method 8	Support	Sampling	DH,	рН _{ох}	Moisture	Consistency					
	<u> </u>	-	мн		c	03	10.01	P***0X		Very Soft	Clavey	Silfy Sand:	grey, with fine	grained	╡
1.00			l	W T	ľ		9.0	6.0		Vory Con	sand, v	with shells		granica	∃
							0.0	0.0			MPS 8	LL 55 P75	60		1
E	. Deing						9.1	5.7							∃
	- SPT bein					l je	0.1	0.7							1
E	samples taken by SPT being					5.0	8.9	5.9							∃
	1.00					σž									1
E	, 1.00 kg					d lase	8.8	5.7							∃
E 1.00						is ker									-
E	bies take					inte inte	8.7	5.7							∃
Ē	-					5m ble									1
E						0.2	8.4	5.6							1
Ē						at	0.4	5.0							-1
1.65	-2.45	┣				From 0.00 to 4.0m Depth samples taken by SPT manually pushed at 0.25m intervals (N<1)	8.6	5.5			-				
Ē			SM				0.0	0.0		Soft			to medium gra	ined sand,	-1
Ē						9.5	8.8	6.0			with sh MPS 1	LL 55 P75	70		1
2.00						La to	0.0	0.0							-1
E						100 Jan									1
						5	8.9	5.6							-
						l i									∃
2.60	-3.4					-	8.8	5.6							-
2.60			сн						м	Soft to	Sandy	Clay: grey, s	and is fine gra	ained to	
Ē							9.3	6.3	to	Firm	mediur	m grained, wit	h shells		-
E							9.3	5.9	w		MPS 0	.5 LL 55 P7	75 60		1
E 3.00							0.5	5.5							-
E															≣
E 3.30	-4.1						9.0	5.8							-
E			СІ				8.7	5.9				LL 50 P75			
Ē-							°./	5,8				22.00 170			-
E								6.0							∃
Ē-							8.8	0.0			Boreho	ole complete a	t 4.0m Depth		-
4.00 -4.8							9.1								ատվուտերուներությունները են
E 4.00	4.00 -4.8							6.0							=
METHOD	METHOD BIT SUPPORT							PLING		_	MOISTUR			SCRIPTION	
A auger W washbo	auger R roller C casing washbore B blank M mud							disturbed n mm	i sam	iple & size	D dr M mois		MPS maxir LL Liquid L	murn particle imit	siz€
P percussio					P	n muu		turbed s	ample	9	W we			sing 75um si	eve
H hammer	ercussion VV bit							ndard P	•					-	

- H hammer C core

R rotary air flush

D diamond

Test & Result

PP Pocket Penetrometer Value

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														(-/11	/93)
	BOREHOL							_				Borehole	No. 4		
				E	BOR	EHOLE	LO	G				Sheet 1	of 1		
Client:	Kinsr	nen	Pty L	.td					Dat Loc	e: ation:	21.5.01 Basin Sta	Job No: ge 1-Centra	al N7755174	10474.1 E685928	
Project:	Shute	e Ha	rbou	r Mar	ina				Sur	face R.L.:	-0.7	Datum:	LAT		
Site:	Shute	e Ha	rbou	г					Sup	ervisor	MS	Chkd:	AW		
Drill Contra			an & I	Nolan (Geotec		-	orill Mode	el 🛛	Jacro 350	Mounting	Barge	Diameter	90mm	-
	STRATA	Ì –	E	Bi	DRI	LING	TEST	TING d ASS	<u> </u>		VISUA	L SOIL DESC	RIPTION		
Depth (m)	Depth (m) R.L Log Log A Classificat A Method & Support Sampling					Sampling	Scre	pH _{ox}	Moisture	Consistency					
	CH W C					8.9	5.6	w	Very Soft	sand, v	lay; grey, with vith shells LL 55 P75	n fine to coarse 80	grained	ասհատետուհատեսուհուսեսու	
	en by SPT being				8.7	5.7							mlm		
	s taken by SPT bei intervals (N<1)			8.7	5.6							mlm			
1.00		om 0.00 to 4.0m Depth samples taken by SPT being manually pushed at 0.25m intervals (N<1)				8.7	5.8							umhuu	
	h samples taken by				8.8	5.7							mhin		
	epth samples to				8.7	5.6							uluu		
						im Dep pushec	9.2	5.6							mhun
2.00						0 to 4.0 nually	9.0	5.6							mhun
						ma ma	9.1	5.7							mhun
						Fro	9.0	5.7							mhun
							8.7	5.9							mhun
3.00	-3.8						9.2	5.8							mhunh
	- 3.10 -3.8				8.5	5.9		Soft	shells		e to coarse gra	ined, with	mhun		
3.00 3.10 4.00						8.5	6.0			MPS 2	LL 35 P75	40			
						8.6	5.6			Boreho	e complete a	t 4.0m Depth		mlum	
4.00	-4.7						8.9	5.6				-	-		=
METHOD			BIT		s	UPPORT	SAM	PLING			MOISTURE	E	VISUAL DES	SCRIPTION	1
A auger	auger R roller C casing								l sam	iple & size	D dry		MPS maxim		size
W washbo Ppercussion					ſ	v mud		n mm turbed s	ample	•	M mois W we		LL Liquid Lir P75 % pass		ieve
H hammer								ndard P							

- C core
- R rotary air flush

D diamond

Test & Result PP Pocket Penetrometer Value

Issue 1 Rev 0

1.14	4	(93)
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UNG2

Client: Kinsmen Pty Ltd								~				Borehole	No. 5	(-/11/93)
				E	SOR	EHOLE	LC	G				Sheet 1	of 1	
Client:	Kinsr	nen	Pty l	td					Dat	e:	21.5.01	Job No:		10474.1
Project	Chut	La	rhou	r Mori					Loc	ation:	Basin Sta	ge 1-North,	N7755274	E685885
Project:	Shute	апа	rbou	i wan	lla				Sur	face R.L.:	0.0	Datum:	LAT	
Site:	Shute	e Ha	rbou	Г					Sup	ervisor	MS	Chkd:	AW	
Drill Contra			an &	Nolan (hnic LING	-	Drill Mode TING	el I	Jacro 350	Mounting	Barge	Diameter	90mm
	STRATA	Ì	5	Bit			_	d ASS		>	1304	L SOIL DESC	RIPTION	
Depth (m)	R.L	Log	Classification	Method & E	Support	Sampling	Scre	eening pH _{ox}	Moisture	Consistency				
	0.0 CH W T C Dilag LdS Ag use of the system						9.0	5.4	w	Very Soft	graine	e y Silt; g rey, v ed sand, with s 3 LL 60 P75		dium Initialiani Initialiani Initia
	by SPT being					being	9.1	5.7						
	1.00 1.00				N<1)	9.0	5.9							
1.00	ples taken by SP					ken by rvals (9.1	5.8						
	samples take					les tal m inte	8.8	5.7						
1.55	55 epth samples take				i samp at 0.25	8.9	5.7							
	1.55 Depth sample				Depth shed a	8.9	5.8							
2.00).00 to 4.0m Dept manually pushed	8.9	5.7						
						0.00 to manua	8.8	6.1						
2.40	-2.4					From								
2.70	-2.7		SM			Ē	9.1	5.8		Loose	with s		ine to coarse g 5 30	rained, _=
			ML	İ			9.0	5.9		Soft				
3.00							9.0	6.0			graine	eySilt; grey, v ed sand, with s 6 LL 55 P75		rained,
							9.2	5.8						
							8.6	5.5						
	-						8.5	5.7						
4.00								5.8			Boreho	le complete at	t 4.0m Depth	
METHOD			BIT			UPPORT		PLING			MOISTURE		VISUAL DES	
A auger W washbo	re		R rol B bla			C casing Vi mud		disturbec n mm	ı sam	iple & size	D dry Minnois		MPS maxim LL Liquid Lii	ium particle size mit
P percussio								turbed s	ample	•	W we			ing 75um sieve
H hammer	washbore B blank M mud ercussion V V bit						N Sta	andard P	enetr	ation				

- C core
- R rotary air flush

D diamond

N Standard Penetration Test & Result

PP Pocket Penetrometer Value

UNG73

ULLMAN & NOLAN GEOTECHNIC

Client: Project: Site: Contractor	Reclam	ed S nation	hute H n Area	TEST P	na Equip TESTING	Sur Sup	e: ation: face R.L.: pervisor Samsung 21t 1	+0.50m PAJD Tracked Excav	Datum: Chkd:	1 of 1 10474.1 55685803E LAT AW Bucket Size 450mm CRIPTION	(-/4/94)
Depth (m)	R.L	Log	Classification		Field ASS Screening	Moisture	Consistency				
0.40 1 1.10 2 2.50 3 3.80 4	+0.60 +0.20 -0.5			1.50-2.00 D1	pH _f = 8.02 pH _{ox} =6.96	W	Loose Very Loose Soft	intersti gravell shell a volcan MPS 2 Dark g SAND, fragme MPS 5 Light g silty CI MPS 1	tial material, fi y siity clayey S nd coral fragm cs 50mm LL 30 rey, medium p Gravels being nts and (5%) 0 LL 45 P7 rey, high plast AY with lense 0 LL 60 P7	lasticity, gravelly claya g (20%) shell and coral angular acid volcanic 5 30 icity, slightly gravelly s s of grey gravelly SAN 5 80	(15%)
3.80	-3.20							Test pi	t complete at :	3.80m	

SAMPLING

U undisturbed sample &

MOISTURE D dry VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit

size in mm D disturbed sample

PP Pocket Pentrometer Valve

M moist W wet

P75 % passing 75um sieve

ULLMAN & NOLAN GEOTECHNIC

												(4/94)
									Pit No.		2	
				TEST PI	T LOG							
									Sheet 1	of 1		
Client:	Kinsme	en Pt	y Ltd			Dat Loc	e: ation:	12.3.01 GSP UTM	Job No: 7755405N	10474.1 685804E		
Project:	Propos	ed S	hute H	larbour Marin	na		face R.L.:	+0.5m	Datum:	LAT		
Site:	Reclam	natior	n Area			Sup	pervisor	PAJD	Chkd:	AW		
Contractor	Demol Pt	ty Ltd				ment	Samsung 21t 1	Tracked Excava	ator	Bucket Size	a 450mm	
	STRATA	ì	c	SAMPLING	TESTING	–		VISU	AL SOIL DES	CRIPTION		
Depth (m)	R.L	Log	Classification		Field ASS Screening	Moisture	Consistency					
	+0.5		0			W	Loose	medium being (2) fragmen		elly clayey S/ (10%) angul		
0.90	-0.4	\square					Very Soft	Light gr gravelly		high plastici	ity, sandy slightly	, and the second s
	-0.7			1015				MPS 10) LL 60 P75	85		
1.25	-1.1			1.2-1.5 D1	pH _f = 8.4 pH _{ox} =7.2			some co	edium plasticr oral boulders 0 LL 20 P75		velly SAND with	
0.50 0.90 1 1.25 2 3 3	-1.1							Test pi	t terminated a i n muds.		to excavator	

SAMPLING

U undisturbed sample &

MOISTURE D dry

W wet

size in mm

D disturbed sample

PP Pocket Pentrometer Valve

D dry M moist VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve ie i Kev u

ULLMAN & NOLAN GEOTECHNIC

												4/94)
									Pit No.		3	
				TEST P	T LOG							
									Sheet 1	of 1		
Client:	Kinsme	n Pt	v Ltd			Dat	e:	12.3.01	Job No:	10474.1		
0.00110			,				ation:		7755414N			
Project:	Propos	ed S	hute H	larbour Mari	na	Sur	face R.L.:	0.6	Datum:	LAT		
Site:	Reclam	atior	n Area			Sup	ervisor	PAJD	Chkd:	AW		
Contractor						oment	Samsung 21t T			Bucket Size	450mm	
	STRATA	ì	e	SAMPLING	TESTING			VISU	AL SOIL DES	CRIPTION		
Depth (m)	R.L	Log	Classification			Moisture	Consistency					
0.50 1 2.25 2.50 3 3.50	+0.6 -1.65 -2.9			2.50-3.0 D1		W	Laose to Soft	grey, k SAND. angula MPS 1 1.0m rock g 2.25 occasii clayey MPS 4	Gravels bein r acidic volcan 80 LL 40 P7 becoming ver ravels gradual transit onal large (400 silt lenses 00 LL 50 P7	plasticity, gra g (10%) shell ics 75 30 ry soft with de tion to darker 0mm) coral fra 75 50	velly silty clayey s and (20%) ccreasing angula	humhundhum
								Test pi	t complete at 3	3.50m		mulum
E 4												Ξ
SAMPLING	3				MOISTURE			VISUAL DES	CRIPTION			

U undisturbed sample &

M moist

W wet

size in mm

D disturbed sample

PP Pocket Pentrometer Valve

DISTURE VISUAL DESCRIPTION D dry MPS maximum particle size LL Liquid Limit

P75 % passing 75um sieve

ULLMAN & NOLAN GEOTECHNIC

TEST PIT LOG Client: Kinsmen Ply Ltd Date: 12.3.01 Job No. 10474.1 Location: GPS UTM 7753377N 665005E Project: Proposed Shute Harbour Marina Surface R.L: 0.3 Datu: LAT Site: Reclamation Area - Central Supervisor PAJD Chixi: AW Contractor Dend Pty Ltd Equipment Samuug 211 Tracked Excavator Bucket Bac 450mm Site: Reclamation Area - Central Supervisor PAJD Chixi: AW Contractor Sampulso Field ASS Screenings Bucket Bac 450mm Straton Screenings Screenings VISUAL SOL DESCRIPTION Screening registration and screening												(~	/4/94)
Sheet 1 of 1 Client: Kinsmen Pty Ltd Date: 12.3.01 Job No. 10474.1 Location: GPS UTM 7755377N 665605E Project: Proposed Shute Harbour Marina Surface R L: 0.3 Datum: LAT Site: Reclamation Area - Central Supervisor PAJD Chik: AW Contractor Demol Pty Ltd Equipment Samung 211 Tracked Excenter Bucket Bize 450mm Str. 37RATA SAMPLING TESTING VISUAL SOL DESCRIPTION Str. Str. Str. VISUAL SOL DESCRIPTION Solution in agroup and the coarse grained. Str. Str. Str. Str. Str. Str. Str. 1.50 Str. Str. Str. Str. Str. Str. Str. 1.50 Str.										Pit No.		4	
Client Kinsmen Pty Ltd Date: 12.3.01 Job No 10474.1 Project: Proposed Shute Harbour Marina Surface R.L:: 0.3 Datum: LAT Site: Reclamation Area - Central Supervisor PAJD Chkd: AW Contractor Demo Pty Ltd Equipment Samsung 21t Tracket Excavator Bucket Size 450mm Stratz Soft Stratz VISUAL SOL DESCRIPTION **0.3 Strate Size Screenings g g g g g g g Screenings g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g g					TEST P	IT LOG							
Project: Proposed Shute Harbour Marina Location: GPS UTM 7755377N 668805E Site: Reclamation Area - Central Supervisor PAJD Chick: AuX Contractor Baueno BPy Lid Equipment Samuag 211 Tacked Excavator Buck Size 450mm STRATA SAMPLING TESTING Supervisor PSJD Chick: AuX STRATA SAMPLING TESTING Supervisor PSJD DECORIFICION STRATA SAMPLING TESTING Supervisor VISUAL BOIL DESCRIPTION STRATA SAMPLING TESTING Supervisor PsdD Note Size 450mm Strata Soft Itage provide Size 450mm Soft Light gray becoming gray, fine to coarse gnined, and sitty sightly days andy GRAVEL. Particles and softward sightly days and softward si										Sheet 1	of 1		
Project: Proposed Shute Harbour Marina Surface R.L.: 0.3 Datum: LAT Site: Reclamation Area - Central Supervisor PAJD Chkd: AW Contractor Demol Py Lid Equipment Samung 21t Tracked Exavator Bucket Size 450mm STRATA SAMPLING Field ASS VISUAL BOIL DESCRIPTION Image: Strate Contractor Soreenings g g G Image: Strate Contractor Soreenings g G G Soreenings Image: Strate Contractor Soreenings g G G G Soreenings G G Image: Strate Contractor Soreenings g G G G Soreenings G G G Soreenings Soreenings Sore Sore Sore Sore Sore Sore Sore Sort 1.5 becoming less gravely with increasing clay length MPS 000 LL 45 P75 45 MPG 000 LL 45 P75 45 Image: Sore Sore Sore Sore Sore Sore Sore Sore	Client:	Kinsme	n Pt	y Ltd			Dat	e:	12.3.01	Job No:	10474.1		
Suitable R.L. 0.3 Datum. LAT Suitable R.L. 0.3 Datum. 241 Supervisor PAJD Chkc: AW Contractor Demol Py Ltd Equipment Samaung 211 Tracked Excavator Bucket Size 450mm VISUAL SOIL DESCRIPTION VISUAL SOIL DESCRIPTION +0.3				-			Loc	ation:	GPS UTM	7755377N	685805E		
Contractor Demol Pty Ltd Equipment Samsung 211 Tracked Excavator Bucket Size 450mm STRATA SAMPLINO TESTING Image: Strate in the strategy of the strategy	Project:	Propos	ed S	hute H	larbour Mari	na				Datum:	LAT		
STRATA SAMPLING TESTING VISUAL SOIL DESCRIPTION Image: Strate in the str	Site:	Reclam	atior	n Area	- Central		Sup	ervisor	PAJD	Chkd:	AW		
Image: Section of the section of t	Contractor					1	ment	Samsung 21t T				450mm	
E I I I I I I 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <t< td=""><td></td><td></td><td>È</td><td>ç</td><td>SAMPLING</td><td></td><td>-</td><td><u> </u></td><td>VISU/</td><td>AL SOIL DESI</td><td>CRIPTION</td><td></td><td></td></t<>			È	ç	SAMPLING		-	<u> </u>	VISU/	AL SOIL DESI	CRIPTION		
43.9 W Loose Light grey becoming grey, fine to coarse grained, sity, sightly claysy sandy GRAVEL. Particles being shells and coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional cobbles and builder sized coart fragments (25%) with accassional larger coral fragments up to 700mm long and coart fragments up to 700mm long and coart fragments (25%) with accassional larger coral fragments up to 700mm long and coart fragments (25%) with accassional larger coral fragment (25%) with accassional	Depth (m)	R.L	Log	Classificatio		1	Moisture	Consistency					
	1.50 2.50								silty, si being s angula and bo MPS 6 MPS 6 1.5 b lenses	ightly clayey s hells and cora r country rock ulder sized co 00 LL 25 P7	andy GRAVE Il fragments (2 (5%) with occ ral heads 75 25	L. Particles 25%) and assional cobble	_
	3							Very Soft	CLAY MPS 75 3.5 oc	ELL 50 P75	50		չ հատկատկատկան
						MOIETURE					.0m		

U undisturbed sample &

D dry M moist

W wet

size in mm D disturbed sample

PP Pocket Pentrometer Valve

MPS maximum particle size LL Liquid Limit

. P75 % passing 75um sieve

UL	LMAN	&	NOL	AN	GEO	TECHNIC	2
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												4/94)
									Pit No.		5	
				TEST P	T LOG							
									Sheet 1	of 1		
Client:	Kinsme	n Pt	/ I td			Dat	'e'	12.3.01	Job No:	10474.1		
Onorne.	Minorite		, Lta				ation:		7755347N			
Project:	Propos	ed S	hute H	arbour Mari	na		face R.L.:	0.2	Datum:	LAT		
Site:	Reclam	atior	n Area			Sup	pervisor	PAJD	Chkd:	AW		
Contractor	Demol Pt	y Ltd			Equip	ment	Samsung 21t T	racked Excave	ator	Bucket Size	450mm	
	STRATA	\		SAMPLING	TESTING			VISU	AL SOIL DES	CRIPTION		
Depth (m)	R.L	Log	Classification		Field ASS Screenings	Moisture	Consistency					
1 1.25 2.25 2.50 3 2.25	+0.2			2.5-3.0 D1	pH _f = 8.1 pH _{αx} =7.2	W	Very Loose	angula and co with oc MPS 4 SILT MPS 10 2.25 3.25 500mm	casional bould 50 LL 25 P7 noderate plasti 00 LL 40 P7	VEL. Particle: (30%) with co Jers of corals 75 30 icity, gravelly : 5 45 reasingly clay- ntent of coral f s not reef)	s being shells untry rock (5%)	
E 4	-4.0							resupic	complete at 4			=
SAMPLING					MOISTURE			VISUAL DES	CRIPTION			

U undisturbed sample &

M moist

W wet

size in mm D disturbed sample

PP Pocket Pentrometer Valve

MOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

ULLMAN & NOLAN GEOTECHNIC

											(-/4/94)
									Pit No.	e	5
				TEST PI	T LOG						
									Sheet 1	of 1	
Client:	Kinomo	Di-	امغا .			Dat		40.0.04		40474.4	
Client.	Kinsmen Pty Ltd						e: ation:	12.3.01 GPS UTM	Job No: 7755351N	10474.1 685831E	
Project:	Propos	ed S	hute H	arbour Marin	na		face R.L.:	0.1	Datum:	LAT	
Site:	Reclam	ation	Area			Sur	ervisor	PAJD	Chkd:	AW	
Contractor	Demol Pt		INICa		Emilia		Samsung 21t T			Bucket Size 45	0
Contractor	STRATA			SAMPLING	TESTING	meni	Samsung zit i		AL SOIL DES		omm
		Ì	E.		Field ASS	\vdash	>				
Ê			Classification		Screenings		Consistency				
Depth (m)			ssifi			Moisture	Isist				
	R.L	Log	Clar			Moi	ő				
	+0.1					w	Very Loose	silty sa (30%) MPS 2 dark gr gravell	ndy GRAVEL.	grey, moderate p ∉SILT	carbonate
2 2.50 3	-2.4			3.5-4.0 D1	pH _f = 8.0 pH _{0x} =7.4				n creasing prop nm size with in	oortion of coral fra iterstital clay	_
4	-3.9							Test pit	complete at 4	.0m	

SAMPLING

U undisturbed sample &

MOISTURE D dry M moist

W wet

size in mm D disturbed sample

PP Pocket Pentrometer Valve

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit

. P75 % passing 75um sieve

ULLMAN	۷ &	NOL	AN (GEO	TEC⊦	INIC
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											(-/-	4/94)
										Pit No.	7	
					TEST PI	T LOG						
										Sheet 1	of 1	
Olivert							D. (40.0.04	-		
Client:		Kinsme	n Pt	/ Ltd			Dat	e: ation:	12.3.01 CDS UTM	Job No: 7755326N	10474.1	
Projec	t:	Propose	ed S	hute H	larbour Marii	na		face R.L.:	0.0	Datum:	LAT	
0.1					0							
Site:		Reclam		n Area	South			ervisor	PAJD	Chkd:	AW	
Contract	tor	Demol Pt					ment	Samsung 21t T			Bucket Size 450mm	
		STRATA	<u> </u>	c	SAMPLING	TESTING Field ASS			VISU/	AL SOIL DES	CRIPTION	
Denth (m)		R.L	Log	Classification		Screenings	Moisture	Consistency				
	50.	<u>-1.5</u>			3.5-4.0 D1	pHr = 8.0 pHox=6.9	W	Soft	Silty sa (30%) MPS 1: Grey to gravelly MPS 11 MPS 11 SILT (15	light grey, me sandy silty Cl 0 LL 60 P7	dium to highly plastic, LAY (15% carbonates) 5 70 um plasticity, gravelly clayey	2
		-4.0							Test pit	complete at 4	.0m	

SAMPLING

U undisturbed sample &

MOISTURE D dry M moist

W wet

size in mm D disturbed sample

PP Pocket Pentrometer Valve

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit . P75 % passing 75um sieve

ULLMAN & NOLAN GEOTECHNIC

												(-/4/94)
									Pit No.		8	
				TEST P	IT LOG				Chart 1			
									Sheet 1	of 1		
Client:	Kinsme					Dat Loc	e: ation:	12.3.01 GPS UTM	Job No: 7755348N	10474.1 685767E		
Project:	Propos	ed S	hute H	larbour Mari	na	Sur	face R.L.:	0.0	Datum:	LAT		
Site:	Reclam	natio	n Area			Sup	pervisor	PAJD	Chkd:	AW		
Contractor					-	oment	Samsung 21t T			Bucket Size	450mm	
	STRATA	Ì	ç	SAMPLING	TESTING	\vdash	<u> </u>	VISU	AL SOIL DES	CRIPTION		+
Depth (m)	R.L	Log	Classification			Moisture	Consistency					
	-1.25					w	Very Loose	sorted, carbon	light grey, fin silty clayey G ate (20%) 25 LL 20 P	RAVEL. All		աստեսություն
2							Soft to Very Soft	(20% c	edium plastici arbonates) 40 LL 45 P7		andy clayey Si	7 Immhannhannhann
	-2.50								ecoming more		increasing	a. առահատահատահատահատահատահատահատահատահատահ
E ,	-4.0					1		Test pit	complete at 4	4.0m		=

SAMPLING

U undisturbed sample &

MOISTURE D dry M moist

W wet

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

size in mm D disturbed sample

PP Pocket Pentrometer Valve

ULLMAN & NOLAN

UNGR 103G

	(-	/1	/0)3)
_	_	_	_		

					Т	echnical S A.C.N.				_td		Borehole	-	(1/03)
					E	BOREHO			G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat	e: ation:	12.7.04 E5506857	Job No: 742 N77554	21024.1/10474.3	
Project:	Environmental & Acid Sulfate Investigation									face R.L.:	1.00	Datum:	AHD	
Site:		e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan 1		al Services	D TEST	rill Mode	el I	Hand Auger	Mounting VISUA	Boat	Diameter 50mm RIPTION	\neg
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}		Consistency	Fill Sit			
			GP/ GM	AT		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.0	6.1 5.8 5.9	w	Loose	angular (Marine		fine to coarse grained, o coarse grained 75 15	
			GC				8.5 8.3 8.4 8.2 8.1	5.9 5.9 5.7 5.9 5.9			grained (Marine	, angular, san	l; grey, fine to coarse d is fine to coarse graine 30	ատակատակատուհա
											Boreh	ole complete	at 2.00m	
E 4 METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond				C casing	Uund ir Ddist NSta	PLING disturbed mm turbed sa ndard P t & Res	ample enetr		MOISTUR D dr M mois W we	y it	VISUAL DESCRIPTIO MPS maximum partic LL Liquid Limit P75 % passing 75um	le size		

R rotary air flush

PP Pocket Penetrometer Value

					Т	echnical S A.C.N.				_td		Borehole I		(-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	Pty Ltd			Dat	e: ation:	12.7.04 E5506858	Job No: 38 N77554	21024.1/10474.3	3
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n		face R.L.:	0.00	Datum:	AHD	
Site:				r Mari						bervisor	CG	Chkd:	AW	
Drill Contra	STRATA		an & I	Nolan 'l		al Services LING	TEST	rill Mode ING		Hand Auger	Mounting VISUA	Boat L SOIL DESC	Diameter 50mm RIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	SSA PL	Screenin B Results XO4 Hd		Consistency	Fill Site			
			GP	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.5	6.1 6.0 6.1	w	Loose	angular, (Colluviu		ine to coarse grained, o coarse grained, with 5 10	sitt
			sc				8.8 8.2 8.6 8.4 8.4	6.2 6.0 6.1 6.1			grained, angular (-		
0.80 1 3										Boreh	ole complete	at 2.00m		
METHOD A auger W washbo P percussio H hammer C core R rotary ai	on		BIT R roll B bla V V E T TC D dia	nk bit		UPPORT C casing // mud	U und ir D dist N Sta Tes	n mm turbed sa indard P it & Resu	ample enetr ult		MOISTURE D dry M moist W wet	/ t	VISUAL DESCRIPT MPS maximum part LL Liquid Limit P75 % passing 75u	ticle size

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole I	(-/1/0 No. A3	3)
					E	BOREHO	DLE	LO	G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	12.7.04 E5506856	Job No: 86 N77553	21024.1/10474.3	_
Project:	Envir	onm	enta	8 Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-0.50 m	Datum:	AHD	
Site:	Shute								Sup	pervisor	CG	Chkd:	AW	_
Drill Contra	ctor STRATA		an &	Nolan 1		al Services	D TEST	rill Mode	el I	Hand Auger	Mounting VISUA	Boat L SOIL DESC	Diameter 50mm	+
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	ASS	Hq Screenn B Resuts Fox		Consistenc/	Fill Site			
			SP/ SM	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.4	5.9 5.9 5.8	w	Loose	fine to c (Colluvi	y Sand; fien to coarse grained, um/Marine) ULL 15 P75	e coarse grained, gravel is angular - 15 -	لسسلسسلسس
1			sc				8.5 8.5 7.6	5.8 6.0 6.3			trace of (Colluvi		ne to coarse grained, n grained gravel, angular 30	հատահե
1 1 1 2 3	1.30 1.39							6.3			(Residu MPS 2		e to coarse grained 0 - at 1.39m - - - - - - - - - - - - - -	
METHOD A auger W washbo P percussio H hammer C core R rotary ai	on		BIT R rol B bla V V t T TC D dia	nk	(UPPORT C casing M mud	U und in D dist N Sta Tes	n mm turbed s ndard P t & Res	ample enetr ult		MOISTURE D dr M mois W we	y t	VISUAL DESCRIPTION MPS maximum particle s LL Liquid Limit P75 % passing 75um sie	size

UNGR 103G

					Т	echnical S A.C.N.				td		Borehole		/03)
					E	BOREHO	DLE	LO	G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	Pty Ltd			Dat	e: ation:	17.7.04 E5506857	Job No: '99 N7755	21024.1/10474.3	
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n		face R.L.:	-1.50m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	ervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan 1		al Services LING	D TEST	rill Mode	el 🛛	Hand Auger	Mounting	Boat L SOIL DESC	Diameter 50mm	\square
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	Hesults Results	Moisture	Consistency	Dredge	e Site		
0.60			GP	A T		Field screening at 0.25m interva ASS and environmenta sampling at	8.7	5.8 5.8	W	Loose	angular, (Colluvit		fine to coarse grained, o coarse grained 75 5	
			SC			0.5m intervals	8.7 8.7 8.8	6.0 5.9 5.8			fine to m		ne to coarse grained, with d gravel, angular (Marine) 30	առահատահատահատահատահատահատո
							8.8 8.8	5.8 5.9						ատեսունուս
2							8.9 9.0 9.1	5.9 6.1 6.2						
3.40 3.50								6.3 6.3 ample very			grained	Sand; purple-t (Residual) LL 20 P75 2	brown, fine to coarse	
3.40 3.50												uger refusal		
METHOD A auger W washbo P percussio H hammer C core	'n		BIT R rol B bla V V b T TC D dia	nk bit	(UPPORT C casing / mud	U und in D dist N Sta Tes	nm urbed sa ndard P t & Resu	ample enetra ult		corres	v t t Proposed dre	VISUAL DESCRIPTION MPS maximum particle LL Liquid Limit P75 % passing 75um s adge level (PDL) at -5.2m in depth in this borehole.	e siz€ sieve

R rotary air flush

PP Pocket Penetrometer Value

No sample recovery 3.0m

UNGR 103G

3)

						A.C.N.				_td		Borehole	No. A5	(-/1/03)
					E	BOREH	OLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	15.7.04 E5506858	Job No: 399 N7755	21024.1/10474. 352	3
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-1.80m	Datum:	AHD	
Site:				r Mari						pervisor	CG	Chkd:	AW	
Drill Contra			an & I	Nolan 1		al Services	_	rill Mode	el T	Hand Auger	Mounting	Boat	Diameter 50mm	
8	STRATA	È	5		DRI	LING	TEST		-		VISUA	L SOIL DESC	RIPTION	$ \rightarrow $
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	PH ASS	B Results Mag Results		Consistency	Fill Site			
1 1.20 2			GP	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.9	6.3 6.6 6.5	w	Loose	angular (Colluvi		fine to coarse grained o coarse grained 5 5	``````````````````````````````````````
1.20			sc				8.6 8.7	6.6 6.5		Very Soft	Clavev	Sand: grev. fir	ne to coarse grained,	
			50				8.6 8.6 8.5	6.3 6.5 6.5			trace of		ravel, angular (Marine	> hhhh
2 3 4								6.9				le complete a	at 2.00m	
METHOD A auger W washbor P percussio H hammer			BIT R rol B bla V V b T TC	nk bit		UPPORT C casing M mud	U und ir D dist	PLING disturbed mm turbed s indard P	ample		MOISTUR D dr M mois W we	y it	VISUAL DESCRIPT MPS maximum par LL Liquid Limit P75 % passing 750	rticle size

Test & Result

PP Pocket Penetrometer Value

C core

R rotary air flush

D diamond

UNGR 103G

					Т	echnical S A.C.N.				_td			Borehole I		/03)
					E	BOREHO	DLE	LO	G				Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:		.7.04	Job No: 31 N7755	21024.1/10474.3 348	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatior	n		face R.L.:		.90m	Datum:	AHD	
Site:	Shute	e Hai	rbou	r Mari	na				Sup	pervisor	CG	3	Chkd:	AW	
Drill Contra			an & I	Nolan 1		al Services		rill Mode	ы I	Hand Auger	Мо	unting	Boat	Diameter 50mm	\neg
(i) fadeo 0.20 1 1.10 1.60 1.67 2 3		Log	C Classification	⊥ > Method & Bit	DRIL	Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	рН _F s8.7 8.8	6.1 6.3 6.2 6.3 6.4 6.5 mple	■ Moisture	Loose Very Stiff		Fill Site Sandy C angular, (Colluvii MPS 20 Clayey 3 grained, (Colluvii MPS 40 Sandy C angular, (Colluvii MPS 100 Sandy C angular, (Colluvii MPS 40 Clayey 3 grained 0 MPS 2	Gravel; grey, fi , sand is fine to um/Marine) 0 LL NP P7 Sandy Gravel angular, sand um/Marine) 0 LL 20 P75 Gravel; grey, fi sand is fine to um/Marine) 0 LL 30 P75 Gravel; grey, fi sand is fine to um/Marine) LL 15 P75	ine to coarse grained, o coarse grained, with slit 5 10 ; grey, fine to coarse l is fine to coarse grained 30 ne to coarse grained, with slit 5 10 ne to coarse grained, with slit 5 10 ne to coarse grained, with slit 10 orown, fine to coarse 0	ահահատեստես
METHOD A auger W washbou P percussio H hammer	n		BIT R roll B bla V V E T TC	nk bit	(UPPORT C casing // mud	in D dist N Sta	isturbed mm urbed sa ndard P	ample enetr		M	OISTURE D dry M mois W web	v t	VISUAL DESCRIPTION MPS maximum particle LL Liquid Limit P75 % passing 75um s	N esize
C core R rotary air	r flush		2 aid	mond				t & Resi ocket Pe		meter Value					

UNGR 103G

)3)

