NSW DEPARTMENT OF COMMERCE

PRELIMINARY GEOTECHNICAL INVESTIGATION

AREAS B & D PRISON HOSPITAL

LONG BAY CORRECTIONAL COMPLEX, MALABAR

E12723.3-BC 4 July 2005



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NSW Department of Commerce Level 13, McKell Building 2-24 Rawson Place SYDNEY NSW 2000

Attention: Mr Peter Shun

Dear Sir.

RE:

PRELIMINARY GEOTECHNICAL INVESTIGATION AREAS B & D PRISON HOSPITAL LONG BAY CORRECTIONAL COMPLEX, MALABAR

Coffey Geosciences Pty Ltd (Coffey) is pleased to present the results of the geotechnical investigation undertaken for the proposed Prison Hospital and drainage works located in Areas B & D at Long Bay Correctional Facility, Malabar. If you wish to discuss any aspect of the report please contact Mr Peter Waddell or the undersigned on 9911 1000.

For and on behalf of

COFFEY GEOSCIENCES PTY LTD

MULIADI MERRY

Senior Geotechnical Engineer

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Important Information About Your Coffey Report

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1. INTRODUCTION

This report details the results of the Stages 1 and 2 geotechnical investigations undertaken by Coffey Geosciences Pty Ltd (Coffey) for a proposed Prison Hospital development and drainage works in Areas B & D of the Long Bay Correctional Centre, Malabar.

The Stage 1 investigation work was undertaken for the NSW Department of Commerce generally in accordance with our proposal (Reference No: E12723/2-AE), dated 26 May 2004 while the Stage 2 investigation was carried out in general accordance with our proposal (Reference No: E12723/4-AE), dated 2 May 2005.

The current preliminary geotechnical investigation was undertaken concurrently with a Stage 2 Environmental Site Assessment, also by Coffey. For details of the environmental site assessment, reference should be made to the Stage 2 Environmental Site Assessment Report E12723.3- AS.

The objectives of the study were to provide information on subsurface conditions, a geotechnical model, discussion and recommendations on relevant geotechnical aspects including:

- A general description of the geology and geomorphology;
- Advice from local authorities on susceptibility to 100 year ARI flooding;
- Preliminary subsurface data;
- Suitability of excavated materials for re-use as fill for engineering and landscaping purposes;
- Preliminary recommendations on footing type, bearing capacities of foundation, earthworks and pavement design; and
- Advice on the need to line a stormwater detention basin.

Our overview of the relevant geotechnical investigation reports for Areas B and D that were prepared by others, is included in this report. Responses to Tasks 3, 4, 5, 6, 7 and 9 that were requested by the Contractors who are bidding for the construction works are also provided (Note that details of the tasks requested in presented in Section 6 of this report).

2. DETAILS OF PROPOSED DEVELOPMENT

It is understood that the new development will comprise:

- A new Long Bay Prison Hospital in Area B for the Department of Corrective Services (DCS). The
 hospital will comprise a mix of one and two storey buildings and yards set within a 6m high wall. The
 development will involve the relocation of the existing maintenance and storage facilities, which
 currently occupy the site of the proposed hospital.
- A new Forensic Hospital in Area D for the Corrections Health Services (CHS). The forensic hospital, like the prison hospital, will comprise a mix of one and two storey buildings and yards set within a 6m high wall. The development will also include a new building to house administration, stores and a pharmacy.
- A combined stormwater detention basin / playing field to be located in the southern part of Area D.
- Two stormwater detention basins in Area D.

At the time of the investigation and preparation of this report, the precise location and nature of the development had not been finalised. Area B covers an area of approximately 2.6Ha and Area D covers an area of approximately 7.9Ha. The location of these areas within the Long Bay Correctional Complex and a site locality plan is provided on Figure 1.

3. FIELD INVESTIGATIONS

3.1 Stage 1 Investigation

The Stage 1 field investigation was undertaken as a combined geotechnical and environmental assessment and comprised:

- Drilling of 17 boreholes (identified as CBH8, CBH25 to CBH32, CBH58 to CBH64 and CBH71) in Area B with the aid of a truck mounted drilling rig (see Figure 2);
- Collection of soil samples from eight hand auger holes (identified as HA14 to HA21) in Area D (see Figure 3):
- Drilling of 17 boreholes (identified as CBH9, CBH10, CBH12, CBH13 to CBH24, CBH65) in Area D with the aid of a truck mounted drilling rig; and
- Installation of groundwater wells into 5 of the boreholes (identified as CBH10/MW1, CBH11/MW2, CBH13/MW3, CBH14/MW4, CBH19/MW5) in Area D.

For the boreholes drilled using a truck mounted drill rig, Standard Penetration tests (SPT's) were undertaken at regular depth intervals to assess the engineering properties of the soils and to obtain samples. Disturbed auger samples were also obtained for laboratory testing purposes.

As part of the preliminary geotechnical investigation, coring of the bedrock was undertaken following the drilling, sampling and in-situ testing of the soil profile, in three of the boreholes. One of the geotechnical boreholes was located in Area B, with the other two located in Area D. The depth of the geotechnical boreholes ranged from 6m to 8.1m.

For the environmental assessment, the boreholes were generally taken 0.5m into natural soil or earlier V-bit refusal. Selected boreholes were extended to V-bit refusal to assess deeper subsurface condition and the presence of groundwater. These boreholes were also used in the geotechnical assessment. The depth of the environmental boreholes ranged from 0.1m to 6.5m.

The truck mounted drilling was undertaken between 25 October and 3 November 2004. The hand auger boreholes were drilled on 12 October 2004. The fieldwork was undertaken in the full time presence of a staff member from Coffey, who located the holes, nominated the sampling and testing and prepared field logs of the materials encountered. Ground surface levels at the test locations have been interpolated from survey data provided by NSW Department of Commerce.

Engineering borehole logs are included in Appendix A, along with Explanation Sheets defining the terms and symbols used in their preparation.

3.2 Stage 2 Investigation

The Stage 2 investigation was carried between 10 and 18 March 2005 and comprised the extension of four environmental borehole locations in Area B (refer to CBH76, CBH91, CBH94 and CBH122 on Figure 2) and





Drilling in soils was carried out using solid flight augers to the refusal depth of a tungsten carbide bit and then rock was cored using a triple tube core barrel.

Standard Penetration Tests were carried out at selected depth intervals as drilling progressed in soils for strength assessment and for obtaining samples for logging purposes.

Rock cores obtained from the borehole drilling were photographed and the photographs are with the borehole logs. Upon completion of the fieldwork the boreholes were backfilled with cuttings.

The field investigation was observed by a Coffey geotechnical engineer who located the boreholes by measuring from existing site features and logged the boreholes. Ground surface levels at the test locations have been interpolated from survey data provided by NSW Department of Commerce.

The engineering borehole logs of the boreholes are presented in Appendix A, along with Explanation Sheets defining the terms and symbols used in their preparation.

4. LABORATORY TESTING

Samples obtained during the Stage 1 investigation were taken to our NATA registered laboratory for testing. The following range of tests were undertaken:

- Soaked California bearing Ratio (CBR) 2 tests
- Soil chemistry agressivity (pH, sulphate and chloride) 2 tests
- Soil pre-planting assessment suite of tests 2 suites

The results or the laboratory testing are presented in Appendix C.

Representative rock core samples obtained during the borehole drilling in the Stage 2 Investigation were designated for Point Load Strength Index (PLI) testing for estimates of rock strength. The results of the PLI testing are presented in the borehole logs and in Appendix C.

5. OVERVIEW OF RELEVANT GEOTECHNICAL INFORMATION

Overview of the existing geotechnical investigation reports for Areas B and D that were prepared by others was carried out.

The relevant documents for Area B that were overviewed are as follows:

- Report dated 19 June 1987 on geotechnical investigation at Katingal area (Reference No: 5070JS);
- Report dated 25 August 1987 on further geotechnical investigations at the special purposes prison area (Reference No: 5212JS);
- Report dated January 1990 on geotechnical investigation at the industries building and warehouse area (Reference No: 89241);
- Report dated July 1986 on foundation investigation for Tower No. 10 (Reference No: L86016); and
- Report dated January 1981 on site investigation for Secure Oval (Reference No: 412 113).



- Report dated 19 June 1987 on geotechnical investigation at Katingal area (Reference No: 5070JS);
- Report dated March 1986 on site investigation for the entrance roads and car park (Reference No: SSI/9508):
- Report dated 19 December 1991 on geotechnical investigations for the stormwater drainage works (Reference No: 01-GG982A);
- Report dated February 2002 on geotechnical investigation for Halfway House (Reference No: 02-GH22A);
- Report dated June 1981 on supplementary foundation investigation for the ward and administration blocks (Reference No: 31181);
- Report dated October 1979 on foundation investigation for the ward and administration blocks (Reference No: 39241-1); and
- Report dated December 1979 on supplementary foundation investigation for the ward and administration blocks.

Relevant geotechnical information from the reports was used in the preparation of this report as supplementary data to the Stages 1 and 2 investigations. Our overview results are presented in Section 7. Boreholes from previous investigations, by other consultants, were referenced in preparation of this report and copies of the engineering logs are provided in Appendix B.

6. TASKS REQUESTED BY PROPONENTS

The contractors who are bidding for the construction works at Areas B and B (referred to as "Proponents") have requested a series of additional tasks to be carried out, as summarised below:

- Task 1. All environmental boreholes within the site boundary of the proposed Forensic Hospital to be assessed for geotechnical purposes as well.
- Task 2. A portion of samples to be analysed for PCBs in areas where TPH and PAHs have previously been found.
- Task 3. Provide recommendations on allowable bearing pressures of the soil layers above the bedrock and estimates of likely settlements.
- Task 4. Provide advice on depth and detail of engineered fill which may be used to bridge over filled ground and provide 100 kPa allowable bearing capacity for raft slabs / strip footings.
- Task 5. Provide CBR values in the areas of proposed roadways, together with recommendations on design parameters for rigid and flexible pavements.
- Task 6. Provide recommendations on design parameters for rigid and flexible retaining walls.
- Task 7. Provide recommendation on Earthquake Site Factor.
- Task 8. Provide recommendation on erosion potential soil parameters.
- Task 9. Carry out CBR tests at similar locations to those proposed for the boreholes and test pits over the whole site, including the site of the proposed Forensic Hospital.





7. RESULTS OF INVESTIGATION

7.1 Site Description

The site is located at Long Bay Correctional Complex, Malabar. Area B is located towards the south-eastern corner of the site. Area D is located near the south-western boundary of the site and includes the maximum security hospital and front of Long Bay Correctional Complex which faces Anzac Parade. These areas are identified in Figure 1.

The site generally slopes upwards towards the east, with Area D being the lowest lying part of the site. The level of the site at the site boundaries is typically consistent with the levels of surrounding land.

7.1.1 Area B

Area B is rectangular in shape with an area of approximately 2.6Ha. The main features of Area B at the time of the investigation are shown on Figure 2 and included:

- A workshop for maintenance of vehicles and plant in the centre of Area B.
- A plant nursery with a number of greenhouses in the south-eastern corner of Area B;
- A fenced area for the temporary storage of waste located between the maintenance stores and nursery;
- A number of concrete lined storage bays located towards the south-eastern corner of Area B for storage of dry material such as aggregate, sand, woodchip, bricks etc; and
- A number of other workshop / storage buildings.

7.1.2 Area D

Area D is irregular in shape with an area of approximately 7.9Ha. The main features of Area D at the time of the investigation are shown on Figure 3 and included:

- A playing field in the south eastern corner of Area D. This area is relatively flat and appears to be used as a soccer field;
- The Long Bay Correctional Centre Hospital, located to the north-west of the soccer field. The hospital
 comprises a number of hospital buildings, a paved recreation area and some landscaped areas. The
 area is surrounded by a wall; and
- The remainder of the Area D was vacant and grass covered. A vegetated fill stockpile is located to the immediate south-west of the hospital. The fill appeared to comprise soil and building rubble. A small pond is located to south-west of the stockpile. Some sandstone bedrock outcrops were observed near the pond.



7.2 Geological Setting

Reference to the Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1) 1983, indicates that the site is underlain by Botany Basin Quaternary deposits and then Triassic Period Hawkesbury Sandstone. The quaternary deposits are described as comprising medium to fine grained sand with podsols. The Hawkesbury Sandstone generally comprises fine to coarse grained quartzose sandstone deposited in 1m to 3m thick beds and lenses. There are two dykes orientated west-northwest to east-southeast in the area. Previous geotechnical investigations carried out by others have identified the presence of the dykes within the site area.

7.3 Subsurface Conditions

For details of the conditions encountered in the boreholes, reference should be made to the engineering logs. Areas B and D are not adjacent and encountered differing subsurface conditions and are therefore discussed separately in the following sections.

7.3.1 Area B

Seventeen boreholes were carried out during the Stage 1 investigation within Area B, while another four cored boreholes were drilled during the Stage 2 investigation. Another twelve boreholes, from previous investigations by other consultants were also located within the area. Figure 2 shows the locations of the geotechnical tests carried out by Coffey and others in Area B.

In summary, the boreholes encountered pavement materials, fill, dune deposits, and minor depths of residual soils over sandstone bedrock. A summary of the Area B subsurface strata units encountered is provided in Table 1.

The top of sandstone levels is highest in the north-eastern corner at approximately RL42m AHD. The rock levels fall in a southerly direction to approximately RL39m AHD over a length of about 110m. A sharper drop-off in the rock levels was observed in a south-easterly direction which falls from RL42m AHD to RL39m AHD over a length of about 70m and in a south-westerly direction over a length of 50m. Inferred top of sandstone contours based on the borehole data are shown on Figure 2A. However, it should be noted that the sandstone bedrock surface could possibly include cliffs and benches.

TABLE 1: SUMMARY OF AREA B SUBSURFACE STRATA UNITS

Strata Unit	Description	
Pavement Materials A flexible pavement with total thickness was encountered in CBH8. No parameterials were encountered in CBH25, CBH26, CBH32, CBH61 or CBH71. Of pavements 150mm to 200mm thick were encountered at the remaining locations.		
	Pavement was also observed at CBH76, CBH94 and CBH122. Ranges in thickness from 0.2m to 0.6m.	
Fill	Sand, coke, building rubble, sandstone rubble, and gravely sand. Ranges in thickness from 0m to 2.1m.	
Dune Deposits	Sand – fine to medium grained, loose to medium dense, becoming medium dense dense near the soil / rock interface. Ranges in thickness from 0m to 2.4m.	
Residual Soil	Silty clay – hard. Only encountered in two boreholes. Ranges in thickness from 0m to 1.5m.	

TABLE 1: SUMMARY OF AREA B SUBSURFACE STRATA UNITS (CONTINUED)

Strata Unit	Description
Bedrock	Sandstone was cored in CBH8, CBH76, CBH91, CBH94 and CBH122, and was inferred from V bit refusal in nine of the remaining sixteen current investigation boreholes. Encountered at depths ranging from 0.2m to 1.45m.
	The sandstone in CBH8 was low strength in the upper 1m and then high strength. The sandstone in the other cored boreholes (CBH76, CBH91, CBH94 and CBH122) was observed to be generally of medium strength with bands of low and high strength rock. In previous boreholes, the sandstone was highly to moderately weathered in the upper 0.4m to 2.5m of the strata unit.

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Our current investigation did not detect the presence of dykes on Area B; however, an igneous dyke was encountered during the previous site investigations carried out by other consultants at the special purposes prison area (refer to Report Reference No: 5212JS, dated 25 August 1987) and at Katingal Area (refer to Report Reference No: 5070S, dated 19 June 1987). The prison is located adjacent to Area B to the southwest and the Katingal area is located to the west. The dyke in the prison area was described to comprise medium to high plasticity, white clay, which extends to depths of up to 10.5m while the dyke in Katingal area was described to consist of medium plasticity, white to pale grey clay.

Groundwater was encountered within the boreholes during auger drilling at depths ranging from 0.8m to 2.4m below existing surface levels. The groundwater levels range from RL38.5 to RL41.5m AHD. Groundwater seepage was observed at RL38.9m AHD in CBH91.

7.3.2 Area D

Seventeen boreholes and eight hand auger holes were drilled within Area D during the Stage 1 investigation. Drilling of another five cored boreholes (refer to CBH99, CBH100, CBH105, CBH108 and CBH109 on Figure 3) was carried out during the Stage 2 investigation. Another eighty boreholes, from the previous investigations by other consultants were also located within the area. Figure 3 shows the locations of the geotechnical tests carried out by Coffey and others in Area D.

The results of the boreholes indicate the presence of an in-filled channel in the sandstone, commonly referred to as a Paleochannel. There are shallow depths to rock on either side of the Paleochannel with up to approximately 20m of fill, dune deposits and alluvium (along the southern area boundary) near the centre of the Paleochannel.

The sandstone levels range from approximately RL34m AHD away from the Paleochannel to approximately RL18m near the centre of the Paleochannel. Inferred top of sandstone contours are shown on Figure 3A.

A summary of the Area D subsurface strata units encountered is provided in Table 2.

TABLE 2: SUMMARY OF AREA D SUBSURFACE STRATA UNITS

Strata Unit	Description		
Fill	Clayey sand, building rubble, silty sand, sandstone rubble, ash, plastic, cloth, organics, grass, brick pats, furniture, sandstone boulders, concrete slabs, timber, bricks and metal pipes. Ranges in thickness from 0m to 7.5m.		
	Described in parts as being very loose, uncompacted and with many voids. The greatest depth of fill was encountered along the alignment of the Paleochannel, and deepened towards the south.		
	A layer of topsoil in the order of 0.1m thick was observed at CBH105 and CBH109.		
Dune Deposits	Sand – fine to medium grained, loose to medium dense. Noted as being very loose above the water table, in parts.		
	Contains some cemented sand layers, noted as being very dense, or described as "Waterloo rock", "Coffee rock" or Indurated Sand.		
	Ranges in thickness from 0m to 7.5m, with the greatest depths encountered along the Paleachannel alignment.		
Peat / Alluvium	Sand, silty sand, sandy clay and silty clay with organics. With a variable consistent ranging from soft to hard and very loose to medium dense.		
	With peat and clay layers.		
	Ranges in thickness from 0m to 7.5m.		
Residual Soil	Clay – stiff and very stiff, up to 3m thick. Only encountered at six locations in the current investigations and generally not differentiated from the alluvium on the previous investigation boreholes.		
Bedrock	Sandstone was exposed on the surface in parts and was as deep as 20m or so near the alignment of the Paleochannel and the southern area boundary. The thickness of extremely to highly weathered sandstone varied from 0m in parts where exposed on the surface to greater than 5.5m.		
	Medium to high strength, moderately weathered sandstone was noted in some of the cored boreholes below the upper extremely to highly weathered sandstone. High fractured to fragmented sandstone was observed in CBH99. Observations of the cores obtained from the Stage 2 investigation indicate that the strength of the sandstone is variable between the cored boreholes.		
	Weaker and more fractured rock was observed in CBH99 and CBH105 within the Paleochannel while stronger rock was observed in the remaining cored boreholes.		

The current geotechnical investigations carried out by Coffey and the previous investigations by others have not detected any intrusion rock in Area D; however, this does not preclude the presence of dykes on the site area.

Groundwater within the boreholes during auger drilling in the current boreholes at depths ranging from 2.0m to 3.6m below existing surface levels, where encountered. The groundwater levels range from RL28.9m AHD to RL33.8m AHD. Groundwater seepage was observed at depths ranging from RL30m AHD in CBH99 to





RL31.7m AHD in CBH100.

8. LABORATORY TEST RESULTS

For details of the laboratory test results, reference should be made to the test results certificates provided in Appendix C. The results, excluding the pre-planting assessment are summarised in Table 3.

TABLE 3: SUMMARY OF LABORATORY TEST RESULTS

Borehole	Depth (m)	Sample Description	FMC (%)	SOMC (%)	SMDD (Vm³)	CBR (%)	Hd	Sulphate (% H2O Sol)	Chloride
CBH8	0.6-1.6	(SP) Sand	5.6	11.0	1.81	20	-	-	-
СВН9	0.6-1.8	(SP) Sand	9.7	13.3	1.71	20	-	-	-
CBH8	1.0	(SP) Sand	-	-	-	-	5.5	0.002	0.001
СВН9	1.0	(SP) Sand	-	-	-	-	7.3	0.002	0.002

Note:

FMC Field Moisture Content
SOMC Optimum Moisture Content
SMDD Standard Maximum Dry Density

CBR California Bearing Ratio - 4 day soaked, 100%SMDD, SOMC, 4.5kg surcharge

pH Acididity

The pH results indicate that the soils are near neutral to slightly acidic. The sulphate and chloride test results indicate that the soil conditions are mild to non-aggressive to steel and concrete piles.

The results of the pre-planting assessment together with a summary and recommendations are provided on the report sheets by Sydney Environmental and Soil Laboratory, also included in Appendix C.

9. DISCUSSION AND RECOMMENDATIONS

9.1 Geological Model for Area B

Based on the results of the current preliminary investigation and the available boreholes from previous investigations, the geological model for Area B is presented in Table 4.

TABLE 4: GEOLOGICAL MODEL FOR AREA B

Strata Unit		Description	Approximate Unit Thickness (m)	Depth to Base of Unit (m)
1	. Fill	Sand and rubble fill.	0 to 2.5	0 to 2.5
2	. Dune Deposits	Sand – fine to medium grained, loose to medium dense, possible very loose and dense layers.	0 to 2.4	0 to 3





TABLE 4: GEOLOGICAL MODEL FOR AREA B (CONTINUED)

Strata Unit		ta Unit Description		Depth to Base of Unit (m)	
3.	Residual Soil	Clay – hard. Located in isolated pockets.	0 to 3	3.5	
4.	Bedrock	Sandstone – variable degree of weathering and generally can be divided into two sub-units: • Unit 4A – Low to Medium Strength, Highly to Moderately Weathered, Highly Fractured Sandstone (Class IV Sandstone*)	-	Drilled to depths of up to 6m	
		 Unit 4B - Medium to High Strength, Moderately to Slightly Weathered, Slightly Fractured Sandstone (Class III Sandstone*) 			



Note:

* Rock class assessed in accordance with Pells et all (1998) "Foundations on Sandstone and Shale in the Sydney Region" Aust. Geomech. Jnl. Dec 1998.

Groundwater level – at or near the soil / rock interface but subject to fluctuations in response to seasonal effects and periods of wet weather.

9.2 Geological Model for Area D

Based on the results of the current preliminary investigation and the available boreholes from previous investigations, the geological model for Area D is dominated by the presence of an in-filled Paleochannel.

During the formation of the Paleochannel, there may have been a series of water falls along the alignment and the sides of the Paleochannel could have been steep, with a series of ledges, overhangs and detached boulders. Coarse sand, cobbles and boulders may be expected at the base of former water falls. With a rise of water levels the water in the lower sections of the gorge would stagnate and vegetation would form and be deposited to form peat layers. Alluvium would also be deposited. Subsequently, wind blown dune deposits, which are present on the site, would have also been deposited over the peat and alluvial layers, further infilling the Paleochannel. Finally, building rubble and general fill would have been placed to complete the filling of the Paleochannel and to provide a near level surface.

The geological model for Area D is provided in Table 5.

TABLE 5: GEOLOGICAL MODEL FOR AREA D

Strata Unit		Description	Approximate Unit Thickness (m)	Depth to Base of Unit (m)
1. F	Fill	Uncontrolled sand, building rubble and domestic waste. The greatest thickness would be expected along the alignment of the Paleochannel, which is shown on Figure 3A. Expected to be poorly compacted and highly variable in composition.	0 to 7.5	0 to 7.5

TABLE 5: GEOLOGICAL MODEL FOR AREA D (CONTINUED)

Strata Unit		trata Unit Description		Depth to Base of Unit (m)
2.	Dune Deposits	Sand – fine to medium grained, loose to medium dense, possible very loose and dense layers.	0 to 7.5	0 to 12
3.	Peat / Alluvium	Sand, silty sand, sandy clay and silty clay with organics. With a variable consistency ranging from soft to hard and very loose to medium dense. With peat and clay layers.	0 to 7.5	Up to >20
4.	Residual Soil	Clay – stiff and very stiff.	0 to 0.9	Up to >20
5.	Bedrock	Sandstone – variable degree of weathering and strength and can be divided into three sub-units: • Unit 5A – Very Low to Low Strength, Highly Weathered, Fragmented to Highly Fractured Sandstone (Class V Sandstone*) • Unit 5B – Low to Medium Strength, Moderately Weathered, Highly Fractured Sandstone (Class IV Sandstone*) • Unit 5C – Medium to High Strength, Moderately to Slightly Weathered, Slightly Fractured Sandstone (Class III Sandstone*)		Drilled to depths of up to 15.1m



^{*} Rock class assessed in accordance with Pells et all (1998) "Foundations on Sandstone and Shale in the Sydney Region" Aust. Geomech. Jnl. Dec 1998.

Perched groundwater may be expected at or near the soil rock interface. The Paleochannel could act as a local drainage line and may be expected to fluctuate in response to seasonal effects and periods of wet weather. Within the Paleochannel water may be expected within 3m of the current ground surface.

9.3 Proposed Development

At the time of the investigation and preparation of this report, the final details and position of the developments were not known and hence preliminary comments are provided herein.

9.4 Earthworks

Recommendations related to treatment of existing fill provided in this section would not apply if a piled foundation were selected.