						A.C.N.				_td			Borehole		-/1/03)
					E	BOREH	OLE		G				Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	6.8 E55		Job No: 36 N7755	21024.1/10474.3 363	
Project:	Envir	onm	enta	1 & Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	2.0	0 m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	i	Chkd:	AW	
Drill Contra			an &	Nolan		al Services		rill Mode	ы	Hand Auger	Mou		Boat	Diameter 50mm	
	STRATA	\ 	-		DRIL	LING	TEST				_	VISUAI	L SOIL DESC	RIPTION	$ \rightarrow $
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	SSV PH _F	d Screenin B Results XO4 H		Consistency		Fill Site			
E			SP	A		Field			w	Loose				fine to coarse grained, graiend, angular to	1
			sc			screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	9.1	6.3 6.3 6.3				Clayey G grained, angular, s	trace of silt (LL NP P7: Gravelly Sand	Colluvium/Marine) 5 5 d: grey, fine to coarse to coarse grained, ral (Marine)	
												Hand Au	ıger Refusal	at 1.0m	
METHOD A auger W washbo P percussion H hammer C core	on		BIT R rol B bla V V I T TC D dia	ink bit	(UPPORT C casing M mud	Uund in Ddist NSta	PLING disturbed mm turbed sa ndard P t & Rest	ample enetr		мс	DISTURE D dry M moist W wet	1	VISUAL DESCRIPTION MPS maximum parti LL Liquid Limit P75 % passing 75un	cle siz€

PP Pocket Penetrometer Value

R rotary air flush

Technical Convices Dty Ltd

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole		1/03)
					E	BOREH	OLE	LO	G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	12.7.04 E5506856	Job No: 95 N7755	21024.1/10474.3 331	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.20m	Datum:	AHD	
Site:	Shute									pervisor	CG	Chkd:	AW	
Drill Contra	ICTOR STRATA		an & I	Nolan		al Services	D TEST	rill Mode		Hand Auger	Mounting	Boat L SOIL DESC	Diameter 50mm	-+
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}		Consistency	Dredge	e Site		
0.50			sc	A T		Field screening at 0.25m interva ASS and	9.2 9.0	6.3 6.5	w	Loose	grained, angular,		-	
			сі			environmenta sampling at 0.5m intervals		6.4 6.6		Soft	trace of f		coarse grained sand, avel, angular (Marine))	
0.50 1 1.20							8.8 9.0 8.8 8.6 8.6	6.8 6.5 6.5 6.4 6.5		Very Soft	grained, (Marine)	trace of fine g	d is fine to coarse rained gravel, angular 5	
2.30	PDL						8.5 8.7 8.7 8.6	6.2 6.5 6.4			trace of f		coarse grained sand, avel, angular (Marine))	
3.80			SC			No ASS sample recovery	8.6 8.4 8.7	6.4 6.2 6.3		Very Stiff to Hard	grained,		P	ատետեսու
METHOD A auger W washbo P percussie H hammer C core B rotary ai	on		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	U und in D dist N Sta Tes	mm urbed s ndard P t & Res	ample enetr ult			y t t Proposed dre	VISUAL DESCRIPTIO MPS maximum partic LL Liquid Limit P75 % passing 75um dge level (PDL) at -5.2m depth in this borehole.	le size sieve

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

						echnical S							UNG	GR 103G
						A.C.N.				-10		Borehole	No. A9	(-/1/03)
					E	BOREH	DLE	LO	G			Sheet 1	of 2	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Date Loc	e: ation:	20.7.0 E5506	4 Job No: 85750 N775	21024.1/10474 5327	.3
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatior	ı	Surf	face R.L.:	-2.00n	n Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	ervisor	CG	Chkd:	AW	
Drill Contra	actor STRATA		an & I	Nolan 1		al Services LING	DI	rill Mode	el I	Hand Auger		g Boat SUAL SOIL DES	Diameter 50mm	
Depth (m)		Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}	Moisture	Consistency		edge Site		
0.30			SP	A T		Field screening at 0.25m interva		6.3	w	Loose	grav		, fine to coarse graine I, angular, shells (Mari 5 5	d, III ne)
0.80			sc			ASS and environmenta sampling at 0.5m intervals	9.0	6.4 6.6 6.5		Soft	grain angu MPS	ned, gravel is fine ular, shells (Collur 20 LL 20 P75	20	
0.30 0.80							8.9 8.7	6.6 6.6			trace	,	ne to coarse grained, ravel. angular (Marine 15	d. ee) maanalaanalaanalaanalaanalaanaalaanaalaanaalaanaalaa
2 2							8.8 8.7	6.5 6.4						
							8.8 8.7	6.4 6.3						
3			сн				8.6 8.6	6.5 6.5			trace		coarse grained sand, gravel, angular (Marine 75	»
2.50 3.10 3.20	PDL		GC				8.7	6.3 6.3		Loose	subr with	,	fien to medium graine fine to coarse grained	
4							8.8 8.7	6.2 6.1						
METHOD A auger W washbo P percussi H hammer C core	on r		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	in Ddista NStar Test	isturbed mm urbed sa ndard P & Rese	ample enetra ult		Mir V) dry moist /wet ote: Proposed dr	VISUAL DESCRIP MPS maximum pa LL Liquid Limit P75 % passing 75 redge level (PDL) at -5 m depth in this boreho	article size um sieve 5.2m

R rotary air flush

PP Pocket Penetrometer Value

Technical Services Ptv Ltd

UNGR 103G (-/1/03)

							103 205 20			Borehole	No. A9	
					E	BOREH	OLE LO	G			Sheet 2	of 2
Client:	G.G.	Betr	os &	Asso	ciates	Pty Ltd		Dat Loc	e: ation:	20.7.04 E5506857	Job No: 750 N7755	21024.1/10474.3 5327
Project:	Envir	onm	enta	& Ac	id Sul	lfate Investi	igation	Sur	face R.L.:	-2.00m	Datum:	AHD
Site:	Shute	e Ha	rbou	r Mari	na			Sup	pervisor	CG	Chkd:	AW
Drill Contra			an & I	Nolan	echnic	al Services	Drill Mode	ы	Hand Auger		Boat	Diameter 50mm
8	STRATA		-		DRIL	LING	TESTING			VISUA	L SOIL DESC	CRIPTION
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	bH ^E bH ^{EOX} B Results	Moisture	Consistency	Dredge	e Site	
4.15			GC	A T				W	Loose	Sandy	Gravel; refer	sheet 1, depth 3.10m
4.15 5 6 7										Hand A	uger Refusal	at 4.15m
E 8 METHOD A auger W washbo P percussio H hammer C core	n		BIT R rol B bla V V b T TC D dia	nk bit	(UPPORT C casing // mud	SAMPLING U undisturbed in mm D disturbed sa N Standard P Test & Rest	ample enetr	Ð		v t t Proposed dre	VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve edge level (PDL) at -5.2m n depth in this borehole.

R rotary air flush

PP Pocket Penetrometer Value

Technical Services Ptv Ltd

UNGR 103G

(-/1/03)

					Т	A.C.N.				_td		Borehole		/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	Pty Ltd			Dat Loc	e: ation:	16.7.04 E5506858	Job No: 93 N7755	21024.1/10474.3 3328	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.00m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an & I	Nolan 1		al Services		rill Mode	ы	Hand Auger	Mounting	Boat	Diameter 50mm	
	STRATA	<u> </u>	_		DRIL	LING	TEST				VISUA	L SOIL DESC	RIPTION	\rightarrow
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	sse PH _F	d Screenin B Results XO4	Moisture	Consistency	Dredge			
0.40			GP	A T		Field screening at 0.25m interva	s ^{9.0}	6.5	w	Soft	gravel is shells (C		,	
			СН			ASS and environmenta sampling at 0.5m intervals		6.4 6.5			grained, shells (N	angular, sand	; grey, gravel is fine I is fine to coarse grained, 0	uhuunhu
							8.7 8.9	6.5 6.8						Indum
							9.1	6.4						
							9.0 9.1	6.6 6.7						
	2 3 4						3.1	0.7			Hand A	Auger Refusa	I at 2.0m depth	
METHOD A auger W washbo P percussio H hammer C core	on		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing // mud	Uuno ir Ddist NSta Tes	n mm turbed sa Indard P st & Resu	ample enetr ult			v t t Proposed dre	VISUAL DESCRIPTION MPS maximum particle LL Liquid Limit P75 % passing 75um s adge level (PDL) at -5.2m in depth in this borehole.	esiz€

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

					Т	echnical S A.C.N.				_td			Borehole	No. A11	(-/1/03)
					E	BOREHO	DLE		G				Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:		3.7.04 550685	Job No: 994 N775	21024.1/1 5311	0474.3
Project:	Envir	onm	enta	8 Ac	id Su	lfate Investi	gatio	n		face R.L.:		2.15m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	С	G	Chkd:	AW	
Drill Contra			an & I	Nolan		al Services	D	rill Mode	el I	Hand Auger	Мо		Boat AL SOIL DES	Diameter 50	mm
Depth (m)		Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}	Moisture	Consistency		Fill Si		CRIPTION	
			GP GC	A T	0	Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	s9.1 8.9	6.4 6.3 6.6 6.5 6.5 6.6 6.7 6.9	W	Soft		Angula coral a MPS 1 Claye) graine coral a MPS 2	nr, sand is fine and shells (Col 00 LL NP F Sandy Grave	el; grey, fine to o nd is fine to coar fine) 5 20 5 30	ed, with slit,
⊢ 4 METHOD A auger W washbo P percussio H hammer C core	n		BIT R rol B bla V V t T TC D dia	ink bit	(UPPORT C casing M mud	Uuno ir Ddist NSta	PLING disturbed n mm turbed si andard P st & Resi	ample enetr		м	IOISTUF Dc Mmo Ww	lry ist	LL Liquid Li	SCRIPTION num particle size

R rotary air flush

PP Pocket Penetrometer Value

Technical Services Ptv I td

UNGR 103G

(-/1/03)

					Т	echnical S A.C.N.				_td		Borehole		1/03)
					E	BOREH	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	19.7.04 E5506855	Job No: 89 N7755	21024.1/10474.3	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n		face R.L.:	-2.50m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an & I	Nolan T		al Services	D TEST	rill Mode	el I	Hand Auger	Mounting	Boat	Diameter 50mm	
Depth (m)		Log	Classification	Method & Bit	Support	LING Buildmeg	ASS	pH _{FOX}		Consistency	Dredge	e Site		
			SC	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	9.5	6.4 5.9 6.1	w	Loose	grained (Marine)	, gravel is fine	d; grey, fine to coarse grained, angular, shells 25	
0.80							8.7 9.0 8.6 8.2	6.4 5.4 5.7 6.2			grained, (Marine)		; grey, fine to coarse grained, angular, shells	
2.70	CI PDL						8.6 8.7 8.6 8.7	6.1 6.5 6.6		Soft	grained, t shells (M	trace of fine g	d is fine to coarse rained gravel, angular,)	
2.70 2.90 3 3.75			СН				8.8 8.7 8.9 9.1	6.7 6.5 6.6 6.8				h fine to coars LL 60 P75 80	e grained sand (Marine))	
4											Boreh	ole complete	at 3.75m	
METHOD A auger W washbo P percussio H hammer C core	on		BIT R roll B bla V V b T TC D dia	nk bit	(UPPORT C casing M mud	U und in D dist N Sta	PLING isturbed mm urbed si ndard P t & Resi	ample enetr			v t t Proposed dre	VISUAL DESCRIPTIO MPS maximum particl LL Liquid Limit P75 % passing 75um : edge level (PDL) at -5.2m n depth in this borehole.	e size sieve

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	,	/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	21.7.04 E5506858	Job No: 523 N7755	21024.1/10474.3 291	
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.60m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	VJ	Chkd:	AW	
Drill Contra			an & I	Nolan	Fechnic	al Services		rill Mode	el	Hand Auger		Boat	Diameter 50mm	
	STRATA	<u> </u>	E		DRI	LING	TEST		<u> </u>		VISUA	AL SOIL DESC	RIPTION	$ \rightarrow $
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	SSV PHF	DH _{FOX}		Consistency	Dredg			
0.20			SM SC	A T		Field screening at 0.25m interva	s ^{8.8}	6.5	w	Soft	with fine (Marine	e grained grave	, fine to coarse grained, el, subrounded, shells 15	
0.20 0.60 1 1.10			сн			ASS and environmenta sampling at 0.5m intervals		6.5 6.6			grained,	Silty Sand; gr shells (Marine LL 50 P75 4		
1							8.8 8.8	6.7 6.5			grained	Silty Clay; gre , shells (Marine LL 55 P75 6	r	, muluum
							8.9	6.6			sand, si	ay; grey.with hells (Marine) LL 60 P75 8	fine to coarse grained	
							8.7 8.8	6.4						
2							с.с 8.б	6.3 6.6						
	PDL						8.5	6.3						
2.60							8.9	6.5			Silty Cl	av: drev trace	e of fine to coarse graine	3
2.50 2.50 3 3.75							8.9	6.5			sand (M		-	
							8.6	6.7						
3.75							8.6 8.8	6.4 6.6						-
4									Boreh	ole complete	at 3.75m			
METHOD A auger W washbo P percussio H hammer C core	on		BIT R rol B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	U und in D dist N Sta	PLING listurbed mm turbed si ndard P t & Resi	ample enetr			y at et Proposed dre	VISUAL DESCRIPTIC MPS maximum partic LL Liquid Limit P75 % passing 75um edge level (PDL) at -5.2r n depth in this borehole.	cle size n sieve

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

					Т	echnical S A.C.N.				td		Borehole		-/1/03)
					E	BOREHO	DLE	LO	G			Sheet 1	of 2	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	12.7.04 E5506857	Job No: 81 N7755	21024.1/10474.3 271	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatior	n	Sur	face R.L.:	-2.70m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	ervisor	CG	Chkd:	AW	
Drill Contra	actor STRATA		an & I	Nolan		al Services	D	rill Mode ING	9I	Hand Auger	Mounting VISUA	Boat	Diameter 50mm RIPTION	-+
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}	Moisture	Consistency	Dredge	e Site		
			sc	A T		Field screening at 0.25m interva ASS and environmenta	9.9	6.7 7.3	v	Loose	(Marine)		ne to coarse grained	
			СІ			sampling at 0.5m intervals	9.5 9.4 9.5	6.6 6.9 6.6			grained. shells (N	trace of fine g	nd is fine to coarse grained gravel, angular. 5	ահատհատհ
0.60 1 1.40	PDL		СН				9.5 8.9 8.9 8.8 8.8	6.7 6.6 6.4 6.7			trace of (Marine)	fine grained gr	o coarse grained sand, avel, angular, shells 5	
2.50 3 3.10 3.50	0 No further ASS and environm						8.9 8.8 8.7 8.7 8.7 8.5 8.5 8.6	6.3 6.5 6.3 6.4 6.3 6.1			sand, tra shells (M	ace of fine grai	e to coarse grained ined gravel, angular,	
E 4 METHOD A auger W washbo P percussio H hammed C core R rotary al	on r		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	SAMF U und in D dist N Star Tesi	PLING isturbed mm urbed sa ndard P t & Resu	ample enetra ult			v t t Proposed dre	VISUAL DESCRIPTION MPS maximum partic LL Liquid Limit P75 % passing 75un dge level (PDL) at -5.2i depth in this borehole.	ON cle size n sieve m

PP Pocket Penetrometer Value

R rotary air flush

Technical Services Pty Ltd

UNGR	103G
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(-/1/03)

A.C.N. 103 205 205 Borehole No. A14 BOREHOLE LOG of 2 Sheet 2 Client: G.G. Betros & Associates Pty Ltd Date: 20.7-6.8.04 Job No: 21024.1/10474.3 Location: E550685781 N7755271 Project: Environmental & Acid Sulfate Investigation Surface R.L.: -2.70m Datum: AHD AW Site: Shute Harbour Marina Supervisor CG Chkd: Drill Contractor Uliman & Nolan Technical Services Drill Model Hand Auger Mounting Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION Screenin g Results Classification 葥 Consistency Ê Method & Dredge Site Sampling ASS Support Moisture Depth 8 pH_F pH_{FOX} R.L SC W Clay; refer sheet 1, 2.50m depth A No further Т 4.20 ASS and 8.7 5.7 Clayey Sand; grey, fine to coarse grained, environmental Soft trace of fine to coarse grained gravel, samples subrounded to rounded (Residual?) collected 8.7 5.7 MPS 3 LL 25 P75 40 Rock; extremely weathered to 8.7 6.1 Clayey Gravelly Sand; grey-purple, fine to 4.80 coarse grained, gravel is fine to coarse, angular Stiff (Residual) 8.7 6.1 MPS 3 LL 25 P75 40 5 5.10 Rock; extremely weathered to Very Dense GP Sandy Gravel; red-purple, fine to coarse 8.7 6.1 to Hard grained, angular, sand is fine to coarse grained (Residual) 8.8 6.1 MPS 20 LL NP P75 10 5.50 Hand Auger Refusal at 5.50m 6 7 BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION METHOD D dry MPS maximum particle size R roller C casino U undisturbed sample & size A auger W washbore B blank M mud M moist LL Liquid Limit in mm VVbit P75 % passing 75um sieve P percussion D disturbed sample W wet T TC bit H hammer

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.5m depth in this borehole.

R rotary air flush

D diamond

C core

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	No. A15	(-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	27.7.04 E5506858	Job No: 20 N7755	21024.1/10474. 268	3
Project:	Envir	onm	enta	8 Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.70m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an &	Nolan 1		al Services		rill Mode	el I	Hand Auger	<u> </u>	Boat	Diameter 50mm	
Depth (m)		Fog	Classification	Method & Bit	Support	LING Buildug	SSV PH _F	H Screenin B Results B Results		Consistency	Dredge	L SOIL DESC	RIPTION	
0.20			SP	AT		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	9.2	6.5 6.4 6.2	w	Loose Soft	coarse (shells (N MPS 20 Clayey 3 of fine to (Marine) MPS 7	grained gravel Marine) LLNP P75 Sand; grey, fir medium grai	ne to coase grained, t ned, angular, shells 5	
1							8.8 8.8	6.4 6.3			trace of angular,		,	
0.20			сі				8.9 8.9 8.8	6.3 6.4 6.4			grained, angular,		,	
	PDL		сн				8.8 8.8	6.4 6.4			trace of f MPS 4	fine grained gr LL 55 P75 70		
2.50 2.60 3 3 3.50							8.9 8.9 9.1	6.0 6.1 6.2			(Marine)	⊧y, with fine to LL65 P7585	coarse grained sand	
3.50							9.1	6.3			Boreho	ple complete	at 3.50m	
METHOD A auger W washbo P percussio H hammer C core	on		BIT R rol B bla V V b T TC D dia	nk bit	(UPPORT C casing M mud	U und ir D dist N Sta	PLING disturbed mmm turbed sa ndard P t & Rest	ample enetr			v t t Proposed dre	VISUAL DESCRIP MPS maximum par LL Liquid Limit P75 % passing 75 dge level (PDL) at -5 depth in this borehol	ticle siz∉ ım sieve 2m

R rotary air flush

PP Pocket Penetrometer Value

lept spon

					Т	LLMAN echnical S A.C.N.	Serv 103 2	ices F 205 20	Pty L	-			Borehole	No. A		103G 1/03)
Client	GG	Retr	05.8	Asso		SOREHO	DLE	: LO	G Dat	e.	29.7.0		Sheet 1 Job No:	of 1	4.1/10474.3	
										ation:			5 N7755		4. 1/104/4.0	
Project:	Envir	onm	enta	& Ac	a su	lfate Investi	gatio	n	Sur	face R.L.:	-2.65	5m I	Datum:	AHD		
Site:	Shute					10-1				bervisor	CG		Chkd:	AW		
Drill Contra	CTRATA		an & i	Nolan		al Services	TEST	rill Mode		Hand Auger			Boat SOIL DESC		ter 50mm N	-
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	bH ^{EOX}	Moisture	Consistency		Dredge S				
0.20	_		SP	A T		Field screening at			Ŵ	Loose	to	medium		-	ined, trace of fin e of silt, shells	
						0.25m interva	\$9.0	6.4		Soft	1 1 2	Marine) IPS 10	LL NP P75	55		
0.70			sc			environmental sampling at 0.5m intervals	9.0 9.0	6.5 6.4		3011	trae she	ace of fin nells (Mar	e to mediun rine)	n grained	rse grained, I gravel, angular	mhuuu
							8.9	6.5			·		L 25 P75			huun
1.20																
0.20			сі				8.9 8.8	6.5 6.3			gra she	ained, tra nells (Mar	-	grained gr	to coarse ravel, angular,	***************************************
							8.8	6.1								l
2			СН	,			8.6	6.1				aut arou	with fine to		grained, trace of	
							8.6	6.1			fine (Ma	e to med larine)		d gravel, a	angular, shells	_
2.50	PDL						8.6	6.1			Cla	av: grev	trace of fin	e to coar	se grained sand	
2.50 2.55 3							8.4	6.1			(Ma	larine)	.65 P759			
3							8.4	6.3								
							8.4	6.2								-
							8.7	6.3								
3.75							8.4	6.1								
4										В	Borehole	e complete	at 3.75m	n		
METHOD A auger W washbo P percussio			BIT R roll B bla V V b	nk oit		UPPORT C casing I/ mud	U un ii D dis	PLING disturbed mmm turbed si	ample		м	STURE D dry M moist W wet		MPS r LL Liq	L DESCRIPTIO maximum partic juid Limit 6 passing 75um	e size

C core R rotary air flush

H hammer

D diamond

T TC bit

N Standard Penetration Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.55m depth in this borehole.

UNGR 103G

						echnical S	Servio	ces P	'ty L			Borehole	No. A17	(-/1/03)
					E	BOREH						Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Date	e: ation:	16.7.04	Job No: 5021 N7755	21024.1/1047	4.3
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gation	ı		face R.L.:	-2.65m	Datum:	AHD	
Site:	Shute	e Hai	rbou	r Mari	na				Sup	ervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan		al Services	Dr TESTI	ill Mode	el	Hand Auger	Mounting	Boat JAL SOIL DESC	Diameter 50mm	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS Screenin		Moisture	Consistency		ge Site		
			SP	A T		Field screening at 0.25m intervs	-8.6	6.3	w	Loose	trace	; grey, fine to co of fine grained (vium/Marine)	arse grained, with s gravel, angular	silt,
0.30			сн			ASS and environmenta sampling at	9.1	6.5		Soft	Clay;		o coarse grained sa	
						0.5m interval:	8.7	6.4 6.3			angula	of medium to co ar, shells 20% (1 5 LL 55 P75 7	,	·
							8.8 8.8	6.6 6.2						
							9.1	6.8						
2							9.0 8.9	6.8 6.8						
2.55	PDL						8.8	6.6			(Marin	-	i sand, shells 20% 35	
2.55							8.8	6.5						
3							8.7	6.5						
							8.8	6.6						
3.75							8.8 8.7	6.8 6.7						
4											Bore	hole complete	at 3.75m	
METHOD A auger W washbo P percussio H hammer	on		BIT R roll B bla V V b T TC	nk oit		UPPORT C casing M mud	in D distu N Stan		ample enetra		MOISTU D M ma W v Note: I	dry bist vət	VISUAL DESCRI MPS maximum (LL Liquid Limit P75 % passing 7 te level (PDL) at -5.2	particle size 75um sieve

Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.55m depth in this borehole.

R rotary air flush

D diamond

C core

Technical Services Ptv I td

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	~	1/03)
					I	BOREHO	DLE	LO	G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	29.7.04 E5506856	Job No: 11 N7755	21024.1/10474.3 264	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatior	n	Sur	face R.L.:	-2.60m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	ervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan		al Services	D TEST	rill Mode	ы I	Hand Auger	Mounting	Boat L SOIL DESC	Diameter 50mm	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}		Consistency	Dredge			
			SP	A T		Field screening at			W	Loose			fine to coarse grained, e grained, angular, shells	,
0.20	SC ASS and 8.6										(Marine) MPS 20)) LL NP P75	5	
0.20 0.60 1 1.50			sc ci			ASS and environmenta sampling at 0.5m intervals		5.9 6.0		Soft	trace of f	fine to medium	e to coarse grained, ngrained gravel, angular 35	
E							8.8	5.9						
							8.7	6.2			grained. shells (N	trace of fine g	nd is fine to coarse rained gravel. angular. 0	
1.50				,			8.4	6.5						
			сн				8.3	6.2			fine grain		coarse grained, trace of gular, shells (Marine))	mulu
2							8.6	6.1						
2.20							8.5	5.9						
E	PDL						8.5	5.6						
2.60							8.5	5.6			(Marine)		coarse grained sand	
3							8.5	5.6						International
							8.5	5.6						hum
							8.5	5.7						
							8.5	5.7						
3.75							0.5	5.7			Boreho	ole complete	at 3.75m	
METHOD A auger W washbo P percussio H hammer C core			BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	in D dist N Sta		ample enetr			v t t oposed dredge	VISUAL DESCRIPTIO MPS maximum partici LL Liquid Limit P75 % passing 75um a level (PDL) at -5.2m pth in this borehole.	N le size

R rotary air flush

Test & Result

PP Pocket Penetrometer Value

corresponds to 2.6m depth in this borehole.

UNGR 103G

3)

					I	A.C.N.			-	_td		Borehole	No. A19	(-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	15.7.04 E5506857	Job No: 18 N7755	21024.1/10474 246	.3
Project:	Envir	onm	enta	& Ac	cid Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.70m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	ina				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an &	Nolan		al Services		Drill Mode	el	Hand Auger	Mounting	Boat	Diameter 50mm	
	STRATA	ì	E	話		LING	TEST		-		VISUA	L SOIL DESC	RIPTION	+
Depth (m)	R.L	Log	Classification	Method &	Support	Sampling	SSA [±]	B Results H ^{LOX}		Consistency	Dredge	e Site		
0.50 1 1.50 2 2.50 3 3.50	PDL		CH	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	s8.8 8.6	6.5 6.6 6.4 6.3 6.4 6.9 6.7 6.8 6.3 6.4 6.5 6.4 6.5 6.6 6.3	w	Very Soft	trace of angular MPS 20 trace of MPS 5	medium to co (Colluvium)M: LL 20 P75 of fine grained LL 40 P75 4	30 gravel, angular 0 o coarse grained san ravel, angular (Marin	e سياسسياسسياسسياسسياسسياس
4											Boreho	ole complete	at 3.50m	
METHOD A auger W washbo P percussic H hammer C core	n		BIT R rol B bla V V I T TC D dia	ink bit		UPPORT C casing M mud	U uno ir D disi N Sta	PLING disturbed n mm turbed s andard P st & Res	ample enetr			v t t oposed dredge	VISUAL DESCRIP MPS maximum pa LL Liquid Limit P75 % passing 75 a level (PDL) at -5.2r pth in this borebole	TION article size ium sieve

R rotary air flush

Test & Result

PP Pocket Penetrometer Value

corresponds to 2.5m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A20 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 29.7.04 Job No: 21024.1/10474.3 E550685883 N7755229 Location: Project: Environmental & Acid Sulfate Investigation Surface R.L.: -2.80m Datum: AHD Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION g Results ASS Screenin Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 pH_F pH_{FOX} R.L Sand; grey, fine to coarse grained, with fine to SF A Loose Field coarse grained gravel, angular, trace of silt, т screening at 0.20 shells (Marine) 0.25m intervals9.1 6.3 sc MPS 20 LL NP P75 10 Soft ASS and 9.0 6.3 Clayey Sand; grey, fine to coarse grained, environmenta trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.5m intervals 9.0 6.3 MPS 15 LL 25 P75 35 6.2 8.8 1.10 Sandy Clay; grey, sand is fine to coarse CI 8.9 6.1 grained, trace of fine grained gravel, angular, shells (Marine) MPS 4 LL 50 P75 65 8.9 6.0 1 50 Clay; grey, with fine to coarse grained, trace of fine grained gravel, angular, shells (Marine) 8.9 5.9 MPS 5 LL 55 P75 80 1.90 8.8 58 2 Clay; grey, trace of fine to coarse grained sand (Marine) CH MPS 2 LL 65 P75 90 8.8 5.9 PDL 2.40 8.8 5.9 8.5 6.1 8.6 6.2 3 8.6 6.3 3.50 6.4 8.4 Borehole complete at 3.50m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION

A auger

W washbore

- P percussion
- R roller B blank V V bit
- D diamond

H hammer C core

R rotary air flush

T TC bit

C casing

M mud

U undisturbed sample & size

in mm

D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

D dry M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

Technical Services Ptv I td

UNGR 103G

(-/1/03)

					1	A.C.N.				_10		Borehole	No. A21	(-/1/03)
					E	BOREHO	DLE	LO	G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	21.7.04 E5506859	Job No: 974 N7755	21024.1/10474 215	.3
Project:	Envir	onm	enta	8 Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.90m	Datum:	AHD	
Site:	Shut	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Conti			an &	Nolan 1		al Services	_	orill Mode	el 🛛	Hand Auger	Mounting	Boat	Diameter 50mm	
	STRATA	\ 			DRI	LING	TEST				VISUA	L SOIL DESC	RIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	SSA H ^E	d Screenin B Results Kesults		Consistency	Dredge	e Site		
Ē			SM	A		Field			w	Soft			to coarse grained, st	nells 🚦
E 0.20			sc	1 .		screening at 0.25m interva	s9.1	6.6			40% (M MPS 4	arine) LL 30 P75 3	80	-
						ASS and environmenta	8.8	6.5						
						sampling at 0.5m intervals		6.7			grained,	ayey Sand: g , shells 25% (M LL 40 P75 4		
1							8.7	6.6						
1.20			\vdash				8.7	6.6						
0.20 0.20 1 1.20 2.10 2.30			сі				8.7	6.6			sand, sh	ny; grey, with fi ells 15% (Mari LL 50 P75 50	r -	
							8.8	6.6						-
2							8.6	6.7						-
2.10	PDL		сн				8.3	6.4			MPS 3	rey,shells 5% LL 60 P75 8		
							8.7	6.5				ıy;dark grey (1 LL 70 P7590	· · · · · · · · · · · · · · · · · · ·	
							8.5	6.5						
3							8.2	6.5						
							8.7	6.4						
3.50							8.5	6.5						
3.50											Boreho	ole complete	at 3.50m	
➡ 4 METHOD A auger W washb P percuss H hamme C core	ore	1	BIT R rol B bla V V I T TC D dia	ank bit		UPPORT C casing M mud	Uuno ir Dolist N Sta	PLING disturbed n mm turbed si andard P st & Resi	ample enetr			y it t oposed dredge	VISUAL DESCRIP MPS maximum pa LL Liquid Limit P75 % passing 75 e level (PDL) at -5.2n	TION irticle size um sieve

R rotary air flush

PP Pocket Penetrometer Value

corresponds to 2.3m depth in this borehole.

UNGR 103G

6-	/1	in.	31
(7		ru	3)

					T	A.C.N.				_td		Borehole	No. A22	(-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	Pty Ltd			Dat Loc	e: ation:	19.7.04 E55068	Job No: 6047 N7755	21024.1/10474.	3
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n		face R.L.:	-2.80m		AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an & I	Nolan 1		al Services		rill Mode	9I	Hand Auger	Mounting	Boat	Diameter 50mm	
8	STRATA	Ì	5		DRIL	LING	TEST				VISI	UAL SOIL DESC	RIPTION	+
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	SSA H ^E	d Screenin B Results XO4 H		Consistency		lge Site		
0.10			SP	A		Field screening at			w	Loose			arse grained, with silt ravel, angular, shells	· 1
			sc	'		0.25m interva	\$8.8	6.4			(Marii	ne)		_
E						ASS and				Firm	MPS	5 LLNP P75	10	
						environmenta	9.2	6.4					e to coarse grained	-
0.60			СН			sampling at 0.5m intervals	8.8	6.5			(Marin	2 LL 20 P75 2	0	
Ē-						0.01111101104	0.0	0.5		Soft				
							8.7	6.4			Clay; ; (Marin		coarse grained sand	1
							8.7	6.2			MPS 2	LL 65 P757	D	
							9.0	6.4						
							8.7	6.0						
							8.7	6.1						
2														-
0.10	PDL						8.5	6.2						
		1					8.4	6.3						_
							8.5	6.2			(Marin	e)	e to coarse grained sa	and _
3							8.5	6.2			MPS 2	2 LL 65 P759	D	
							8.6	6.4						
3.50							8.3	6.0						
3.50										Bore	shole complete	at 3.50m	and Internet in the second sec	
METHOD A auger W washbor P percussio H hammer C core			BIT R rol B bla V V b T TC D dia	nk bit	(UPPORT C casing // mud	Uund ir Ddist NSta	PLING disturbed mm turbed sa indard P at & Resu	ample enetr		M ma W v Note:	dry pist wet Proposed dredge	VISUAL DESCRIP MPS maximum par LL Liquid Limit P75 % passing 75 e level (PDL) at -5.2m opth in this borehole.	rticle siz∈ um sieve

PP Pocket Penetrometer Value

R rotary air flush

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A23 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 29.7.04 Job No: 21024.1/10474.3 E550685534 N7755224 Location: Project: Environmental & Acid Sulfate Investigation AHD Surface R.L.: -2.00m Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} Gravelly Sand; grey, fine to coarse grained, SP 0.10 A Field Loose gravel is fine to coarse grained gravel, angular, т screening at sc with silt, shells (Marine) 0.25m interval\$.1 5.9 MPS 20 LL NP P75 10 Soft ASS and environmental^{9.0} 5.9 Clayey Sand; grey, fine to coarse grained, with fine to medium grained gravel, angular, shells sampling at (Marine) 0.5m intervals 8.8 5.8 MPS 15 LL 20 P75 25 0.90 8.5 5.8 CI Sandy Clay; grey, sand is fine to coarse 1 grained, trace of fine to medium grained gravel. angular (Marine) 1.20 8.4 5.8 MPS 7 LL 40 P75 55 сн 8.5 5.9 Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) 8.3 5.6 MPS 7 LL 55 P75 75 8.3 55 2 8.3 5.7 2.40 8.4 5.7 Clay; grey, trace of fine to coarse grained sand (Residual) MPS 2 LL 65 P75 95 8.5 5.8 5.7 3 Hand Auger Refusal at 3.0m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION R roller A auger C casing U undisturbed sample & size D dry MPS maximum particle size W washbore M mud M moist LL Liquid Limit

- H hammer

C core

- P percussion
- B blank
 - V V bit T TC bit

- D diamond
- R rotary air flush

in mm

D disturbed sample

N Standard Penetration Test & Result

PP Pocket Penetrometer Value

W wet P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 3.2m depth in this borehole.