The fill and residual soil should be able to be excavated using hydraulic excavators and tracked loaders. Large hydraulic excavators with the assistance with rock breakers will be required to excavate the sandstone. If vibration sensitive structures are within close proximity to the excavations it may be necessary to restrict the use of rock breakers, or use rock saws or milling heads to limit vibrations.





The Proponents have requested that advice on depth and detail of engineered fill, which may be used to bridge over filled ground and is capable of supporting an allowable bearing pressure of 100kPa for shallow footings or rafts (refer to Task 4). Our response to this request is provided in the paragraph below. Should raft slabs / strip footings not be adopted then the recommendation provided below is not applicable. Furthermore, if the required bearing pressure is less than 100kPa then the thickness of compacted fill may be less than 2m.

Due to the variability and uncontrolled nature of the existing filling on the site, should shallow footings or rafts are considered, it is recommended that the fill below the proposed buildings in Area B be removed since the fill extends to relatively shallow depths. Fill, loose sediments and alluvium extend to considerable depth within the Paleochannel in Area D. It is not considered feasible to remove the entire fill from all locations. A compacted fill layer not less than 2m thick could be formed to bridge over filled ground in areas where fill exists at depth to support pavements and floor slabs. It may be difficult to compact the lower layers of fill, although we anticipate that these layers would eventually form a bridging layer, which would enable the placement and compaction of the subsequent fill layers in accordance with an engineering specification. The compaction specification should be met after placing not more than 0.5m thickness of fill. If excessive heaving occurs, a tensile geofabric may be required prior to placing the bridging material. In Area D, where present in shallow depths, the fill should be excavated and re-compacted or replaced.

The fill materials in Area B may generally be suitable for re-use as structural fill although unsuitable materials such as organics and oversize materials would require separation and removal prior to reuse. The use of Area B fill materials will also depend on its environmental classification.

The fill materials in Area D appear to contain a high proportion of unsuitable and oversize materials, which would require separation and removal prior to reuse. It is recommended that reference be made to the individual logs in areas where reuse of the fill is being considered. The use of Area D fill materials will also depend on its contamination classification.

Where natural soils are proposed to be exposed, subgrade preparation of natural soils for foundation or pavement construction should include the following:

- Strip all fill and stockpile suitable materials for re-use, if required. Proof roll the exposed surface of
 natural material. Excavate localised soft spots and replace with suitable fill, compacted to a
 minimum dry density ratio of 98% Standard Compaction at a moisture content within ± 2% of
 Standard Optimum Moisture Content. If fill with low fines (< 5% silt and clay) is used it should be
 compacted to a minimum Density Index of 70%.
- Compact the exposed subgrade soils to a minimum dry density ratio of 98% Standard Compaction (or 70% Density Index).

In areas where fill is intended to be left in place (because removal of the fill is either not practicable or not desired by the proponent), other options could be considered such as partial removal of fill and replacement with compacted fill, modification of the in-situ soil or piled foundations. For the non-piling options consideration would need to be given to likely differential settlement.

Any new filling should be placed in layers (not exceeding 300 mm loose thickness) and compacted to a minimum dry density ratio of 98% Standard Compaction at a moisture content within $\pm~2\%$ of Optimum Moisture Content or 70% Density Index for low fines material.

9.5 Dewatering

Groundwater levels were observed in Area B at depths ranging from 0.8m to 2.4m below the existing site

grade while relatively deeper groundwater levels at depths ranging from 2m to 3.6m were observed in Area D. It is not known whether the proposed developments will involve any basement excavations. Dewatering may be able to be achieved using excavated sumps; however, the saturated sands may prove to be unstable and in relatively deep excavations, it may be necessary to use spears points instead of sumps and submersible pumps.

9.6 Slope Stability Issues

Permanent batter slope angles within controlled filling or natural sands should be no steeper than 2H:1V for batter heights up to 3m. Fill batters should be overfilled and trimmed back to profile. Soil batters should be vegetated (or covered by shotcrete, stone pitching or similar) to reduce the risk of erosion. Sandstone batters could be cut near vertical but should be inspected by a suitably qualified engineer to assess whether flatter angles or support measures such as shotcrete or rock bolts are required.

9.7 Retaining Walls

In Task 6, the Proponents have requested that recommendations on design parameters for rigid and flexible retaining walls be provided. Where retaining walls are required to be constructed, the structures could be designed assuming the preliminary geotechnical design parameters provided in Table 6.

TABLE 6: PRELIMINARY GEOTECHNICAL DESIGN PARAMETERS FOR RETAINING STRUCTURES

Strata Unit	Unit Weight, γ (kN/m3)	Effective Cohesion, c' (kPa)	Friction Angle, φ' (degrees)	Elastic Modulus, E' (MPa)	Poisson's Ratio, v	Active Earth Pressure Coefficient, Ka ¹	'At Rest' Earth Pressure Coefficient ² , Ko
Compacted Fill and Residual Soils	20	0	32	20	0.35	0.3	0.5
Class V Sandstone*	22	30	35	100	0.3	0.27	0.5
Class IV Sandstone*	22	200	35	1,000	0.3	0.27 ³	_ 3
Class III Sandstone*	24	500	35	4,000	0.2	0.27 ³	_ 3

Note:

- * Rock class assessed in accordance with Pells et all (1998) "Foundations on Sandstone and Shale in the Sydney Region" Aust. Geomech. Jnl. Dec 1998.
- 1. Assume no wall friction.
- 2. Values provided assume a lateral movement of the wall of about 0.2% of the wall height is allowed to occur.
- Values for better quality rock unit are dependent on the global effects of defects. Variability also occurs due to the in-situ stress environment and geometry of the excavation. For design parameters use should be made of the cohesion and friction angle parameters.





9.8 Foundations

9.8.1 Shallow Footings and Rafts

Our comments provided below serve as responses to Task 3 that was requested by the Proponents.

It is understood that the existing fill has not been placed in a controlled manner. Therefore, we consider that the fill will not be suitable as a bearing stratum to support the proposed building loads.

For lightly loaded structures, it may be possible to adopt shallow footings or a raft. However, with such foundations there is a greater potential for differential settlements, compared to rock foundations, which would require careful detailing of joints. To reduce the risk of adverse impacts from differential settlement it may be possible to adopt measures such as over-excavating the rock to a minimum of 0.6m below the footing level and replacing with compacted fill won from excavated sand or sandstone.

Shallow footings or edge and internal beams of a raft bearing on natural soils that are at least medium dense or compacted fill could be designed assuming an allowable bearing pressure of:

60B + 80D (kPa)

Where:

- B is the footing width in metres and the minimum footing width is 0.4m
- D is the depth of embedment in metres and the minimum embedment is 0.3m.

An elastic modulus of 20MPa should be assumed for estimates of settlements in medium dense sand or compacted fill and a lower elastic modulus of 5MPa should be adopted for very loose to loose sand.

9.8.2 Footings to Rock

In areas of shallow sandstone, strip and pad footings or bored piles should be suitable to support structural loads. Open bored piles should be feasible, however, cohesionless sands could be encountered and/or seepage could occur and provision for measures such as temporary liners, dewatering and cleaning of open bored piers will be required. Alternatively, continuous flight auger (CFA) piles or driven piles could be adopted, which do not require cleaning and dewatering.

Within the vicinity of the Paleochannel in Area D, where compressible alluvium occurs at depth and/or uncontrolled fill is left in-situ, it is recommended that all floor slabs be suspended and that all loads be taken to the sandstone bedrock using either driven or CFA piles. Note that the depths to rock may be highly variable and possibly in excess of 20m in places. Consideration may be given to relocation of buildings proposed over the Paleochannel, particularly the deeper sections. Where piling foundation is not preferred then other options could be considered such as complete or partial removal of fill and replacement with compacted fill or modification of the in-situ soil. However, for the non-piling options consideration will need to be given to likely differential settlement.

Table 7 presents parameters for the preliminary design of footings bearing on controlled fill, residual soil and sandstone. Note that the parameters for controlled fill are applicable only when all underlying fill is first removed. If a shallow foundation system is to be adopted within variable foundation strata, consideration will need to be given to likely differential settlement. As a guide to likely settlements it could be assumed that footings founding in sands or fill (and not underlain by highly compressible soils), with a working load of 100kPa, will settle approximately 1% of the minimum footing dimension (eg approximately 10mm for a 1m wide footing) while footing founding on sandstone with working load of 100kPa would have negligible settlement.



TABLE 7: PRELIMINARY ALLOWABLE FOOTING DESIGN PARAMETERS

Geotechnical Unit	Rock Class	Allowable End Bearing Pressure (kPa) (1)	Allowable Shaft Adhesion (kPa) (2)	
Controlled Filling, Residual Sands	-	100	Nil	
Sandstone	Class V	1,000	100	
	Class IV	2,000	150	
	Class III	3,500	350	



- (1) Allowable bearing pressures assume a minimum embedment of 0.3m into the relevant material. The recommended end bearing pressures should result in settlement of <1% of minimum footing dimension.
- (2) Shaft adhesion should only be assigned where piles are socketed at least 3 diameters into rock.

Where footings are designed to bear directly onto bedrock, the footing inspection and assessment requirements are provided in Table 8. Where the serviceability end-bearing pressure is greater than 2MPa, footing assessment should also include spoon testing (or cored boreholes) to assess whether defects below the base of the footing are within tolerable limits for the respective rock class.

TABLE 8: FOOTING INSPECTION AND ASSESSMENT REQUIREMENTS

Rock Unit	Testing Requirements
Class V and Class IV Sandstone	Visual inspection of pad footings
Class III Sandstone with serviceability bearing	Observation of piling and correlation with borehole
pressures up to 2MPa	information
Class III Sandstone with serviceability bearing	Visual inspection; and
pressures greater than 2MPa	 Initial allowance for spoon testing 1/3 of all pad footings or coring of pier locations.
	May be reduced if consistent conditions are exposed in
	early testing or if rock below founding levels can be
	inspected in lift shaft excavations.

9.9 Aggression to Concrete and Steel

The results of the chemical testing on the samples from 1.0m depth in CBH8 and CBH9 and reference to Tables 6.1 and 6.3 of the Australian Standard AS 2159-1995 "Piling – Design and Installation" indicates the samples tested can be considered mild to non-aggressive to concrete and steel.

9.10 Pavements

This section serves to provide responses to Tasks 5 and 9 that were requested by the Proponents.

A subgrade CBR of 14% was recommended by others where the sands observed in the industries building and warehouse area forms the pavement subgrade (refer to Report Reference No: 89241, dated January 1990). The sands were described as fine to medium grained, brown to grey brown sand, classified as "SP" under the Unified Soil Classification System. An estimated CBR of 14% was provided for fine grained sands observed in the ward and administration blocks (refer to Report Reference No: 39241-1 dated October 1979), compacted to 100% Standard Maximum Dry Density Ratio (SMDD).

As part of the Stage 2 investigation, two sand samples from CBH8 in Area B and CBH9 in Area D were tested





for compaction and CBR. The sands observed in CBH8 and CBH9 were of fine to medium grained and grey brown in colour, containing minor low plasticity fines, also classified as "SP" under the USCS. The test results indicated that the sands have a soaked CBR value of 20%.

Our visual assessment of the available soil samples obtained from the Stages 1 and 2 investigations indicates that the natural sands are variable in nature. Variable particle sizes, colour and proportion of fines were observed in the sands. Due to the variability in the grain size and fines content in the sands, we would expect that the CBR of the sands to be variable. On the basis of our observations of the sand samples the available laboratory test results, we estimate that the CBR would range from 10% to 20%. Provided earthworks are undertaken as indicated in Sectio 9.4 of this report, pavements could be designed assuming a CBR value of 10%, subject to confirmation by a geotechnical engineer during construction.

9.11 Earthquake Loading Factors

This section is to respond to Task 7 that was requested by the Proponents.

Australian Standard AS 1170.4-1993, Minimum Design Loads on Structures - Part 4: Earthquake Loads, indicates the site lies within a region with a combined acceleration coefficient and site factor (aS) of 0.08.

9.12 Soil Dispersion Potential

For assessment of soil dispersion potential, six disturbed samples from Area B and seven disturbed samples from Area D has been designated for Emerson Class Number testing. At the time of reporting, the testing is currently underway. An addendum letter will be issued to address Task 8 regarding soil dispersion potential.

9.13 Soil Pre-planting Assessment

For details of the results and recommendations for soil planting reference should be made to the soil preplanting assessment results by Sydney Environmental and Soil Laboratory, which are provided in Appendix C. In summary the soils are suitable for planting provided treatment and additives as recommended on the test results sheets are followed.

10. LIMITATIONS AND FURTHER INVESTIGATION

The recommendations presented in this report are based on limited subsurface investigations. Ground conditions can change over relatively short distances and additional geotechnical advice may be required during construction to assess whether conditions are consistent with design assumptions. Coffey would be pleased to provide additional advice and construction stage services, if required.