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole		(-/1/03)		
					E	BOREH		LO	G			Sheet 1	of 1			
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	30.7.04 E5506856	3				
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n	Surface R.L.:		-2.72m	Datum:	AHD			
Site:	Shute									pervisor	CG	Chkd:	AW			
Drill Contra			an & I	Nolan 1		al Services	_	rill Mode	el T	Hand Auger		Boat	Diameter 50mm	$ \rightarrow $		
	STRATA	ì	=		DRIL	LING	TEST	ING c 2	-		VISUA	AL SOIL DESC	RIPTION	-+		
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	SSA F	d Screenin B Resuts Kesuts		Consistency	Dredge					
Ē			SP	A T		Field			w	Loose			fine to coarse grained, e grained, angular, with	, 1		
0.20			sc			screening at 0.25m interva	-85	5.6		<u> </u>		ells (Marine)	, granica, angalar, wa			
E			SC			U.25m Interva	so.o	5.6			MPS 20	LLNP P75	10	1		
0.20 0.60 1 1.20						ASS and	8.5	5.5		Soft	Clayey	itte sin ar, ar, at de				
0.60			\vdash			environmenta sampling at	1				fine to m	nedium grained	d gravel, angular, shells	, 1		
E_			сі			0.5m intervals	8.6	5.4			(Marine) MPS 15	LL 20 P75 2	25	1		
E																
E 1							8.5	5.4			Sandy O		d in fine to second	_		
E												lay; grey, sand is fine to coarse trace of fine to medium grained gravel,				
L 1.20			сн		8.4 5.5						angular, s	shells (Marine)				
E											MPS 7 L	LL 40 P75 50		3		
E_							8.2	5.6								
E											Clay: or	ev, with fine to	coarse grained sand,	1		
E.							8.3	6.1					grained gravel, angula	ar, 📑		
E											shells (M	farine) LL 60 P75 75		1		
L 2							8.3	6.2			MF57	LL 60 F/5/5	,	1		
											Clay: or	ev. trace of fin	e to coarse grained sa	nd 📕		
E_							8.5	5.7			(Marine)		e to course grained sa	~ <u> </u>		
E											MPS 2	LL 70 P75 95	i -			
	PDL						8.6	5.6								
Ē_							8.5	5.8								
E																
L 3							8.4	5.7								
Ē																
E_							8.3	5.7								
E																
2.48							8.4	5.6								
E											Bore	hole complete	at 3.50m			
E_																
E																
∎ ₄														1		
METHOD			BIT			UPPORT	SAM	PLING			MOISTURI	F	VISUAL DESCRIPTI			
A auger			R roll	ler		C casing			d sam	nple & size	D dr		MPS maximum part			
W washbo	re		B bla			vi mud		n mm			M mois	-	LL Liquid Limit			
P percussio			VVE					turbed s	•		W we	et	P75 % passing 75ur	n sieve		
H hammer C core			T TC D dia					indard P it & Resi		ation			e level (PDL) at -5.2m			
C core D diamond Test & Result R rotary air flush PP Pocket Penetrometer Value									correspor	nus to 2.48m d	lepth in this borehole.					

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	(-/1/03)
					I	BOREHO	DLE	LO	G			Sheet 1	of 1	
Client	G.G.	Betro	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	4.8.04 E5506857	Job No: 764 N7755	21024.1/10474.3 173	J
Project:	Envir	onme	ental	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.85m	Datum:	AHD	
Site:	Shute	e Harl	bour	r Mari	ina				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			n & N	Nolan		cal Services		rill Mod	el	Hand Auger		Boat	Diameter 50mm	
(E) 4400 0.20 0.20 1 1.20 1.90 2.34	PDL	foon - or	H 25 4 Classification	⊥ > Method & Bit	Thoopy	Field screening at 0.25m interva ASS and environments sampling at 0.5m intervals	PH _F 158.8 1 8.6 8.7 8.7 8.7 8.7 8.4 8.5 8.4	pH _{FO} 5.8 5.8 6.1 6.0 5.9 5.8 5.9 5.8 5.7 5.8	≦ Moisture	Loose Soft	Dredge Gravell gravel is shells (I MPS 25 Clayey S trace of f shells (M MPS 25 Sandy C grained, angular, MPS 10 Clay; gre trace of f shells (M MPS 7	y Sand; grey, s fine grained, Marine) 5 LL NP P75 Sand; grey, fin fine to medium Marine) LL 20 P75 2 Clay; grey, san trace of fine to shells (Marine LL 40 P75 9 ey, with fine to ine to medium larine) LL 55 P75 70	fine to coarse grained, angular, trace of silt, 5 10 te to coarse grained, or grained gravel, angula 25 to medium grained gravel 55 coarse grained sand, or grained gravel, angula or source grained sand, or source grained s	
3.50							8.5 8.4 8.6 8.6 8.6	5.9 6.0 5.9 6.0 6.1			Boreh	ole complete	at 3.50m	
METHOD A auger W washbo		I	BIT R roll B blai			UPPORT C casing M mud	U und	PLING listurbe	d sam	nple & size	MOISTURI D dr M mois	У	VISUAL DESCRIPTI MPS maximum parti	

- W washbore
- P percussion H hammer

C core

- B blank V V bit
- T TC bit D diamond
- M mud
- U undisturbed sample & size
- in mm
- D disturbed sample
- N Standard Penetration
- Test & Result
- PP Pocket Penetrometer Value

M moist LL Liquid Limit P75 % passing 75um sieve

W wet

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.34m depth in this borehole.

R rotary air flush

Technical Services Pty Ltd

UNGR 103G

					Т	echnical S A.C.N.		Borehole	No. A26	-/1/03)				
					E	BOREH			G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat	e: ation:	3.8.04 E5506858	Job No: 308 N7755	21024.1/10474.3	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n			-2.80m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	ina				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an & I	Nolan		al Services	_	rill Mod	el	Hand Auger	<u> </u>	Diameter 50mm		
Depth (m)		Log	Classification	> Method & Bit	Support	LLING Build Build Build Build Build Field	PH _F	pH _{FO}	≤ Moisture	e Consistency	Dredg	ly Sand; grey,	fine to coarse grained,	
0.20 0.60 1 1.80 2.40 3 3.25	PDL		CI CH			ASS and environments sampling at 0.5m interval	9.1	6.1 5.8 5.9 5.6 5.7 5.8 5.7 5.8 5.7 5.0 5.0 5.0 5.8 5.9 5.8		Soft	gravel i (Marine MPS 20 Clayey S trace of shells (N MPS 20 Sandy 0 grained, angular, MPS 7 Clay; gr sand, tra angular, MPS 7 Clay; gr sand, tra angular, MPS 2	s fine grained. Sand; grey, fin fine to medium Marine) LL 20 P75 Clay; grey, sa trace of fine to shells (Marine LL 40 P75 5 ey, with fine to fine to medium farine) LL 55 P75 7 rey, trace of fin	angular, with silt, shells 510 the to coarse grained, in grained gravel, angula 25 nd is fine to coarse o medium grained gravel 5 coarse grained sand, in grained gravel, angula 5 the to coarse grained hedium grained gravel, e) 0	
METHOD A auger W washbo	re		BIT R roll B bla			UPPORT C casing	U uno	PLING disturbe	d sam	iple & size	MOISTURI D dr	ry .	VISUAL DESCRIPTI MPS maximum parti	

- A auger
- W washbore
- P percussion H hammer

C core

- B blank V V bit
- R rotary air flush
- T TC bit

M mud

- D diamond
- N Standard Penetration Test & Result

D disturbed sample

in mm

PP Pocket Penetrometer Value

D dry M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A27 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 30.7.04 Job No: 21024.1/10474.3 E550685897 N7755144 Location: Project: Environmental & Acid Sulfate Investigation AHD Surface R.L.: -2.80m Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & mpling Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} 88 Gravelly Sand; grey, fine to coarse grained, SP A Field Loose 0.10 gravel is fine to coarse grained, angular, with т SC screening at silt, shells (Marine) 0.25m intervals8,7 5.8 MPS 25 LL NP P75 15 ASS and Soft Clayey Sand; grey, fine to coarse grained, with 8.6 5.6 environmenta fine grained gravel, angular, shells Marine) 0.60 sampling at MPS 15 LL 25 P75 20 cı 0.5m intervals 5.7 8.6 Sandy Clay; grey, sand is fine to coarse 5.8 grained, trace of fine to medium grained gravel, 8.7 1 angular, shells (Marine) MPS 7 LL 45 P75 50 1.20 8.6 5.8 сн Clay; grey, with fine to coarse grained sand, trace of medium to coarse grained gravel, 8.6 5.8 angular, shells (Marine) MPS 7 LL 65 P75 75 8.7 5.7 1.80 Clay; grey, trace of fine to coarse grained sand 8.6 57 (Marine) 2 MPS 2 LL 75 P75 95 8.6 5.6 PDL 2.40 8.5 5.6 8.6 5.6 8.6 5.8 3 8.6 5.6 57 3.50 85 Borehole complete at 3.50m METHOD BIT SUPPORT SAMPLING MOISTURE

A auger

W washbore

P percussion H hammer

- R roller B blank V V bit

C core R rotary air flush

D diamond

T TC bit

C casing

M mud

Test & Result PP Pocket Penetrometer Value

U undisturbed sample & size

in mm

D disturbed sample

N Standard Penetration

D dry M moist W wet

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A28 BOREHOLE LOG Sheet 1 of 1 G.G. Betros & Associates Pty Ltd Client: Date: 29.7.04 Job No: 21024.1/10474.3 E550685997 N7755121 Location: Project: Environmental & Acid Sulfate Investigation Surface R.L.: -3.10m Datum: AHD Site: Shute Harbour Marina Supervisor CG Chkd: AW Hand Auger Mounting Drill Contractor Ullman & Nolan Technical Services Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION Screenin g Results Classification 뷺 Consistency Ē Method & Sampling ASS Dredge Site Moisture Support Depth 8 pH_F pH_{FOX} R.L Gravelly Sand; grey, fine to coarse grained, SF A Loose Field gravel is fine to coarse grained, angular, trace т screening at 0.20 of silt, shells (Marine) 0.25m interva s8.8 6.0 MPS 20 LL NP P75 5 Soft SC ASS and Clayey Sand; grey, fine to coarse grained, with 8.7 6.0 environmenta fine to medium grained gravel, angular, shells 0.60 sampling at (Marine) CI 0.5m intervals 8.3 5.6 MPS 15 LL 25 P75 35 Sandy Clay; grey, sand is fine to coarse 8.2 5.5 grained, trace of fine grained gravel, angular, 1 shells (Marine) MPS 5 LL 45 P75 60 1.20 8.3 5.7 СН Clay; grey, with fine to coarse grained sand, trace of fine grained gravel, angular, shells 5.7 8.4 (Marine) MPS 4 LL 55 P75 80 1.70 8.4 5.7 Clay; grey, with fine to coarse grained sand (Marine) 55 8.4 MPS 2 LL 65 P75 90 2 PDL 2.10 8.3 5.6 8.3 5.7 8.2 5.45.3 8.1 3 8.2 5.5 3.50 8.2 5.6 Borehole complete at 3.50m

METHOD

A auger

W washbore H hammer

P percussion

R roller B blank V V bit

BIT

T TC bit

D diamond

C core

R rotary air flush

M mud

SUPPORT

C casing

U undisturbed sample & size

in mm

SAMPLING

D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

D dry M moist W wet

MOISTURE

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.1m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A29 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 3.8.04 Job No: 21024.1/10474.3 E550685566 N7755167 Location: Project: Environmental & Acid Sulfate Investigation AHD Surface R.L.: -2.60m Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Drill Contractor Drill Model Mounting Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 pH_F pH_{FOX} R.L Gravelly Sand; grey, fine to coarse grained, SF A Field Loose gravel is fine grained, angular, with silt, shells 0.20 т screening at (Marine) SC 0.25m intervals9.3 6.2 MPS 20 LL NP P75 10 ASS and envirenmental 9.2 Clayey Sand; grey, fine to coarse grained, 6.1 trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.5m intervals 9.0 6.1 MPS 20 LL 20 P75 25 0.90 9.0 6.1 CI Sandy Clay; grey, sand is fine to coarse 1 grained, trace of fine to medium grained gravel. angular, shells (Marine) 8.8 6.0 MPS 7 LL 45 P75 55 1.30 СН Clay; grey, with fine to coarse grained sand, 8.7 5.9 trace of fine to medium grained gravel, angular, shells (Marine) MPS 7 LL 55 P75 70 8.9 6.0 1.90 8.8 6.0 Clay; grey, trace of fine to coarse grained 2 sand, trace of fine to medium grained gravel, angular, shells (Marine) 8.7 5.9 MPS 4 LL 60 P75 90 8.8 5.8 2.60 PDL 8.7 5.9 8.6 6.0 3 8.7 6.1 6.4 8.7 8.8 6.3 3.75 Borehole complete at 3.75m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION C casing U undisturbed sample & size

A auger

- W washbore

C core

P percussion

R rotary air flush

R roller B blank V V bit

- H hammer

T TC bit

D diamond

N Standard Penetration Test & Result

M mud

PP Pocket Penetrometer Value

in mm

D disturbed sample

D dry M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.6m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A30 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 3.8.04 Job No: 21024.1/10474.3 E550685650 N7755160 Location: Project: Environmental & Acid Sulfate Investigation Surface R.L.: -2.70m Datum: AHD Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION g Results Screenin Classification 뷺 Consistency Ē Method & Sampling ASS Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} Gravelly Sand; grey, fine to coarse grained, SP A Field Loose 0.10 gravel is fine grained, angular, with silt, shells т screening at (Marine) SC 0.25m intervals8.9 6.0 MPS 25 LL NP P75 10 Soft ASS and Clayey Sand; grey, fine to coarse grained, 8.8 6.0 environmenta trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.70 0.5m intervals 8.7 6.5 MPS 20 LL 20 P75 25 CI Sandy Clay; grey, sand is fine to coarse 6.4 grained, trace of fine to medium grained gravel, 8.8 1 angular, shells (Marine) MPS 7 LL 40 P75 50 1.20 8.7 6.4 сн Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, 8.7 6.2 shells (Marine) MPS 7 LL 60 P75 75 8.7 6.1 1.90 8.7 61 Clay; grey, trace of fine to coarse grained 2 sand, trace of fine to medium grained gravel, angular, shells (Marine) 8.6 6.1 MPS 4 LL 65 P75 90 2.50 PDL 8.7 6.0 8.7 6.0 8.6 6.0 3 8.6 5.9 5.9 8.6 3.50 Borehole complete at 3.50m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION

A auger

W washbore P percussion

H hammer

C core

R roller

B blank V V bit

T TC bit

D diamond

C casing M mud

D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

D dry M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.5m depth in this borehole.

U undisturbed sample & size in mm

R rotary air flush

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A31 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 4.8.04 Job No: 21024.1/10474.3 E550685709 N7755145 Location: Project: Environmental & Acid Sulfate Investigation -2.70m AHD Surface R.L.: Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} Gravelly Sand; grey, fine to coarse grained, SF A Loose Field gravel is fine grained, angular, with silt, shells т screening at 0.20 (Marine) SC 0.25m intervals9.0 5.9 MPS 20 LL NP P75 10 Soft ASS and Clayey Sand; grey, fine to coarse grained, 9.0 5.9 environmenta trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.5m intervals 8.5 6.2 MPS 25 LL 20 P75 25 0.90 8.6 6.1 Sandy Clay; grey, sand is fine to coarse CI 1 grained, trace of fine to medium grained gravel, angular, shells (Marine) 1.20 8.6 5.9 MPS 10 LL 40 P75 50 сн 8.7 5.9 Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, 8.8 5.9 shells (Marine) MPS 7 LL 50 P75 70 1.90 8.7 57 2 Clay; grey, trace of fine to coarse grained sand, shells (Marine) 8.7 5.8 MPS 5 LL 75 P75 95 PDL 8.6 5.7 2.50 8.7 5.9 8.6 5.9 3 8.7 6.0 6.0 87 3.50 Borehole complete at 3.50m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION

A auger

W washbore

P percussion

- R roller B blank V V bit
- H hammer
- C core
- R rotary air flush

T TC bit

D diamond

C casing

M mud

U undisturbed sample & size

in mm

D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

M moist LL Liquid Limit W wet P75 % passing 75um sieve Note: Proposed dredge level (PDL) at -5.2m

MPS maximum particle size

D dry

corresponds to 2.5m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A32 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 4.8.04 Job No: 21024.1/10474.3 E550685809 N7755131 Location: Project: Environmental & Acid Sulfate Investigation Surface R.L.: -2.80m Datum: AHD Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} Gravelly Sand; grey, fine to coarse grained, SP A Loose Field 0.10 gravel is fine grained, angular, with silt, shells т screening at (Marine) SC 0.25m intervals8.9 5.9 MPS 25 LL NP P75 15 Soft ASS and Clayey Sand; grey, fine to coarse grained, environmental 9.0 5.8 trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.5m intervals 8.9 5.9 MPS 20 LL 25 P75 25 0.80 CI Sandy Clay; grey, sand is fine to coarse 5.9 grained, trace of fine to medium grained gravel, 8.7 1 angular, shells (Marine) MPS 10 LL 45 P75 50 1.20 8.9 5.7 сн Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, 8.9 5.8 shells (Marine) MPS 7 LL 60 P75 75 8.8 6.1 1.90 8.7 63 Clay; grey, trace of fine to coarse grained 2 sand, shells (Marine) MPS 4 LL 75 P75 90 8.7 6.1 PDL 2.40 8.7 6.1 8.8 6.0 8.9 5.8 3 8.8 5.9 5.8 8.8 3.50 Borehole complete at 3.50m METHOD BIT SUPPORT SAMPLING MOISTURE

A auger

W washbore

C core

P percussion H hammer

R roller B blank V V bit

C casing

M mud

R rotary air flush

T TC bit D diamond

U undisturbed sample & size

in mm

D disturbed sample

N Standard Penetration

Test & Result PP Pocket Penetrometer Value M moist W wet

D dry

VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A33 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 30.7.04 Job No: 21024.1/10474.3 E550685958 N7755100 Location: Project: Environmental & Acid Sulfate Investigation AHD Surface R.L.: -3.10m Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION ASS Screenin g Results Classification 뷺 Consistency Ē Method & mpling Moisture Dredge Site Support Depth 8 R.L pH_F pH_{FOX} 88 Gravelly Sand; grey, fine to coarse grained, SP 0.10 A Field Loose gravel is fine to coarse grained, angular, with т sc screening at Soft silt, shells (Colluvium/Marine) 0.25m intervals8.6 6.0 MPS 20 LL NP P75 15 ASS and 0.50 8.7 6.0 Clayey Sand; grey, fine to coarse grained, with environmenta fine to medium grained gravel, angular, shells CI sampling at (Marine) 0.5m intervals 8.5 5.9 MPS 15 LL 20 P75 25 6.0 8.4 1 Sandy Clay; grey, sand is fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) 8.4 5.9 MPS 7 LL 40 P75 55 5.9 8.4 1.60 Clay; grey, with fine to coarse grained sand, СН 8.2 5.6 1.80 trace of medium to coarse grained gravel, angular, shells (Marine) MPS 7 LL 65 P75 70 57 8.1 2 PDL 2.10 Clay; grey, trace of fine to coarse grained sand 8.2 5.6 (Marine) MPS 2 LL 75 P75 95 8.3 5.6 8.4 5.6 8.3 6.7 3 3.25 5.7 8.2 Borehole complete at 3.25m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION R roller A auger C casing U undisturbed sample & size D dry M mud

C core

W washbore

- P percussion H hammer
- - B blank V V bit

- T TC bit
- D diamond

R rotary air flush

in mm D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.1m depth in this borehole.

UNGR 103G

					Т	echnical S A.C.N.				Ltd		Borehole		-/1/03)					
					E	BOREH	DLE	E LO	G			Sheet 1	of 1						
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Date: 2.8.04 Location: E5506854			Job No: 21024.1/10474.3 141 N7755131							
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Surface R.L.:		-2.40m	Datum:	AHD						
Site:	Shute	e Ha	rbou	r Mari	ina				Supervisor		CG	Chkd:	AW						
Drill Contra	ctor STRATA		an &	Nolan		al Services	TEST	Drill Mode	el	Hand Auger	<u> </u>	ing Boat Diameter 50mm /ISUAL SOIL DESCRIPTION							
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	ASS	pH _{FOX}		Consistency	Dredge	Site							
0.20			SP SC	AT		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.9	6.2 6.2	w	Soft	gravel is (Marine) MPS 25 Clayey S trace of f shells (M	LL NP P75 and; grey, fin fine to mediun larine)	angular, with clay, shel 5 10 he to coarse grained, h grained gravel, angula	i i i i i i i i i i i i i i i i i i i					
0.20	= 0.80 - 1 = 1.20 CI CI CI CI CI CI CI CI CI CI					0.5m intervals	8.8 8.9 8.9 8.9 9.0	5.9 6.0 5.9 5.9			trace of f shells (M MPS 10	Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 10 LL 40 P75 75 MPS 7 LL 55 P75 80							
2.80	PDL						9.0 9.0 9.0 8.8 8.8	6.3 6.3 5.9 5.8 5.9			sand, tra shells (M	ce of fine grain	e to coarse grained ned gravel, angular, 5						
2.80							8.8 8.6 8.8 8.8 8.8	5.8 5.9 5.8 5.8 5.8			Boreh	ole complete	at 4.00m						
METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DE A auger R roller C casing U undisturbed sample & size D dry MPS maxin W washbore B blank M mud in mm M moist LL Liquid L P percussion V V bit D disturbed sample W wet P75 % pas H hammer T TC bit N Standard Penetration Note: Proposed dredge level (PDL)										VISUAL DESCRIPTI MPS maximum parti LL Liquid Limit P75 % passing 75un e level (PDL) at -5.2m pth in this borehole.	ON cle size								

R rotary air flush

PP Pocket Penetrometer Value

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 1 2.8.04 Job No: 21024.1/10474.3

Borehole No. A35

AHD

Project: Environmental & Acid Sulfate Investigation

G.G. Betros & Associates Pty Ltd

Location: E550685491 N7755137 Surface R.L.: -2.50m Datum:

Client:

Date:

Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	6	Chł	kd:	AW		
Drill Contra	ctor	Ullm	an & I	Nolan 1	echnic	al Services	D	rill Mode	Ы	Hand Auger	Мо	unting	Boat	t	Diame	ter 50mm	1
5	STRATA	ι			DRIL	LING	TEST			_		VISU	JAL SOI	L DESC	RIPTIO	N	
Depth (m)	R.L	Log	Classification	Method & Bt	Support	Sampling	ssy pH _F	PHFOX	Moisture	Consistency		Dredg	ge Site				
0.20 0.90 1 1.30 1.80 2.70 3 3.75 4			SP SC CI	T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.9	5.9 6.0 6.3 6.2	w	Soft		gravel (Marin MPS 2 Clayey trace o shells (MPS 1: Clay; §	is fine (e) 20 LL M (Sand; f fine to (Marine) 5 LL 2 grey, wit	grained, <u>NP P75</u> grey, fin medium 5 P75: th fine to	angular, 5 10 te to coa n grained 30 o coarse	oarse grai , with silt, s rse graine I gravel, a grained s	shells
1.30			СН				8.8 8.8 8.8	6.2 6.2 6.0				shells (MPS 10	f fine to (Marine) 0 LL 40 LL 55	0 P757	70	i gravel, a	ngular,
2							8.8 8.7 8.7	6.0 6.1 6.0				sand, tr shells (ine grai	ned grav	rse graine el, angula	d r,
2.70	PDL						8.6 8.6 8.7	6.1 6.2 6.1									_
3.75							8.6 8.7	6.2 6.0				Bore	hole co	mplete	at 3.75n	n	
METHOD A auger W washbo	re		BIT R roll B bla			UPPORT C casing // mud	U uno	PLING listurber nmm	i sam	iple & size	M	DISTUF Da Mimo	iry		MPS	L DESCR maximum juid Limit	RIPTION particle size

P percussion

H hammer

C core

R rotary air flush

V V bit

T TC bit

D diamond

N Standard Penetration Test & Result

D disturbed sample

PP Pocket Penetrometer Value

W wet P75 % passing 75um sieve Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.7m depth in this borehole.

UNGR 103G

(-/1/03)

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	No. A36	(-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	4.8.04 E5506855	Job No: 587 N7755	21024.1/10474.	3
Project:	Envir	onm	enta	8 Ac	id Su	lfate Investi	gatio	n		face R.L.:	-2.70m	Datum:	AHD	
Site:				r Mari						pervisor	CG	Chkd:	AW	
Drill Contra	STRATA		an &	Nolan		al Services	TEST	rill Mode		Hand Auger		Boat AL SOIL DESC	Diameter 50mm	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	ASS	DH _{FOX}	_	Consistency	Dredge	e Site		
0.10			SP	A		Field			W	Loose			fine to coarse grained	
Ē.			sc	T		screening at 0.25m interva	\$9.1	6.0			(Marine)	angular, with slit, she	
0.80 0.80 1.50						ASS and environmenta sampling at 0.5m intervals		6.0 6.0		Soft	Clayey S trace of shells		ne to coarse grained, n grained gravel, angu	, and a set of the set
0.80			сі				8.9	6.0			Sandy C grained,	Clay; grey, sa	nd is fine to coarse o medium grained gra	
							8.7	6.1				LL 45 P75		h
1.50	50							6.2					coarse grained sand, n grained gravel, angu	lar
1.80							8.8	6.3			shells (N			
2							8.5	6.4			sand, she	ey, trace of fin ells (Marine) LL 75 P75 95	e to coarse grained	hum
	PDL						8.6	6.6			MICH		,	
							8.7	6.4						
3							8.5	6.2						h
							8.7	5.9						hum
3.50							8.6	6.0			Borel	hole complete	e at 3.50m	
2.50														
METHOD A auger								PLING disturbed	d sam	nple & size	MOISTURI D dr		VISUAL DESCRIPT MPS maximum par	
W washbo P percussi	washbore B blank M mud ercussion V V bit							n mm turbed s	ample	9	M mois W we	st	LL Liquid Limit P75 % passing 75.	
H hamme C core	r		T TC D dia	bit mond				andard P at & Resi		ation			e level (PDL) at -5.2m oth in this borehole.	

- C core
- R rotary air flush

Test & Result

PP Pocket Penetrometer Value

corresponds to 2.5m depth in this borehole.

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole		/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	5.8.04 E5506857	Job No: 754 N7755	21024.1/10474.3 067	
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatior	n	Sur	face R.L.:	-2.80m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan 1		al Services	D TEST	rill Mode	el I	Hand Auger		Boat AL SOIL DESC	Diameter 50mm	
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	ASS	PH _{FOX}	Moisture	Consistenc/	Dredg	e Site		
0.10			SP	A		Field			w	Loose			fine to coarse grained, angular, with silt, shells	
			sc			screening at 0.25m interva	s8.6	6.0		Soft	(Colluvi	ium/Marine) 5 LL NP P75	•	-
0.10 0.70 1 1.20			сі			ASS and environmenta sampling at 0.5m intervals		5.9 6.3			Clayey trace of shells (M	Sand; grey, fin fine to medium	e to coarse grained, grained gravel, angula	
1							8.9 9.0	6.3 6.4			grained, angular,		,	mulum
	1.20 СН						9.0	6.4			trace of shells (N	fine to medium	coarse grained sand, grained gravel, angula	يسسسا
1.90							8.9	6.2						
2							8.7	6.1			sand, sh	rey, trace of fin ells (Marine) LL 75 P75 95	e to coarse grained	
	PDL						8.9	6.2				LE 10 11000		-
							9.1	6.3						
							8.9	6.2						
3							9.0	6.2						
							8.6	6.3						
3.50							8.7	6.2						
											Bore	hole complete	e at 3.50m	
3.50														
METHOD A auger W washbo P percussio H hammer C core	on		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	in Ddist NSta Tes	isturbed mm urbed sa ndard P t & Resu	ample enetri ult			ry st et roposed dredge	VISUAL DESCRIPTION MPS maximum partie LL Liquid Limit P75 % passing 75um elevel (PDL) at -5.2m pth in this borehole.	cle siz€

R rotary air flush

PP Pocket Penetrometer Value

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 1 5.8.04 Job No: 21024.1/10474.3

Borehole No. A38

AHD

Project: Environmental & Acid Sulfate Investigation

G.G. Betros & Associates Pty Ltd

E550685800 N7755066 Location: Surface R.L.: -2.80m Datum:

Client:

Date:

Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	С	G		С	hkd:		AW			
Drill Contra	ctor	Ullm	an &	Nolan T	echnic	al Services		Drill Mode	el 🛛	Hand Auger	Мо	ounti	ng	Bo	pat		Diame	ter 50m	nm	
8	STRATA	(DRI	LING		TING			_	<u>\</u>	/ISU/	AL S	OIL DE	SCR	IPTION	4		
Depth (m)	R.L	Fog	Classification	Method & Bt	Support	Sampling	PH PH	B Results M B Results	Moisture	Consistency		D	redg	e Sit	e					
0.10 0.70 1 1.30 2.40	PDL		CI	<u>∞</u> A T	0	6 Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	s9.2 9.1	6.2 6.1 6.3 6.4 6.4 6.4 6.4 6.0 6.0 6.0 6.1 6.1 6.1 6.1	W	O Loose Soft		(M (M MI Cla she Sa gra ang MF Cla she MP Cla san	avel i i larine PS 25 iyey 5 coord alls (N S 20 indy C s 20 indy C indy C S 20 indy C indy C S 20 indy C indy C in	s fine) 5 LL Sand fine Marin LL Clay; , trac , she ULL ey, w to m larin LL 6 ey, t ey, t ell (e graine NP F d; grey, to medi e) 25 P7 grey, e of fin- lls (Mar 45 P7 ith fine edium e) 0 P75	ed, ar P75 1 , fine lium g 75 30 sand e to r r/ine) 75 55 to co grain 5 70 fine t	ngular, 0 to coar grained 1 is fine medium carse g ed grav	with sil se grai gravel to coar	, angula rse ed grave sand, gular,	
3.50							8.7 8.7	6.1					Bore	hole	compl	lete a	at 3.501	m		1
METHOD A auger W washbo P percussio			BIT R rol B bla V V I	ank		UPPORT C casing M mud	U un i	PLING disturbed n mm sturbed sa		nple & size	м	м	TURI D dr I mois W we	ry st			MPS r LL Liq	naximu uid Lim		cle size

P percussion H hammer

C core

R rotary air flush

D diamond

T TC bit

PP Pocket Penetrometer Value

N Standard Penetration

Test & Result

W wet P75 % passing 75um sieve Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

UNGR 103G

(-/1/03)

UNGR 103G

						Т	A.C.N.				_td		Borehole	No. A39	(-/1/03)			
						E	BOREHO	DLE	LO	G			Sheet 1	of 1				
Client:	G.0	Э. В	etro	os &	Asso	ciates	Pty Ltd			Dat Loc	e: ation:	5.8.04 E5506858	Job No: 384 N7755	21024.1/10474 047	.3			
Project:	En	iror	nme	ental	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-3.00m	Datum:	AHD				
Site:	Shu	ıte H	lar	bou	r Mari	na				Sup	pervisor	CG	Chkd:	AW				
Drill Cont			llma	in & I	Nolan 1		al Services		rill Mode	el	Hand Auger	<u> </u>	Boat	Diameter 50mm				
Depth (m)	STRA		Log	Classification	Method & Bit	Support	LING Buildwes	SSV PH _F	PHFOX		Consistency	Dredg						
0.20				SP SC	A T		Field screening at 0.25m interva	I\$9.0	6.2	w	Soft	gravel i (Marine	s fine grained,	fine to coarse graine angular, with silt, she 10				
0.70	- ASS a enviro sampli 0.70 CI								6.3 6.2		300	trace of shells (N	fine to medium	e to coarse grained, n grained gravel, ang 30	ular,			
	0.70 CI 0.5m i								6.1 6.1			grained, angular,		r				
				СН				8.7 8.8	6.1 6.1		trace of f shells (M	ine to medium larine)	coarse grained sand, grained gravel, angu	lar,				
1.70 2 2.20	PDI							8.7	6.1			sand, tra angulars	grey, trace of fine to coarse grained trace of fine to medium grained gravel, arshells (Marine)					
		1						8.6	6.2			MPS 5	LL 75 P75 95	,				
								8.6	6.2									
3								8.6	5.9						-			
								8.6	5.8									
3.25	\vdash	+	+					8.5	5.7			Borel	nole complete	at 3.25m				
3.25															d, sills line line line line line line line line			
E 4 BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond							C casing	U und in D dist N Sta	PLING isturbed mm urbed s ndard P t & Res	ample enetr			y st oposed dredge	VISUAL DESCRIP MPS maximum pa LL Liquid Limit P75 % passing 75 e level (PDL) at -5.2n pth in this borehole.	rticle siz∉ um sieve			

R rotary air flush

PP Pocket Penetrometer Value

sp ep

UNGR 103G

					Т	A.C.N.				_td		Borehole	No. A40		1/03)
					E	BOREH	OLE		G			Sheet 1	of 1		
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	22.7.04 E5506861	Job No: 01 N7755		1/10474.3	
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-3.40m	Datum:	AHD		
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW		
Drill Contra	ctor	Ulim	an &	Nolan 1	Technic	al Services	_	Drill Mode	ы	Hand Auger		Boat	Diameter	50mm	
	STRATA	Ì	6		DRI	LING	TEST				VISUA	L SOIL DESC	RIPTION		$ \rightarrow $
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	P ASS	bH _{FOX} B Results		Consistency	Dredge				
1 1.10 1.80	PDL		сн	AT		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.3 8.6	6.4 6.5 6.4 6.3 6.5 6.4 6.3 6.3	w	Soft	COARSE O MPS 2 Silty Class sand, she	Silty Sand; gr grained, shells LL 35 P75 3 y; grey, with fin lls 10% (Marin LL 60 P75)	(Marine) 5 ne to coarsi ne)		
2.30							8.6 8.4 8.3	6.3 6.3 6.4			sand (Ma	y; grey, trace nrine) LL 75 P7590		arse grained	
3											Borehol	e complete at	: 3.00m		
4 BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush						C casing	U une in D dis N Sta Tes	n mm turbed si andard P st & Resi	ample enetr ult			r t	MPS ma LL Liquid P75 % po elevel (PDL	assing 75um .) at -5.2m	esiz∈

					_	LLMAN echnical S A.C.N.	Servi	ces F	Yty L	-		Borehole	No. A41	UNGR 103G (-/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	29.7.04 E5506854	Job No: 459 N7755	21024.1/1 5090	0474.3
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.60m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	ina				Sup	pervisor	CG	Chkd:	AW	
Drill Contra			an &	Nolan		al Services		rill Mode	el	Hand Auger	<u> </u>	Boat	Diameter 50	mm
	STRATA	Ì	- C	**	DRI	LING	TEST				VISU/	AL SOIL DESC	RIPTION	
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	SSV PHF	DH ^{EOX}		Consistency	Dredg			
0.10			SP	T		Field screening at 0.25m interva	\$8.5	5.6	w	Loose	gravel i of silt, s			grained, Jar, trace
0.60			sc cı			ASS and environmenta sampling at 0.5m intervals		5.7 5.7		Con	trace of Marine)		ne to coarse gra ravel, angular, : 35	ained, shells
0.10 0.60								5.8 5.6			grained, shells (N	trace of fine g	nd is fine to coa grained gravel, a 5	
	СН							5.6			shells (-	o coarse graine 10	d sand,
							8.4	5.4						
2							8.3	5.5			(Marine		ne to coarse gr 95	ained sand
							8.3	5.4						
2.60	PDL						8.2	5.3						
							8.0	5.2						
3							7.9	5.2						
							8.2	5.5						
2.60 3.75							8.4	5.8						
3.75							8.5	5.9						
4											Boreh	ole complete	at 3.75m	
METHOD A auger			BIT R rol			UPPORT C casing		PLING	d sam	ple & size	MOISTUR D dr	У	VISUAL DES MPS maxim	um particle size

W washbore

P percussion

- B blank V V bit
- H hammer

C core

R rotary air flush

T TC bit

D diamond

M mud

N Standard Penetration Test & Result

in mm

D disturbed sample

PP Pocket Penetrometer Value

M moist W wet

LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.6m depth in this borehole.

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. A42 BOREHOLE LOG Sheet 1 of 1 Client: G.G. Betros & Associates Pty Ltd Date: 5.8.04 Job No: 21024.1/10474.3 E550685559 N7755075 Location: Project: Environmental & Acid Sulfate Investigation AHD Surface R.L.: -2.60m Datum: Site: Shute Harbour Marina Supervisor CG Chkd: AW Ullman & Nolan Technical Services Hand Auger Mounting Drill Contractor Drill Model Boat Diameter 50mm STRATA DRILLING TESTING VISUAL SOIL DESCRIPTION g Results ASS Screenin Classification 뷺 Consistency Ē Method & Sampling Dredge Site Moisture Support Depth 8 R.L pH_F pH_{FOX} Gravelly Sand; grey, fine to coarse grained, SF A Field Loose 0.20 gravel is fine grained, angular, with silt, shells т screening at (Colluvium/Marine) SC 0.25m intervals9.0 6.1 MPS 25 LL NP P75 10 Soft ASS and Clayey Sand; grey, fine to coarse grained, environmental 9.0 6.2 trace of fine to medium grained gravel, angular, sampling at shells (Marine) 0.5m intervals 9.0 6.0 MPS 20 LL 20 P75 25 0.90 8.9 6.1 Sandy Clay; grey, sand is fine to coarse CI 1 grained, with fine to medium grained gravel, angular, shells (Marine) 8.7 6.0 MPS 10 LL 45 P75 60 1.30 сн Clay; grey, with fine to coarse grained sand, 9.0 6.0 with fine to medium grained gravel, angular, shells (Marine) MPS 7 LL 60 P75 70 8.9 6.1 8.7 63 2 2.10 Clay; grey, trace of fine to coarse grained 8.8 6.0 sand, trace of fine grained gravel, angular, shells (Marine) 8.7 5.9 MPS 4 LL 75 P75 90 PDL 2.60 8.7 6.0 8.6 5.9 3 8.5 6.0 8.5 6.0 3.75 8.6 6.0 Borehole complete at 3.75m METHOD BIT SUPPORT SAMPLING MOISTURE VISUAL DESCRIPTION

A auger

W washbore

P percussion H hammer

R roller B blank

C casing

M mud

C core

R rotary air flush

V V bit T TC bit D diamond U undisturbed sample & size

in mm

D disturbed sample

N Standard Penetration

Test & Result

PP Pocket Penetrometer Value

D dry M moist W wet

MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.6m depth in this borehole.

					Т	LLMAN echnical S A.C.N. BOREH(Serv 103 2	ices F 205 20	Pty I 5	-			Borehole Sheet 1	No. of		UNGR (-	103G /1/03)
Client:	G.G.	Betr	05 &	Asso		s Pty Ltd			Dat	e: ation:	28.7.0	04	Job No: 6 N7755	210		0474.3	
Project:	Envir	onm	ental	& Ac	id Su	lfate Investi	gatio	n		face R.L.:			Datum:	AH	D		
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG		Chkd:	AW	/		
Drill Contra	ctor	Ullm	an & I	Nolan 1		al Services		Drill Mod	el	Hand Auger			Boat		neter 50	mm	
	STRATA		6		DRIL	LING	TEST		<u> </u>		<u> </u>	VISUAL	SOIL DESC	RIPTI	ON		
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	SSA PL DH	bH ^{EOX} B Results		Consistency	D	Dredge S	Site				
E			SP	A T		Field			w	Loose		-	Sand; grey, ine to mediu				
0.20				'		screening at 0.25m interva	lsg.0	6.1			t of	f silt, she	Ils (Marine)	-	ineu, ang	jular, trav	° 11
0.20 0.90 1 1.20			sc			ASS and environments sampling at 0.5m intervals		6.1 6.1		Soft	tra she	ice of fin ells (Ma	nd; grey, fir e to mediun rine) LL 25 P75 :	n grain			
1			сі				9.3	6.2			gra	ained, tra	iy; grey, sa ace of fine g				
							9.2	6.2				ells (Ma PS 10 L	rine) LL 45 P75	60			
							8.8	6.4			trac		, with fine to e grained gr				- - - - - - - - - - - - - - - - - - -
2							8.7	6.0			MP	PS5 LL	.45 P758	D			
F			СН				8.8	6.0					and the state of the				
2.40	PDL						9.0	5.8			(M	farine)	y, with fine t L65 P759		se graine	ed sand	m
							8.7	6.1									-
3							8.7	6.1									mh
							8.5	6.1									-
3.50							8.6	6.1									
2.40 2.40 3 3.50											в	Borehole	complete	at 3.75	im		ահատահատահատահատահատահ
METHOD A auger W washbo			BIT R roll B bla	ink		UPPORT C casing M mud	U un i	PLING disturbed n mm		nple & size	м	D dry M moist		MPS LL I	6 maxim Liquid Li	SCRIPTK num partic mit	cle size

- W washbore
- P percussion
- B blank V V bit
- H hammer
- C core
- R rotary air flush
- T TC bit D diamond
- in mm
- D disturbed sample
- N Standard Penetration Test & Result
- PP Pocket Penetrometer Value

M moist W wet

LL Liquid Limit P75 % passing 75um sieve

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.4m depth in this borehole.

Technical Services Pty Ltd A.C.N. 103 205 205

			(-/1/03)
Borehole N	ю.	A44	
Sheet 1	of	1	

21024.1/10474.3

Diameter 50mm

BOREHOLE LOG

G.G. Betros & Associates Pty Ltd Project: Environmental & Acid Sulfate Investigation

Client:

Site:

Drill Contractor

Location: Surface R.L.: -2.70m

Date:

E550685721 N7755038 Datum:

Boat

Job No:

AHD Chkd: AW

Shute Harbour Marina

Ullman & Nolan Technical Services

CG Supervisor Drill Model Hand Auger Mounting

26.7.04

STRATA	DRIL	LING	TEST	ING			VISUAL SOIL DESCRIPTION		
Depth (m) R.L	Log Classification	Method & Bit	Support	Sampling	ASS	d Screenin H ^{EOX}	Moisture	Consistency	Dredge Site
0.10 0.10 1 1.10 2.50 PDL 2.60 3.50	CI CH	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	89.0 8.9	6.4 6.5 6.5 6.5 6.3 6.2 6.5 6.3 6.2 6.5 6.8 6.5 6.4 6.4 6.4 6.4 6.4 6.4 6.7	S	Soft	Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, trace of silt, shells (Marine) MPS 10 LL NP P75 5 Clayey Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 10 LL 20 P75 25 Sandy Clay; grey, sand is fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 10 LL 40 P75 60 Clay; grey, with fine to coarse grained sand, trace of fine grained gravel, angular, shells (Marine) MPS 5 LL 60 P75 75 Clay; grey, with fine to coarse grained sand (Marine) MPS 2 LL 65 P75 95
									Borehole complete at 3.50m
METHOD A auger W washbore P percussion H hammer	METHOD BIT SU A auger R roller C N washbore B blank M P percussion V V bit				U und in D dist	PLING listurbed mm turbed sa ndard Pe	mple		MOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size M moist LL Liquid Limit W wet P75 % passing 75um sieve Note: Proposed dredge level (PDL) at -5.2m

H hammer C core

R rotary air flush

D diamond

N Standard Penetration Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.5m depth in this borehole.

UNGR 103G

Technical Services Pty Ltd A.C.N. 103 205 205

			(-/1/0)3)
Borehole No.		A45		
Sheet 1 of	f	1		

21024.1/10474.3

BOREHOLE LOG

Client: G.G. Betros & Associates Pty Ltd Date: 26.7.04 Location: E550685844 N7755029 Project: Environmental & Acid Sulfate Investigation Surface P L · 2.05m

Job No:

UNGR 103G

Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n	Sur	face R.L.:	-2.95m	Datum:	AHD				
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW				
Drill Contra	otor	Ullm	an & I	Nolan 1	echnic	al Services	D	Drill Mode	əl	Hand Auger	Mounting	Boat	Diameter 50mm				
,	STRATA	\			DRIL	LING	TEST				VISUA	L SOIL DESC	RIPTION				
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	SSA TE	B Results H ^{EOX}		Consistency	Dredge	e Site					
0.70 1 1.20 1.50 2.25 3			SP	T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	8.8 8.9	6.2 6.3 6.4	w	Soft	of fine g MPS 5 Clayey S trace of f	LL NP P75	to coarse grained, trace , angularshells (Marine) 15 ne to coarse grained, ravel, angular, shells	ակուստեսուսեսուսեսուսեսուներությունը՝			
1.20			8.9 6.3 (Marine) MPS 3 LL 30 P75 40 CH Clay; grey, with fine to coarse grained sar										سلسسللت				
1.50							8.6 8.6	5.9 6.3			trace of shells (N	fine to medium	n grained gravel, angular				
2.25	PDL						8.8 8.7 8.6	6.7 6.8 6.3			(Marine)	-	- with fine to coarse grained sand				
							8.7 8.8 8.9	6.3 6.2 6.1									
3.25					Borehole complete at 3.25m												
P percussion H hammer C core	METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit						U und ir D dis N Sta Tes	n mm turbed sa andard P at & Resu	amplo enetr			y it t oposed dredg	VISUAL DESCRIPTIO MPS maximum partic LL Liquid Limit P75 % passing 75um e level (PDL) at -5.2m depth in this borehole.	le size			

Technical Services Pty Ltd

Drill Model

TESTING

ASS

9.2

9.1

8.9

9.0

Screenin g Results

pH_F pH_{FOX}

6.9

6.2

6.4

6.3

6.3

A.C.N. 103 205 205

			(-/1/0)3)
Borehole	No.	A46		
			I	
Sheet 1	of	1		

Diameter 50mm

BOREHOLE LOG G.G. Betros & Associates Pty Ltd Date:

27.7.04 Job No: 21024.1/10474.3 E550685381 N7755036

Gravelly Sand; grey, fine to coarse grained,

gravel is fine to medium grained, angular, trace

Clayey Sand; grey, fine to coarse grained, with

fine to medium grained gravel, angular, shells

Project: Environmental & Acid Sulfate Investigation

뷺

Method &

A

Classification

SF

SC

Ullman & Nolan Technical Services

DRILLING

Support

Sampling

screening at 0.25m intervalsg.0

ASS and

environmenta

sampling at

0.5m intervals

Field

Surface R.L.:

Location:

Moisture

W

Shute Harbour Marina Site:

<u>6</u>

Client:

Drill Contractor

Ê

Depth

0.20

1 1.20

1.60

2 2.20

2.90

3

PDL

STRATA

R.

-2.30m Supervisor CG

Consistency

Loose

Soft

Hand Auger Mounting

Datum: Chkd: AW

VISUAL SOIL DESCRIPTION

Boat

of silt, shells (Marine)

MPS 20 LL NP P75 5

MPS 10 LL 25 P75 25

Dredge Site

(Marine)

AHD

CI Clay; grey, with fine to coarse grained sand, with fine to medium grained gravel, angular, 8.7 6.4 shells (Marine) MPS 10 LL 45 P75 60 СН 8.7 6.3 Clay; grey, with fine to coarse grained sand, shells (Marine) MPS 2 LL 60 P75 80 8.9 6.3 8.9 6.2 Clay; grey, trace of fine to coarse grained sand, shells (Marine) 8.8 6.4 MPS 2 LL 65 P75 90 8.8 6.4 8.9 6.2 8.9 6.3 8.5 6.4 8.3 6.2 Borehole complete at 4.00m 8.2 6.1 SUPPORT MOISTURE VISUAL DESCRIPTION BIT SAMPLING R roller U undisturbed sample & size MPS maximum particle size C casing D dry B blank M mud in mm M moist LL Liquid Limit V V bit D disturbed sample W wet P75 % passing 75um sieve T TC bit N Standard Penetration

C core R rotary air flush D diamond

METHOD

A auger

W washbore

P percussion

H hammer

Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.9m depth in this borehole.

Technical Services Pty Ltd

A.C.N. 103 205 205

			(-/1/03)
Borehole N	lo.	A47	
Sheet 1	of	1	

BOREHOLE LOG G.G. Betros & Associates Pty Ltd Date:

27.7.04 Job No: 21024.1/10474.3 E550685477 N7755033

Project: Environmental & Acid Sulfate Investigation Surface R.L.: -2.60m

Location:

Site: Shute Harbour Marina

Client:

CG Supervisor

Datum: Chkd:

AHD AW

0.50.1					al Services		Drill Mode		Hand Auger		unting Boat Diameter 50mm
STRA	TA			DRI	LING	TEST					VISUAL SOIL DESCRIPTION
Depth (m) R.L	Log	Classification	Method & Bit	Support	Sampling	년 ASS	Hot Screenin Kosults	Moisture	Consistency		Dredge Site
0.20 0.20 1 1.10 1.65 2 2.60 PD 3.75 4		SP SC CI CH	T A Wet	dhs	Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	pH _F Is8.9 9.1	pH _{FOX} 6.3 6.5 6.3 6.2 6.2 6.4 6.4 6.4 6.5 6.5 6.5 6.6 6.3 6.1 6.2 6.2 6.2	≤ Moi	Soft		Gravelly Sand; grey, fine to coarse grained, gravel is fine to coarse grained, angular, trace of silt, shells (Marine) MPS 20 LL NP P755 Clayey Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 10 LL 20 P75 20 Sandy Clay; grey, sand is fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 15 LL 45 P75 55 Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 7 LL 55 P75 70 Clay; grey, trace of fine to coarse grained sand, trace of fine grained gravel (Marine) MPS 3 LL 65 P75 90 Borehole complete at 3.75m
METHOD A auger		BIT R rol	ler		UPPORT C casing		PLING	sam	ple & size	M	OISTURE VISUAL DESCRIPTION D dry MPS maximum particle size

- A aug W washbore

C core

H hammer

R rotary air flush

- P percussion
- B blank V V bit T TC bit

D diamond

- M mud
- in mm
- D disturbed sample
- N Standard Penetration
- Test & Result
- PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.6m depth in this borehole.

LL Liquid Limit

P75 % passing 75um sieve

M moist

W wet

UNGR 103G

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 1 10.8.04 Job No: 21024.1/10474.3

Borehole No. A48

AHD

Project: Environmental & Acid Sulfate Investigation

G.G. Betros & Associates Pty Ltd

E551686151 N7755040 Location: Surface R.L.: -2.94m Datum:

Client:

CG Supervisor

Date:

Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	С	G	С	hkd:	AW		
Drill Contra	ctor	Ullm	an &	Nolan T	echnic	al Services		Drill Mode	el 🛛	Hand Auger	Мо	ounting	B	bat	Diamo	eter 50mm	
	STRATA				DRIL	LING		TING			_	VISU	JAL S	OIL DES	CRIPTIO	N	
Depth (m)	R.L	fog	Classification	Method & Bt	Support	Sampling	sse PH⊧	B Results MFOX	Moisture	Consistency				annel			
0.20			SP	A T		Field screening at			w	Loose		gravel	is fin			oarse grair , with silt, s	ned, E
			sc			0.25m interva	s9.0	6.2			Π	(Marin MPS 2		LNP P	75 10		
0.70						ASS and environmenta sampling at		6.1		Soft			f fine	to media		rse grained d gravel, ar	d, ngular,
			СІ			0.5m intervals	8.3	6.0			h			25 P7			
0.20 0.70 1 1.20 2.75 3 3.75				8.5	5.9				grained shells (d, trac (Marin	e of fine	grained g	e to coarse ravel, angu	-			
1.20			сн				8.6	6.0			⊢					grained sa	
							8.7	6.0				with fin (Marine	e grai		/el, angula	-	
1.90							8.5	5.8									
2							8.6	5.7				(Marine)	race of f 5 P75		rse grained	isand
							8.5	5.8									
							8.5	5.8									
2.75	PDL						8.6	5.8									
3							8.5	5.7									
							8.5	5.8									
							8.3	5.9									
3.75							8.2	5.9			⊢						
4												Bore	hole	complet	te at 3.75r	n	
METHOD A auger W washbo	uger R roller C casing					C casing	U un	PLING disturbed n mm	lsam	nple & size	М	iOISTUF م M mo	dry		MPS	AL DESCR maximum quid Limit	IPTION particle size

P percussion

H hammer C core

D diamond R rotary air flush

V V bit

T TC bit

D disturbed sample

N Standard Penetration

LL Liquid Limit M moist W wet P75 % passing 75um sieve

Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.75m depth in this borehole.

UNGR 103G

(-/1/03)

UNGR 103G

					Т	echnical S A.C.N.				_td		Borehole	,	/1/03)
					E	BOREHO	DLE		G			Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	s Pty Ltd			Dat Loc	e: ation:	10.8.04 E5506862	Job No: 48 N7755	21024.1/10474.3 011	
Project:	Envir	onm	enta	& Ac	id Su	lfate Investi	gatio	n		face R.L.:	-3.04m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na				Sup	pervisor	CG	Chkd:	AW	
Drill Contra	ctor STRATA		an & I	Nolan 1		al Services	TEST	rill Mode) 	Hand Auger	<u> </u>	Boat L SOIL DESC	Diameter 50mm RIPTION	-+
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	ASS	PHFOX	Moisture	Consistency		Channel		
0.20			SP SC	A T		Field screening at 0.25m interva ASS and		6.5	w	Loose	grained, (Marine) MPS 20	, gravel is fine) LL NP P75		
0.70			сі			environmenta sampling at 0.5m intervals		6.4 6.3			trace of f shells (M	fine to medium	e to coarse grained, n grained gravel, angula 25	, subsection of the section of the s
0.20 0.70 1 1.40 2.65 3 3.75						8.7 8.6	6.2 6.1			grained, angular,		,		
1.40			сн				8.6 8.7	6.0 5.9			with fine t shells (Ma	to medium gra	coarse grained sand, ined gravel, angular,	
2							8.8	5.9			sand, she	ey, trace of fine ells (Marine) LL 70 P75 90	e to coarse grained	muluum
							8.6 8.7	5.9						
2.65	PDL						8.6	5.9						
3	3						8.5	5.8						
							8.5	5.9						
3.75							8.5	5.7						
3.75 4							8.4	5.7			Boreh	ole complete	at 3.75m	
METHOD A auger W washbo P percussio H hammer	on		BIT R rol B bla V V b T TC	nk bit	(UPPORT C casing I/ mud	U und ir D dist	PLING disturbed mm turbed sa ndard P	ample		MOISTURE D dry M mois W we Note: Pro	v t t	VISUAL DESCRIPTIO MPS maximum partio LL Liquid Limit P75 % passing 75um a level (PDL) at -5.2m	cle size

Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.65m depth in this borehole.

R rotary air flush

D diamond

C core

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 1 10.8.04 Job No: 21024.1/10474.3

Chkd:

Borehole No. A50

AHD

AW

Project: Environmental & Acid Sulfate Investigation

G.G. Betros & Associates Pty Ltd

Client:

Site:

E550686386 N7754971 Location: Surface R.L.: -3.09m Datum:

Shute Harbour Marina

Supervisor CG

Date:

Sile.	Shute	: па	rbou	man	na				Sup	Dervisor	0	G CIIKU. AVV
Drill Contrac	ctor	Ullm	an & I	Nolan 1	ſechnic	al Services	D	rill Mode	el	Hand Auger	Mo	ounting Boat Diameter 50mm
S	TRATA	\			DRI	LING	TEST	ING			_	VISUAL SOIL DESCRIPTION
Depth (m)	R.L	Log	Classification	Method & Bt	Support	Sampling	SS¥ pH _F	PHFOX	Moisture	Consistency		Access Channel
0.25 0.80 1 1.30 2.60			SP SC CI	A T		Field screening at 0.25m interva ASS and environmenta sampling at 0.5m intervals	9.1 8.9 8.7	6.1 6.1 6.2 6.2	w	Soft		Gravelly Sand; grey, fine to coarse grained, gravel is fine grained, angular, with silt, shells (Marine) MPS 20 LL NP P75 10 Clayey Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 25 LL 20 P75 25 Sandy Clay; grey, sand is fine to coarse grained gravel, angular, shells (Marine) MPS 5 LL 45 P75 65 Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 3 LL 55 P75 75 Clay; grey, trace of fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 3 LL 55 P75 75 Clay; grey, trace of fine to coarse grained sand, shells (Marine) MPS 2 LL 70 P75 95
			СН				8.7 8.6 8.6 8.6	6.0 6.1 6.2 6.2				Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 3 LL 55 P75 75
2	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2						8.7 8.6	6.0 6.0				Clay; grey, trace of fine to coarse grained sand, shells (Marine) MPS 2 LL 70 P75 95
3 1	2.60 PDL						8.7 8.6 8.6	6.1 6.0 6.2				
3.75							8.4 8.5	6.2 6.2				Borehole complete at 3.75m
METHOD A auger W washbor	e		BIT R rol B bla			UPPORT C casing M mud	U und	PLING listurber	i sam	ple & size	N	TOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size M moist LL Liquid Limit

P percussion

H hammer

C core

R rotary air flush

V V bit

T TC bit

D diamond

D disturbed sample

M moist W wet

ZE LL Liquid Limit P75 % passing 75um sieve

N Standard Penetration Test & Result

PP Pocket Penetrometer Value

Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.6m depth in this borehole.

UNGR 103G

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

Date:

Supervisor

BOREHOLE LOG

Sheet 1 of 1 10.8.04 Job No: 21024.1/10474.3

> AHD AW

Borehole No. A51

Project: Environmental & Acid Sulfate Investigation

Shute Harbour Marina

G.G. Betros & Associates Pty Ltd

Client:

Site:

Location: E550686484 N7754935 Surface R.L.: -3.14m Datum:

> CG Chkd:

Drill Contrac	ctor	Ulim	an & I	Nolan 1	echnic	al Services	D	rill Mode	el -	Hand Auger	Mounting Boat Diameter 50mm
S	TRATA		_		DRIL	LING	TEST				VISUAL SOIL DESCRIPTION
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling	ssy pH _F	Hesults PA	Moisture	Consistency	Access Channel
0.25			SP SC	A T		Field screening at 0.25m interva ASS and	Isg.2	6.1	W	Loose Soft	Gravelly Sand; grey, fine to coarse grained, gravel is fine grained, angular, with silt, shells (Marine) MPS 25 LL NP P75 10
						environmenta sampling at 0.5m intervals		6.2 6.0			Clayey Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 25 LL 25 P75 20
			СІ				8.8 8.6	6.0 5.9			Gravelly Sand; grey, fine to coarse grained, gravel is fine grained, angular, with silt, shells (Marine) MPS 25 LL NP P75 10 Clayey Sand; grey, fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 25 LL 25 P75 20 Sandy Clay; grey, sand is fine to coarse grained, trace of fine to medium grained gravel, angular, shells (Marine) MPS 5 LL 40 P75 65 Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine) MPS 4 LL 55 P75 75 Clay; grey, trace of fine to coarse grained sand, shells (Marine) MPS 2 LL 65 P75 90
1.40			сн				8.7 8.7	5.8 5.8			Clay; grey, with fine to coarse grained sand, trace of fine to medium grained gravel, angular, shells (Marine)
1.90							8.7	5.8			MP3 4 LL 55 P75 75 Clay; grey, trace of fine to coarse grained sand, shells (Marine)
2.50	PDL						8.8 8.7	5.9 5.8			MPS 2 LL 65 P75 90
							8.7 8.7	5.8 5.9			
3							8.7	5.9			
0.25 0.90 1 1.40 2.50 3 3.50							8.8	6.0			Borehole complete at 3.50m
METHOD A auger W washbor P percussio H hammer C core	METHOD A auger W washbore P percussion H hammer			ler nk bit mond	(UPPORT C casing M mud	U und ir D dist N Sta Tes	n mm turbed sa indard P at & Resu	ample enetr		MOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size M moist LL Liquid Limit W wet P75 % passing 75um sieve Note: Proposed dredge level (PDL) at -5.2m corresponds to 2.5m depth in this borehole.

UNGR 103G

(-/1/03)

						LLMAN echnical (A.C.N.	Serv	vices F	Pty L				Borehole I	No. A52	UNGR 103G (-/1/03)
					E	BOREH	OLI	E LO	G				Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	8 Pty Ltd			Dat	e: ation:		10.04	Job No: E685736	21024.1/1	0474.3
Project:	Envir	onm	ental	& Ac	id Su	lphate Inve	stiga	tion		face R.L.:	3.6		Datum:	AHD	
Site:	Shute	e Hai	rbou	r Mari	na				Sup	ervisor	RC		Chkd:	AW	
Drill Contra	ctor	Ullm	an & I	Nolan 1	echnic	al Services		Drill Mod	el	Hand Auger	Mou	inting	Boat	Diameter 50r	nm
8	STRATA		-		DRIL	LING	TES	Screenin g Results				VISUA	L SOIL DESC	RIPTION	
Depth (m)									Moisture	Consistency					
0.15			ML	A T		SPOCAS	6.0 5.8	4.6 4.1	w	Very Dense	\mathbb{N}	grained,		pale brown, fin lium to coarse ; 50	grained
												Hand a	uger refusal	at 0.15m	grained
1															
	1														
2															
3	3														
alanan a															ևոուհատեսուն
E 4 METHOD A auger W washbor P percussio			BIT R roll B bla V V b	nk oit	0	UPPORT C casing // mud	U ur D di:	IPLING indisturber in mm sturbed s	ample	ple & size	MC	DISTURE D dry M moist W wet	r t	LL Liquid Lin	CRIPTION um particle size

H hammer C core R rotary air flush

D diamond

T TC bit

N Standard Penetration Test & Result PP Pocket Penetrometer Value

						echnical \$	N & NO Services I 103 205 20	⊃ty I			Borehole 1	No. A53	UNGR 10 (-/1	03G /03)]
					E	BOREH	OLE LO	G			Sheet 1	of 1		
Client	G.G.	Betr	os &	Asso	ciates	s Pty Ltd		Dat Loc	e: ation:	18.10.04 N7755570	Job No: E685836	21024.1/10)474.3	
Project:	Envir	onm	ental	& Ac	id Su	lphate Inve	stigation	Sur	face R.L.:	2.4m	Datum:	AHD		
Site:	Shute	e Hai	rbou	r Mari	na			Sup	pervisor	RC	Chkd:	AW		
Drill Contra			an & I	Nolan 1		al Services	Drill Mod	lei	Hand Auger		Boat	Diameter 50r	nm	
	STRATA	Ì	c	*	DRIL	LING	TESTING ද සී	+		VISUA	L SOIL DESC	RIPTION		-
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling	H ^L ASS BH ^L ASS BH ^L B Results	_	Consistency					
0.15			GM	A T		SPOCAS	7.3 4.8 6.2 4.7	D	Very Dense	coarse grained	- /	,		
GM A SPOC 1 I I I I 1 I I I I 2 I I I I 3 I I I I										Hand	auger refusal	at 0.15m		առոհակահատահաստեսումուստեսումուստեսումեսումեսումեսումեսումեսումեսում
METHOD BIT SUPPO A auger R roller C cas W washbore B blank M muc P percussion V V bit H hammer T TC bit							SAMPLING U undisturbe in mm D disturbed s	sampl	•	MOISTUR D dr M mois W we	/ t	VISUAL DES MPS maximu LL Liquid Lin P75 % passi	um particle nit	l size

N Standard Penetration

PP Pocket Penetrometer Value

Test & Result

H hammer

R rotary air flush

C core

T TC bit

D diamond

						LLMAN echnical { A.C.N.	Servi	ces F				Borehole	No. A54	UNGR 103G (-/1/03)	
					E	BOREH	OLE	LO	G				Sheet 1	of 1	
Client:	G.G.	Betr	os &	Asso	ciates	Pty Ltd			Dat	e: ation:		.10.04 755547	Job No: E685836	21024.1/1	0474.3
Project:	Envir	onm	enta	& Ac	id Su	lphate Inve	stigat	on		face R.L.:	2.6		Datum:	AHD	
Site:	Shute	e Hai	rbou	r Mari	na				Sup	ervisor	RC	;	Chkd:	AW	
Drill Contra			an & I	Nolan 1		al Services	_	rill Mode	el	Hand Auger	Мо	unting	Boat	Diameter 50	mm
S	STRATA		c	**	DRIL	LING	TEST	ING			-	VISUA	L SOIL DESC	RIPTION	
Depth (m)	R.L	fog	Classification	Method & Bit	Support	Sampling	pH _F	DH Screenin B Results FOX	Moisture	Consistency					
0.30							6.2	4.8 4.9	D	Dense to Very Dense		coarse g grained		,	to coarse
											`	Hand a	uger refusal	at 0.30m	
GM A T 0.30 1 1 2 3														to coarse	
P percussio	METHOD BIT					UPPORT C casing / mud	U und in D dist	PLING listurbed mm urbed si ndard P	ample		M	OISTURE D dry M moist W wet	/ t	LL Liquid Lir	um particle size

C core R rotary air flush T TC bit

D diamond

H hammer

Test & Result

N Standard Penetration

PP Pocket Penetrometer Value

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 52 BOREHOLE LOG Sheet 1 of 2 Client: Port Binnli C/- CUN Brisbane 29.3.06 21024.1 Date: Job No: N 7755249 E 55K 0685444 Location: Project: Additional Geotechnical Investigation Surface R.L.: 0.4m Datum: AHD Site: Shute Harbour Marina Supervisor CG. WE Chkd⁻ AW Drill Contractor Ullman & Nolan Technical Services Diameter 50mm Auger Drill Model Hand Auger VISUAL SOIL DESCRIPTION STRATA DRILLING TESTING Classification ă Consistency Ē Method & Sampling Moisture Support Depth <u>6</u>0 R.L 0.4 Clayey Sand; grey, fine to coarse grained, Very Soft to SC D W А -Soft trace of shells (Marine Sand) 0.20 0.2 MPS 5 LL 35 P75 35 n MPS 10 LL 40 P75 40 0.80 -0.4 D MPS 4 LL 50 P75 55 CI 1 -1.0 1.40 CH Clay; grey, with fine to coarse grained sand -1.1 D Very Soft 1.50 (Marine Mud) Vane Shear MPS 2 LL 65 P75 70 = 4kPa 2 -1.6 trace of fine to coarse grained sand D MPS 2 LL 65 P75 85 3 Vane Shear = 3kPa -3.1 3.50 D dark grey MPS 2 LL 80 P75 95 4 SUPPORT MOISTURE VISUAL DESCRIPTION METHOD BIT SAMPLING R roller C casing U undisturbed sample & size MPS maximum particle size A auger D dry W washbore B blank M mud in mm M moist LL Liquid Limit P percussion V V bit D disturbed sample W wet P75 % passing 75um sieve H hammer T TC bit N Standard Penetration D diamond C core Test & Result R rotary air flush PP Pocket Penetrometer Value

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Client: Port Binnli C/- CUN Brisbane Date: 29.3.06 Job No: Location: N 7755249 E 55K 0685444

Project: Additional Geotechnical Investigation

Site: Shute Harbour Marina

Surface R.L.: Supervisor 0.4m

CG, WE Chkd:

Datum:

Sheet 2

Borehole No. 52

of 2

AHD

AW

Sile. Shu	e nai	bou	wan	na			Sub	ervisor	CG, WE	Crika.	AW		
Drill Contractor	Ullm	an & I	Nolan T	Technic	al Services	Drill Mod	el	Hand Auger			Diameter	50mm Auge	er -
STRATA	4			DRIL	LING	TESTING			VISUA	L SOIL DES	SCRIPTION		
Depth (m) R. L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
		СН	A		D		w	Very Soft	Clay:	refer sheet	t 1 depth 3.5m	1	
4.20 -3.8 5 6.50 -6.1 6.70 -6.3 7 7							M	Stiff	grain	; brown-gre ed sand (Re 2.0 LL 50		coarse	առոհաստեսուսեսուսեսուսեսուսեսուսեսուսեսուսեսո
6.70 -6.3					D			Low to Very Low Strength		nbrite; brov	wn, extremely	weathered	
7	70 -6.3						Refu	isal on rock	د @ 6.7m				
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush					SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res	samp Penet sult	le	MOISTURI D dr M mois W we	y MF st LL	SUAL DESCR PS maximum Liquid Limit 5 % passing 7	particle size		

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty	Ltd
A.C.N. 103 205 205	

BOREHOLE LOG

Client: Port Binnli C/- CUN Brisbane 29.3.06 Date: Job No: N 7755250 E 55K 0685541 Location: Project: Additional Geotechnical Investigation Surface R.L.: -1.5m Datum: AHD

Borehole No. 53

Sheet 1 of 2

Site:	Shute	e Ha	rbou	r Mari	na			Sup	pervisor	CG, WE	Chkd:	AW		
Drill Contra	actor	Ullm	an & I	Nolan 1	echnic	al Services	Drill Mod	el	Hand Auger			Diameter	50mm Auge	er
	STRATA	\			DRIL	LING	TESTING			VISUA	L SOIL D	ESCRIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
	-1.5		SC	A		D		w	Very Loose to Loose			grey, fine to co rine Sand)	arse grained,	
E ^{0.20}	-1.7					D	{		to Loose			P75 20		
E						-						25 P75 30		1
L														
0.60	-2.1													
E_						D					-85 LL3	30 P75 35		
E														
E 1	.1													
E	1.20 -2.7													
E ^{1.20}	1.20 -2.7 CI D						1		Very Soft	Sand	iy Clay; g	grey, sand is fin	e to coarse	ակատահատահատահատահատահատահատահատահատահատ
E	CI				U			very con	grain	ed, trace	shells (Marine N			
1.50									MPS	5 LL 40	P75 60		_	
L 1.65	1.65 -3.15						Vane Shear = 1kPa							
E_	.65 -3.15 CH D						- 181-0					th fine to coarse	grained sand	
E	СН										ine Mud) 3 LL 55	P75 70		
E_ 2														_
2.10	-3.6					-	-				09.2 11.2	70 P75 85		
Ē.						D					-02 LL /	0 175 65		
E														=
Ē.														_
E														=
E_														-
E														1
<u></u> ∎ 3														-
E							Vane Shear = 3kPa							1
E-														-
E														
E-														-
E														
E-													-	
0.20 0.60 1 1.20 1.65 2 2.10 3	4													
•														=
METHOD	METHOD BIT SUPPORT A auger R roller C casing						SAMPLING	d	nnla P cine	MOISTUR		/ISUAL DESCR		
-	W washbore B blank M mud						U undisturbe in mm	u sar		D dr Mimois	-	MPS maximum .L Liquid Limit	particle size	
P percussi			VV				D disturbed s	amp	le	W we		75 % passing	75um sieve	
	Hhammer TTCbit Ccore Ddiamond						N Standard F		ration					
C core R rotarva	ir flusb		D dia	rnond			Test & Res		ometer Value					

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

(-/1/03)

Technical Services Pty Lt	d
A.C.N. 103 205 205	

BOREHOLE LOG

G Sheet 2 of 2

Borehole No. 53

Client:	nt: Port Binnli C/- CUN Brisbane							Dat Loc	e: ation:	29.3.06 N 7755250	Job No: E 55K 06	85541	21024.1
Project:	Addit	iona	Geo	otechr	nical I	nvestigatior	ı	Sur	face R.L.:	-1.5m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	ina			Sup	ervisor	CG, WE	Chkd:	AW	
Drill Contra	actor Ullman & Nolan Technical Services					al Services	Drill Mod	el	Hand Auger			Diameter	50mm Auger
s	STRATA DRILLING					LING	TESTING			VISUA	SOIL DESCR	RIPTION	
			ő	B					y.				