The attached document entitled "Important Information about your Coffey Report" provides additional information on the uses and limitations of this report.

This report provides the results of a preliminary geotechnical investigation, which has been undertaken prior to the development location and details being finalised. Review of this report and further investigation is recommended once the final development details are known.





Complex subsurface geological conditions are present in Area D, related to the presence of a Paleochannel. Further investigation may be required depending on the proposed development, to assess piling conditions for driven or CFA piles, the quality of the sandstone, which is indicated to be highly variably, and to more accurately define the top of rock. Recommended additional investigation may include drilling and coring of the bedrock under proposed buildings, geophysical traverse lines to obtain continuous bedrock profiles along selected section lines.



Coffey

For and on behalf of COFFEY GEOSCIENCES PTY LTD

MULIADI MERRY

Senior Geotechnical Engineer

Information

Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by

earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffev cannot be held responsible misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.





Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

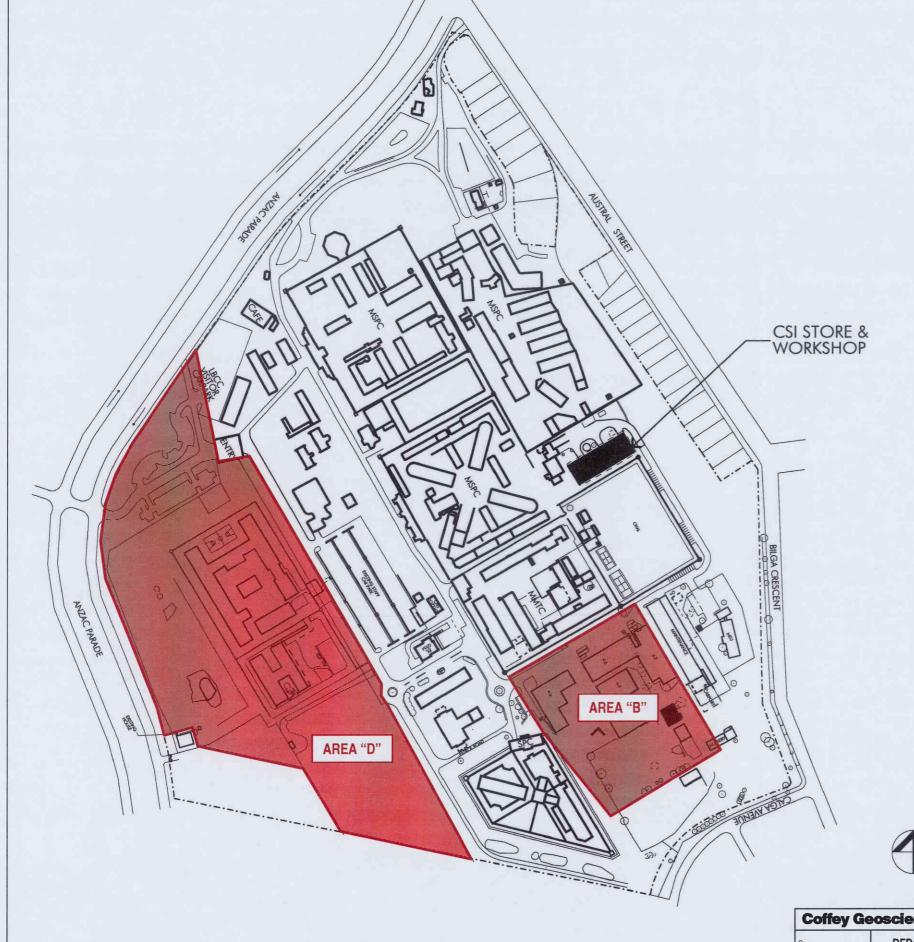
Rely on Coffey for additional assistance

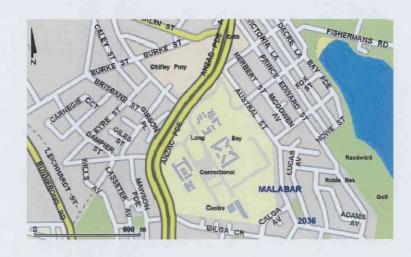
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design toward construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts. reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical Information in Construction Contracts" published by the Institution of Engineers Australia, National Headquarters, Canberra, 1987.





LOCATION PLAN

1:4000

Coffey Geosciences Pty Ltd ACN 056 335 516 Geotechnical | Resources | Environmental | Technical | Project Management NSW DEPARTMENT OF COMMERCE DFD/SW PRELIMINARY GEOTECHNICAL INVESTIGATION

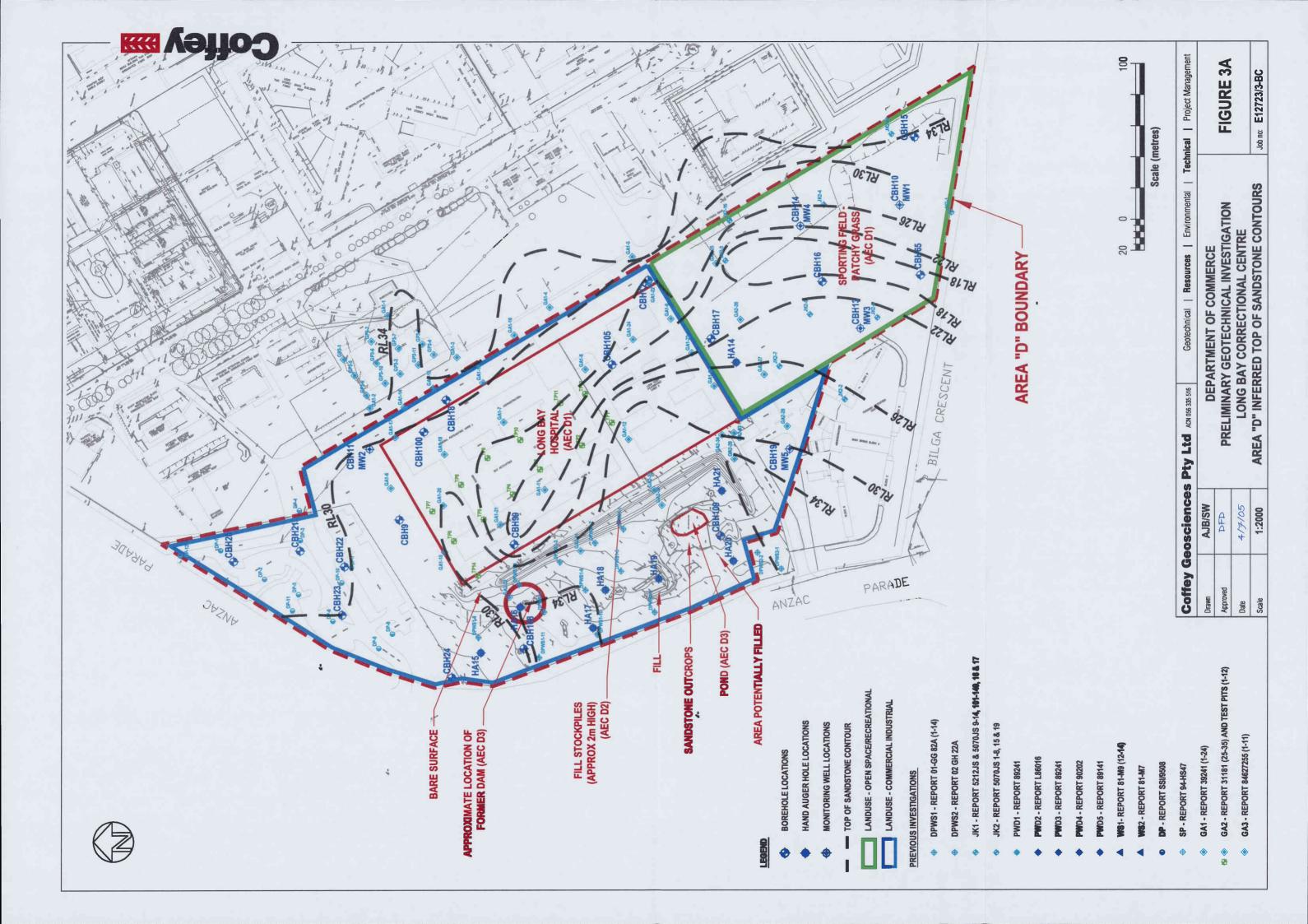
DFD Approved LONG BAY CORRECTIONAL CENTRE 4/7/05

SITE PLAN

FIGURE 1

Job no: **E12723/3-BC**





APPENDIX A

ENGINEERING LOGS – AREA B



Soil Description

Explanation Sheet



DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil.

Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (USC) as shown in the table on the following page.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200mm
Cobbles		63mm to 200mm
Gravel	coarse	20mm to 63mm
	medium	6mm to 20mm
	fine	2.36mm to 6mm
Sand	coarse	600μm to 2.36mm
	medium	200µm to 600µm
	fine	75μm to 200μm

MOISTURE CONDITION

No. GEO5.7, Issue 3, Rev.2.

Dry	Looks and feels dry. Cohesive and cemented soils
-	are hard, friable or powdery. Uncemented
	granular soils run freely through hands.

Soil feels cool and darkened in colour. Cohesive Moist soils can be moulded. Granular soils tend to

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

	UNDRAINED				
TERM	STRENGTH	FIELD GUIDE			
	su (kPa)				
Very Soft	<12	A finger can be pushed well into the soil with little effort.			
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.			
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.			
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.			
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.			
Hard	>200	The surface of the soil can be marked only with the thumbnail.			
Friable	-	Crumbles or powders when scraped by thumb nail.			

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)		
Very Loose	Less than 15		
Loose	15 - 35		
Medium Dense	35 - 65		
Dense	65 - 85		
Very Dense	Greater than 85		

MINOR COMPONENTS

TERM	TERM ASSESSMENT GUIDE		PROPORTION OF MINOR COMPONENT IN:		
		Coarse grained	Fine grained		
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	<5%	<15%		
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	5% - 12%	15% - 30%		

SOIL STRUCTURE -

	ZONING	CEMENTING		
Layers	Continuous across exposure or sample	Weakly cemented	Easily broken up by hand in air or water	
Lenses	Discontinuous layers of lenticular shape	Moderately cemented	Effort is required to break up the soil by hand in air or water	
Pockets	Irregular inclusions of differential material			

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely	Structure and fabric of parent rock visible
weathered material	

Structure and fabric of parent rock not Residual soil

TRANSPORTED SOILS

Aeolian soil	Deposited by wind

Alluvial soil Deposited by stream and rivers

Colluvial soil Deposited on slopes (transported downslope

by gravity)

Man made deposit. Fill may be significantly

more variable between tested locations

than naturally occurring soils.

Lacustrine soil Deposited by lakes

Deposited in ocean basins, bays, beaches Marine soil

and estuaries

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

	/5	Evaluding part		ATION PROCEDURES	ortimated mass)	USC	PRIMARY NAME			
	(1	excluding part	ticles larger than 60mm	and basing fractions on	estimated mass)	-				
rger	coarse r than	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.		GW	GRAVEL				
n is la		GRAVELS Nore than half of coarse fraction is larger than 2.0mm	CLI GRA (Littl no f	Predominantly one size more intermediate size	e or a range of sizes with es missing.	GP	GRAVEL			
LS n 63mr	d eye)	GRAVELS tan half of on is large 2.0mm	ELS INES able t of	Non-plastic fines (for it ML below)	dentification procedures see	GM	SILTY GRAVEL			
COARSE GRAINED SOILS More than 50% of material less than 63mm is larger than 0.075mm	(A 0.075mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of fraction is larger 2.0mm	GRAVELS WITH FINES (Appreciable amount of fines)	Plastic fines (for identi below).	ification procedures see CL	GC	CLAYEY GRAVEL			
RSE GR nateria than 0.	sible to	parse than	CLEAN SANDS (Little or no fines)	Wide range in grain siz all intermediate sizes i	es and substantial amounts of missing.	SW	SAND			
COA	icle vi <u>s</u>	DS If of contraction	CLL SAI (Litt	Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	SAND			
than 5	t parti	SANDS nan half o nn is small 2.0mm	Non-plastic fines (for identification procedures see ML below).		SM	SILTY SAND				
More	More than 50% of mater than 50% of mater than smallest particle visible a SANDS More than half of coarse fraction is smaller than 2.0mm		SANDS WITH FINES (Appreciable amount of fines)	Plastic fines (for identification procedures see CL below).		SC	CLAYEY SAND			
	ţ		IDENTIFIC	ATION PROCEDURES ON I	FRACTIONS <0.2mm					
_	out		DRY STRENGTH	DILATANCY	TOUGHNESS					
FINE GRAINED SOILS More than 50% of material less than 63mm is smaller than 0.075mm	le is ab	SILTS AND CLAYS Liquid limit less than 50	None to Low	Quick to slow	None	ML	SILT			
SOILS terial l	63mm is smaller than 0.075mm (A 0.075mm particle is al	particl	particl	partic	rS AND CL uid limit l than 50	Medium to high	None	Medium	CL	CLAY
RAINED of mai	75mm	SILT	Low to medium	Slow to very slow	Low	OL	ORGANIC SILT			
FINE GRAINED SOILS an 50% of material lo is smaller than 0.0	(A 0.0	CLAYS limit than 50	Low to medium	Slow to none	Low to medium	МН	SILT			
ore tha	SILTS & CLAYS Liquid limit greater than 50	High	None	High	СН	CLAY				
¥		SILT Lic great	Medium to high	None	Low to medium	ОН	ORGANIC CLAY			
HIGHLY O	RGANI	C SOILS	Readily identified by texture	colour, odour, spongy fe	eel and frequently by fibrous	Pt	PEAT			
Low pla	sticity	- Liquid Limi	t W _L less than 35%. Me	dium plasticity - W_L betw	veen 35% and 50%.					