5	IRAIA	<u>،</u>			DRIL	LING	TESTING			VISUAL SOIL	DESCRIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency			
4.40	-5.9		СН	A		D		w	Soft		sheet 1 depth 2.1m	
4.40 5.50 6.50 7	7.0					D			Soft to Firm	MPS 2 LL		
6.50	-7.0							м	Stiff	Clay; grey-b grained sand MPS 20 LL		
						D			Low to Very Low Strength	lgnimbrite; highly jointeo	brown, extremely weathered, d	l
	-8.4									Refusal on	rock @ 6.9m	
E 8 METHOD A auger W washbor P percussio H hammer C core R rotary air	n	<u> </u>	BIT R rol B bla V V t T TC D dia	nk	(UPPORT C casing // mud	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE D dry M moist W wet	VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve	

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Port Binnli C/- CUN Brisbane 30.3.06 Client: Date: Job No: N 7755260 E 55K 0685644 Location: Project: Additional Geotechnical Investigation

-2.7m

Surface R.L.:

Datum:

Borehole No. 54

Sheet 1 of 2

AHD

Site:								Sup	ervisor	CG,	WE	Chkd:	AW		
Drill Contra	ctor	Ullm	an &	Nolan 1	echnic	al Services	Drill Mod	el	Hand Auger				Diamete	r 50mm Aug	er
5	STRATA	ι			DRIL	LING	TESTING				VISUAL	SOIL D	ESCRIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency						
	-2.7		SC	Α		D		W	Loose to				grey, fine to co	arse grained,	=
0.20	-2.9								Very Loose				rine Sand) P75 20		
Ē						D				יו	L	e shells			l.
E													P75 35		Ξ
E															- The second sec
E ^{-0.60}	-3.4					D	1			<u>⊦</u>	MPS	34 11 4	5 P75 40		
E_													0 170 40		
E															
E 1															Ξ
E															
E															
1.30	-4.0														
E			СН			D			Very Soft				grey, sand is fir		
E_1.50							Vane Shear	ł				ed, trace 4 LL 60	shells (Marine I P75.60	Mud)	-
E.							= 2kPa				MI-O		1000		
E ^{1.70}	-4.4					D	1			\vdash	Clav:	arev, wi	th fine to coars	e grained san	
E						_						ne Mud)		- 3	
E ₂											MPS	4 LL 70	P75 70		
															-
E															I
2.30	-5.0									L					- The second sec
E	0.0					D					MPS	S2 LL7	0 P75 85		Ξ
E_															1
E															
															Ξ
E															
E ,															Ξ
Ē							Vane Shear	t							1
E							= 4kPa								=
E-															- The
E															
3.50	-6.2									L					_
E						D							coarse grained	sand	
E											MPS	2 LL 70	P/0 90		
E															Ξ
0.20 0.60 1 1.30 1.70 2.30 2.30 3.50															
		L													-
METHOD BIT SUPPORT A auger R roller C casing			SAMPLING	al e =	unia 8 cinn	MOI	STURE		ISUAL DESCR						
A auger R roller C casing W washbore B blank M mud			U undisturbe in mm	d sar	nple & size		D dry M moist		IPS maximum L Liquid Limit	i particle size					
			D disturbed s	amp	le		W wet		75 % passing	75um sieve					
			N Standard F												
C core D diamond			Test & Res												
				PP Pocket P	enetr	ometer Value									

ULLMAN & NOLAN
Technical Services Ptv I td

A.C.N. 103 205 205

BOREHOLE LOG

Sheet 2 of 2

Borehole No. 54

					E	BOREH	DLE LO	G			Sheet 2	of 2	
Client	Port I	Port Binnli C/- CUN Brisbane Date: Location:									Job No: 0 E 55K 0	685644	21024.1
Project:	Addit	iona	Geo	otechr	nical I	nvestigatior	ı	Sur	face R.L.:	-2.7m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na			Sup	pervisor	CG, WE	Chkd:	AW	
Drill Contra	ctor	Ullm	an & I	Nolan 1	Technic	al Services	Drill Mod	el	Hand Auger			Diameter	50mm Auger
1	STRATA	۹.			DRIL	LING	TESTING			VISUA	L SOIL DESC	RIPTION	
(m) (tj	th (m) sification nod & Bit port port							sture	sistency				

Depth (m)	R.L	Log	Classificatio	Method & Bi	Support	Sampling		Moisture	Consistency			
5	-8.1		СН	A		D		w	Very Soft	Clay: refer s	sheet 1 depth 3.5m	
6.50	-9.2					D		M- 150	Soft to Firm	Clay; dark (MPS 2 LL	grey (Residual?) 80 P75 95	لىيلىسىلىيىساسىيا
6.70	-9.4					D		м	Low to Very Low Strength	Ignimbrite;	brown, extremely weathered	
7										Refusal on	rock @ 6.7m	դատետուհատեսու
METHOD A auger W washbor P percussion H hammer C core R rotary air	n		BIT R rol B bla V V t T TC D dia	nk	(UPPORT C casing // mud	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	ampi Penet sult	e	MOISTURE D dry M moist W wet	VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve	

UNGR 103G

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 2

				011000		_
						_
Client:	Port Binnli C/- CUN Brisbane	Date:			005000	
		Location:	N //55210	6 E 55K 0	685923	
Project:	Additional Geotechnical Investigation	Surface R.L.:	-2.8m	Datum:	AHD	

Borehole No. 55

Site: Shute Harbour Marina Drill Contractor Ullman & Nolan Technical Services								Sup	pervisor	CG, WE	Chkd:	AW		
Drill Contra	ctor	Ullm	an & I	Nolan 1	lechnic	al Services	Drill Mod	el	Hand Auger			Diameter	50mm Auge	er
s	TRATA				DRIL	LING	TESTING		_	VISUAI	SOIL DE	SCRIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
	-2.8		SC	Α		D		W	Loose to			n silt, with shel	ls (Marine	
E_ 0.20	-3.0						4		Very Loose	Sand)	5 LL NP	P75 20		=
0.70	-3.5					D				Claye		rey, fine to co	arse grained,	hundrund
1	0.0					D				MP	S 5 LL 35	P75 35		
1.20	-4.0						4							
1.50						D	Vane Shear = 1kPa			MPS	33 LL 45	P75 45		hundhund
1.80	-4.6		СН			D	-		Very Soft	Sandy	Clav: ore	y, sand is fine	to coarse	1
0.20 0.70 1 1.20 1.50 2.50 2.50 3 3.60 4			0.1			U			very cort	graine	d (Marine I 2 LL 60 F	Mud)	10 004130	
2.50	-5.3					D	1			Clay:	grey, with	fine to coarse	grained sand	
3						-				(Marin	ne Mud) 2 LL 65 1		granica caria	muluum
							Vane Shear	1						_
E							= 1kPa							
														humhum
3.80	3.80 -6.6		-			trace	e fine to co	arse grained s	and					
						MPS 2	2 LL 80 I	P75 95	ana					
METHOD BIT SUPPORT		UPPORT	SAMPLING			MOISTURE		SUAL DESCR	IPTION	-				
A auger R roller C casing			d sar	mple & size	D dry		PS maximum							
W washbore B blank M mud			U undisturbed sample & size in mm			M moist	t LL	Liquid Limit						
			D disturbed s			W wet	t P7	'5 % passing	75um sieve					
H hammer T TC bit N C core D diamond			N Standard F Test & Res		ration									
					ometer Value									
R rotary air flush				- F FOCKELP	onen	onneter value								

UNGR 103G

21024.1

(-/1/03)

UNGR 103G

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 2 of 2

Borehole No. 55

						-		
Client:	Port Binnli C/-	CUN Brisbane		Date:	30.3.06	Job No:		21024.1
				Location:	N 7755216	6 E 55K 06	685923	
Project:	Additional Geo	otechnical Investigation	1	Surface R.L.:	-2.8m	Datum:	AHD	
Site:	Shute Harbou	r Marina		Supervisor	CG, WE	Chkd:	AW	
Drill Contra	ctor Ullman & I	Nolan Technical Services	Drill Mod	el Hand Auger			Diameter	50mm Auger
	TRATA	DDILLING	TECTING		VICUA		NOTION	

	STRATA				DRILLING			TESTING VISUAL SOIL DESCRIPTION				DESCRIPTION	
	Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency			
	- - - - - - - - - - - - - - - - - - -	-9.2		CH	A		D		W	Very Soft	Ignimbrite;	sheet 1 depth 3.8m	պաստեսուսեսություներությունենենեներությունենենենենենենենենենենենենենենենենենենե
	6.70	-9.5								Low Strength	weathered Refusal on	rock @ 6.7m	
	7												muluunhuunhuun
MAWPHC	ETHOD auger washbor percussion hammer core rotary air	n		BIT R roll B bla V V b T TC D dia	nk	0	UPPORT C casing // mud	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	sampl Penet sult	e	MOISTURE D dry M moist W wet	VISUAL DESCRIPTION MPS maximum particle size LL Liquid Limit P75 % passing 75um sieve	

UNGR 103G

21024.1

(-/1/03)

Fechnical	Services Pty	Ltd
ACN	103 205 205	

BOREHOLE LOG

Client: Port Binnli C/- CUN Brisbane 30.3.06 Date: Job No: N 7755259 E 550685465 Location: Project: Additional Geotechnical Investigation

Datum: Surface R.L.: +0.72m Supervisor CG WE Chkd

Borehole No. 56

Sheet 1 of 1

AHD

Site:	Shute Harbour Marina						Supervisor			CG,	WE	Chkd	d:	AW		
Drill Contrac	ctor	Ullm	an &	Nolan T	Fechnic	al Services	Drill Mod	el	Hand Auger					Diameter	50mm Aug	ger
S	TRATA				DRIL	LING	TESTING				VISUAL	SOIL I	DESCR	RIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency							
				A				D	Medium to High Strength					highly wea al at surfa		
METHOD A auger W washbor P percussio H hammer C core			BIT R rol B bla V V I T TC D dia	nk	(UPPORT C casing // mud	SAMPLING U undisturbed in mm D disturbed N Standard Test & Ret	sampl Penet	e		ISTURE D dry M moist W wet		MPS LL Lic	quid Limit	IPTION particle size 75um sieve	

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 1 Port Binnli C/- CUN Brisbane 30.3.06 Date: Job No: N 7755344 E 55K065547 Location:

Project: Additional Geotechnical Investigation

Site: Shute Harbour Marina

Client:

Surface R.L.: Supervisor

CG, WE Chkd:

Datum:

0.0m

Borehole No. 57

AHD

AW

	ute i la						20141301	00, WL	Oliku.				
Drill Contractor											Diamete	r 50mm Aug	er
STR/	ATA			DRIL	LING	TESTING			VISUA	L SOIL D	ESCRIPTION		
Depth (m)	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
			A					Medium to High Strength	Ignin	ibrite; br	own, highly we Refusal at suffa	athered, ce)	
METHOD						SAMPLING			MOISTUR		VISUAL DESCR		
A auger R roller C casing				U undisturbe	d sar	nple & size	D dr		MPS maximum	particle size			
W washbore B blank M mud				in mm			M mois		L Liquid Limit				
P percussion V V bit				D disturbed sample			W we	t F	975 % passing	75um sieve			
H hammer T TC bit				N Standard F		ration							
C core D diamond				Test & Res	ult								
					PP Pocket P	enetr	ometer Value						

UNGR 103G

(-/1/03)

Fechnical Services Pty	Ltd
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 1 of 2

Borehole No. 58

Client	Port Binnli C/- CUN Brisbane	Date: Location:	30.3.06 N 7755287	21024.1		
Project:	Additional Geotechnical Investigation	Surface R.L.:	-2.4m	Datum:	AHD	
Site:	Shute Harbour Marina	Supervisor	CG, WE	Chkd:	AW	
Drill Contra	actor Ullman & Nolan Technical Services	Drill Model Hand Auger			Diameter	50mm Auger

STRATA				Tolall		LING	TESTING	<u>,</u>	Fight Page	VISUALSOI	DESCRIPTION	lager
		Ì	c	*			TESTING		<u> </u>	13076 3016	DEBORIFTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency			
	-2.4		SC	A		D		w	Loose to Very Loose		d; grey, fine to coarse grain (Marine/Colluvial Sand)	ed,
0.20	-2.6					D	{		very Loose	MPS 5 LL 2		_
E										MPS 3 L	L 30 P75 35	1
Ē_												_
0.70												1
0.20 0.70 1 1.20 2.10 3	-3.1		СІ	t		D	1				; grey, sand is fine to coars	ed, and sand sand sand sand sand sand sand
										grained, trac MPS 3 LL	ce shells (Marine Sand) 40 P75 55	
1.20	-3.6											
			СН			D]		Very Soft to	Clay; grey, (Marine Mu	, with fine to coarse grained	sand
E									Soft		60 P75 70	1
												1
E												1
												-
2.10	-4.5									L		
E_						D				MPS 3 L	L 55 P75 80	
E												1
E_												_
Ē												3
E_												-
E												1
<u></u> _3	-3.4					D	-		Soft	trace fine t	to coarse grained sand	-
E										MPS 2 LL		1
												-
E												3
E												1
Ē												1
E 4												
METHOD		•	BIT		s	UPPORT	SAMPLING	•		MOISTURE	VISUAL DESCRIPTION	
A auger			R rol			C casing	U undisturbe	d san	nple & size	D dry	MPS maximum particle s	ize
W washbor Ppercussio			B bla		N	/ mud	in mm D disturbed :	amel	le	M moist W wet	LL Liquid Limit P75 % passing 75um siev	
H hammer			T TC				N Standard I			VV WGL	Fro to passing round alo	
C core			D dia	mond			Test & Res					
R rotary air	flush						PP Pocket P	enetr	ometer Value			

						LLMAN echnical S A.C.N.		Pty			Borehole	No. 58	UNGR 103G (-/1/03)
					E	BOREH		G			Sheet 2	of 2	
Client:	Port	Binn	li C/-	CUN	Brisb	ane		Dat Loc	e: ation:	30.3.06 N 775528	Job No: 37 E 55K (0685676	21024.1
Project:	Addit	iona	l Ge	otechr	nical I	nvestigatior	n	Sur	face R.L.:	-2.4m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na			Sup	ervisor	CG, WE	Chkd:	AW	
Drill Contra	ctor STRATA		nan &	Nolan 1		al Services	Drill Mod TESTING	del	Hand Auger	VISIIA	L SOIL DESC		50mm Auger
<u> </u>		Ì		B				\vdash	5		2 3012 0232	ALL HON	
Depth (m)	R.L	Log	Classification	Method &	Support	Sampling		Moisture	Consistency				
4.40	-6.8		СН	A		D		w	Soft	Clay:	refer sheet 1	depth 3.0m	
4.40 5	0.0					D				MF	PS 2 LL 80 1	P75 95	
5													_
													_
													_
6													_
-													_
	-8.8			ĺ		D	1	м	Medium to Low Strength	lgnir resid	nbrite; browr ual	n, extremely	weathered to
6.90	-9.3												_
6.40 6.90 7										Refu	usal on rock (@ 6.9m	_
													_
Ē													
8													
METHOD A auger W washbo P percussio H hammer C core R rotary ai	on		BIT R rol B bla V V I T TC D dia	ink bit		UPPORT C casing M mud	SAMPLING U undisturbed in mm D disturbed N Standard Test & Re PP Pocket F	samp Penet sult	le	MOISTURI D dr M mois W we	y MPS at LL L	JAL DESCR maximum iquid Limit % passing i	particle size

UNGR 103G

(-/1/03)

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Technical Services Pty Ltd A.C.N. 103 205 205	
BOREHOLE LOG	

Sheet 1 of 2

Borehole No. 59

Client:	Port Binnli C/- CUN Brisbane	Date: Location:	31.3.06 N 7755277	Job No: 7 E 55068	5746	21024.1
Project:	Additional Geotechnical Investigation	Surface R.L.:	-2.4m	Datum:	AHD	
Site:	Shute Harbour Marina	Supervisor	CG, WE	Chkd:	AW	
Drill Contra	actor Ullman & Nolan Technical Services	Drill Model Hand Auger			Diameter	50mm Auger

Drill Contrac			ancei	Nolan		al Services			Hand Auger	2/10/141-00/1	Diameter Summ A	uger
s	TRATA	<u> </u>	6		DRIL	LING	TESTING	<u> </u>		VISUAL SOIL	DESCRIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency			
	-2.4		SC	Α		D		w	Loose		d; grey, fine to coarse graine	d,
0.20	-2.6									trace shells MPS 5 LL 2	0 075 00	1
Ē						D				`		1
E										MPS 5 L	L 30 P75 30	3
E												1
0.80	-3.2											
0.20 0.80 1 1.40 2.20 2.20			CI			D			Very Soft	Sandy Clay grained, trad	; grey, sand is fine to coarse	d, <u>s</u> <u>a</u>
										MPS 3 LL		
E												
Ē-												-
1.40	-3.8									L		=
E_			СН			D				MPS 3 L	L 60 P75 60	
E												=
E_												
E												1
2												_
E												3
2.20	-4.6					D	-			Clay: grey	with fine to coarse grained s	
E										MPS 3 LL 6	50 P75 80	
E_												
E												1
E												
E ₃	-5.4											1
Ē	0.4					D	1		Soft		to coarse grained sand	
E										MPS 2 LL	65 P75 90	1
Ē												1
E												3
Ē												
E												1
F												
4												
												=
METHOD			BIT			UPPORT	SAMPLING	al e = -	unia 8 cine	MOISTURE	VISUAL DESCRIPTION	
A auger W washbor	e		R rol B bla			C casing / mud	U undisturbe in mm	d sar	nple & size	D dry M moist	MPS maximum particle siz LL Liquid Limit	ze
P percussio			VVE				D disturbed s	samp	le	W wet	P75 % passing 75um siev	e
H hammer			т тс				N Standard R	Penet	ration			
C core			D dia	mond			Test & Res					
R rotary air	R rotary air flush						PP Pocket P	enetr	ometer Value			

						LLMAN echnical S A.C.N.		Pty			Borehole	No. 59	UNGR 103G (-/1/03)
					E	BOREH	OLE LO	G			Sheet 2	of 2	
Client:	Port E	Binn	li C/-	CUN	Brisb	ane		Dat	e: ation:	31.3.06 N 7755273	Job No: 7 E 55068	5746	21024.1
Project:	Addit	iona	l Ge	otechr	nical I	nvestigatior	n		face R.L.:	-2.4m	Datum:	AHD	
Site:	Shute	e Ha	rbou	r Mari	na			Sup	ervisor	CG, WE	Chkd:	AW	
Drill Contra			an &	Nolan 1		al Services		lel	Hand Auger	VICUA		Diameter	50mm Auger
<u> </u>	STRATA	Ì	5	ä	DRIL	LING	TESTING		2	VISUAI	L SOIL DESC	RIPTION	
Depth (m)	R.L	Log	Classification	Method & E	Support	Sampling		Moisture	Consistency				
			СН	A		D		w	Soft	Clay:	refer sheet 1	depth 3.0m	
4.30	-6.7					D					kgrey 2 LL 70 P7	5 95	
4.30													առովուստեսուսեսուսեսուսեսուսեսուսեսուսեսուսե
6.50	-8.9		┢			D		м	Medium to Low Strength		nbrite; brown ual	, extremely	weathered to
6.50 6.70 7	-9.1									Refu	sal on rock @	≬6.7m	weathered to
8													
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush K						C casing	SAMPLING U undisturbed in mm D disturbed N Standard Test & Re PP Pocket F	samp Penet sult	le	MOISTURE D dry M moisi W wel	/ MPS t LL L	AL DESCR maximum iquid Limit % passing 3	IPTION particle size

ULLMAN & NOLAN UNGR 103G Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 60 BOREHOLE LOG Sheet 1 of 2 Client: Port Binnli C/- CUN Brisbane 31.3.06 21024.1 Date: Job No: N 7755266 E 55K 685874 Location: Project: Additional Geotechnical Investigation Surface R.L.: -2.65m Datum: AHD Site: Shute Harbour Marina Supervisor CG. WE Chkd⁻ AW Drill Contractor Ullman & Nolan Technical Services Diameter 50mm Auger Drill Model Hand Auger VISUAL SOIL DESCRIPTION STRATA DRILLING TESTING Classification ā Consistency Ē Method & Sampling Moisture Support Depth 80 R.L -2.65 Clayey Sand; grey, fine to coarse grained, SC D W/ Loose to А Very Loose with shells (Marine Sand) 0.20 -2.85 D MPS 10 LL 15 P75 20 trace shells MPS 5 LL 20 P75 25 0.60 -3.25 MPS 5 LL 35 P75 35 D 1 -3.85 1.20 D MPS 5 LL 50 P75 45 -4.35 1.70 Sandy Clay; grey, sand is fine to coarse CH D Very Soft grained MPS 2 LL 60 P75 65 2 2.40 -5.05 Clay; grey, with fine to coarse grained sand D MPS 2 LL 60 P75 80 3 3.50 -6.15 D dark grey, trace fine to coarse grained Soft sand MPS 2 LL 70 P75 95 4 SUPPORT MOISTURE VISUAL DESCRIPTION METHOD BIT SAMPLING R roller U undisturbed sample & size MPS maximum particle size A auger C casing D dry W washbore B blank M mud in mm M moist LL Liquid Limit P percussion V V bit D disturbed sample W wet P75 % passing 75um sieve H hammer T TC bit N Standard Penetration D diamond C core Test & Result

PP Pocket Penetrometer Value

UNGR 103G

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

8 METHOD

A auger

W washbore

P percussion

R rotary air flush

H hammer

C core

BIT

R roller

B blank

V V bit

T TC bit

D diamond

SUPPORT

C casing

M mud

SAMPLING

in mm

D disturbed sample

Test & Result

N Standard Penetration

U undisturbed sample & size

PP Pocket Penetrometer Value

Sheet 2 of 2

Borehole No. 60

	BOREHOLE							Ŭ			offeet 2	01 2		
Client:	Port Binnli C/- CUN Brisbane Additional Geotechnical Investigation							Dat Loc	e: ation:	31.3.06 N 7755266	Job No: 6 E 55K 6	85874	21024.	.1
Project:	Addit	iona	Geo	otechr	nical I	nvestigatio	n	Sur	face R.L.:	-2.65m	Datum:	AHD		
Site:	Shute	e Ha	rbou	r Mari	na			Sup	ervisor	CG, WE	Chkd:	AW		
Drill Contra	actor	Ullm	an & I	Nolan 1	Fechnic	al Services	Drill Mod	lel	Hand Auger			Diameter	50mm Aug	er
	STRATA	1			DRIL	LING	TESTING			VISUA	L SOIL DESC	RIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
	-8.85		СН	A		D		W	Soft	Clay:	refer sheet	1 depth 3.5n	7	
6.50	-9.15					D]		Medium to Low Strength	lgnim residu	nbrite; browr ual	n, extremely	weathered t	
7 7 8										Refu	sal on rock (ĝ 6.5m		

MOISTURE

D dry

W wet

M moist

VISUAL DESCRIPTION

LL Liquid Limit

MPS maximum particle size

P75 % passing 75um sieve

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd	
A.C.N. 103 205 205	

BOREHOLE LOG

Client: Port Binnli C/- CUN Brisbane Date: 31.3.06 Job No: Location: N 7755322 E 550 0685842 Project: Additional Geotechnical Investigation Surface R.L.: -1.75m Datum: AHD

Site: Shute Harbour Marina

Supervisor CG,

WE	Chkd:

Borehole No. 61

of 2

AW

Sheet 1

Site: Shute Harbour Marina Supervisor CG, WE Crikd: AVV										CG, WE CIRU. AW
Drill Contract	or	Ullm	an & I	Nolan 7	Technic	al Services	Drill Model Hand Auger		Hand Auger	Diameter 50mm Auger
ST	RATA		DRILLING				TESTING			VISUAL SOIL DESCRIPTION
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency	
	-1.75 -1.95 -2.95		SC	A		D	-	Ŵ	Loose	Clayey Gravelly Sand: grey, fine to coarse grained, gravel is fine to medium grained, angular to subangular (Marine/Colluvial Sand) MPS 30 LL 20 P75 20 Clayey Sand; grey, fine to coarse grained, with fine to medium grained gravel, angular to subangular MPS 15 LL 30 P75 35 Clayey Sand; grey, fine to coarse grained, trace shells (Marine Sand) MPS 5 LL 35 P75 45 MPS 3 LL 45 P75 45 Sandy Clay; grey, sand is fine to coarse grained, trace shells (Marine Mud) MPS 3 LL 55 P75 55
						D			Very Loose	Clayey Sand; grey, fine to coarse grained, trace shells (Marine Sand) MPS 5 LL 35 P75 45
2	-3.55					D				MPS 3 LL 45 P75 45
3.30	-5.05		СН			D			Very Soft	Sandy Clay; grey, sand is fine to coarse grained, trace shells (Marine Mud) MPS 3 LL 55 P75 55
	-3.05					D			Soft	Clay; grey, with fine to coarse grained sand MPS 2 LL 60 P75 70
W washbore B bla P percussion V V H hammer T T C			R rol B bla V V b T TC	nk	(UPPORT C casing M mud	SAMPLING U undisturbed in mm D disturbed s N Standard I Test & Res	sampl Penet	e	MOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size M moist LL Liquid Limit W wet P75 % passing 75um sieve

R rotary air flush

PP Pocket Penetrometer Value

UNGR 103G

(-/1/03)

Technical	Serv	vices	Pty	Ltd
A.C.N	103	205 2	05	

BOREHOLE LOG

Sheet 2 of 2 Port Binnli C/- CUN Brisbane 31.3.06 Date: Job No: 21024.1 N 7755322 E 550 0685842 Location: Project: Additional Geotechnical Investigation

Shute Harbour Marin Site

Client:

Supervisor

Surface R.L.: -1.75m

Borehole No. 61

Datum: AHD

Site:	Shute	Ha	rbou	r Mari	na			CG, WE	Chkd	-	AW				
Drill Contrac	tor	Ullm	an &	Nolan	Fechnic	al Services	Drill Mod	el	Hand Auger				Diameter	50mm Au	ger
S	TRATA				DRIL	LING	TESTING			VISUA	LSOILD	DESCR	RIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency						
4 60	-6.35		SC	A		D		w	Soft	Rock Claye brown	; extrem ey Grave	nely w My Sa	ind; grey-l fine to coar	xcavates as blue mottled se grained, ad, angular t	-
5.30	-7.05									subai MPS	ngular (R 15 LL 2	lesidu 25 P7	al) 75 25		
6 ° 8										Refu	sal on ro	ock @	5.3m		
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond				SAMPLING U undisturbed in mm D disturbed s N Standard Test & Res	sampl Penet	e	MOISTURE D dry M moist W wet	t t	MPS LL Lic	quid Limit	IPTION particle size 75um sieve				

R rotary air flush

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 1 of 2 Port Binnli C/- CUN Brisbane 30.3.06 Date: Job No:

Surface R.L.:

Location:

Project: Additional Geotechnical Investigation

Client:

-1.75m

N 7755313 E 55K 0685795

Datum:

Borehole No. 62

AHD

Site:	Shute	e Ha	rbou	r Mari	na			Sup	pervisor	CG, WE	Chkd:	AW		
Drill Contra	ctor	Ullm	an & I	Nolan	Technic	al Services	Drill Mod	el	Hand Auger			Diameter	50mm Aug	er
	STRATA				DRIL	LING	TESTING		_	VISUA	L SOIL DES	CRIPTION		
Depth (m)	R.L	fog	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
0.20 0.20 1 1 1.70 2 2.40 3 3.20	-1.75 -1.95 -2.75		SP	A		D		w	Loose	Grave mediu coarse (Marir MPS (Claye grain angui MPS	elly Sand; e im to coarse e grained, a he/Colluvial 60 LL NP ey Gravelly ed, gravel is lar to suban 20 LL 15	grey mottled a grained, gra ngular to sub Sand) P75 10 Sand; grey, s fine to coars gular P75 25	black, ivel is fine to angular fine to coars se grained, arse grained, arse grained san	
	-2.70					D			Soft	Claye with s MPS	ey Sand; gi hells (Marin 5 LL 30 F	rey, fine to co le Sand) 275 30	arse grained,	
1.70 2	-3.45					D				trac MPS	e shells 3 LL 40 F	 975 40		
2.40 2.40 3 3.20	-4.15					D				мр	5 4 LL 50	P75 60		
3.60	-4.95		СН			D			Very Soft	L		fine to coarse P75 75 arse grained		
3.90 4	-5.65					D					2 LL 70 I		ed refer sheet	2
METHOD A auger W washbo P percussion H hammed C core R rotary ai	IOD BIT SUPPORT ger R roller C casing ashbore B blank M mud cussion V V bit mmer T TC bit					C casing	SAMPLING U undisturbe in mm D disturbed N Standard Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M moisi W wet	/ MP	SUAL DESCR S maximum Liquid Limit 5 % passing	particle size	

UNGR 103G

21024.1

(-/1/03)

Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 2 Port Binnli C/- CUN Brisbane 30.3.06 Date: Job No: N 7755313 E 55K 0685795 Location:

Project: Additional Geotechnical Investigation

Client:

Supervisor

Surface R.L.:

Datum:

-1.75m

Borehole No. 62

of 2

AHD

Site:	Shute	e Ha	rbou	r Mari	na			ervisor	CG, WE	Chkd	t	AW			
Drill Contrac			an &	Nolan 1		al Services	Drill Mod	el	Hand Auger					50mm Auge	r
s	TRATA				DRIL	LING	TESTING			VISU/	AL SOIL [DESCRI	PTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency						
5.20	-6.95			A		D			Low to Very Low Strength	exca blue coar grain	vates as mottled b se graine	Clayey brown an d, grave lar to su	nd orange el is fine to ubangular	Sand; grey- , fine to	
5 5.20 6 7										Refi	usal on r	ock @	5.2m		
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond			C casing	SAMPLING U undisturbed in mm D disturbed s N Standard I Test & Res	samp Penet	le	MOISTUR Dd Mmoi Ww	ry st	MPS n LL Liqu	uid Limit	IPTION particle size 75um sieve				

R rotary air flush

UNGR 103G

(-/1/03)

A.C.N. 103 205 205										
BOREHOLE	LOG									
Port Binnli C/- CUN Brisbane	Date: Location:	30.3.06 N 775538								
Additional Geotechnical Investigation	Surface R L	-1.5m								

21024.1 Job No: 81 E 55K 0685824 Surface R.L.: -1.5m Datum: AHD AW

Borehole No. 63

Sheet 1 of 1

Site: Shute Harbour Marina

Client:

Project:

Supervisor CG, WE Chkd:

Drill Contractor Ullman & Nolan Technical Services							s Drill Model Hand Auger			
	rill Contractor Ullman & Nolan Technical Services STRATA DRILLING							el	Hand Auger	Diameter 50mm Auger
S	TRATA	<u> </u>			DRIL	LING	TESTING			VISUAL SOIL DESCRIPTION
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency	
0.15 1.70 2 3.40	-1.5 -1.65		GP SC	A		D		W	Loose	Sandy Gravel; red-brown mottled orange, yellow and grey, fine to coarse grained, angular to subangular, sand is fine to coarse grained, with silt (Colluvial/Beach Debris) MPS 60 LL NP P75 10 Clayey Gravelly Sand; grey mottled brown and yellow, fine to coarse grained, gravel is fine to coarse grained, angular to subangular, with shells (Marine Sand) MPS 30 LL 15 P75 20 Clayey Sand; grey, fine to coarse grained, trace shells MPS 20 LL 40 P75 40
1.70 2 hhuuuuhuuuhuuuhuuuhuuuhuuuhuuuhu	-3.2								Soft	Clayey Sand; grey, fine to coarse grained, trace shells MPS 20 LL 40 P75 40
	-4.9					М	Dense	Clavey Gravelly Sand: grav-blue mottled =		
3.60	-								gravel is fine to medium grained, angular to subangular (Residual) MPS 10 LL 20 P75 20 Refusal on rock @ 3.6m	
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond				C casing	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res	amp Penet	le	MOISTURE VISUAL DESCRIPTION D dry MPS maximum particle size M moist LL Liquid Limit W wet P75 % passing 75um sieve		

R rotary air flush

					10	A.C.N.	103 205 20		Borehole I	No. 6	(-/1/03)			
					E	BOREHO	DLE LO	G			Sheet 1	of 5		
Client:	Port E	Binni	ili					Dat Loc	e: ation:	8.5.06 E 5506860	Job No: 035 N 775		1778.1	
Project:	Additi	iona	l Ove	er Wa	ter In	vestigation		Sur	face R.L.:	-3.7m	Datum:	AHD (From near known spot heig		
Site:	Shute							· ·	ervisor	CG, TAB, WS		AW		
Drill Contra	CTRATA		ino Ul	man 8		Geotechnic LING	Drill Mod TESTING	el	Jacro 350	Mounting	Truck L SOIL DESCI	Diameter 75mr	m Auger	
<u> </u>		Ì	ő	đ	DRI		TESTING		~	VISUAI	L SOIL DESCI	RIPTION		
Depth (m)	R.L	Log	Classification	Method &	Support	Sampling		Moisture	Consistency					
0.20	-3.7 -3.9		SC	W B	с	D		w	Loose		Aravelly Clayey Sand; grey, fine to coarse rained, gravel is fine to coarse grained, ngular, shells (Marine Sands) IPS 2.0 LL 20 P75 20 Sandy Clay; grey, sand is fine to coarse rained, with fine to medium grained gravel, ngular, shells (Marine Clay) IPS 10 LL 40 P74 55 Trace of fine grained gravel, angular. shells IPS 5 LL 55 P75 60			
	-3.9		СІ			D	1		Very Soft		ar, shells (Mar			
Ē											2.0 LL 20 P y Clay; grey,	sand is fine to coa	arse	
Ē-											ed, with fine to ar, shells (Mar	medium grained g	gravel,	
E											10 LL 40 P7			
	-4.7											-		
			СН			D	1			trac		ed gravel, angular	r. 📗	
Ē.											, 5 LL 55 P75	5 60	_	
E														
1.50	-5.2							ļ					-	
E							Vane Shear = 1kPa							
Ē.							- 161 0						4	
E														
2 ²													-	
E														
Ē-													-	
2.50	-6.2												=	
2.00	-0.2					D	1					sand is fine to coa	arse	
E											ed (Marine Cla 2 LL 65 P75		=	
0.20 1.50 2.50 3.90 4												*	rained	
3	-6.7													
E							Vane Shear = 2kPa							
Ē.							Lin a							
E													=	
Ē-														
Ē													=	
E										1 /	dark grey, wit	th fine to coarse g	rained	
3.90	-7.6					D	{		Soft	MPS:	2 LL 70 P75	5 80		
METHOD			BIT				SAMPLING			MOISTURE	VISU	AL DESCRIPTION		
A auger			R roll	er		C casing		d san	nple & size	D dry		maximum particle		
W washbo		B bla		P	M mud	in mm M					quid Limit			
P percussion H hammer			V V Ł			D disturbed sample W wet P75 % passing 75um sie N Standard Penetration					Heve			
C core			D diamond Test & Result											
R rotary ai	r flush					PP Pocket Penetrometer Value								

UNGR 103G

(-/1/03)

Technical Services Pty Lto	
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 2 of 5

Client:	Port E	Binni	ili					Dat	e: ation:	8.5.06 E 5506860	Job No: 35 N 7		21778.1
Project:	Additi	iona	Ove	er Wa	ter Inv	estigation/			face R.L.:	-3.7m	Datum:		
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	or noight)
Drill Contra	ctor	Card	Ino UI	lman &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auger
s	TRATA				DRIL	LING	TESTING			VISUAI	SOIL DE	SCRIPTION	
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
4.50 5 5.50 6 6 6 7 7.05	-8.2		СН	В	c	D U50	Vane Shear = 8kPa		Soft	trace (Marin		coarse grained	
E 8 METHOD A auger W washbor P percussio H hammer C core R rotary air	R roller C casing bore B blank M mud sion V V bit er T TC bit D diamond					C casing	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE D dry M moist W wet	MF LL	SUAL DESCRI PS maximum . Liquid Limit /5 % passing 7	IPTION particle size

UNGR 103G

Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 6 BOREHOLE LOG Sheet 3 of 5 8.5.06 Client: Port Binnili 21778.1 Date: Job No: E 550686035 N 7754920 Location: Additional Over Water Investigation Project: AHD (From nearest Surface R.L.: -3.7m Datum: known spot height) Site: Shute Harbour Supervisor Chkd: AW CG, TAB, WS Drill Contractor Cardno Uliman & Nolan Geotechnic Drill Model Jacro 350 Mounting Truck Diameter 75mm Auger DRILLING STRATA TESTING VISUAL SOIL DESCRIPTION ä Classification Consistency Ê Method & Sampling Support Moisture Depth <u>6</u>0 R.L Soft Clay; refer sheet 2 depth 5.5m W CH w С n 8.10 -11.8 Very Soft в SPT1 N=0(Sank under own weight) 8.55 9 -13.3 9.60 SPT2 N- 0 (Sank under own weight) 10 10.05 11 12 METHOD SUPPORT MOISTURE VISUAL DESCRIPTION BIT SAMPLING R roller C casing U undisturbed sample & size D dry MPS maximum particle size A auger W washbore B blank M mud in mm M moist LL Liquid Limit P percussion V V bit D disturbed sample W wet P75 % passing 75um sieve H hammer T TC bit N Standard Penetration C core D diamond Test & Result R rotary air flush PP Pocket Penetrometer Value

UNGR 103G

(-/1/03)

Technical	Services Pty Ltd	
ACN	103 205 205	

BOREHOLE LOG

Sheet 4 of 5

Client:	Port E	Binni	li					e: ation:	8.5.06 Job No: 21778.1 E 550686035 N 7754920				
Project:	Addit	ional	Ove	er Wa	ter Inv	estigation/			face R.L.:	-3.7m	Datum:	AHD (Fro known sp	
Site:	Shute	e Hai	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	,
Drill Contra	ctor	Card	no Ul	lman &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auger
5	STRATA				DRIL	LING	TESTING			VISUAI	SOIL DES	CRIPTION	
Depth (m)	R.L	Год	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
13 13.20 13.40 14.60	-16.9 -17.1		SC	В	c	D SPT4 N= 8 (1, 4, 4)		w	Very Soft	Claye black graine (Resid	y Gravelly mottled red d, gravel is	Sand; very da and blue, fine fine to coarse P75 35	ark grey-
15 15.65	-18.9			WR		SPT5 N= 37 (21. 20. 17)			Low Strength	red, w (Ignim	hite and bla brite)	weathered, p ack, highly join oderately weat lenses	
METHOD A auger W washbo P percussion H hammer C core R rotary ai	R roller C casing bore B blank M mud sion V V bit er T TC bit D diamond						SAMPLING U undisturbed in mm D disturbed s N Standard Test & Res PP Pocket P	sampl Penet sult	e	MOISTURE D dry M moist W wet	MF	BUAL DESCR S maximum Liquid Limit 5 % passing 7	IPTION particle size

UNGR 103G

Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 6 BOREHOLE LOG Sheet 5 of 5 8.5.06 Port Binnili 21778.1 Client: Date: Job No: E 550686035 N 7754920 Location: Project: Additional Over Water Investigation AHD (From nearest Surface R.L.: -3.7m Datum: known spot height) Site: Shute Harbour Supervisor Chkd: AW CG, TAB, WS Drill Contractor Cardno Uliman & Nolan Geotechnic Diameter 75mm Auger Drill Model Jacro 350 Mounting Truck DRILLING VISUAL SOIL DESCRIPTION STRATA TESTING ă Classification Consistency Ē Method & Sampling Support Moisture Depth 8 R.L w D W Medium to Rock: refer sheet 4 depth 14.6m С Low Strength R -20.3 16.60 moderately weathered, brown-grey D mottled red and orange Appears that rock has many layers 17 ranging from residual to moderately weathered 17.20 -20.9 SPT 6 N= >50 (21,25/120mm, HB) 18 19 SPT -23.42 19.72 N= >50 Borehole complete @ 19.72m (25/90mm) 20 MOISTURE VISUAL DESCRIPTION METHOD BIT SUPPORT SAMPLING R roller C casing U undisturbed sample & size D dry MPS maximum particle size A auger W washbore B blank M mud in mm M moist LL Liquid Limit P percussion V V bit D disturbed sample W wet P75 % passing 75um sieve H hammer T TC bit N Standard Penetration C core D diamond Test & Result R rotary air flush PP Pocket Penetrometer Value

					Te	echnical S A.C.N.	Services 103 205 20		Ltd		Boreho	le No. 7	(-/1	1/03)
					E	BOREH	OLE LO	G			Sheet	1 of 5		
Client	Port E	Binn	ili					Dat	e: ation:	5.5.06 E 55K068	Job No:		21778.	1
Project:	Addit	iona	l Ove	er Wa	ter Inv	vestigation			face R.L.:	-2.5m	Datum:	AHD (Fro	om nearest oot height)	
Site:	Shute								ervisor	CG, TAB, WS		AW		
Drill Contra	ctor STRATA		ino Ul	iman 8		Geotechnic LING	Drill Mod TESTING	lel	Jacro 350	Mounting VISUA	Truck	Diameter SCRIPTION	r 75mm Auge	÷r
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
0.20	-2.5		SC	W B	С	р		w	Loose			Sand; grey, fine to coarse	fine to coarse e grained,	
	-2.7		СІ	_		D	1		Soft		ar, shells (M 25 LL 30	Aarine Sands) P75 30		-
0.20	-3.5									Sandy graine angula	y Clay; gre ed, with fine	ey, sand is fine to medium g //arine Clay)	e to coarse rained gravel,	
			СН			D					e of fine to 10 LL 55	medium grain P75 60	ned gravel	
1.50	-4.0						Vane Shear = 3kPa							mhumhun
	-5.0													Ξ
						D				sand,		fine to coarse le gravel, ang P75 80		mhum
2.50 3	-5.5						Vane Shear = 4kPa							
4														
METHOD A auger W washbo P percussio H hammer C core R rotary air	auger R roller C casing washbore B blank M mud bercussion V V bit hammer T TC bit						SAMPLING U undisturbe in mm D disturbed N Standard Test & Ret PP Pocket F	sampi Penet sult	le	MOISTURE D dry M mois W we	y MF t LL	SUAL DESCR PS maximum Liquid Limit 5 % passing	particle size	

UNGR 103G

(-/1/03)

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Technical Services Pty Ltd	
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 2 of 5

														-
Client	Port E	Binni	ili					Date Loca	e: ation:	5.5.06 E 55K068	Job N 5729	o: N 7754905	21778.1	
Project:	Additi	iona	l Ove	er Wa	ter Inv	vestigation			ace R.L.:	-2.5m	Datum			
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	t noight/	
Drill Contra	ctor	Card	Ino UI	man &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auger	7
	STRATA					LING	TESTING					ESCRIPTION		
			5	ä					~					\neg
(m) filde	R.L	Log	Classification	Method &	Support	Sampling		Moisture	Consistency					
4.40 4.50 4.85 5 5.80 6 6.40 7.90	-6.6 -7.0 -8.5 -8.9		СН	WB	c	D U50 PP= too soft for reading D D SPT1 N= 0 (Sank under of	Vane Shear = 6kPa	W	Soft Very Soft	dark	grey 2 LL 65	 P75 85		առուհարդերությունը են
7.90 8	-10.4					SPT2 refer st	eet 3							
METHOD A auger W washbor P percussio H hammer C core R rotary air	'n		BIT R rol B bla V V t T TC D dia	nk	(UPPORT C casing // mud	SAMPLING U undisturbee in mm D disturbed s N Standard P Test & Res PP Pocket P	sampli Penetr sult	0	MOISTURE D dry M moist W wet	r M	/ISUAL DESCRIF IPS maximum p L Liquid Limit 175 % passing 75	article size	

UNGR 103G

(-/1/03)

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A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 3 of 5

								-			011001			
Client:	Port E	Binni	ili					Date	e: ation:	5.5.06 E 55K068	Job No 5729 N		21778. 5	.1
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	-2.5m	Datum	AHD (F	From nearest spot height)	
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW		
Drill Contra			ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diame	ter 75mm Aug	er
5	STRATA				DRIL	LING	TESTING			VISUAI	SOIL DE	SCRIPTION		
(m) the	R.L	Fog	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
8.10 9 9.30 10 11 10.80 11	-10.6		СН	WB	с	SPT2 N= 0 (Sank under of N= 0 (Sank under of SPT4 N= 1 (1)		W	Very Soft		refer she 3 2 LL 65	e <u>t 2</u> depth 6.	Om	
METHOD A auger W washbo P percussio H hammer C core R rotary ai	on	L	BIT R rol B bla V V I T TC D dia	ank bit	(UPPORT C casing M mud	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	sampl Peneti sult	e	MOISTURE D dry M moist W wet	r M	L Liquid Lim	m particle size	

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(-/1/03)

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Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 4 of 5

						OKER		G			Sheet 4	of 5		
Client:	Port E	Binni	ili					Dat Loc	e: ation:	5.5.06 E 55K068	Job No: 5729 N 7	7754905	21778.1	1
Project:	Addit	iona	l Ove	er Wa	ter Inv	vestigation		Sur	face R.L.:	-2.5m	Datum:	AHD (Fro known sp	m nearest ot height)	
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	j,	
Drill Contra	ctor	Card	ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auge	er
5	STRATA				DRIL	LING	TESTING			VISUAI	L SOIL DESC	RIPTION		
Depth (m)			Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
	R.L	Log	СН	₩ W	л с			⊮ ₩	ර Soft to Firm	Claur		de eth 8 dee		_
12.40				В		D			Solution	Clay:	refer sheet 3	depth 8.1m	1	muluu
12.70	-14.9 -15.2 -15.3		SC			D SPT 5 N=8 (1, 3, 5)			Dense	graine (Resi MPS	ey Sand; gre ed, trace of fin dual?) 5 LL 30 P7 dark grey-br 2 LL 35 P7	ne gravel, ar 75 30 own (Residu	ngular	ահատեսուն
13.60	-16.1					D			Low to Very Low Strength	Sand	; extremely v ; grey-brown 2 LL 15 P7	n, fine to coa		
13	-16.9					SPT 6 N=18 (10, 9, 9)			Medium to Low Strength		; brown, mott nely to moder	-		
15	-18.1					D			Low to Very Low Strength		dual to extrem		red	
METHOD A auger W washbo P percussio H hammer C core R rotary air	n		BIT R roll B bla V V b T TC D dia	nk bit	(UPPORT C casing M mud	SAMPLING U undisturbed in mm D disturbed s N Standard I Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M moist W wet	MPS	AL DESCR maximum iquid Limit % passing 7	particle size	

UNGR 103G

(-/1/03)

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Technical Services Pty Ltd A.C.N. 103 205 205

POPEHOLE LOC

						SOREH	JLE LO	G			Sheet 5	of 5		
Client:	Port I	Binni	ili					Dat Loc	e: ation:	5.5.06 E 55K068	Job No: 35729 N	7754905	21778.1	1
Project:	Addit	ional	l Ove	er Wa	ter Inv	vestigation			face R.L.:	-2.5m	Datum:	AHD (From known spo		
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	a,	
Drill Contra	ctor	Card	Ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auge	er
5	STRATA				DRIL	LING	TESTING			VISUAI	L SOIL DESC	RIPTION		
Depth (m)	R.L	Fog	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
16.10	-18.6			W B	с	D	-	w	Low to Very Low Strength		refer sheet			
				в		SPT 7 N=32 (15, 15, 17)			Medium to Low Strength		emely to mod	lerately weat	hered	mhmm
16.10						D								lumburdum du su
17.80 18 18.60 18.70	-20.3					SPT 8 N=45 (22, 22, 23)	-							1
19										Boreł	hole comple	te @ 18.70m	1	
METHOD A auger W washbo P percussid H hammer C core R rotary ai	on		BIT R rol B bla V V I T TC D dia	ink bit	(UPPORT C casing M mud	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M moist W wet	y MPS t LL L	JAL DESCRI 3 maximum p .iquid Limit % passing 7	particle size	

					10	A.C.N.	103 205 20		Lta		Borehole	No. 8	(-/1/03)
					E	BOREHO	DLE LO	G			Sheet 1	of 4	
Client:	Port E	Binni	ili					Dat Loc	e: ation:	4.5.06 E 55K068	Job No: 35421 N 7		778.1
Project:	Additi	iona	l Ove	er Wa	ter Inv	estigation/		Sur	face R.L.:	-2.3m	Datum:	AHD (From near known spot heigl	
Site:	Shute							· ·	ervisor	CG, TAB, WS	Chkd:	AW	
Drill Contra	CTRATA		Ino UI	lman &		Geotechnic LING	Drill Mod TESTING	el	Jacro 350	Mounting	Truck L SOIL DESC	Diameter 75mn	n Auger
<u> </u>			5	ä	DRIL	LING	TESTING		×.			KIP HON	
Depth (m)	R.L	Log	Classification	Method &	Support	Sampling		Moisture	Consistency				
0.20	-2.3 -2.5		SC	W B	с	D		w	Loose			ind; grey, fine to c ne to coarse graine	oarse 📕 d,
	-2.5		CI	B		D			Very Soft	angula MPS 3 Sand graine angul MPS	ar, shells (Mar 25 LL 20 P) y Clay; grey, ad, with fine to ar, shells (Ma 10 LL 40 P)	rine Sand) 75 20 sand is fine to coa medium grained g rine Clay) 75 50	rse Iravel,
			СН			D				angula	e of fine to me ar, shells 10 LL 55 P7	edium grained grav 75 60	el.
1.50	-3.8						Vane Shear = 5kPa	•					el.
2.50	-4.8					D				shells	-	 ed gravel, angular, 5 60	mhunuhunu
0.20 1 1.50 2 2.50 3 4	-5.3						Vane Shear = 6kPa	•					ռեսուն
METHOD A auger W washbo P percussio H hammer C core R rotary air	on		BIT R rol B bla V V t T TC D dia	nk	0	UPPORT C casing / mud	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE D dry M moisi W wei	/ MPS t LL L	AL DESCRIPTION maximum particle iquid Limit % passing 75um si	size

					T	echnical S A.C.N.	Services 103 205 20	Pty 5	Ltd		Borehol	e No. 8	(-	/1/03)
					E	BOREHO		G			Sheet 2	of 4		
Client:	Port E	Binni	ili					Dat	e: ation:	4.5.06 E 55K068	Job No:	775014	21778	.1
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	-2.3m	Datum:	AHD (Fro	om nearest oot height)	
Site:	Shute								ervisor	CG, TAB, WS		AW		
Drill Contra	ctor STRATA		ino Ul	lman 8		Geotechnic LING	Drill Mod TESTING	el	Jacro 350	Mounting	Truck L SOIL DES		r 75mm Aug	er
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		6 Moisture	Consistency				* 0.50	
4.50 5 5.20 6 6.10 7	-6.8 -7.5		СН	WB	c	D U50 PP= reading for gauge	Vane Shear = 12kPa too small	w	Very Soft	Clay; sand		y)	oarse grained	
E 8 METHOD A auger W washbo P percussik H hammer C core R rotary ai	on	L	BIT R rol B bla V V t T TC D dia	nk		UPPORT C casing M mud	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE D dry M moisi W wel	/ MP t LL	UAL DESCR S maximum Liquid Limit 5 % passing	particle size	=

					Te	echnical S A.C.N.	Services 103 205 20	Pty 15	Ltd		Borehole	e No. 8	(-/	/1/03)
					E	BOREHO	DLE LO	G			Sheet 3	of 4		
Client:	Port E	Binni	ili					Dat	e: ation:	4.5.06 E 55K068	Job No: 35421 N	775914	21778.	1
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	-2.3m	Datum:	AHD (Fr	om nearest pot height)	
Site:	Shute								pervisor	CG, TAB, WS	Chkd:	AW		
Drill Contra	STRATA		ino UI	iman &		Geotechnic LING	Drill Mod TESTING	lel	Jacro 350	Mounting VISUA	Truck L SOIL DES	Diamete CRIPTION	r 75mm Aug	er
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
			СН	W	с	D		w	Very Soft	Clay:	refer sheet	2 depth 6.10	Dm	
8.40 8.60 8.70 9 9	-10.7 -10.9 -11.0		CI	В.		D SPT1 N= 0 (Sank under	øwn weight)			coars rootle MPS	e grained, d ts, organic o 2 LL 40 P ; residual to	extremely v	organics, e Clay) weathered	
						D			Low to Very Low Strength	fine g graine	rained, angu	lar, sand is osed organic	≩ravel; grey, fine to coarse s	
10.80	-13.1			υĎ						Core	hole begins	: @ 10.80m		
METHOD A auger W washbo P percussion H hammer C core R rotary ai	on		BIT R rol B bla V V t T TC D dia	nk	(UPPORT C casing M mud	SAMPLING U undisturbed in mm D disturbed : N Standard I Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M mois W we	y MP t LL	Liquid Limit	RIPTION particle size 75um sieve	

Technical Services Pty Ltd A.C.N 103 205 205

CORED BOREHOLE LOG

Borehole	no	:	8		
Sheet no	:	4		of	4

Clien Proje Job I Site: Loca	No: 2	21778.1 hute H	nal Over Wate	er Inve	stigation					Ho Lo Ch	gg ec	Co ed kec	mp by i b	y :	ed: AW	4.9	4.5.	5		Drill Rig: Ja Barrel type: I Bit Type: TC Driller: Carc Datum: AHD	MNLC	;				
Depth (m)	Geological Unit	Graphic Log	Descript	tion c	of Core	Weathering			oci Stre			_		De			Spa Im)	acii	ng	Description And Orientation of Rock Defects	D	rillir	ıg In	forr	nati	on
10.5							ц.	Ł	г мн ۷			Ŧ	E	10	30	100	300	1000	3000		core run	TCR	scR	RaD	Method & Bit	casing depth
-			continued fro	om BH8																						
 			Dolerite; gre slightly discol phenocrysts			SW- DW	I													Sample highly fractured throughout, persistant joint sets at 45°and 60°	1	40	10	5		
- _11.3 - _11.5				gnimbrite; yeliow with brown raneer on joint surfaces Dolerite: grey. fine gained, with																						
-			Dolerite: gre feldspar phen		ained. with	sw															2	30	0	0		
11.8 														F												
- - 12.5 12.6			yeliow-brown joint surfaces	weather	ring on	DW																				
-																					3	20	0	0		
- _13.2 - _ 			Ignimbrite; re fine grained Dolerite; grey	, fine ga	ined,	DW SW														Sample intensely						
			yellow-brown w surfaces Borehole ends				μ				+	+	-	Ц						fractured						
-																										
- - -																										
_ 																										
	Voina	Tests	NDa)	Weatherin	-			Str			(B	ase)		De	fect type		ing li					
	Pressure Uncon.		IPa) Strength (MPa)	DW	Extremely we Destinctly We	athered	VL L .	-Ver	ry Lo v	w	W0.			0.03	-0.3	10 30				J Joint S Foliation B Bedding	SCR:	Total (Solid (Rock (Core R	ecove	ry (%)	
L 1 ₉₅₇ N PI PSD	Point los Standar Plasticit		ation Test	SW FR	Slightly We	athered Fresh	H - VH	- Hig Ve		igh	High	1		0.30 1.00 3.00	-3.0	00										ngsten smond

					Т	echnical S A.C.N.	Services 103 205 20		Ltd		Borehole	No. 9	(-/1	/03)
					E	BOREHO	DLE LO	G			Sheet 1	of 5		
Client:	Port E	Binn	ili					Dat Loc	e: ation:	11.5.06 E 55K068	Job No: 5862 N	7755073	21778.1	
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	-3.0m	Datum:	AHD (From known spo		
Site:	Shute	e Ha	rbou	r				· ·	ervisor	CG, TAB, WS	Chkd:	AW		
Drill Contra	ctor STRATA		ino Ul	man 8		Geotechnic	Drill Mod TESTING	el	Jacro 350	Mounting	Truck L SOIL DES		75mm Auge	r
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
	-3.0	-	SC	w	0) C	U50		w	Loose			and; grey, fi		=
0.20	-3.2		СІ	в		PP= too soft f	br reading		Very Soft	angula	ar, shells (Ma	fine to coarse arine Sands)	grained,	-
						D				Sand graine angul	ed, with fine	y, sand is fine to medium gra arine Clays)		
1.50	-4.0		СН							mps	e of fine gra 5 LL 55 P	ined gravel, a 75 60	ngular, shells	_
0.20 0.20	-4.5						Vane Shear = 1kPa							
	-5.5										; grey, with 1 2 LL 65 F	fine to coarse	grained sand	
2.50 3 3.70	-6.0						Vane Shear = 1kPa				2 22 00 1			
3.70	-6.7										e of fine to c 2 LL 65 P	oarse grained 75 95	l sand	
METHOD A auger W washbo P percussik H hammer C core R rotary ai	on		BIT R roll B bla V V b T TC D dia	nk bit		UPPORT C casing M mud	SAMPLING U undisturbe in mm D disturbed s N Standard Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE Ddry Mmois Wwe	/ MPS t LL	UAL DESCRI S maximum p Liquid Limit & passing 7	article size	

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Technical Services Pty Ltd	
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 2 of 5

Client:	Port I	Binni	li				Date: Location:			11.5.06 E 55K068	Job No: 5862 N	7755073	21778.1	
Project:	Addit	iona	Ove	er Wa	ter Inv	vestigation			face R.L.:	-3.0m	Datum:	AHD (From		
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	known spot AW	neight)	
Drill Contra	ctor	Card	Ino UI	man &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 7	5mm Auge	r
	STRATA	-	_		DRIL	LING	TESTING			VISUAI	SOIL DES	CRIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
4.50 5.40 6.80 6.90	-7.5		СН	В	c	U50 PP= too soft t	Vane Shear = 9kPa or reading	w	Very Soft	Clay:	refer sheet	1 depth 3.7m		առովուստեսուսեսուսեսուսեսուսեսուսեսուսեսուսե
6.80 6.90 7	-9.8 -9.9					U50 PP= too soft f	or reading							
METHOD A auger W washbo P percussio H hammer C core R rotary ai	R roller C casing bore B blank M mud sion V V bit ler T TC bit D diamond				SAMPLING U undisturbe in mm D disturbed s N Standard f Test & Res PP Pocket P	ampi Penet	e	MOISTURE D dry M moist W wet	/ MF	SUAL DESCRIP S maximum pa Liquid Limit 5 % passing 75	rticle size			

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Technical Services Pty Ltd
A.C.N. 103 205 205

BOREHOLE LOG

Sheet 3 of 5

								-			0.1001 0	0. 0	
Client:	Port E	Binni	ili					Date	e: ation:	11.5.06 E 55K068	Job No: 5862 N		21778.1
Project:	Additi	iona	l Ove	er Wa	ter Inv	vestigation			face R.L.:	-3.0m	Datum:	AHD (From ne known spot he	
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	
Drill Contra	ctor	Card	ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 75r	mm Auger
5	STRATA				DRIL	LING	TESTING			VISUA	L SOIL DES	CRIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
8.40 9 9.80 9.90 10 11 11 11.20	-11.4 -12.8 -12.9		СН	WB	c	U50 PP= too soft t		V	Very Soft Soft to Firm Medium to Very Low Strength	Sand coars angui MPS	y Clay; grey e grained, tra ar to subang 4 LL 55 Pi ; brown-pun extremely w	² -purple, sand is fi ace of fine grained ular (Marine ?) 75 60	d gravel,
12 METHOD A auger W washbo P percussio H hammer C core R rotary air	ETHOD BIT SUPPORT auger R roller C casing washbore B blank M mud percussion V V bit hammer T TC bit core D diamond					SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	sampl Peneti sult	e	MOISTURE D dry M moist W wet	/ MPS t LL	UAL DESCRIPTIO 3 maximum partio Liquid Limit • % passing 75um	ON cle size	

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Technical Services Pty Lt	d
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 4 of 5

														_
Client:	Port E	Binni	ili					Date Loc	e: ation:	11.5.06 E 55K068	Job No 5862 1): N 7755073	21778.1	1
Project:	Addit	ional	Ove	er Wa	ter In	vestigation			face R.L.:	-3.0m	Datum		m nearest ot height)	
Site:	Shute	e Hai	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	U /	
Drill Contra	ctor	Card	Ino UI	man &	Nolan	Geotechnic	Drill Mod	· ·	Jacro 350	Mounting	Truck	Diameter	75mm Auge	er
	STRATA					LING	TESTING					SCRIPTION		
			ő	Bì					Y.					
Depth (m)	R.L	Log	Classification	Method &	Support	Sampling		Moisture	Consistency					
13 13.50 13.60 14 14.10 15	-16.5 -16.6 -17.1			W B W R	c	SPT 1 N=30 (12, 18, 12) N=>50 (25, 120mm)		W	Medium to Very Low Strength		brown	eet 3 depth 11.	20m	
METHOD A auger W washbo P percussik H hammer C core R rotary ai	R roller C casing bore B blank M mud sion V V bit er T TC bit D diamond					C casing	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	sampl Penet sult	e	MOISTURE D dry M moist W wet	r N	ISUAL DESCR IPS maximum L Liquid Limit 75 % passing 1	particle size	

		A.C.N. 103 205 205 Borehole No. 9											
					E	BOREH	OLE LO	G			Sheet 5	of 5	
Client:	Port I	Binni	ili					Dat Loc	e: ation:	11.5.06 E 55K068	Job No: 5862 N 7	21778 7755073	3.1
Project:	Addit	iona	l Ove	er Wa	ter Inv	vestigation	Surface R.L.: -3.0m			-3.0m	Datum:	AHD (From nearest known spot height)	
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	
Drill Contra			ino U	lman 8		Geotechnic	Drill Mod	lel	Jacro 350	Mounting	Truck	Diameter 75mm Au	ger
	STRATA		c		DRIL	LING	TESTING			VISUAI	SOIL DESC	RIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
16.50	-19.5			R	с	D		w	Medium to Very Low Strength	 orar	 nge-grey, resi	3 depth 11.20m dual, with bands of weathered rock	ատեսունունո
16.50 17 18 19 19 19.40													
19 19 19 19.40	-22.4									Boret	nole complet	e @ 19.40m	
20													_
METHOD A auger W washbo P percussio H hammer C core R rotary ai	R roller C casing bore B blank M mud sion V V bit ner T TC bit D diamond				SAMPLING MOIST U undisturbed sample & size I in mm M D disturbed sample V N Standard Penetration Test & Result PP Pocket Penetrometer Value				MPS	AL DESCRIPTION maximum particle size iquid Limit % passing 75um sieve	,		

	Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 10											1/03)			
					E	BOREH	OLE LO	G			Sheet	1 of	4		
Client:	Port E	Binni	ili				Date: 3.5.06 Location: E 55K06				Job No 35394 N)55	21778.	1
Project:	Additi	iona	l Ove	er Wa	ter Inv	vestigation				-2.4m	Datum	AHD		nearest	
Site:	Shute								ervisor	CG, TAB, WS		AW	/		
Drill Contra	STRATA		ino UI	man 8		Geotechnic LING	Drill Mod TESTING	el	Jacro 350	Mounting VISUA	Truck L SOIL DE			75mm Aug	ər
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	: Consistency						
0.20	-2.4 -2.6		SC	W B	С	D		w	Medium Dense		ey Sand; g ine to coar				
	2.0		СІ			D	1		Soft	shells		P75 35			-
0.20 0.20										Sand grain grave	20 LL 30 ly Clay; g ed, trace o sl, shells 10 LL 40	rey, sand f fine to n	nedium		
1.50	-3.9						Vane Shear = 4kPa								muluun huun
			СН			D			Very Soft	sand,	grey, with trace of fin 5 LL 60	ne graineo			_
3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-5.4						Vane Shear = 3kPa								
METHOD A auger W washbo P percussio H hammer C core R rotary ai	er Rroller Ccasing shbore Bblank Mrnud ussion VVbit nmer TTCbit e Ddiamond				C casing	SAMPLING MOI U undisturbed sample & size in mm I D disturbed sample N Standard Penetration Test & Result PP Pocket Penetrometer Value				y M t Ll	ISUAL DE PS maxin L Liquid L 75 % pas	mum pa .imit	rticle size		

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Technical Services Pty Ltd	
A.C.N. 103 205 205	

BOREHOLE LOG

Borehole No. 10 Sheet 2 of 4

								·			011000 2		
Client	Port E	Binni	ili					Date Loc	e: ation:	3.5.06 E 55K068	Job No: 5394 N		21778.1
Project:	Additi	iona	l Ove	er Wa	ter Inv	estigation/		Sur	face R.L.:	-2.4m	Datum:	AHD (From n known spot h	
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	
Drill Contra			ino Ul	lman &		Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 75	5mm Auger
5	STRATA		6		DRIL	LING	TESTING		CRIPTION				
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
4.50 4.80 5.90 6 7 7 7.40	-6.9 -7.2 -7.4 -8.3		СН	ΨB	c	D D U50 sample not recovered	Vane Shear = 10kPa Vane Shear = 11kPa		Firm	Clay; graine			arse
B METHOD A auger W washboi P percussio H hammer C core R rotary air	er Rroller Ccasing shbore Bblank Mimud ussion VVbit ammer TTCbit e Ddiamond					C casing	SAMPLING U undisturbe in mm D disturbed s N Standard F Test & Res PP Pocket P	sampl Penet sult	e	MOISTURE D dry M moisi W wet	/ MF t LL	SUAL DESCRIPT 'S maximum part Liquid Limit 5 % passing 75u	ION ticle size

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Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 3 of 4

					E	BOREHO	DLE LO	G			Sheet 3	of 4		
Client:	Port E	Binni	ili					Dat Loc	e: ation:	3.5.06 E 55K068	Job No: 5394 N 7	755055	21778.1	
Project:	Additi	iona	l Ove	er Wa	ter Inv	vestigation		Sur	face R.L.:	-2.4m	Datum:	AHD (From known spo		
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW		
Drill Contra			Ino UI	lman 8		Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck		75mm Auger	<u></u>
	STRATA	Ì	c	~	DRIL	LING	TESTING			VISUAL	SOIL DESC	RIPTION		-
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
8.40	-10.8		СН	W B		D		w	Firm	Clay:	refer sheet 2	depth 5.0m?	h	I
			SC			D			Very Loose	graine gravel	y Sand; dark d, trace of fin s, angular, sh 40 LL 35 Pi	e to coarse ells (Marine	grained	سلمسطين
8.90 9	-11.3					SPT 1 N= 0 (Sank under o	own weight)							առեսուն
9.50	-11.9					D			Loose	fine to	/ Gravelly Sa coarse graine m gained, ang	ed, gravel is	fine to	
8.40 8.90 9 9.50 10.40	-12.8					SPT 2				(decon	nposed rootle 0 LL 30 P7	ts?) (Marine		
	-13.0					N= 3 (1, 0, 3)			Medium Dense	coarse graine rootlet	· ·	ce of fine to anics (decon	medium	_
11.40	-13.8			ŭ					Louiste Veni		brown mottle		nd white	կատե
11.40 11.40	-14.3					D SPT3 refer st	ost 4		Low to Very Low Strength	extrem	terlayered res	d, intensely		
METHOD			BIT			UPPORT	SAMPLING		I	MOISTURE	1/1011	AL DESCRI	PTION	
A auger			R roll	ler		C casing	U undisturbe	d san	nple & size	D dry		maximum p		
W washbo P percussio								amel	le	M moist W wet		iquid Limit % passing 7	5um sieve	
H hammer							D disturbed sample W wet P75 % passing 75um N Standard Penetration					outri aleve		
C core	D diamond						Test & Result							
R rotaryai	ary air flush						PP Pocket Penetrometer Value							

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Technical Services Pty Ltd
A.C.N. 103 205 205

BOREHOLE LOG

Sheet 4 of 4

Client:	Port E	Binni	ili					Dat	e: ation:	3.5.06 E 55K068	Job No: 5394 N		21778.1
Project:	Addit	iona	l Ove	er Wa	ter Inv	vestigation			face R.L.:	-2.4m	Datum:	AHD (From n known spot h	
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	eigni)
Drill Contra	ctor	Card	ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 75	mm Auger
	STRATA	ι			DRIL	LING	TESTING			VISUAI	SOIL DES	SCRIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
12.35	-14.75			C D		SPT 3 N=27 (11, 11, 16) D		w	Low to Very Low Strength	Rock	refer she	et 3 depth 11.4m	
15 16 METHOD			ВІТ		9	UPPORT	SAMPLING			Boreh		ated @ 15.0m	
A auger W washbo P percussion H hammer C core	auger R roller C casing V washbore B blank M mud percussion V V bit hammer T TC bit					U undisturbe in mm D disturbed s N Standard I Test & Res	sampi Penet sult	le	MOISTORE D dry M moist W wet	MF	PS maximum part Liquid Limit 5 % passing 75ur	icle size	

					T		al Services Pty Ltd N. 103 205 205					(-/1/03 Borehole No. 11			
					E	BOREH	OLE LO	G			Sheet	1 of	4		
Client:	Port E	Binni	ili					Dat	e: ation:	4.5.06 E 550068	Job No: 5435 N			1778.1	
Project:	Addit	iona	ΙΟνε	er Wa	ter In	vestigation			face R.L.:	-1.2m	Datum:	AHD	(From near		
Site:	Shute	e Ha	rbou	r				Sup	pervisor	CG, TAB, WS	Chkd:	know AW	m spot heig	ht)	
Drill Contra			ino Ul	lman 8		Geotechnic	Drill Mod	lel	Jacro 350	Mounting	Truck		eter 75mr	n Auger	
	STRATA	Ì	5		DRIL	LING	TESTING			VISUA	L SOIL DE	SCRIPTIO	DN		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency						
0.20	-1.2		SC	W B	С	D		w	Loose				rey, fine to o barse graine		
0.20			СІ			D	1		Soft	shells	20 LL 20	P75 25		_	
Ē										Sand	y Clay; gr	ey, sand is	s fine to coa	arse	
										graine MPS	ed, with fine 10 LL 40	to mediu P75 55	ım grained,	shells -	
Ē.															
E															
	-2.2		СН				-			trac	e of fine or		vol eholle	-	
										MPS	5 LL 55	P75 60	ver, strens	=	
Ē.														_	
E															
Ē-														_	
Ē.															
2 2															
														arse shells	
2.50	-3.7					D	-						arse graine		
E						_					2 LL 65			=	
2.50															
3														_	
Ē															
Ē-														-	
Ē														1	
Ē															
Ē_														_	
Ē,															
•	1		B17		L	UPPORT				MOIOTUET			CODIDITICS		
METHOD BIT SUPPORT A auger R roller C casing						UPPORT C casing	SAMPLING U undisturbe	ed san	nple & size	MOISTURE D dry			SCRIPTION num particle		
W washbore B blank M mud						-	in mm			M mois W wet	t LL	Liquid Li	mit		
-	Ppercussion VVbit Hhammer TTCbit							D disturbed sample N Standard Penetration				ວ % pass	ing 75um s	ieve	
C core				mond			Test & Re	sult							
R rotaryai	r flush						PP Pocket Penetrometer Value								