COMMON DEFECTS IN SOIL

	TERM	DEFINITION	DIAGRAM
	PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
	ТИІОС	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2m in length	
e 3. Kev.z.	SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
FOILING, GEOS./. ISSUE 3. REV.Z	SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.	

TERM	DEFINITION	DIAGRAM
SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter.	
TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planer to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

Rock Description

Explanation Sheet

AS1726-1993 - The descriptive terms used by Coffey are given below. They are broadly consistent with Australian Standard AS1726-1993

DEFINITIONS:

Rock substance, defect and mass are defined as follows:

Defect Mass

Effectively homogeneous material, may be isotropic or anisotropic Discontinuity or break in the continuity of a substance or substances

Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or

more substances with one or more defects.

In engineering terms rock substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or in water. Other material is described using soil descriptive terms.

SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME -Simple rock names are used rather than precise

geological classification

PARTICLE SIZE -

Grain size terms for sandstone are:

Coarse grained Medium grained Fine grained

0.6mm to 2mm

0.2mm to 0.6mm 0.6mm (just visible) to 0.2mm

FARRIC -

Terms for layering or penetrative fabric (eg.

bedding, cleavage) are:

No layering or penetrative fabric Poorly developed Layering or fabric just visible. Little effect on

properties.

Well developed

Layering or fabric distinct. Rock breaks more

easily parallel to layering or fabic

0.1 to 0.3

Easily scored with a knife;

CLASSIFICATION OF WEATHERING PRODUCTS Abbreviation Definition

Residual Soil RS Soil derived from the weathering of rock; the mass structure and substance fabric

are no longer evident; there is a large change in volume but the soil has not

been significantly transported.

XW Extremely Weathered

Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded, in

water. Fabric of original rock still visible

Distinctly Weathered nw

Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or

may be decreased due to deposition of

weathering products in pores

SW Slightly Weathered

Rock is slightly discoloured but shows little or no change of strength from fresh

Fresh FR

Rock shows no sign of decomposition or

Note: Where physical and chemical changes were caused by hot gases and liquids associated with igneous rocks the terms slightly altered (SA), distinctly altered (DA) and extremely altered (XA) may be used.

ROCK SUBSTANCE STRENGTH TERMS Term Abbreviation Point Load

Index, I_S50 (MPa)

Field Guide to Strength

Very Low ٧L Less than 0.1 Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger

pressure.

indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.

Medium 0.3 to 1

Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.

Hiah 1 to 3

A piece of core 150mm long by 50mm diameter can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under

hammer

Very High VH

3 to 10

Hand specimen breaks with pick after more than one blow; rock rings under hammer.

Extremely EH More than 10

High

Specimen requires many blows with geological pick to break through intact material; rock

rings under hammer.

Notes:

- In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy.
- The term extremely low is not used as a rock substance strength term. The term is used in AS1726-1993 but the field guide to
- strength makes it clear that it is a soil in engineering terms. The unconfined compressive strength to isotropic rocks and anisotropic rocks which do not fail parallel to the planar anisotropy is typically 10 to 25 times the point load index. The ratio may vary for different rock types and lower strength rocks often have lower ratios than higher strength rocks.





Rock Description Explanation Sheet

COMMON D	DEFECTS IN ROCK MASS	SES			ge	ological terms.
Term	Definition	Diagram	Мар	Graphic	DEFECT SH	HAPE TERMS
Double	A	-	Symbol	Log (Note 1)	Planar	The defect does not vary in orientation
Parting	A surface or crack across which the rock has little or no tensile strength.				Curved	The defect has a gradual change in orientation
	Parallel or sub parallel to layering (eg bedding) or a		20 Beddin	9	Undulating	The defect has a wavy surface
	planar anisotropy in the rock substance (eg, cleavage). May be open		Cleavag	ge (Note 2)	Stepped	The defect has one or more well defined steps
Latina	or closed.				Irregular	The defect has many sharp changes in orientation
Joint	A surface or crack across which the rock has little or no tensile strength but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance. May be open or closed.		60	(Note 2)		nt of defect shape is partly the scale of observation.
Sheared	Zone of rock substance				ROUGHNESS TERMS	
Zone (Note 3)	with roughly parallel near planar, curved or undulating boundaries				Slickensided	Grooved or striated surface; usually polished
	cut by closely spaced	33.7			Polished	Shiny smooth surface
	joints, sheared surfaces or other defects. Some of the defects are usually		35		Smooth	Smooth to touch; few or no surface irregularities
	curved and intersect to divide the mass into lenticular or wedge shaped blocks.			[.5]	Rough	Many small surfaxce irregularities (amplitude generally less than 1mm); feels like fine to coarse sand paper
Sheared Surface Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.		40	3000	Very rough	Many large surface irregularities (amplitude generally more than 1mm); feels like, or coarser than, very coarse
Crushed Seam (Note 3)	Seam with roughly parallel almost planar boundaries, composed of disoriented, usually angular fragments of the host rock substance which may be more weathered than the host		50		COATING T	sand paper
	rock. The seam has soil			12 1	Clean	No visible coating
	properties.				Stained	No visible coating but surfaces are discoloured
Infilled Seam	Seam of soil substance usually with distinct roughly parallel bounda- ries formed by the	/:			Veneer	A visible coating of soil or mineral too thin to measure; may be patchy
	migration of soil into an open cavity or joint. Infilled seams less than 1mm thick may be described as veneer or coating on joint surface.		65		Coating	A visible coating up to 1mm thick. Thicker soil material is described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein
Extremely Weathered Seam	Seam of soil substance, often with gradational boundaries. Formed by weathering of the rock substance in places.		32		BI OCK SH	·

Notes on defects:

Borehole logs show the true dip of defects and face sketches and sections the apparent dip.

substance in places.

- Partings and joints are not usually shown on the graphic log unless considered significant.
- Sheared zones, sheared surfaces and crushed seams are faults in

BLOCK SHAPE TERMS

Blocky Approximately equidimensional

Thickness much less than Tabular

length or width

Columnar Height much greater than cross section

20257 / 07-01

Borehole No.

Sheet

CBH8

1 of 2

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by:

Office Job No.:

Date started:

25.10.2004 AD/SG

DOD

E12723/03

25.10.2004

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

V bit

ADI

*bit shown by suffix

TC bit

on date shown

water inflow

water outflow

Bs

refusal

Checked by:

R.L. Surface: 41.9 drill model and mounting: P160 Truck Easting: Northing bearing: AHD 100 mm hole diameter: drilling information material substance pocket penetro meter consistency/ density index penetration classification symbol notes material structure and moisture condition samples additional observations graphic suppor tests, etc soil type: plasticity or particle characteristics, depth metres 5888 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS D ᇤ SANDY GRAVEL: Fine to medium grained, dark D grey brown, fine to medium grained sand. AEOLIAN SANDS OR BEACH SAND: Fine to medium grained, pale grey brown, MD DEPOSIT low plasticity clay (<5%). 41 1 From 1-1.2m environmental SPT 5.5.5 N*=10 SAND: Fine to medium grained, dark grey brown, low plasticity clay (<5%). _40 2 D D SAND: Fine to medium grained, dark brown, low W D SP SPI From 2.5-2.7m environmental plasticity clay (<5%). sample. 15.25. N*=R 3 SANDSTONE V-bit refusal at 3m on sandstone.
Borehole CBH8 continued as cored hole D 38 4 _37 5 COFFEY.GDT 01.12.04 36 6 E12723.3.GPJ 35 7 BOREHOLE classification symbols and consistency/density index notes, samples, tests soil description N nil undisturbed sample 50mm diameter vs very soft AS auger screwing M mud based on unified classification undisturbed sample 63mm diameter C casing AD auger drilling Ues system RR penetration disturbed sample firm St standard penetration test (SPT) stiff W washbore Ν moisture VSt very stiff SPT - sample recovered N СТ cable tool SPT with solid cone hard HA hand auger DT vane shear (kPa) М moist Fb friable diatube pressuremeter W ٧L very loose В blank bit wet 10/1/98 water level plastic limit loose bulk sample Wp

liquid limit

MD

VD

medium dense

very dense

dense



Borehole No.

Sheet

CBH8

Engineering Log - Cored Borehole

Office Job No.:

E12723/03

NSW Department Of Commerce

25.10.2004 Date started:

2 of 2

Principal:

NSW Department Of Corrective Services

25.10.2004

Project:

Environmental/Geotechnical Investigation

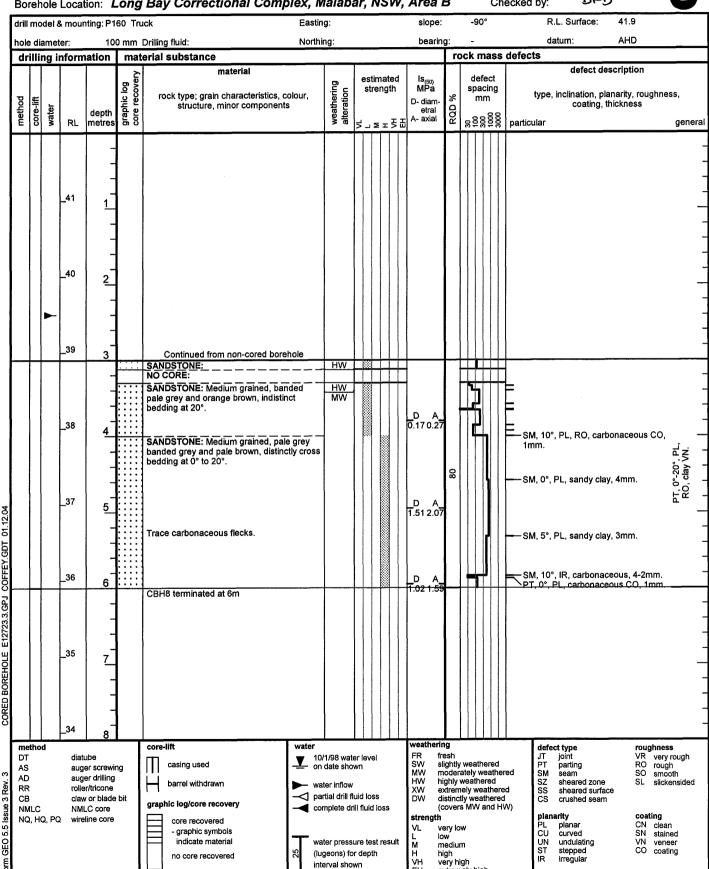
Date completed: Logged by:

AD/SG

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Checked by:

DED



Sheet

CBH25

Engineering Log - Borehole

Office Job No.:

: E12723/03

1 of 1

Client:

NSW Department Of Commerce

Date started:

28.10.2004 28.10.2004

Principal:

TC bit

ADT

*bit shown by suffix

e.g

water inflow

water outflow

NSW Department Of Corrective Services

Date completed: 28.1

AD Environmental/Geotechnical Investigation Logged by: Project: DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: P160 Truck R.L. Surface: 40.8 Easting: slope: drill model and mounting: datum: AHD Northing bearing: 100 mm hole diameter: drilling information material substance pocket penetro-meter consistency/ density index notes classification symbol structure and <u>8</u> moisture condition samples, additional observations penetr graphic tests, etc kPa soil type: plasticity or particle characteristics, depth metre 5885 colour, secondary and minor components. RL 123 FILL: CLAYEY SAND: Fine to coarse grained, dark Е BIT grey-black, low plasticity clay. _40.5 0.<u>5</u> D 40.0 None observed AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, pale grey-brown, ī D 1.0 DEPOSIT low plasticity clay (<5%). From 1-1.3m environmental sample. 5,5,9 N*=14 1.<u>5</u> SAND: Fine to medium grained, yellow-pale grey, MD low plasticity clay (<5%) _39.0 D 2.0 From 2-2.2m environmental sample. _38.5 Borehole CBH25 terminated at 2.25m 2.<u>5</u> COFFEY.GDT 01.12.04 38.0 3.0 E12723.3.GPJ _37.5 3.<u>5</u> BOREHOLE _37.0 consistency/density index notes, samples, tests classification symbols and support undisturbed sample 50mm diameter soil description VS very soft auger screwing* M mud based on unified classification undisturbed sample 63mm diameter auger drilling* roller/tricone AD C casing disturbed sample system RR firm penetration 1 2 3 4 St W washbore Ν standard penetration test (SPT) stiff very stiff VSt moisture SPT - sample recovered CT cable tool N* SPT with solid cone HA hand auger Nc DT vane shear (kPa) М moist Fb friable diatube pressuremeter blank bit W VL very loose 10/1/98 water leve loose plastic limit V hit on date shown Bs bulk sample Wρ

environmental sample

. liquid limit MD

VD

medium dense

dense

very dense

Coffey

Office Job No .:

Date started:

Sheet

CBH26

E12723/03

28.10.2004

28.10.2004

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Logged by:

Date completed:

AD

DED

1 of 1

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 39.9 P160 Truck Easting: drill model and mounting: Northing bearing: AHD hole diameter: 100 mm drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and moisture condition samples, additional observations graphic method tests, etc kPa soil type: plasticity or particle characteristics, depth metre: 5888 RL colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, dark V BIT Ε grey, low plasticity clay. None observed 0.5 _39.0 W AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, pale brown, low ī Е 1.0 plasticity clay (<5%).
Borehole CBH26 terminated at 1m 38.5 1.5 _38.0 2.0 _37.5 2.5 BOREHOLE E12723.3.GPJ COFFEY.GDT 01.12.04 37.0 3.0 _36.5 3.<u>5</u> notes, samples, tests classification symbols and consistency/density index method support auger screwing* soil description VS very soft mud undisturbed sample 50mm diameter based on unified classification undisturbed sample 63mm diameter AD RR auger drilling* roller/tricone C casing firm D disturbed sample GEO 5.3 Issue 3 Rev.2 penetration 1 2 3 4 St standard penetration test (SPT) stiff W washbore VSt very stiff moisture cable tool SPT - sample recovered ranging to SPT with solid cone dry HA DT No hand auger vane shear (kPa) moist Fb friable diatube pressuremeter VL В w wet very loose 10/1/98 water leve plastic limit loose Wρ V bit Bs bulk sample medium dense liquid limit MD environmental sample TC bit water inflow *bit shown by suffix very dense water outflow

Engineering Log - Borehole

E12723.3.GPJ COFFEY.GDT 01.12.04

BOREHOLE

Issue 3 Rev.2

Borehole No. CBH27

Sheet 1 of 1

Date completed:

Office Job No.: *E12723/03*Date started: *28.10.2004*

28.10.2004

AD

Client: NSW Department Of Commerce

Principal: NSW Department Of Corrective Services

Project: Environmental/Geotechnical Investigation Logged by:

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: DED

R.L. Surface: 41.5 P160 Truck Easting: drill model and mounting: Northing datum: AHD 100 mm bearing: hole diameter: material substance drilling information classification symbol consistency/ density index pocket penetro-meter notes structure and graphic log moisture condition samples additional observations tests, etc oddns soil type: plasticity or particle characteristics, depth metres 9889 RL colour, secondary and minor components. 123 PAVEMENT MATERIAL 占 FILL FILL: CLAYEY SAND: Fine to coarse grained, D E ᆵ brown, low plasticity clay. 0.<u>5</u> MD AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, mottled yellow brown and dark brown, low plasticity clay (<5%). **DEPOSIT** D 1.0 From 1-1.3m environmental 5,5,9 N*=14 1.<u>5</u> _40.0 D SAND: Fine to medium grained, pale grey brown, E(D) low plasticity clay (<5%).
Borehole CBH27 terminated at 1.9m 2.0 39.5 2.<u>5</u> 39.0 3.0 38.5 3.<u>5</u> _38.d notes, samples, tests classification symbols and consistency/density index support AS mud undisturbed sample 50mm diameter soil description VS very soft based on unified classification soft undisturbed sample 63mm diameter auger drilling* roller/tricone AD C casing RR firm D disturbed sample penetration 1 2 3 4 W washbore standard penetration test (SPT) St stiff VSt cable tool very stiff moisture CT N۶ SPT - sample recovered SPT with solid cone dry HA No hand auger DT vane shear (kPa) М moist Fb friable diatube water pressuremeter В blank bit w wet VL very loose 10/1/98 water leve Wp plastic limit loose V bit on date shown Bs bulk sample MD medium dense environmental sample TC bit water inflow dense *bit shown by suffix VD ADT water outflow very dense e.g



Office Job No .:

Date started:

Sheet

CBH28

E12723/03

28.10.2004

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

ADT

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by:

28.10.2004

AD

DF1) Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 42.8 drill model and mounting: P160 Truck Easting: Northing bearing: AHD 100 mm hole diameter: drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetration notes material structure and samples additional observations graphic tests, etc suppor soil type: plasticity or particle characteristics, depth metres 5888 RL colour, secondary and minor components. 123 CONCRETE: 150mm thick. PAVEMENT MATERIALS 占 М FILL: CLAYEY SAND: Fine to coarse grained, 띪 Ε brown-orange brown, low plasticity clay. Traces of gravel fines (<5%). 0.<u>5</u> D SAND: Fine to medium grained, yellow and pale AEOLIAN DUNE OR BEACH grey brown, low plasticity clay (<5%). DEPOSIT D 1.0 From 1-1.2m environmental 41.5 1.5 Vone observed D 2.0 RESIDUAL SILTY CLAY: Medium to high plasticity, pale H grey-pale yellow, low liquid limit silt. D 40.5 2.5 From 2-2.6m environmental SPT 25/100mm COFFEY.GDT 01.12.04 _40.d 3.0 D E12723.3.GPJ _39.5 3.5 SILTY CLAY: Medium to high plasticity clay, pale yellow to pale grey, low liquid limit silt. Borehole CBH28 terminated at 3.5m. Refusal on BOREHOLE sandstone. 39.0 classification symbols and consistency/density index notes, samples, tests soil description undisturbed sample 50mm diameter very soft AS auger screwing M mud based on unified classification s undisturbed sample 63mm diameter AD auger drilling casing RR disturbed sample system firm penetration Issue 3 Rev.2 St stiff standard penetration test (SPT) W washbore moisture VSt very stiff N* CT HA SPT - sample recovered cable tool SPT with solid cone hard hand auge DT vane shear (kPa) М moist Fb friable diatube ٧L very loose blank bit pressuremeter wet Wp plastic limit bulk sample V bit on date shown Bs environmental sample liquid limit MD medium dense TC bit water inflow wn by suffix refusal dense *bil very dense water outflow

Sheet

CBH29

1 of 1

Engineering Log - Borehole

Office Job No .:

E12723/03

NSW Department Of Commerce

Date started: Date completed: 28.10.2004

Principal:

NSW Department Of Corrective Services

AD Logged by:

28.10.2004

Project:

Environmental/Geotechnical Investigation

DFD Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 42.5 P160 Truck Easting: drill model and mounting: Northing bearing: datum: AHD 100 mm hole diameter: material substance drilling information consistency/ density index pocket penetro-meter classification symbol notes material structure and moisture condition samples, penetra additional observations tests, etc soil type: plasticity or particle characteristics, depth metre 5888 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS CONCRETE: 200mm thick 4 4 占 D . FILL: CLAYEY SAND: Fine to coarse grained, dark М FILL Е 늄 grey, low plasticity clay, waste building materials ie pieces crushed brick and gravel (<5%). 0.<u>5</u> AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, orange-brown and dark brown, low plasticity clay (<5%), mild DEPOSIT D NB: Oil film on inner layer of bag. 1.0 hydrocarbon odour. From 1-1.3m environmental 5,7,10 N*=17 D Borehole CBH29 terminated at 1.45m 2.0 40.5 2.5 _40.d COFFEY.GDT 01.12.04 3.<u>0</u> 39.5 E12723.3.GPJ 3.<u>5</u> _39.0 BOREHOLE consistency/density index notes, samples, tests classification symbols and soil description auger screwing* undisturbed sample 50mm diamete very soft AS M mud based on unified classification s soft undisturbed sample 63mm diameter C casing AD auger drilling roller/tricone system firm RR penetration 1 2 3 4 GEO 5.3 Issue 3 Rev.2 St stiff standard penetration test (SPT) W washbore Ν moisture VSt very stiff N* SPT - sample recovered СТ cable tool hard SPT with solid cone Nc HA hand auger DT vane shear (kPa) М moist Fb friable diatube pressuremeter w VL very loose blank bit wet 10/1/98 water level Wp plastic limit bulk sample V hit on date shown Bs environmental sample liquid limit MD medium dense TC bit water inflow dense *bit shown by suffix very dense ADT water outflow

Sheet

CBH30

Engineering Log - Borehole

NSW Department Of Commerce

NSW Department Of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

water inflow

water outflow

*bit shown by suffix

e.g.

ADT

refusal

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Office Job No.: Date started:

E12723/03 28.10.2004

dense

very dense

_ VD

28.10.2004 Date completed:

1 of 1

AD Logged by:

DFD

Checked by: Easting: R.L. Surface: 41.4 drill model and mounting: 100 mm Northing bearing: datum: AHD hole diameter: drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and samples, moisture condition additional observations graphic tests, etc kPa soil type: plasticity or particle characteristics, depth metres 5885 RL colour, secondary and minor components. 123 CONCRETE: 150mm thick. PAVEMENT MATERIAL 늄 FILL: CLAYEY SAND: Fine to coarse grained, dark М ᇤ Е grey-black, low plasticity clay. 0.<u>5</u> D MD AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, pale grey and dark D 1.0 grey, low plasticity clay (<5%). DEPOSIT From 1-1.3m environmental 40.0 1.5 D SAND: Fine to medium grained, pale grey and dark W 2.0 grey, low plasticity clay (<5%).
Borehole CBH30 terminated at 2m _39.0 2.5 COFFEY.GDT 01.12.04 _38.5 3.0 E12723.3.GPJ _38.0 3.5 BOREHOLE consistency/density index method support notes, samples, tests classification symbols and auger screwing* soil description VS very soft M mud undisturbed sample 50mm diameter undisturbed sample 63mm diameter based on unified classification AD RR auger drilling* C casing D disturbed sample firm roller/tricone penetration GEO 5.3 Issue 3 Rev.2 W standard penetration test (SPT) St stiff washbore no resistance VSt very stiff cable tool СТ N* SPT - sample recovered moisture SPT with solid cone D Nc dry НΑ hand auger moist Fb friable vane shear (kPa) DT diatube pressuremeter w wet VL very loose В blank bit 10/1/98 water level loose V hit on date shown Rs bulk sample Wρ plastic limit MD medium dense liquid limit environmental sample TC bit



Office Job No.:

Date started:

Sheet

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

28.10.2004

E12723/03

28.10.2004 **NSW Department Of Corrective Services** Date completed: Principal: Environmental/Geotechnical Investigation Logged by: AD Project: DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 42.6 P160 Truck Easting: drill model and mounting: slope AHD datum: hole diameter: 100 mm Northing bearing: drilling information material substance pocket penetro-meter consistency/ density index classification symbol structure and material moisture condition samples, penetra additional observations graphic tests, etc water kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. 2882 RL 123 metre CONCRETE: 200mm thick PAVEMENT MATERIAL ᆸ 42. D D FILL: CLAYEY SAND: Fine to coarse grained, М V BIT Ε None observed brown, low plasticity clay. 0.5 ם MD AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, pale yellow-grey, low plasticity clay (<5%). D Е 1.0 Borehole CBH31 terminated at 1m. Refusal on _41.5 sandstone. 1.5 2.0 40.5 2.5 _40.0 E12723.3.GPJ COFFEY.GDT 01.12.04 3.0 3.5 39 0 BOREHOLE classification symbols and consistency/density index notes, samples, tests method support soil description vs auger screwing

AS ΑD RR W СТ НА DT В

*bit shown by suffix

ADT

auger drilling roller/tricone washbore cable tool hand auge diatube blank bit V bit TC bit

M mud C casing penetration

No

Bs

Ε

R

10/1/98 water level on date shown

water outflow

undisturbed sample 50mm diamete D_{e3} undisturbed sample 63mm diameter disturbed sample standard penetration test (SPT)

SPT - sample recovered SPT with solid cone vane shear (kPa) pressuremeter bulk sample

environmental sample

refusal

moisture drv moist w Wp plastic limit liquid limit

system

based on unified classification

St

VL

VD

very soft soft firm stiff VSt very stiff hard friable very loose loose MD medium dense

very dense

CBH32

1 of 1

AD

Engineering Log - Borehole

Office Job No.:

E12723/03

NSW Department Of Commerce

Date started:

Date completed:

28.10.2004

Principal:

NSW Department Of Corrective Services

. .