	Technical Services Pty Ltd (-/1/0 A.C.N. 103 205 205 Borehole No. 11													/03)
					E	BOREHO	DLE LO	G			Sheet 2	of 4		
Client:	Port E	Binni	ili					Dat Loc	e: ation:	4.5.06 E 550068	Job No: 5435 N	7755180	21778.1	
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	-1.2m	Datum:	AHD (From known spo		
Site:	Shute			-				· ·	pervisor	CG, TAB, WS	Chkd:	AW	• ·	
Drill Contra	ctor STRATA		Ino UI	lman 8		Geotechnic LING	Drill Mod TESTING	lel	Jacro 350	Mounting VISUA	Truck L SOIL DES		75mm Auger	r
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
			СН	W B	С	D		w	Soft	Clay:	refer to she	et 1 depth 2.5	im	
5.80 6.25 6.60	-7.0					U50 PP= too soft	for reading		Firm		y Clay; grey ed (Residual?	r, sand is fine	to coarse	
											2 LL 65 P7			lum
6.60 7 7.30 7.75	-8.2					D SPT 1 N=10 (6, 7, 3)			Low to Very Low Strength	white	extremely w	ple mottled or veathered, int f residual thre	tensely	
8 BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush							SAMPLING U undisturbe in mm D disturbed N Standard Test & Re PP Pocket F	samp Penet sult	le	MOISTURE Ddnj Mmois Wwe	y MPS t LL I	UAL DESCRI 3 maximum p Liquid Limit % passing 7	particle size	

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Technical	Services Pty Ltd	
ACN	103 205 205	

BOREHOLE LOG

Sheet 3 of 4

Client:	Port E	Binni	ili					Dat	e: ation:	4.5.06 E 550068	Job No: 5435 N	7755180	21778.1	
Project:	Additi	iona	l Ove	er Wa	ter Inv	estigation/			face R.L.:	-1.2m	Datum:	AHD (From known spot		
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	(neight)	
Drill Contra	ctor	Card	ino Ul	lman &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	75mm Auger	
5	STRATA				DRIL	LING	TESTING			VISUAL SOIL DESCRIPTION				
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
8.90 9 9.35 10 10 11.25	-10.1			WB	c	D SPT 2 N=24 (8, 11, 13) SPT 3 N=>50 (15,16, 25/11	0mm)		Low to Very Low Strength Medium to Low Strength	Rock, purple fine to to coa	; excavates a mottled ye		d white,	
METHOD A auger W washbo P percussio H hammer C core R rotary air	n		BIT R rol B bla V V t T TC D dia	nk	0	UPPORT C casing / mud	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M moist W wet	y MP t LL	SUAL DESCRIF 'S maximum pa Liquid Limit 5 % passing 75	article size	

UNGR 103G

Technical Services Pty Ltd (-/1/03) A.C.N. 103 205 205 Borehole No. 11 BOREHOLE LOG Sheet 4 of 4 4.5.06 Port Binnili 21778.1 Client: Date: Job No: E 5500685435 N 7755180 Location: Project: Additional Over Water Investigation AHD (From nearest Surface R.L.: -1.2m Datum: known spot height) Site: Shute Harbour Supervisor Chkd: AW CG, TAB, WS Drill Contractor Cardno Uliman & Nolan Geotechnic Drill Model Jacro 350 Mounting Truck Diameter 75mm Auger DRILLING VISUAL SOIL DESCRIPTION STRATA TESTING ă Classification Consistency Ē Method & Sampling Moisture Support Depth 8 R.L Rock: moderate to extremely weathered. w W Medium to Low Strength very pale red-white mottled orange, white в and brown, intensely fractured, with residual bands 13 -14.5 13.30 SPT 4 N=>50 13.50 (25/125mm, 88/150mm) slightly fractured -15.0 13.80 highly fractured 14 15 15.10 -16.3 SPT 5 15.20 -16.4 N=>50 w (25/50mm, J B) R 15.40 -16.6 Rock; residual excavates as Sandy Clayey Gravel; purple mottled orange, white and brown, fine to coarse grained, angular, sand is fine to coarse grained, with bands of extremely weathered rock MPS 25 LL 30 P75 20 16 Borehole complete @ 16.0m MOISTURE VISUAL DESCRIPTION METHOD BIT SUPPORT SAMPLING MPS maximum particle size R roller U undisturbed sample & size A auger C casing D dry W washbore B blank M mud in mm M moist LL Liquid Limit P percussion V V bit D disturbed sample W wet P75 % passing 75um sieve H hammer T TC bit N Standard Penetration C core D diamond Test & Result R rotary air flush PP Pocket Penetrometer Value

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Technical Services Pty Ltd A.C.N. 103 205 205

POPEHOLE LOC

					E	SOREH			Sheet 1	of 4			
Client:	Port	Binni	ili					Dat Loc	e: ation:	10.5.06 E 55K068	Job No: 5489 N 7	21778 755280	3.1
Project:	Addit	ional	Ove	er Wa	ter Inv	estigation/		Sur	face R.L.:	0.3m	Datum:	AHD (From nearest known spot height)	
Site:	Shute	e Hai	rboui	r				Sup	pervisor	CG, TAB, WS	Chkd:	AW	
Drill Contra	ctor	Card	Ino UI	man &	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 75mm Au	ger
5	TRATA	<u> </u>			DRIL	LING	TESTING			VISUAI	L SOIL DESC	RIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
	0.3		SC	W B	с	D		w	Loose	graine		ind; grey, fine to coars ne to coarse grained,	
0.30	0.0		СІ						Very Soft	-	25 LL 20 P7	75 25	
			0.						Tory con	graine angul		sand is fine to coarse medium grained grave 75 55	ž.
1	-0.7		СН							shells		edium grained gravel. 5 60	ահատեսո
0.30	-1.2						Vane Shear = 3kPa						
2.20	-1.9									graine		sand is fine to coarse 5 65	
2.90	-2.6 -2.7					U50 PP= too soft for reading	Vane Shear = 4kPa						
3.80	-3.5								Soft to Firm	grave	/ mottled red a l, subangular 5 LL 40 P75	and white, trace of fine	
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush							SAMPLING U undisturbed in mm D disturbed s N Standard I Test & Res PP Pocket P	sampi Penet sult	le	MOISTURE D dry M moist W wet	/ MPS t LL Li	AL DESCRIPTION maximum particle size iquid Limit % passing 75um sieve	

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(-/1/03)

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Technical Services Pty Ltd	
A.C.N. 103 205 205	

BOREHOLE LOG

Sheet 2 of 4

					-					officer 2	01 4		
Client:	Port E	Binn	ili					Dat Loc	e: ation:	10.5.06 E 55K068	Job No: 5489 N		778.1
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation			face R.L.:	0.3m	Datum:	AHD (From near known spot heigh	
Site:	Shute	e Ha	rbou	г				Sup	ervisor	CG, TAB, WS	Chkd:	AW	,
Drill Contra	ctor	Card	ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter 75mm	Auger
5	STRATA				DRI	LING	TESTING	TESTING VISUAL SOIL DESCRIPTION					
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
4.40	-4.1		сн	₩в	с	D	Vane Shear = 5kPa	w	Soft to Firm			r sheet 1 depth 3.8m	
4.40 5.70 5.50 5.50 6						U50 PP= too soft	or reading					, residual to extreme ely fractured (Boulde	
5.70 5.90 6	-5.4 -5.6 -5.7		sc			SPT 1			Very Dense	pale	colours		hund
7.60	-7.3					N=>50 (25, 130mm)	HB)		very Dense	coarse graine MPS 1 oran suban	grained, tra d gravel, ang 15 LL 30 P ge-white, tra	 ice of fine grained gr	
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush							SAMPLING U undisturbed in mm D disturbed s N Standard I Test & Res PP Pocket P	sampi Penet sult	e	MOISTURE D dry M moist W wet	MPS t LL I	UAL DESCRIPTION S maximum particle Liquid Limit % passing 75um sid	size

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Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 3 of 4

								0			Sheet 3	01 4		
Client:	Port I	Binn	ili					Dat Loc	e: ation:	10.5.06 E 55K068	Job No: 35489 N	7755280	21778.	1
Project:	Addit	iona	l Ove	er Wa	ter In	vestigation		Sur	face R.L.:	0.3m	Datum:		om nearest pot height)	
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	AW	sot neight)	
Drill Contra	ctor	Card	dno U	lman 8	Nolan	Geotechnic	Drill Mod	el	Jacro 350	Mounting	Truck	Diameter	r 75mm Aug	er
5	STRATA				DRI	LING	TESTING			VISUA	L SOIL DESC	CRIPTION		
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency					
9.80 9.80 10 10.20 10.60 11.70 11.70 11.74 12	-7.7		sc	WB		SPT 2 N=>50 (14, 25, 140n SPT 3 N=>50 (25, 110mm) SPT 3 N=>50 (25, 40mm)		w	Low to Very Low Strength	Graine subar MPS Clay grain extre MPS Rock	ed, trace of fin ngular (Resid 4 LL 30 P7 ey Sand; ora ned, with band mely weathe 2 LL 30 P c; grey-brown sely fractured	ange, fine to dange, fine to da of fracture ered rock 275 40 n, extremely	o coarse ed, purple,	
METHOD BIT SUPPORT A auger R roller C casing W washbore B blank M mud P percussion V V bit H hammer T TC bit C core D diamond R rotary air flush					C casing	SAMPLING U undisturbe in mm D disturbed s N Standard I Test & Res PP Pocket P	samp Penet sult	le	MOISTURE D dry M mois W we	y MPS t LLI	Liquid Limit	RIPTION I particle size 75um sieve		

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Technical Services Pty Ltd A.C.N. 103 205 205

BOREHOLE LOG

Sheet 4 of 4

	BOREHOLE LOG										Sheet 4	of 4	
Client	Port I	Binni	ili					Dat Loc	e: ation:	10.5.06 E 55K068	Job No: 5489 N		21778.1
Project:	Addit	iona	l Ove	er Wa	ter Inv	vestigation		Sur	face R.L.:	0.3m	Datum:	AHD (From nea	
Site:	Shute	e Ha	rbou	r				Sup	ervisor	CG, TAB, WS	Chkd:	known spot hei AW	igni)
Drill Contra	ctor	Card	Ino Ul	lman 8	Nolan	Geotechnic	Drill Mod	lel	Jacro 350	Mounting	Truck	Diameter 75m	nm Auger
5	STRATA	<u>۱</u>			DRI	LING	TESTING			VISUAI	SOIL DES	CRIPTION	
Depth (m)	R.L	Log	Classification	Method & Bit	Support	Sampling		Moisture	Consistency				
12.50	-12.3			W B		D		w	Low to Very Low Strength			t 4 depth 10.60m	
13									Very Dense	graine fractu	d, residual v	ange, fine to coars with bands of inten ly weathered rock 75 40	ie sely
13.40	-13.1												
12.50 13 13.40 14 15													
METHOD A auger W washbo P percussio H hammer C core	ETHOD BIT SUPPORT auger R roller C casing / washbore B blank M mud percussion V V bit hammer T TC bit							samp Penet sult	nple & size le ration ometer Value	MOISTURE D dry M moist W wet	MPS LL	UAL DESCRIPTIC 3 maximum partic Liquid Limit 5 % passing 75um	DN le size



ATTACHMENT B

Dynamic Cone Penetrometer Results

Technical Services Pty Ltd

A.C.N. 103 205 205

UNGR 92 G (~12/05)

	DY		PENETROMETER			
Page 1 of 1					Mac	kay Laboratory
CLIENT:	Port Binnli		JOB NO: 21778.1	LAB REF	NO:	06-1833A
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	DATE	2: 3.5.06
LOCATION:	Shute Harbour Mari	na	CHECKED BY	Y: AW	DATE	8.5.06
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:	-	
Test No.:	A		Test No.:	A (cont'd)		
Test Location	n/Chainage : BHI	10	Test Location/C	chainage :	BH10	
	ace R.L. (m) : -1.8	m	Ground Surface		-1.8m	
Depth Below			Depth Below G			
1	rt of Test (mm): 400		Surface at start		4000	
Soil Descript	ion : Refe	rr Logs	Soil Description	1:	Refer Lo	ga
Soil Moisture	Condition: Ver	y Wet	Soil Moisture C	ondition:	Very We	t
Depth to Gro	undwater (m) : -1.8	m	Depth to Groun	dwater (m) :	-1.8m	
Cumulative	Depth Below	Penetration	Cumulative	Depth Belo	ow Pe	netration
No. of	Starting Level	Rate	No. of	Starting Le		Rate
Blows	(mm)	(mm/blow)	Blows	(mm)		m/blow)
				-		
.	4000	100	93		000	20
	4100	100	99		100	17
4	4200 4300	100 50	105		200 300	17 20
6	4400	50	115		400	20
8	4500	50	113		500	14
10	4600	50				
12	4700	50				
14	4800	50				
16	4900	50				
18	5000	50				
20	5100	50				
22	5200	50				
24	5300	50				
26		50				
28 30	5500 5600	50 50				
30	5700	50				
34	5800	50				
40	5900	17				
46	6000	17				
50	6100	25				
54	6200	25				
59	6300	20				
64	6400	20				
68	6500	25				
73	6600	20				
78 83	6700	20				
83	6800 6900	20 20				
	0900	20				



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DYNAMIC CONE PENETROMETER

UNGR 92 G

(~12/05)

Page 1 of 1	Di	NAMIC CONE	PENETROMETER			Mackav I	aboratory
	Port Binnli		JOB NO: 21778.1	LAB REF	NO:		5-1833B
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	D	ATE:	4.5.06
LOCATION:	Shute Harbour Mari	_	CHECKED BY			ATE:	8.5.06
					D.	112.	0.5.00
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:	_		
Test No.:	В		Test No.:	B (cont'd)			
Test Location		3	Test Location/C	-	BH8		
1	ace R.L. (m) : -1.7	m	Ground Surface		-1.7r	n	
Depth Below			Depth Below G				
1	rt of Test (mm): 330		Surface at start	· · ·	3300		
Soil Descript	ion : Refe	r Logs	Soil Description	1:	Refe	r Logs	
Soil Moisture	Condition: Wet		Soil Moisture C	andition	Wet		
1	undwater (m) : +1.7		Depth to Groun		+1.7	m	
Loput to Gro	unovater (m) : 1.5	m	Deput to Orotal	evaler (m) .	• 1.77		
Cumulative	Depth Below	Penetration	Cumulative	Depth Be	elow	Penetra	ation
No. of	Starting Level	Rate	No. of	Starting L	.evel	Rat	ie
Blows	(mm)	(mm/blow)	Blows	(mm))	(mm/b	low)
	3300	50	93		6300		20
2	3400 3500	50	97		6400		25
5	3600	100 50	102		6500 6600		20
7	3700	50	116		6700		14 14
9	3800	50	110		6800		17
10	3900	100	122		6900		14
12	4000	50	135		7000		17
15	4100	33	142		7100		14
18	4200	33	148		7200		17
21	4300	33	154		7300		17
24	4400	33	161		7400		14
27	4500	33	167		7500		17
30	4600	33					
33	4700	33					
36		33					
39	4900	33					
42	5000	33					
45	5100 5200	33					
49 52	5200 5300	25 33					
56	5400	25					
60	5500	25					
64	5600	25					
68	5700	25					
72	5800	25					
76	5900	25					
80	6000	25					
84	6100	25					
88	6200	25					



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DYNAMIC CONE PENETROMETER

UNGR 92 G

(~12/05)

Page 1 of 1			ENETROMETER		Ν	Mackay I	Laboratory
CLIENT:	Port Binnli	JO	OB NO: 21778.1	LAB REF	NO:	0	5-1833C
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	DA	TE:	4.5.06
LOCATION:	Shute Harbour Mari	na	CHECKED BY	AW	DA	TE:	8.5.06
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:			
		1207.0.0.2					
1	C DIF			N/A	27/4		
Test Location		/	Test Location/C Ground Surface		N/A		
Depth Below			Depth Below G	· · ·	N/A		
	rt of Test (mm): 4400		Surface at start		N/A		
Soil Descript		r Logs	Soil Description		N/A		
Constant		1 2060	Con Description		1011		
Soil Moisture	e Condition: Wet		Soil Moisture C	ondition:	N/A		
Depth to Gro	undwater (m) : 0		Depth to Groun	dwater (m) :	N/A		
Cumulative	Depth Below	Penetration	Cumulative	Depth Be		Penetr	
No. of	Starting Level	Rate	No. of	Starting L		Ra	
Blows	(mm)	(mm/blow)	Blows	(mm)		(mm/b	low)
	4400		N/A	N/A			
4	4500	25					
7	4600	33					
9	4700	50					
10		100					
12	4900	50					
14	5000	50					
16		50					
19		33					
21	5300	50					
25		25					
29 32	5500 5600	25 33					
32		33					
38		33					
42		25					
45	6000	33					
49		25					
53	6200	25					
57	6300	25					
60	6400	33					
64	6500	25					
69	6600	20					
73	6700	25					
78 84	6800 6900	20 17					
84	7000	25					
93	7100	25					
97	7200	25					
103	7300	17					



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UNGR 92 G (√12/05)

	D	YNAMIC CONE I	PENETROMETER			
Page 1 of 1					Macka	y Laboratory
CLIENT:	Port Binnli	J	OB NO: 21778.1	LAB REF N	0:	06-1847A
PROJECT:	Additional Over W	ater Investigation	TESTED BY:	CG	DATE:	8.5.06
LOCATION:	Shute Harbour Mar	ina	CHECKED BY	í: AW	DATE:	10.5.06
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:	-	
Test Location Ground Surfa Depth Below Surface at sta Soil Descript Soil Moisture Depth to Gro	ace R.L. (m) : -36 9 Ground art of Test (mm): 360 10 ion : Ref 10 Condition: We 10 undwater (m) : -36	900 for Logs et 900	Test Location/C Ground Surface Depth Below G Surface at start Soil Description Soil Moisture C Depth to Groun	R.L. (m) : round of Test (mm): n : ondition: dwater (m) :	BH6 -3600 3600 Refer Logs Wet -3600	
Cumulative	Depth Below	Penetration	Cumulative	Depth Below		tration
No. of	Starting Level	Rate	No. of	Starting Leve		ate
Blows	(mm)	(mm/blow)	Blows	(mm)	(mm	/blow)
2 4 6 8 10 12 14 17 19 22 25 28 31 34 37 40 45 49 53 57 62 67 72 78 83 89 95 102 108	3600 3700 3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5100 5200 5300 5400 5500 5600 5500 5600 5700 5800 6000 6100 6200 6300 6400 6500	50 50 50 50 50 50 50 33 33 33 33 33 33 33 33 33 3	114 120 127 133	660 670 680 690	0	17 17 14 17



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A C N 102 205 205

UNGR 92 G (~12/05)

			3 205 205			
Page 1 of 1	DY	NAMIC CONE PI	ENETROMETER		Mackay Labo	ratory
	Dort Bineli	10	P NO: 217791	LABBEENO		
CLIENT:	Port Binnli		DB NO: 21778.1	LAB REF NO:		
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	DATE: 9.	.5.06
LOCATION:	Shute Harbour Mari	na	CHECKED BY	(: AW	DATE: 10.	.5.06
TEST PROC	EDURES : AS	1289.6.3.2		CLIENT REF:	-	
Test No.:	А		Test No.:	A (cont'd)		
Test Location		11	Test Location/C	hainage :	BH11	
	ace R.L. (m) : -490	00	Ground Surface	1 /	-4900	
Depth Below			Depth Below Gr			
1	art of Test (mm): 490		Surface at start		4900	
Soil Descript	tion : Refe	r Logs	Soil Description	1:	Refer Logs	
Soil Moistur	e Condition: Wet		Soil Moisture C	ondition:	Wet	
	oundwater (m) : -490	- I	Depth to Ground		-4900	
Cumulative	Depth Below	Penetration	Cumulative	Depth Below	Penetratio	n
No. of	Starting Level	Rate	No. of	Starting Level	Rate	
Blows	(mm)	(mm/blow)	Blows	(mm)	(mm/blow)
	4900		05	7900		
2		50	95 99	8000		20 25
4	5100	50	105	8100		17
5		100	112	8200		14
7		50	117	8300		20
9	5400	50	122	8400		20
10		100	127	8500		20
12		50	132	8600		20
14		50	137	8700		20
16		50	144	8800		14
18 20		50 50	151	8900 9000		14 14
20		50	130	9000		14
24		50				
26		50				
29		33				
32	6500	33				
34		50				
37	6700	33				
40		33				
43		33				
47 54	7000 7100	25 14				
57	7200	33				
61	7300	25				
65		25				
73		13				
79	7600	17				
	7700		I I		1	



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7700

7800

06-184RA 10.5.06

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Authorized Signatory ...



A. J. Williams

Technical Services Pty Ltd

A.C.N. 103 205 205

-

UNGR 92 G (~12/05)

Page 1 of 1	DY	NAMIC CONE P	PENETROMETER		Mackay Laboratory
	Port Binnli	Jt	OB NO: 21778.1	LAB REF NO:	06-1896A
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	DATE: 10.5.06
LOCATION:	Shute Harbour Mari	na	CHECKED BY	í: AW	DATE: 12.05.06
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:	
Depth Below Surface at sta Soil Descript Soil Moisture	-380 Ground art of Test (mm): 3800 ion : Refe	00 0 27 Logs	Test No.: Test Location/C Ground Surface Depth Below G Surface at start Soil Description Soil Moisture C Depth to Groun	R.L. (m) : N round of Test (mm): N 1 : N	1/A 1/A 1/A 1/A 1/A
Cumulative	Depth Below	Penetration	Cumulative	Depth Below	Penetration
No. of	Starting Level	Rate	No. of	Starting Level	Rate
Blows	(mm)	(mm/blow)	Blows N/A	(mm) N/A	(mm/blow)
2 4 6 7 9 11 15 21 31 38 58 68 84 103 128 156 181 217	3800 3900 4000 4100 4200 4300 4400 4500 4600 4700 4800 4900 5000 5100 5200 5300 5400 5460 5500	50 50 100 50 25 17 10 14 5 10 6 5 4 4 2 1			



Accredited No. 910 Certificate No. Date of Issue

06-1896A 12.5.06

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A.C.N. 103 205 205

DYNAMIC CONE PENETROMETER

UNGR 92 G (~/12/05)

Page 1 of 1	DI	NAMIC CONE II	LI DI KOMBILK		М	lackay I	aboratory
CLIENT:	Port Binnli	JC	DB NO: 21778.1	LAB REF	NO:	06	5-1897A
PROJECT:	Additional Over Wa	ter Investigation	TESTED BY:	CG	DAT	ΓE:	11.5.06
LOCATION:	Shute Harbour Marin	na	CHECKED BY	(: AW	DAT	ΓE:	12.5.06
TEST PROCI	EDURES : AS	1289.6.3.2		CLIENT REF:	-		
Test No.:	Α		Test No.:	N/A			
Test Location		,	Test Location/C		N/A		
1	ace R.L. (m) : -370	0	Ground Surface	-	N/A		
Depth Below			Depth Below Gr				
1	rt of Test (mm): 3700		Surface at start	· · ·	N/A		
Soil Descript	ion : Refe	r Logs	Soil Description	1:	N/A		
Soil Moisture	e Condition: Wet		Soil Moisture C	ondition:	N/A		
1	undwater (m) : -370	0	Depth to Groun		N/A		
Cumulative	Depth Below	Penetration	Cumulative	Depth Bel		Penetra	I
No. of Blows	Starting Level (mm)	Rate (mm/blow)	No. of Blows	Starting Le (mm)		Rat mm/b	
DIOWS	(1111)	(1111/010w)	N/A	N/A		nin/o	10 (1)
	3700			1011			
2	3800	50					
4	3900	50					
6	4000	50					
7	4100	100					
11	4200 4300	50 50					
14	4400	33					
17	4500	33					
20	4600	33					
23	4700	33					
26	4800	33					
29	4900	33					
32 35	5000 5100	33 33					
38		33					
41	5300	33					
44	5400	33					



Accredited No. Certificate No. Date of Issue

910 06-1897A 12.5.06 This document is issued in accordance with NATA's accreditation requirements.

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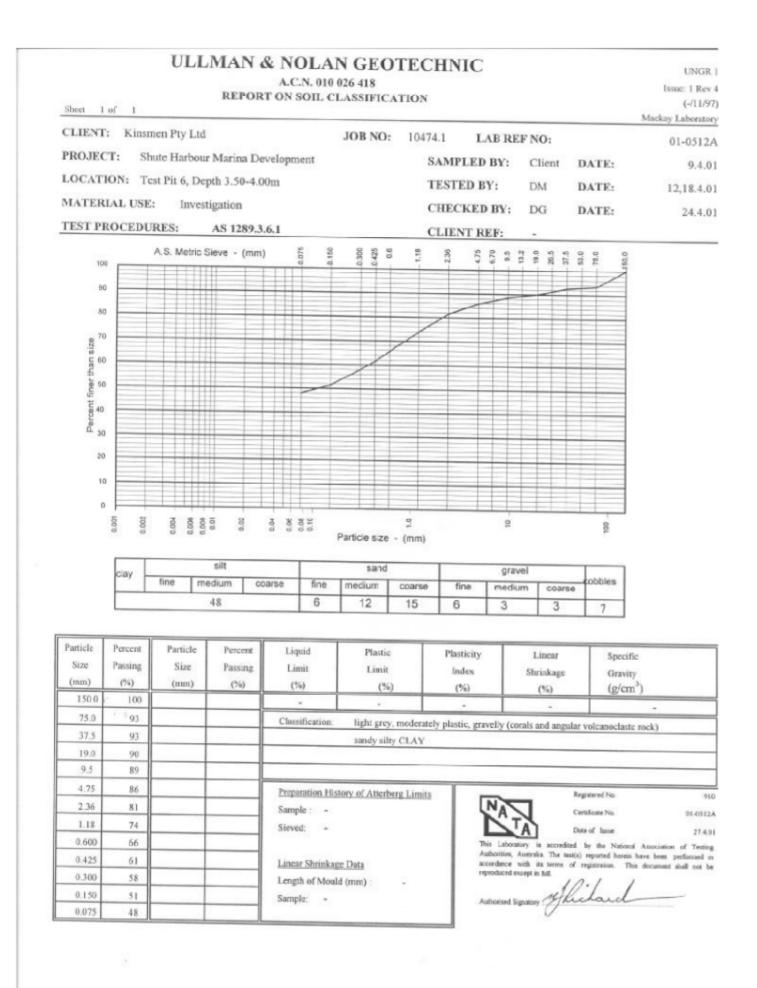


A. J. Williams



ATTACHMENT C

Laboratory Test Results



Sheet 1 d	of 1	ULL		A.C.	N. 010	N GEO 026 418 LASSIFIC		HNIC				UNG Issue: 1 Re (-/11/ Mackay Laborat
CLIENT:	Kinsm	en Pty Ltd				JOB NO:	1047	4.1 L	AB REF	NO:		01-051
PROJEC	T: Sh	ute Harbou	r Marina D	evelopm	ent		-	SAMPLEI	BY:	Client	DATE:	9.4
LOCATI	ON: Te	st Pit 7, De	pth 3.50-4.	.00m			,	TESTED I	W:	DM	DATE:	12,18.4
MATERI			tigation									
			E					CHECKEI		DG	DATE:	24.4
TEST PR	OCEDU	RES:	AS 1289.		an 30			CLIENT R		-		
100		A.S. Metric 5	Sieve - (mr	m)	0.150	0.300	1.16	236	9.5	19.0	53.0	0.021
										-		
90									/			
80								/				
							/		-			
size												
U 60					-	/						
ja 50					-		-					
Percent finer than size												
a a												
- 30												
20					-				-			
10												
10 0		0.004	0.07	0.04		Particle size	0; 0;		10		- 005	
		0.004	500 silt	0.04	0.10	Particle size	e - (mm)		grav		cobble	5
	0.001	0.004	silt nedium		fine	sand medium	coarse	_	grav mediu	im coa	cobble	5
	0.001	0.004	500 silt	0.04	0.10	sand	e - (mm)	e fine 8	grav		arse cobble	5
	0.001	0.004	silt nedium	0.04	fine	sand medium	coarse		grav mediu	im coa	cobble	5
	0.001	0.004	silt nedium	coarse	fine	sand medium	coarse 17		grav mediu 8	im coa	arse cobble	s
0	10000 clay	100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	silt 47	coarse	fine 5	sand medium 11	coarse 17	8	grav mediu 8	im co: 3	arse cobble	
Particle	Clay Percent	fine m Particle	silt edium 47 Percent	coarse	fine 5	sand medium 11 Plasti Limi	coarse 17	Plasticit	grav mediu 8	im coi 3 Linear	tobble	Specific
0 Particle Size	Clay Percent Fassing	fine n Particle Size	silt nedium 47 Percent Passing	coarse	fine 5 quid	sand medium 11 Plasti Limi	coarse 17	Plasticit	grav mediu 8	im coa 3 Linear Shrinka	tobble	Specific Gravity
Particle Size (mm)	Clay Percent Passing (%)	fine n Particle Size	silt nedium 47 Percent Passing	coarse	fine 5 quid mit %)	sand medium 11 Plasti Limi (9	coarse 17	Plasticit Index (%)	grav mediu 8	um coi 3 Linear Shrinkaj (%)	tobble	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5	Percent Passing (%) 100 97	fine n Particle Size	silt nedium 47 Percent Passing	coarse	quid imit %)	sand medium 11 Plasti Limi (9 -	coarse 17	Plasticit Index (%)	grav mediu 8	um coi 3 Linear Shrinkaj (%)	tobble 1	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0	Percent Passing (%) 100 97 95	fine n Particle Size	silt nedium 47 Percent Passing	coarse	quid imit %)	sand medium 11 Plasti Limi (9 -	e - (mm) coarse 17	Plasticit Index (%)	grav mediu 8	um coi 3 Linear Shrinkaj (%)	tobble 1	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5	Percent Fassing (%) 100 97 95 91	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	quid imit %)	sand medium 11 Plasti Limi (%	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8	um coi 3 Linear Shrinkaj (%)	arse cobble	Specific Gravity (g/cm ³) -
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75	Percent Fassing (%) 100 97 95 91 86	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	quid imit %)	sand medium 11 Plasti Limi (9 -	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8	um coi 3 Linear Shrinkaj (%)	arse cobble 1 ge ((ral fragments) Registered b	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75 2.36	Percent Passing (%) 100 97 95 91 86 80	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	quid imit %) - saration Fi uple : -	sand medium 11 Plasti Limi (%	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8	um coi 3 Linear Shrinkaj (%)	arse cobble 1 ge () () () () () () () () () ()	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75 2.36 1.18	8 8 Clay - Clay - Percent - Fassing (%) 100 97 95 91 86 80 72 -	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	quid imit %)	sand medium 11 Plasti Limi (%	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8 avelly (she	Inn Con 3 Linear Sturinkag (%) - ells and con	Registered N Centificate N Date of Ian	Specific Gravity (g/cm ³) - 1 sandy 40. 60. 60. 61. 61. 61. 61. 61. 61. 61. 61. 61. 61
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600	Percent Passing (%) 100 97 95 91 86 80 72 63	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	quid imit %) - saration Fi uple : - ved: -	sand medium 11 Plasti Limi (? clay	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8	Im con 3 Linear Sturinkay (%) - ills and con	Registered N Centificate N Date of Iam redited by the a tet((s) reported	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600 0.425	Percent Passing (%) 100 97 95 91 86 80 72 63 59	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	guid imit %) - ssification Paple : - red: -	sand medium 11 Plasti Limi (? clay clay clay	e (mm) coarse 17 e t t y, moderat rey SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8 v	In Con I and Con Linear Sturinkay (%) 	Registered N Centificate N Date of Iam redited by the a test(s) reported ms of registratic	Specific Gravity (g/cm ³)
Particle Size (mm) 150.0 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600	Percent Passing (%) 100 97 95 91 86 80 72 63	fine n Particle Size	silt nedium 47 Percent Passing	Coarse	guid imit %) - ssification Paple : - red: -	sand medium 11 Plasti Limi (9 : grey clay istory of Atter age Data ald (mm) :	coarse 17 17 v t t y, moderate vy SILT	8 Plasticit Index (%) - ely plastic, gr	grav mediu 8 v	In Con I and Con Linear Sturinkay (%) 	Registered N Centificate N Date of Iam redited by the a tet((s) reported	Specific Gravity (g/cm ³)