28.10.2004

Project:

Environmental/Geotechnical Investigation

Logged by:

DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: P160 Truck Easting: R.L. Surface: 42.5 drill model and mounting: AHD 100 mm Northing bearing datum: hole diameter: drilling information material substance pocket penetro-meter classification symbol consistency/ density index structure and graphic log moisture condition penetra samples, additional observations method support tests, etc kPa soil type: plasticity or particle characteristics, depth 5885 RL colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, pale yellow brown and grey, low plasticity clay (<5%). Ε D AEOLIAN DUNE OR BEACH MD SAND: Fine to medium grained, pale grey-pale 0.<u>5</u> yellow, low plasticity clay (<5%). D 1.<u>0</u> Ε Borehole CBH32 terminated at 1.2m. Refusal on 1.<u>5</u> 2.0 2.<u>5</u> E12723.3.GPJ COFFEY.GDT 01.12.04 3.<u>0</u> _39.5 3.<u>5</u> 39.d BOREHOLE classification symbols and consistency/density index support notes, samples, tests soil description undisturbed sample 50mm diamete auger screwing M mud AD auger drilling* C casing undisturbed sample 63mm diamete hased on unified classification s soft RR roller/tricone disturbed sample system firm penetration GEO 5.3 Issue 3 Rev.2 Ν standard penetration test (SPT) stiff W washbore no resista ranging to SPT - sample recovered VSt very stiff CT cable tool HA SPT with solid cone D dry hard hand auger moist Fb friable DT vane shear (kPa) M VL very loose pressuremeter wet В blank bit plastic limit loose Bs bulk sample V bit on date shown MD medium dense environmental sample liquid limit TC bit water inflow dense suffix refusal VD very dense water outflow ADI

Coffey **E**

Sheet

CBH58

Engineering Log - Borehole

auger drilling

roller/tricone

washbore

cable tool

hand auger

diatube

blank bit

V bit

ADI

*bit shown by suffix

TC bit

RR

W

CT HA

DT

В

٧

C casing

penetration

10/1/98 water level

on date shown

water inflow

water outflow

NSW Department Of Commerce

NSW Department Of Corrective Services Principal:

Project: Environmental/Geotechnical Investigation

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Office Job No.: Date started:

E12723/03 1.11.2004

firm

stiff

hard

friable

loose

dense

very stiff

very loose

medium dense

very dense

St

VSt

Fb

VL

MD

VD

1.11.2004 Date completed: AD

1 of 1

Logged by: DED Checked by:

R.L. Surface: 42.8 Mitsi Truck Easting: slope: drill model and mounting: datum: AHD hole diameter: 100 mm Northing bearing: drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and moisture condition samples additional observations graphic tests, etc Suppor water soil type: plasticity or particle characteristics, depth metre 5885 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS 5 observed D D FILL: SAND: Fine to coarse grained, pale grey and pale brown, low plasticity clay (<5%). Traces of gravel XXXМ FILL SP Ε 늄 None fines (<5%).

Borehole CBH58 terminated at 0.3m. Refusal at 0.3m. 0.<u>5</u> on unknown fill. Maybe crushed concrete? 1.0 1.5 2.0 _40.5 2.5 E12723.3.GPJ COFFEY.GDT 01.12.04 40.0 3.0 _39.5 3.<u>5</u> BOREHOLE consistency/density index notes, samples, tests classification symbols and AS AD auger screwing* soil description undisturbed sample 50mm diameter ٧S very soft M mud based on unified classification undisturbed sample 63mm diameter

disturbed sample

SPT with solid cone

environmental sample

vane shear (kPa)

pressuremeter

bulk sample

standard penetration test (SPT)

SPT - sample recovered

moisture

moist

plastic limit

liquid limit

М

w wet

Wp

Ν

N

No

Bs



Office Job No.:

Date started:

Sheet

CBH59

E12723/03

1.11.2004

1.11.2004

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

NSW Department Of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Date completed: Logged by:

DED

AD

Checked by: Mitsi Truck Easting: R.L. Surface: 42.8 drill model and mounting:

100 mm Northing bearing: datum: AHD hole diameter drilling information material substance pocket penetro-meter consistency/ density index classification symbol notes material structure and graphic log samples, moisture condition penetr additional observations poddns tests, etc soil type: plasticity or particle characteristics, depth metre **5888** RL colour, secondary and minor components. 123 CONCRETE: PAVEMENT MATERIALS 00 0.0 g Borehole CBH59 terminated at 0.2m. TC bit refusal at 42.5 0.2m on sandstone. None 0.<u>5</u> 1.<u>0</u> 1.<u>5</u> 2.0 _40.5 2.5 E12723.3.GPJ COFFEY.GDT 01.12.04 _40.0 3.0 39.5 3.<u>5</u> BOREHOLE 39.0 consistency/density index classification symbols and method support notes, samples, tests undisturbed sample 50mm diameter soil description very soft N nil auger screwing M mud undisturbed sample 63mm diameter based on unified classification s soft ΑD casing auger drilling RR disturbed sample system firm penetration GEO 5.3 Issue 3 Rev.2 St stiff Ν standard penetration test (SPT) W washbore VSt very stiff no resistance ranging to SPT - sample recovered moisture CT HA cable tool SPT with solid cone dry hard hand auger friable DT v vane shear (kPa) М moist Fb very loose B V W wet blank bit pressuremete plastic limit loose bulk sample Wp Bs V bit on date shown environmental sample liquid limit MD medium dense TC bit water inflow *bil refusal dense very dense water outflow ADT



Borehole No. CBH60

Engineering Log - Borehole

Sheet 1 of 1 Office Job No.: **E1**

Date completed:

Logged by:

Client: NSW Department Of Commerce

No.: *E12723/03*

NOW Department of Commerce

Date started: 1.11.2004

Principal:

NSW Department Of Corrective Services

1.11.2004

Project:

Environmental/Geotechnical Investigation

AD

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Checked by: DCD

R.L. Surface: 42.9 Mitsi Truck Easting: slope drill model and mounting: Northing bearing: datum: AHD hole diameter: 100 mm drilling information material substance pocket penetro meter consistency/ density index classification symbol notes structure and moisture condition samples, penetr additional observations method Poddns tests, etc soil type: plasticity or particle characteristics, depth metres 5885 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS 4 4 占 None observed D 0 Borehole CBH60 terminated at 0.2m. TC bit refusal at 0.2m on sandstone 42.5 0.<u>5</u> 42.0 1.0 1.<u>5</u> 2.0 _40.5 2.5 COFFEY.GDT 01.12.04 _40.0 3.0 E12723.3.GPJ _39.5 3.<u>5</u> BOREHOLE consistency/density index notes, samples, tests classification symbols and soil description undisturbed sample 50mm diameter very soft auger screwing* M mud based on unified classification soft undisturbed sample 63mm diameter auger drilling AD C casing disturbed sample RR system firm GEO 5.3 Issue 3 Rev.2 penetration 1 2 3 4 St stiff standard penetration test (SPT) W washbore moisture very stiff N* SPT - sample recovered CT HA cable tool SPT with solid cone hard hand auge Fb DT vane shear (kPa) М moist friable diatube ٧L pressuremeter W very loose B V blank bit wet bulk sample Wp V bit on date shown Bs environmental sample liquid limit MD medium dense TC bit water inflow refusal dense VD very dense ADT water outflow

Coffey

CBH61

Engineering Log - Borehole

Sheet 1 of 1 Office Job No.:

E12723/03

NSW Department Of Commerce

Date started:

Logged by:

1.11.2004

Principal:

NSW Department Of Corrective Services

1.11.2004 Date completed:

Project:

Environmental/Geotechnical Investigation

AD

MD

νD

liquid limit

W

medium dense

dense

very dense

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

TC bit

ADT

*bit shown by suffix

F

water inflow

environmental sample

refusal

DED Checked by:

R.L. Surface: 42.1 Mitsi Truck Easting: drill model and mounting: Northing datum: AHD 100 mm hole diameter: bearing: drilling information material substance consistency/ density index pocket penetro-meter penetration notes classification symbol material structure and g samples, moisture condition additional observations graphic support tests, etc kPa soil type: plasticity or particle characteristics, depth metres 5888 colour, secondary and minor components. RL 123 FILL: CLAYEY SAND: Fine to coarse grained, grey Ε _42.0 brown, low plasticity clay. 0.<u>5</u> _41.5 AEOLIAN SAND OR BEACH W SAND: Fine to coarse grained, dark grey-black, low E plasticity clay (<5%). Borehole CBH61 terminated at 0.9m due to H20 1.0 1.<u>5</u> 40.5 2.0 40.0 39.5 BOREHOLE E12723,3.GPJ COFFEY.GDT 01,12,04 3.0 39.0 3.<u>5</u> _38.5 classification symbols and consistency/density index notes, samples, tests method support auger screwing* M mud undisturbed sample 50mm diameter soil description VS very soft soft AD RR W based on unified classification auger drilling* C casing undisturbed sample 63mm diameter firm system D disturbed sample roller/tricone GEO 5.3 Issue 3 Rev.2 standard penetration test (SPT) St stiff washbore VSt verv stiff СТ SPT - sample recovered moisture cable tool hard SPT with solid cone НΑ hand auger No drv Fb friable moist vane shear (kPa) DT diatube water w VL. very loose В blank bit 10/1/98 water leve loose V bit Bs bulk sample Wρ plastic limit

Sheet

CBH62

Engineering Log - Borehole

NSW Department Of Commerce

Office Job No.: Date started: Date completed: E12723/03

Principal:

NSW Department Of Corrective Services

1.11.2004 1.11.2004

AD

1 of 1

Project:

Environmental/Geotechnical Investigation

Logged by:

DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 42.9 Mitsi Truck Easting: slope: drill model and mounting: bearing: datum: AHD Northing hole diameter: 100 mm drilling information material substance consistency/ density index pocket penetro-meter classification symbol penetration notes structure and moisture condition samples additional observations graphic 1 tests, etc suppor water kPa soil type: plasticity or particle characteristics, depth metre 2883 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS П None observed 0.0 FILL: CLAYEY SAND: Fine to medium grained, grey FILL V BIT Е brown, low plasticity clay. Ε 0.5 Borehole CBH62 terminated at 0.5m. TC bit refusal on 42.0 1.0 1.<u>5</u> 2.0 40.5 2.5 E12723.3.GPJ COFFEY.GDT 01.12.04 40.0 3.0 39. 3.<u>5</u> BOREHOLE consistency/density index samples, tests classification symbols and support undisturbed sample 50mm diamete soil description VS very soft mud based on unified classification undisturbed sample 63mm diameter AD RR auger drilling* C casing roller/tricone firm disturbed sample penetration 1 2 3 4 ssue 3 Rev.2 St stiff washbore standard penetration test (SPT) W VSt very stiff SPT - sample recovered moisture СТ cable tool N* SPT with solid cone dry Nc HA hand auge DT vane shear (kPa) moist Fb friable diatube water pressuremeter ٧L w wet very loose В blank bit 10/1/98 water level loose plastic limit V bit on date shown Bs bulk sample Wρ MD medium dense environmental sample liquid limit TC bit water inflow dense *bit shown by suffix VD very dense ADT water outflow

CBH63

1 of 1

Engineering Log - Borehole

Office Job No.:

Sheet

E12723/03

NSW Department Of Commerce

Date started:

2.11.2004

dense

verv dense

Principal:

TC bit

ADT

*bit shown by suffix

water inflow

water outflow

NSW Department Of Corrective Services

Date completed:

2.11.2004

AD Project: Environmental/Geotechnical Investigation Logged by: DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 42.7 Mitsi Truck Easting: drill model and mounting: Northing bearing: datum: AHD 100 mm hole diameter: drilling information material substance pocket penetro-meter consistency/ density index classification symbol notes penetra samples, moisture condition additional observations graphic support tests, etc water kPa soil type: plasticity or particle characteristics, depth metres 5888 RL colour, secondary and minor components. 123 PAVEMENT MATERIALS 00 42. SANDSTONE SANDSTONE 늄 Borehole CBH63 terminated at 0.25m on sandstone None (no sample collected). 0.5 1.0 1.<u>5</u> 2.0 _40.5 2.5 40.0 BOREHOLE E12723.3.GPJ COFFEY.GDT 01.12.04 3.0 _39.5 3.<u>5</u> _39.0 classification symbols and consistency/density index support soil description auger screwing* mud undisturbed sample 50mm diameter VS very soft based on unified classification s soft AD RR auger drilling* roller/tricone U₆₃ undisturbed sample 63mm diameter C casing disturbed sample penetration 1 2 3 4 GEO 5.3 Issue 3 Rev.2 St W standard penetration test (SPT) stiff washbore very stiff VSt СТ cable tool SPT - sample recovered moisture SPT with solid cone hard dry HA DT hand auger No moist Fb friable vane shear (kPa) diatube blank bit pressuremeter w VL very loose В 10/1/98 water leve plastic limit loose V bit on date shown Bs bulk sample Wρ MD medium dense environmental sample liquid limit