Sheet 1	of 1		MAN G	A.C.	N. 010	026 418 LASSIFIC						Issue:	/1
CLIENT	: Kinsn	nen Pty Ltd				JOB NO:	10474	1 L	AB REF	NO:		01-0	
PROJEC	T: Sh	ute Harbour	r Marina De	velopm	ent		S/	MPLED	BY: (Client	DATE:		9.4
LOCAT	ION: Te	st Pit 8, De	pth 1.50-2.0	Om				ESTED B		DM	DATE:		
	IAL USE		tigation										
TEST PH			AS 1289.3	61				HECKEI		DG	DATE:	2	0.4
						0 4 9	Sec. 19.	LIENT R		-			-
10		A.S. Method	Sieve - (mm)	0.150	0.300	1.18	236	6.70 8.5 13.2	26.5	75.0	190.0	
96								1					
81													
01							/						
8 70						/	-	-					
Percent finer than size					-		_						
∰ \$0 50													
Li Li													
erce													
								-				-	
<u>□</u> 30													
n. 30 20													
20													
		0.004		0.06	010	Particle size	- (mm)		10		100		
20		0.006	001 500			sand	- (mm)		gravel				
20	0.001	0.006	silt edium C	anse	fine	sand	- (mm)	fine	gravel medium	coars	cobbles		
20	0.001	0.006	001 500			sand	- (mm)	fine 4	gravel	coars: 0	cobbles		
20	1000 clay	10000 0000 0000 0000 0000 0000 0000 00	silt edium c	oarse	fine 8	sand medium 11	- (mm) coarse 17	4	gravel medium 4	0	e cobbles		
20	0.001	0.006	silt edium co 56	Liq	fine 8 uid	sand medium 11 Plastic	- (mm) coarse 17	4 Plasticity	gravel medium 4	0 Linear	e cobbies 0 St	pecific	
20 11 0 Particle	elay Percent	fine m Particle	silt edium c	oarse	fine 8 uid	sand medium 11 Plastic Limit	coarse	4 Plasticity Index	gravel medium 4	0 Linear hrinkage	e cobbles	pecific	
20 10 0 Particle Size	Percent Passing (%)	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq C	fine 8 uid	sand medium 11 Plastic	coarse	4 Plasticity	gravel medium 4	0 Linear	e cobbles	pecific ravity g/cm ³)	
20 14 0 Particle Size (mm)	Percent Passing	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq	fine 8 uid nit 6)	sand medium 11 Plastic Limit (%	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbles 0 Sr G (g	pecific	
20 10 0 Particle Size (mm) 150.0 ¹	Percent Passing (%)	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq	fine 8 uid nit 6)	sand medium 11 Plastic Limit (%	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbles 0 Sr G (g	pecific ravity g/cm ³)	
20 14 0 0 150 0 150 0 750 37,5 19,0	Percent Passing (%)	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq	fine 8 uid nit 6)	sand medium 11 Plastic Limit (%	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbles 0 Sr G (g	pecific ravity g/cm ³)	
20 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Percent Passing (%) 100 98	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq	fine 8 uid nit 6)	sand medium 11 Plastic Limit (%	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbles 0 Sr G (g	pecific ravity g/cm ³)	
20 14 0 0 150.0 1 75.0 37.5 19.0 9.5 4.75	Percent Passing (%) 100 98 95	fine m Particle Size	silt edium co 56 Percent Passing	Liq Lin Class Prepa	fine 8 uid nit 6) - ification: ration Hi	sand medium 11 Plastic Limit (%	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbles 0 Si G (g	pecific rawity y/cm ³)	
20 14 0 150.0 ¹ 150.0 ¹ 150.0 ¹ 75.0 37.5 19.0 9.5 4.75 2.36	Percent Passing (%) 100 98 95 92	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq Class Prepa Samp	fine 8 uid nit 6) - ification: aration Hi le : -	sand medium 11 Plastic Limit (% grey, hig	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4	0 Linear hrinkage (%)	e cobbies 0 Si G (g y CLAY	pecific rawity g/cm ³)	
20 10 0 10 0 10 0 150.0 ³ 75.0 37.5 19.0 9.5 4.75 2.36 1.18	Percent Passing (%) 100 98 95 92 83	fine m Particle Size	silt edium co 56 Percent Passing	Liq Lin Class Prepa	fine 8 uid nit 6) - ification: aration Hi le : -	sand medium 11 Plastic Limit (% grey, hig	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4 S elly (shells),	0 Linear hrinkage (%)	e obbies e 0 St G (g y CLAY Registered No Certificate No Date of Issue	pecific ravity y/cm ³)	2
20 Particle Size (mm) 150.0 ³ 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600	Percent Passing (%) 100 98 95 92 83 75	fine m Particle Size	silt edium co 56 Percent Passing	Liq Lin Class Prepa Samp Sieve	fine 8 uid nit 6) - ification: uit cation Hi le : - d: -	sand medium 11 Plastic Limit (% - grey, hig	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4 S elly (shells),	0 Linear hrinkage (%) - sandy silt	e cobbles e 0 Sp G (g y CLAY Registered No Certificate No Date of Issue ed by the b	pecific ravity y/cm ³)	2
20 14 0 150.0 ³ 150.0 ³ 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600 0.425	Percent Passing (%) 100 98 95 92 83 75 71	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq Class Prepa Samp Sieve Linea	fine 8 uid nit 6) - ification: ration Hi le : - d: -	sand medium 11 Plastic Limit (% 	- (mm) coarse 17 17) uly plastic, s erg Limits	4 Plasticity Index (%) dightly grav	gravel medium 4 S elly (shells),	0 Linear hrinkage (%) sandy silt	e cobbles e 0 Sp G (g y CLAY Registered No Certificate No Date of Issue ed by the b	pecific ravity p/cm ³)	brank
20 Particle Size (mm) 150.0 ³ 75.0 37.5 19.0 9.5 4.75 2.36 1.18 0.600	Percent Passing (%) 100 98 95 92 83 75	fine m Particle Size	silt edium co 56 Percent Passing	Liq Liq Class Prepa Samp Sieve Linea Leng	fine 8 uid nit 6) - ification: ration Hi le : - d: -	sand medium 11 Plastic Limit (% - grey, hig	- (mm) coarse 17	4 Plasticity Index (%)	gravel medium 4 S elly (shells), his Laboratory	0 Linear hrinkage (%) sandy silt	e cobbles e 0 S; G (g y CLAY Registered Nc Certificate No. Date of Issue w(s) reported I of registration.	secific ravity y/cm ³)	2

ULLMAN & NOLAN CEOTECHNIC

UNCD 1

				MAN &	A.C.N.	010 026 4	418		IC			UNGR 1 Issue: 1 Rev 5 (-/8/00)
Sheet 1	of	1								Ma	ackay	Laboratory
CLIENT:	Ki	nsmen	Pty Ltd			J	OB NO.:	104	74.1	LAB RE	EF NO.: 0	1-0973A
PROJECT:	Sł	ute Ha	arbour Ma	arina			SAME	TEDBA	U&N		DATE, 2	2,23.5.0
LOCATION	Bo	rehole	e 1, Dept	th 1.50m	n		TEST	ED BV-	NJR		DATE. 2	2.6.01
MATERIAL	. Ir	vesti	ation				CHEC	KED R	v. VJ		DATE: 2	5.6.01
TEST PROC												
		A.S.	Metric Sieve	- (mm)	-0.150	0.300	1.18	- 2.36	9.5 13.2 19.0	- 26.5 - 37.5 - 53.0	76.0	
	100											
	50					-	1					
	60						/					
	70					,	/					
925						/						
han	60					/						
finort	50											
Percont finor than size	:40											
Por	-30											
	-				1							
	20											
	10											
	0		1 9 60		111				I I I		1,1	
		0.002	0.004 0.006 0.008 0.01	0.02	9000 9000 Pi	article size	9 (mm) -		10		100	
		alau	silt			sand		1	gravel			
		clay	ine mediu	m coarse		medium	coarse	fine	medium	coarse	cobbles	
1.89			26		16	30	25	3				
Parti Siz (mn	e	Percent Passing (%)	Particle Size (mm)	Percent Passing (%)	Lìqui Limi (%)	t L	lastic .imit (%)	Plasticity Index (%)	Shri	ncar nkage %)	Soil Particle Density (g/cm ³)	
150	0.0				-		-	-		-	-	
75	5.0				Classific	ation: S	ilty S	and				
37	.5											

Classification: Silty Sand	
Design of the second second life	
Preparation History of Atterberg Limits	
Nateral State/Air Dried/Oven Dried	Accredited Nov. 910
(delete two)	Catificate No. 01-0973A
Wet Sieved/Dry Sieved (delete one)	Date of four: 25.6.01
Linear Shrinkage Data	This Laboratory is accredited by the National
Length of Mould mm	Association of Testing Authorities, Australia, The tests, reported herein have been performed in accordance with
Sample: Crumbled/Curled/Crumbled &	its term of accorditation Price for another and he
Curied (delete as required)	Autorized Sectory N. J. Richards

19.0

9.5

4.75

2.36

1.18

0.60

0.425

0.300

0.150

0.075

100

98

97

88

72

64

55

35

26

ULLMAN & NOLAN GEOTECHNIC UNGR 1 Issue: I Rev 5 A.C.N. 010 026 418 (-/8/00) REPORT ON SOIL CLASSIFICATION Sheet 1 of 1 Mackay Laboratory Kinsmen Pty Ltd 10474.1 01-0974A JOB NO.: CLIENT: . LAB REF NO .: DATE: 22,23.5.01 Shute Harbour Marina PROJECT: .. LOCATION: Borehole 2, Depth 1.50m TESTED BY: NR,MS DATE: 19-22.6.01 MATERIAL: Investigation CHECKED BY: VJ DATE: 25.6.01 TEST PROCEDURES: AS 1289.3.6.1,3.6.3 CLIENT REF: --0.425 2 30 A.S. Metric Sieve - (mm) 3.2 80 28.5 37.5 53.0 250 10 100 11111 90 80 70 Percent finer than size 60 50 40 30 20 10 ŏ Tri 9000 000 100 100 8 8 0 0 Particle size - (mm) silt sand gravel clay cobbles fine medium coarse fine medium coarse fine medium coarse 53 10 13 8 4 8 4 Particle Particle Percent Percent Liquid Plastic Plasticity Soil Particle Linear Size Passing Size Passing Shrinkage Limit Limit Index Density (NK) (mm) (%) (%) (%) (%) (%) (%) (g/cm3) um 150.0 61.6 85 _ _ -----_ 75.0 44.0 83 Silty Clay Classification: 31.3 37.5 81 77 22.5 19.0 15.3 74 9.5 11.3 70 4.75 Preparation History of Atterberg Limits 100 8.2 66 Natural State/Air Dried/Oven Dried 2.36 910 Accerdited Nor. 98 5.9 01-0974A 63 (delete two) 1.18 Centificate No. 25.6.01 96 4.2 0.60 61 Wet Sieved/Dry Sieved (delete one) Dute of Issue: . 0.425 3.0 94 56 Linear Shrinkage Data This Laboratory is accredited by the National Association of Testing Authorities, Australia, The (esits) 92 2.1 53 0.300 Length of Mould mm reported hereis have be 2.1 with its term of accreditatio 87 1.2 Sample: Grambled/Curled/Crumbled & 50 0.150 conduced except in NI 1 m

84

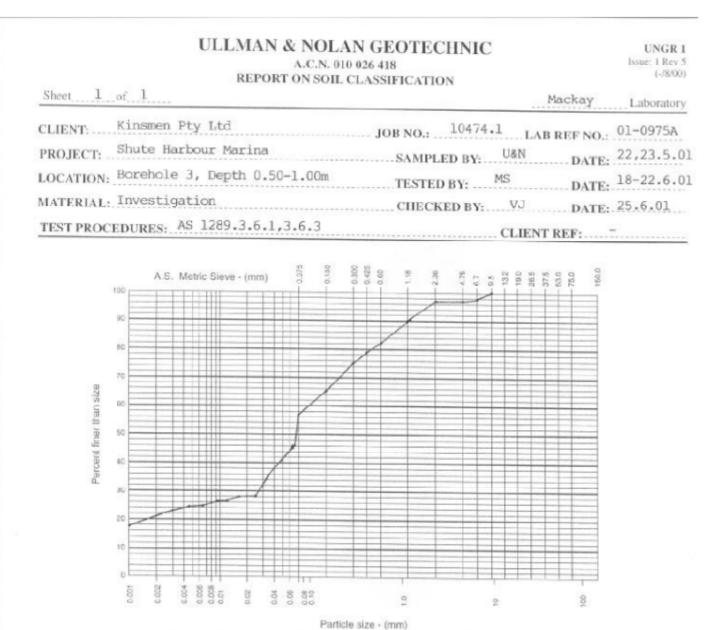
0.075

0.9

48

Eurled (delete as required)

Authorised Signatery . H. J. Richardsens



clay -		silt			sand			gravel		
onay	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	cobbies
21	4						0	3		

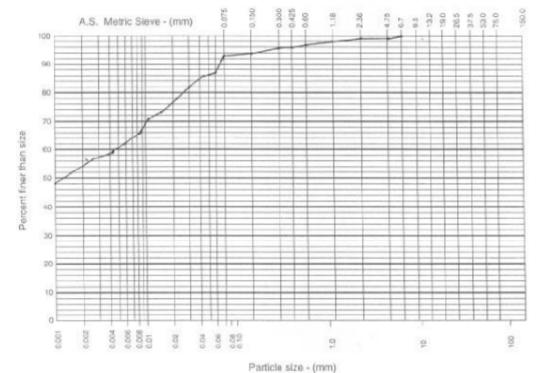
Particle Size (mm)	Percent Passing (%)	Particle Size (XX)	Percent Passing (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Soil Partic Density (g/cm ³)	
150.0		69.1	46	1.7	-	-	-	-	
7.5.0		49.8	41	Classification	Silty (layey San	d		
37.5		35.8	36		1				
19.0		25.8	28						
9.5	100	17.7	28						
4.75	97	13.0	27	Preparation H	istory of Atterb	erg Limits			
2.36	97	9.2	27	Natural State/	Air Dried/Oven	Dried			910
1.18	90	6.5	25	(delete two)			NA	coreanea por	01-0975A
0.60	82	4.6	25	Wet-Sieved/D	ry Sieved (delet	e one)	A	entiticate Not	25.6.01
0.425	79	3.1	23	Linear Shrink	age Data				
0.300	75	2.3	22	Length of Mo	uld mm	Second 1	Association	of Testing Authorit	lited by the Nation ties, Australia. The test operating accordance w
0.150	66	1.3	19	Sample: Grun	bled/Curled/Cr	umbled &	its term of	accreditation. Th	by flow ment shall not
0.075	57	0.9	18	Curled (delete	as required)			P	J. Richards

ULLMAN & NOLAN GEOTECHNIC A.C.N. 010 026 418

UNGR I Issue: 1 Rev 5 (-/8/00)

1				REPOI		A.C.N					ATI	ON									(-/8/0
Sheet 1			Dtre I to								_				_		-	-	-	-	Laborator
LIENT:		manen	PLY Ltd																		
PROJECT:	Sh	nute Ha	rbour Ma	arina						.SA!	MP	LED	BY:		U&I	N		D	ATE	: 22	,23.5.
LOCATION	: Bo	prehole	e 4, Dept	th 1.0	-0(2.00	m			TES	TE	DB	Y:	1	IJR			D	ATE	. 22	.6.01
MATERIAL	. Ir	vestig	ation																		.6.01
TEST PROC				9.3.6.	1										CL	IEN	TR	EF:		-	
	100	A.S.	Metric Sieve	ə - (mm)		-0.075	0.150	0300	- 0.425	- 1,18		- 230	-4.75	56-	- 19.0	- 26.5	- 37.5	- 75.0	150.0		
	100										-	~	-	-	1	-			_		
	90					-			2		_							+	_		
	80						1	1						-					_		
						/	1				_										
9	70							-								-					
U S I	60					_	-			_			-						_		
er the	50						-			-	_					-		-	-		
Percent finer than size	30					-	-												-		
roen	40						-	-	H	-	-	-							=		
đ	30						-												_		
																		+	-		
	20						-	-	+ +			-	-		_		-	-	_		
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	10												-						_		
	0		004 008 008 008 008 008 008 008 008 008	20	04	11				- 0									- 0		
	0		0.004	0.02	0.04	000				1.0 -									100 -		
	0			2010	0.04		Part			(mm)									100 -		
	0	Elay	silt				_	san	d	(mm)				gra	vel			- 00	T 81		
	0	Elay	silt ine mediu		arse		e		d		-	fin	e 3	gra	ivel	co	arse	- 00			
	0	Elay	silt			fin	e	san medi	d	(mm) coar	-			gra med	ivel	co	arse	- 00			
Parti	cle	clay fi	silt ine mediu 74 Particle	im coa	arse	fin E	e 5 quid	san medi	d um Pla	(mm) coar 6	-	Plast	3 icity	gra med	dium	near		Soi	oties il Part		
	o cle	clay fi	silt ine mediu 74	im coa	arse	fin 6 Lic Li	6	san medi	um	(mm) coar 6 stic	-	3	3 icity ex	gra med	livel dium Li Shri			Soi	btles	ty	
Parti	o cle re n)	clay fi	silt ine mediu 74 Particle Size	em coa	arse	fin 6 Lic Li	e 5 quid	san medi	d um Pla Lir	(mm) coar 6 stic nit b)	-	Plasti	3 icity ex	gra med	livel dium Li Shri	near		Soi	bbles il Part Densit	ly }	
Parti Siz (mm	o cle re n)	clay fi	silt ine mediu 74 Particle Size	em coa	arse	fin 6 Lic Li	e 5 quid imit %)	san medi 9	d um Pla Lin (9	(mm) coar 6 stic nit b)	-	Plasti	3 icity ex	gra med	livel dium Li Shri	near		Soi	il Part Densit g/cm	ly }	
Partis Siz (mn 150 75	cle cle m)	clay fi	silt ine mediu 74 Particle Size	em coa	arse	fin 6 Lic Li ('	e 5 quid imit %)	san medi 9	d um Pla Lin (9	(mm) coar 6 she nit 5)	-	Plasti	3 icity ex	gra med	livel dium Li Shri	near		Soi	il Part Densit g/cm	ly }	
Parti Siz (mn 150 75 37	0 cle re n) 0.0 5.0	clay fi	silt ine mediu 74 Particle Size	em coa	arse	fin 6 Lic Li ('	e 5 quid imit %)	san medi 9	d um Pla Lin (9	(mm) coar 6 she nit 5)	-	Plasti	3 icity ex	gra med	livel dium Li Shri	near		Soi	il Part Densit g/cm	ly }	
Partic Siz (mm 150 75 37 19	0 icle 2 m) 0.0 5.0 7.5	clay fi	silt ine mediu 74 Particle Size	em coa	arse	fin 6 Lic Li ('	e 5 quid imit %)	san medi 9	d um Pla Lin (9	(mm) coar 6 she nit 5)	-	Plasti	3 icity ex	gra med	livel dium Li Shri	near		Soi	il Part Densit g/cm	ly }	
Parti Siz (mn 150 75 37 15	0 cle xe n) 0.0 5.0 7.5 9.0	clay f	silt ine mediu 74 Particle Size	em coa	arse	fin Ei Lic (' Classi	quid mit %)	san medi 9	d um Pla Lin (9 - Si	(mm) coar 6 she nit 5)		Plast) Ind (%	3 icity ex	gra med	livel dium Li Shri	near		Soi	il Part Densit g/cm	ly }	
Partia Sizz (mm 150 75 37 15 0 0 4	0 cle m) 0.0 5.0 7.5 9.0 0.5	clay fi	silt ine mediu 74 Particle Size	em coa	arse	Lia Lia (i Classi Prepar	quid imit %) 	san medi 9	Pla Lin (9 - Si	(mm) coar 6 stic mit b) 1t	berg I	Plasti Ind (%	3 icity ex	gra med	livel dium Li Shri	near	e	Soi	il Part g/cm	ly j	
Partie Siz (mm 150 75 37 16 4, 4, 2	0 cle 22 m) 0.0 5.0 7.5 9.0 0.5 .75	Clay f	silt ine mediu 74 Particle Size	em coa	arse	Lia Lia (i Classi Prepar	e 5 quid mit %) - ificat	san medi 9	Pla Lin (9 - Si	(mm) coar 6 she nit 6) 1t	berg I	Plasti Ind (%	3 icity ex	gra med	livel dium Li Shri	near	2 Acat	Soi	d Parties	91(
Partia Sizz (mm 150 75 37 15 0 0 4, 2, 1,	0 cle ce m) 0.0 5.0 5.0 5.0 9.0 9.0 9.5 .75 .36	clay f	silt ine mediu 74 Particle Size	em coa	arse	Classi Prepau Nature (delet)	quid mit %) - ificat al Sta e two	san medi 9 ion: a Hist	d um Pla Lin (9 - Si	(mm) coar 6 she nit 6) 1t	erg I	Plasti Ind (%	3 icity ex	gra med	livel dium Li Shri	near	e Acore	Soi	il Parti g/cm	91(01-) -0976A 6.01
Partic Siz (mm 150 75 37 16 4, 2, 1, 0,	0 cle 22 m) 0.0 5.0 7.5 9.0 9.5 7.5 .18	Clay f	silt ine mediu 74 Particle Size	em coa	arse	Classi Prepau Nature (delet)	quid imit %) = ificat al Sta e two ilieveo	san medi 9 ion: ion: ate/Ai ate/Ai	d um Pla Lin (9 - Si si r Drie	(mm) coar 6 stic hit b) lt (Auerb d/Gwer d (dele	erg I	Plasti Ind (%	3 icity ex	gra med	Li	near nkag %)	e Acat Cenii Duie	Soi I (il Parti g/cm	91(01- 25	-0976A 6.01
Partia Sizz (mm 150 75 37 15 0 4, 2, 1, 0, 0,4	0 cle se m) 0.0 5.0 5.0 9.0 9.0 9.5 .75 .36 .18 .60	Clay f Clay f Percent Passing (%) 99 98 95 93 89	silt ine mediu 74 Particle Size	em coa	arse	Elinea Prepau (deleto Wet S Linea	quid imit %) - ificat al Sta e two lieven r Shr	san medi 9 ion: ion: a Hist ate/Ai	d um Pla Lin (9 - Si Si ory of r Drie Sieve e Date	(mm) coar 6 strc mit 6) 1t (Auerb d/Gver d (dele	erg l	Plasti Ind (% -	3 icity ex	gra med		near inkag %)	e Acat Cenii Duie	edited ficare of box	id Parti Densit g/cm	91(01- 25.	0976A 6.01 by the Na Australia. The
Partic Siz (mm 150 75 37 15 0 4, 2, 1, 0, 4, 0, 4 0, 4 0, 3	0 cle <u>x</u> n) 0.0 5.0 7.5 9.0 9.5 .75 .36 .118 .600 425	Clay f Clay f Percent Passing (%) 999 98 95 93 89 87	silt ine mediu 74 Particle Size	em coa	arse	Prepau (delete Wet-S Linea Lengt	e quid mit %) - ificat al Sta e two lieven h of	san medi 9 ion: ion: ate/Ai ate/Ai ate/Ai Monto	d um Pla Lin (9 - Si Si r Drie Sieve e Dat	(mm) coar 6 stic hit b) lt (Atterb d/Gver d (dete	erg l	Plasti Ind (% -	3 icity ex b)	gra med		near inkag %)	e Acat Cenii Duie	edited ficare of box	id Parti Densit g/cm	91(01- 25.	-0976A 6.01

ULLMAN & NOLAN GEOTECHNIC UNGR 1 Issue: 1 Rev 5 A.C.N. 010 026 418 (-/8/00) REPORT ON SOIL CLASSIFICATION Sheet 1 of 1 Mackay Laboratory JOB NO.: 10474.1 Kinsmen Pty Ltd 01-0977A LAB REF NO .: CLIENT:SAMPLED BY: U&N Shute Harbour Marina DATE: 22,23.5.01 PROJECT: LOCATION: Borehole 5, Depth 0.5m DATE: 18,19.6.01 MS TESTED BY: -CHECKED BY: VJ DATE: 25.6.01 MATERIAL: Investigation TEST PROCEDURES: AS 1289.3.6.1,3.6.3 CLIENT REF: _____



elau -		silt		1	sand				cobbles	
clay -	fine	medium	coarse	fine	medium	coarse	fine	medium	coarse	0000000
54	8	13	18	1	3	2	1			

		1.0							
Particle Size (mm)	Percent Passing (%)	Particle Size (XXX) UM	Percent Passing (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Soil Particle Density (g/cm ³)	
150.0		60.4	87	8575	77	~	-		
75.0		42.9	86	Classification	Silty	Clay			
37.5		30.7	82						
19.0		22.3	78						
9.5	100	15.6	73	1					
4.75	99	11.4	71	Preparation H	istory of Atterb	erg Limits			
2.36	99	8.3	66	Natural-States	Air-Dried/Over	Dried		exceeding Nor 91	0
1.18	98	5.9	62	(delete two)				entificate Nor 01	-0977A
0.60	97	4.2	59	Wet Sieved/D	ry Sieve d (dele	te one)		tate of time: 25	.6.01
0.425	96	2.8	57	Linear Shrink	age Data		This 1 sh	oratory is accredited	he the Nation
0.300	96	2.1	53	Length of Mo	uld mm		Association reported he	of Testing Authorities, min have been perform	Australia. The test
0.150	94	1.3	50	Sample: Grun	nbled/Curicd/C	rumbled &		except in fighter	havet
0.075	93	0.9	48	· Curled (delet	e as required)			NI. J.	Richards

ULLMAN & NOLAN GEOTECHNIC A.C.N. 010 026 418 REPORT ON MOISTURE CONTENT

UNGR 41 Issue: 1 Rev 1 (-/2/00)

CLIENT:	Kinsmen Pty Ltd	JOB NO:	10474	L1	LAB REF NO:	ay Laboratory 01-1038A-I
PROJECT:	Shute Harbour Marina	SAMPLED	BY:	U&N	DATE:	7,20,21.5.01
LOCATION:	Refer Below	TESTED BY	Y:	DG	DATE:	
MATERIAL U	SE: Fill	CHECKED	BY:	AW	DATE:	
TEST PROCE	DURES: AS 1289.2.1.1			CI	JENT REF:	-

Sample Identification Number	Sampling Location	Moisture Content (%)	For Subsid	iary Methods
			Original Value	Amended Value
01-1038A	BH3, Depth 1.00m	86.5		
01-1038B	BH3, Depth 2.00m	51.5		
01-1038C	BH4, Depth 1.50m	71.5		
01-1038D	BH5, Depth 1.50m	78.0		
01-1038E	TP 1, Depth 1.20-1.50m	38.0		
01-1038F	TP2, Depth 1.20-1.50m	54.5		
1.4.9				



Accredited No 910

Certificate No 01-1038A Date of Issue 22.6.01

This laboratory is accredited by the National Association of Tessing Authorities, Australia. The ten(s) reported humin have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

A.C.N. 103 205 205

REPORT ON SOIL CLASSIFICATION

Sheet 1 of 1

10 0

CLIENT: P	Port Binnli	JOB NO:	21024.1 LAB RI	EF NO:		06-14654
PROJECT:	Additional Geotechnical Investigation	n	SAMPLED BY:	U&N	DATE:	29-31.3.0
LOCATION:	Shute Harbour Marina, Borehole 54	Depth 0.60-1.30n	TESTED BY:	DN	DATE:	13.4.00
MATERIAL:	Sandy Clay; grey		CHECKED BY:	NJR	DATE:	20.4.06
TEST PROC	EDURES: AS 1289.3.6.1, 3.8.1		CLIENT REF:	12276.1		
100	A.S. Metric Sieve - (mm)	0.150 0.300 0.425 - 0.6	-1.18 -2.36 -6.70 - 6.70	-13.2 -18.0 -26.5 -37.5	-75.0 -75.0	
90						
80						
a 70						
Percent finer than size						
et a						
tine						
U9 40						
a 30						
20						

0.00		0.002	0,004	0,008	0.008	0.04	an.n	0.10	Particle size	은 - (mm)		9		100
	clay				silt				sand			gravel		obbles
	ciuy	fi	ine	Τ	medium	coarse		fine	medium	coarse	fine	medium	coarse	000100
				7	18			5	6	8	3	0	0	0

Particle Size (mm)	Percent Passing (%)	Particle Size (mm)	Percent Passing (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Soil Particle Density (g/cm ³)	
150.0				· ·				-	
75.0				Classification:	Sandy Clay;	grey, sand is fine to	coarse grained.		
37.5								(CH)	
19.0									
9.5									
4.75	100			Preparation His	story of Atterberg Lim	its	•		
2.36	97			Sample : Na	tural/Air Dried/O	_		redited No.	910
1.18	93			Sieved: We	₩/dry	N	ATA Cart	ificate No.	06-1465A
0.600	89						Data	1 of 19816	29.4.06
0.425	88			Linear Shrinka	ge Data		•		
0.300	86			Length of Mou	ld (mm) :			with NATA's accreditation requ	iremants.
0.150	82			Sample: -		Authorise	d Signatory	Herbert	-
0.075	78						-	N. J. Richardson	

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Mackay Laboratory

A.C.N. 103 205 205

REPORT ON SOIL CLASSIFICATION

			REPO	ORT ON	SOIL CI	ASSIFICA	TION	N					
Sheet 1	of 1											λ	fackay Laboratory
CLIENT	: Port E	Binnli				JOB NO:	210)24.1	LA	AB REF N	NO:		06-1466A
PROJEC	T: Ad	lditional Ge	otechnic	al Investig	ation			SAM	PLED	BY: U	lån I	DATE:	29-31.3.06
LOCATI	ION: Sh	ute Harbour	Marina,	, Borehole	54, Dept	th 1.70-2.30	m	TES	FED BY	Y: 1	DN I	DATE:	13.4.06
MATER	IAL: Cl	ay; grey						СНЕ	CKED	BY: N	JR I	DATE:	19.4.06
TEST PF	ROCEDU	RES:	AS 1289	.3.6.1, 3.8.	1			CLI	ENT RI	EF: 1	2276.1		
		A.S. Metric S	Sieve - (r	nm)	0,075 0,150	0.300 0.425 - 0.6	1,18	2.36				-75.0 450.0	
100			·) ••••	, 	0 0	0.9	-	2	-	6	F N N V		
90	,												
80	,												
a 70													
Percent finer than size													
than	' <u> </u>												
line 1	, <u> </u>												
tu eou							_	_	_				
۳ ³⁰	,						_						
20	,												
10													
0							_						
·	0.002	- #00.0 800.0	0.02	0.04	0.10	Particle size sand	ຼິ - (mm	0		gravel		100	
	clay	fine m	edium	coarse	fine	medium	coars	50	fine	medium	coarse	cobbles	
		89			2	3	4		2	0	0	0	
Particle	Percent	Particle	Perce	nt Li	quid	Plastic		Р	lasticity		Linear	Soil Partic	le
Size	Passing	Size	Passir	ng L	imit	Limit			Index	s	nrinkage	Density	I
(mm)	(%)	(mm)	(%)		(%)	(%)		(%)		(%)	(g/cm ³)	
150.0		I			-	-			•		-		·
75.0 37.5		┨────	<u> </u>	Cla	ssification:	Clay	; grey,	with fir	e to coars	se grained sa	nd.	(CH)	
19.0												(CII)	
9.5													
4.75	100			Pre	paration Hi	story of Atterb	erg Lim	uits					
2.36	98			Sar	-	tural/Air D	ied⁄ O	ven		\sim	A	ccredited No.	910
1.18	96			Sie	ved: W4	et/dry				NAT/	-	ertificate No.	06-1465A
0.600	94	l	<u> </u>	-		Dete				\mathbf{v}	D	and of lassie	19.4.06
0.425 0.300	93 92				ear Shrinka 19th of Mou				Thi	s document is ise	ued in accordance	e with NATA's accred	tation requirements.
0.500	76	l			Par of MOR	as (mail) -			li l			10 1 1	

Sample: -

91

89

0.150

0.075

Authorised Signatory ...

Thele N.J. Richardson

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A.C.N. 103 205 205

REPORT ON SOIL CLASSIFICATION

Sheet 1 of 1		KEFU	OKI UN S	UIL CI	ASSIFIC	ATION						Mackay Laboratory
	rt Binnli				JOB NO:	210	24.1	LAB	REFN	0:		06-1467A
PROJECT:	Additional	Geotechnica	l Investiga	tion			SAMPLI	ED BY	Y: Uá	en I	DATE:	29-31.3.06
LOCATION:	Shute Harb	our Marina.	Borehole :	54. Dept	h 2.30-3.50	m	TESTED	BY:	с	D I	DATE:	26.4.06
MATERIAL:		,		.,			CHECK				DATE:	26.4.06
TEST PROCE		AS 1289.	361				CLIENT			276.1		
TEST FROCE				n 9	0 53 4							
100	A.S. Metr	ic Sieve - (m	im) 5	0,150	0.300 0.425	1.18	2.36	4.75	13.2 13.2 18.0	26.5 37.5 53.0	75.	
90												
80												
9 ⁷⁰												
uer 60												
50 E												
Percent finer than size							_					
ы азо												
20												
10												
• F	8 8 8	8 2 8	± + + + + + + + + + + + + + + + + + + +	0.10		2					100	
0.001	0.002 0.004	0.008	0.04	<u> </u>	Particle size	- (mm)					-	
	1	silt			sand				gravel		cobbles	
clay	fine	medium	coarse	fine	medium	coars	e fi	ne n	nedium	coarse		
		85		1	3	6		3	2	0	0	
Particle Perce	nt Partic	a Duar	t Liq	mid	Plastic	.	Plastic			inear	e_it r	Particle
Size Passi					Limit		Inde	+		inkage	Densi	

Particle	Percent	Particle	Percent	Liding	Plastic	Plasticity	Linear	Soft Particle	- 1
Size	Passing	Size	Passing	Limit	Limit	Index	Shrinkage	Density	1
(mm)	(%)	(mm)	(%)	(%)	(%)	(%)	(%)	(g/cm ³)	
150.0				-				-	
75.0				Classification:	Clay; grey				
37.5									
19.0									
9.5	100								
4.75	98			Preparation His	tory of Atterberg Lim	its	•		_
2.36	95			Sample : Na	tural/Air Dried/Ov			edited No.	910
1.18	92			Sieved: We	xt/dry	N	ATA Certi	ficate No. 06-14	167 A
0.600	89						Data	of 19916 26	4.06
0.425	88			Linear Shrinka	ge Data		-		
0.300	87			Length of Mou	ld (mm) :			wh NATA's accreditation requirements	
0.150	86			Sample: -		Authorise	d Signatory	ladad	
0.075	85							J. Richardson	

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(-12/05)

A.C.N. 103 205 205

REPORT ON SOIL CLASSIFICATION

Sheet 1 of	1											Mackay Laboratory
CLIENT:	Port	Binnli				JOB NO:	21024.1	L	AB REF N	0:		06-1468A
PROJECT:	A	dditional	Geotechnic	cal Investiga	ntion		SAI	MPLED	BY: U	&N D	ATE:	29-31.3.06
LOCATION	N: S	shute Harb	our Marina	i, Borehole	54, Deptl	h 1.70-2.3	om TES	STED B	Y: DN	i,ss D	ATE:	13-18.4.06
MATERIA	L: (layey Sar	d; grey				СН	ECKED	BY: N	JR D	ATE:	19.4.06
TEST PRO	CED	URES:	AS 128	9.3.6.1, 3.8.1			CL	ENT R	EF: 12	2276.1		
400		A.S. Met	ric Sieve - ((mm)	0.150	0.300	-1.18	-2.36	-6.70 - 8.5 -13.2	-26.5 -37.5 53.0	-75.0	
100								\sim				
90							$\boldsymbol{\wedge}$					
80							/					
970 215												
00 than												
Percent than size					\sim							
Jaona 40												
20												
10												
0	5	3 8 8	008 10.0 008	0.04	0.10		2		<u>e</u>		100	
0.01		200'0 900'0	0.00		66 	Particle size	- (mm)				**	
ſ	clay					sand			gravel			
		fine	medium 44	coarse	fine 14	medium 18	coarse 20	fine 4	medium 0	coarse 0	0	
l			44		14	10	20	4	, v	0	v	

Particle Size (mm)	Percent Passing (%)	Particle Size (mm)	Percent Passing (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Linear Shrinkage (%)	Soil Particle Density (g/cm ³)				
150.0				-	-		-	-				
75.0				Classification: Clayey Sand; grey, fine to coarse grained.								
37.5				(SC)								
19.0												
9.5				Emerson Class No.: 4								
4.75	100			Preparation His	story of Atterberg Lim	its	•					
2.36	96			Sample : Na	tural/Air Dried/O			edited No. 910				
1.18	88			Sieved: We	st/dry	N	ATA Certi	ficate No. 06-1468A				
0.600	76						Dana	of 19816 19.4.06				
0.425	71			Linear Shrinka	ge Data		•					
0.300	65			Length of Mould (mm) : This document is issued in accordance with NATA's accreditation requirements.								
0.150	53			Sample: -		Authorise	ed Signatory	dad				
0.075	- 44		2					J. Richardson				

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