Office Job No.:

Date started:

Sheet

CBH64

Engineering Log - Borehole

Client:

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by: 2.11.2004 2.11.2004

E12723/03

AD

1 of 1

AD

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B

Checked by:

DFD

Bo	re	hol	e l	_00	atio	n: Long	y Ba	y Co	rrec	tiona	l Complex, Malab	ar, NSW, Ar	_		Checke	ed b		- Dt	· · · · · · · · · · · · · · · · · · ·	
drill	l m	ode	el a	nd ı	moui	nting: M	∕litsi 7	ruck			Easting:	slope:	-90°				R.I	L. Surface:	42.9	
hole		_		_			100 m	m			Northing	bearing:	-		-		da	tum:	AHD	
dr	rill		$-\tau$	Ifor	rma	tion			mate		ıbstance			Γ		Ī	<u> </u>			
method		N penetration	- 1	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	mat soil type: plasticity or colour, secondary ar	erial particle characteris d minor componer	stics, nts.	moisture condition	consistency/ density index	k	300 m penetro-		structure and ditional observation	ons
DΤ			Ĭ	N	_			_	000		CONCRETE:			D					ENT MATERIALS	
V BIT	-				None observed	E	40.5	_	***		FILL: CLAYEY SAND: Fine grey brown, low plasticity c	e to coarse grained lay.	l, dark	М				FILL		
		88	Ħ	1	7		42.5	0. <u>5</u>	~~~		Borehole CBH64 terminate on sandstone.	ed at 0.4m. Refusa	l at 0.4m				\parallel		***	_
								-												
							_42.0	1. <u>0</u>												_
								-												-
							_41.5	1. <u>5</u>												-
								-												-
							_41.0	2. <u>0</u>												-
								-												-
							_40.5	2. <u>5</u>												
								1 1												-
							_40.0	3. <u>0</u>												- -
							39.5	_												-
							_55.5	3. <u>5</u>												- -
							39.0	-												-
me AS AD	AD auger drilling*				rilling* cone	4.0 support M mud N C casing penetration				notes, samples, tests U _{so} undisturbed sample U _{so} undisturbed sample D disturbed sample	e 63mm diameter	soil des	cription	mbols an			VS S F	stency/density index very soft soft firm		
W CT HA DT B				ca ha dia	ishbo ble to nd au atube ank bi	ore 1 2 3 4 pool ran uger water					N standard penetration N* SPT - sample record Nc SPT with solid cone V vane shear (kPa) P pressuremeter	vered	moisture D dr M m W we	y oist	y oist			St VSt H Fb VL	stiff very stiff hard friable very loose	
V T	V V bit T TC bit *bit shown by suffix							on date			Bs bulk sample E environmental sam R refusal	ple	Wp pl	astic limit quid limit	t			L MD D VD	loose medium den dense very dense	se

Coffey

Office Job No.:

Date completed:

Date started:

Sheet

CBH71

E12723/03

3.11.2004

3.11.2004

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

ADT

water outflow

NSW Department Of Corrective Services

AD

Environmental/Geotechnical Investigation Project: Logged by: DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area B Checked by: R.L. Surface: 40.1 drill model and mounting: Hand Auger Easting: Northing bearing: datum: AHD 100 mm hole diameter: drilling information material substance pocket penetro-meter consistency/ density index penetration classification symbol notes structure and graphic log samples, additional observations method tests, etc water soil type: plasticity or particle characteristics, depth 5883 RL metre colour, secondary and minor components. 123 SP ¥ Ε None observed 40.0 AEOLIAN DUNE OR BEACH brown-pale grey, fine to coarse grained sand.

SAND: Fine to medium grained, dark grey brown, DEPOSIT low plasticity clay (<5%). D SAND: Fine to medium grained, pale grey-pale D 0.5 brown, low plasticity clay (<5%). Ε Hand auger CBH71 terminated at 0.6m 1.0 39.0 1.5 38.5 2.0 38.0 2.5 _37.5 E12723.3.GPJ COFFEY.GDT 01.12.04 37.0 3.<u>5</u> 36.5 BOREHOLE classification symbols and consistency/density index notes, samples, tests AS AD RR soil description undisturbed sample 50mm diameter ٧S very soft auger screwing* M mud undisturbed sample 63mm diameter based on unified classification auger drilling* C casing system roller/tricone penetration disturbed sample firm GEO 5.3 Issue 3 Rev.2 W CT HA DT St standard penetration test (SPT) stiff washbore no resistance ranging to moisture VSt very stiff SPT - sample recovered cable tool SPT with solid cone hard hand auger vane shear (kPa) М moist Fb friable pressuremeter w VL. very loose blank bit wet Wp Bs bulk sample V bit on date shown medium dense environmental sample . liquid limit MD TC bit water inflow refusal n by suffix dense very dense

Sheet

CBH76

1 of 2

VD

Engineering Log - Borehole

ADT

Department of Commerce

Department of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Office Job No .: Date started: Date completed:

Logged by:

E12723/4 11.3.2005

11.3.2005

SD/CW

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. MM Checked by: GEMCO TRUCK Easting: slope: R.L. Surface: 41.95 drill model and mounting: AHD 125 mm Northing bearing: datum: hole diameter: drilling information material substance pocket penetro-meter classification symbol consistency/ density index penetratio notes structure and graphic log samples. moisture condition additional observations method support tests, etc kPa water soil type: plasticity or particle characteristics, colour, secondary and minor components. depth 5888 RL 123 BASE COURSE: CONCRETE PAVEMENT NONE OBSERVE SUB BASE COURSE: GRAVELLY SAND: Fine to ADT coarse grained, dark grey/brown, gravel is sandstone VD AEOLIAN SAND SILTY SAND: Fine to medium sand, black, with SM SPT TC Bit Refusal at 0.9m on some organic matter and roots. 1.R.R Sandstone Borehole CBH76 continued as cored hole 40 2 _39 3 38 4 _37 5 PHASE 2 UPDATED GPJ 36 6 B&D 35 7 BOREHOLE consistency/density index classification symbols and notes, samples, tests method support undisturbed sample 50mm diameter soil description VS very soft M mud AS auger screwing AD RR undisturbed sample 63mm diameter based on unified classification S soft auger drilling* casing firm roller/tricone penetration D disturbed sample system GEO 5.3 Issue 3 Rev.2 W CT HA standard penetration test (SPT) St stiff Ν washbore SPT - sample recovered moisture VSt very stiff cable tool hard SPT with solid cone D dry hand auger М moist Fb friable diatube DT vane shear (kPa) W ٧L very loose pressuremete 10/1/98 water level В blank bit Bs bulk sample Wp plastic limit loose V bit MD medium dense TC bit environmental sample liquid limit water inflow dense n by suffix refusal very dense



Borehole No. CBH76

Engineering Log - Cored Borehole

2 of 2 Sheet Office Job No .:

E12723/4

Department of Commerce

Date started:

11.3.2005

Principal:

Department of Corrective Services

 graphic symbols indicate material

no core recovered

11.3.2005 Date completed:

Environmental/Geotechnical Investigation

SD/CW Logged by:

planar curved undulating

stepped

CU UN ST IR

very low low medium

high very high

VL

water pressure test result

(lugeons) for depth

interval shown

CN clean SN stained VN veneer CO coating

Project: Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. MM Checked by: drill model & mounting: GEMCO TRUCK Easting: R.L. Surface: 41.95 Northing: bearing datum: AHD 125 mm Drilling fluid: hole diameter: material substance rock mass defects drilling information defect description estimated IS₍₅₀₎ MPa weathering alteration <u>8</u> spacing mm type, inclination, planarity, roughness, rock type; grain characteristics, colour, graphic l method core-lift D- diamcoating, thickness structure, minor components water etral A- axial depth general RL ı≅±₹∐ particular metre Continued from non-cored borehole SANDSTONE: Coarse grained, pale grey /W/SV and pale yellow brown, massive with some distinct laminations 0-20°. -JT, 20°,PL,RO,CN \JT,70°,PL,RO,CN NONE OBSERVED 0.77 0.78 JT,65°,IR,VRO,CN _40 2 0-5°, PL, RO, CN 86 1.02 1.22 39 grading to medium grained, becoming grey, massive, trace of carbonaceous material. 9 38 CBH76 terminated at 3.95m COFFEY CORED BOREHOLE E12723.4 AREA B&D PHASE 2 UPDATED.GPJ _37 5 _36 6 35 ring defect type method joint parting seam sheared zone sheared surface VR very rough RO rough SO smooth SL slickensided fresh 10/1/98 water level on date shown slightly weathered moderately weathered highly weathered casing used AS AD auger screwing MW SM SZ auger drilling barrel withdrawn extremely weathered distinctly weathered (covers MW and HW) RR roller/tricone SS XW partial drill fluid loss claw or blade bit crushed seam graphic log/core recovery complete drill fluid loss NMLC NMLC core planarity PL plan coating strenath NQ. HQ. PQ wireline core core recovered



CBH91

Engineering Log - Borehole

1 of 2 Sheet Office Job No.:

E12723/4

Client:

Department of Commerce

Date started:

10.3.2005

Principal:

Department of Corrective Services

Date completed:

10.3.2005

Project:

Environmental/Geotechnical Investigation

Logged by:

SD/SG MM Checked by:

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. R.L. Surface: 39.50 GEMCO TRUCK slope: Easting: drill model and mounting: bearing: datum: AHD hole diameter: 125 mm Northing drilling information material substance consistency/ density index pocket penetro-meter notes material structure and <u>60</u> classificatic symbol penetra moisture condition samples, additional observations graphic tests, etc poddns soil type: plasticity or particle characteristics, depth 5888 RL colour, secondary and minor components. 123 D E + DUP5 ADT grey, coal and ash sand and gravel.
SILTY SAND: Fine to medium sand, black, organics. AEOLIAN SAND М SAND: Medium to coarse sand, pale brown, poorly MD SF graded, quartz sand. 0.<u>5</u> 39.0 8,R,R N*=R BEDROCK VD SANDSTONE: Very low strength, moderately weathered, pale grey and yellow, medium to coarse grained quartz sand Borehole CBH91 continued as cored hole 1.0 38.5 38.0 1.<u>5</u> E12723.4 AREA B&D PHASE 2 UPDATED.GPJ COFFEY.GDT 27.06.05 37.5 2.0 _37.d 2.<u>5</u> 36.5 3.<u>0</u> 36.0 3.5 consistency/density index classification symbols and notes, samples, tests method support VS very soft undisturbed sample 50mm diameter soil description AŞ auger screwing M mud AD RR W CT based on unified classification auger drilling* C casing undisturbed sample 63mm diameter firm disturbed sample roller/tricone penetration GEO 5.3 Issue 3 Rev.2 St standard penetration test (SPT) stiff washbore VSt very stiff cable tool SPT - sample recovered moisture hard HA hand auger No SPT with solid cone dry moist Fh friable vane shear (kPa) DT diatube VL very loose pressuremeter W wet blank bit B V 10/1/98 water level plastic limit loose Bs bulk sample Wp liquid limit MD medium dense environmental sample TC bit water inflow refusal dense *bit shown by suffix VD very dense water outflow ADT e.g.



CBH91

Sheet

2 of 2

Office Job No.:

E12723/4

Department of Commerce

Engineering Log - Cored Borehole

Date started:

10.3.2005 10.3.2005

Principal:

Department of Corrective Services

Date completed:

Logged by:

SD/SG

Project:

Environmental/Geotechnical Investigation

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. Checked by: MM drill model & mounting: GEMCO TRUCK Easting: R.L. Surface: 39.50 bearing AHD Northing: datum: hole diameter: 125 mm Drilling fluid: drilling information | material substance rock mass defects defect description defect recoven IS₍₅₀₎ MPa <u>8</u> weathering strength spacing alteration type, inclination, planarity, roughness, rock type; grain characteristics, colour, structure, minor components mm graphic I core reo core-lift method D- diam coating, thickness Rab water etral depth A- axial 85888 ~zı≧⊞ particular general RL metres 0.5 39.0 Continued from non-cored borehole SANDSTONE: Coarse grained, pale NMLC 0.73 0.69 38.5 orange brown and pale grey, massive. - JT, 40°, IR, RO, CN -JT, 50°, PL, RO, CN -JT, 50°, PL, RO, CN 38.0 1.5 NO CORE: 1.44-1.69m. -SM, 0°, clayey sand, 30mm thick SANDSTONE: Medium grained, pale grey MW -PT, 5°, PL, RO, VN banded pale orange brown, indistinctly laminated with some iron staining, 0-15 degrees, trace of carbonaceous flecks. D A_ 0.5 0.63 GDT 2.0 37.5 COFFEY -PT, 5°, PL, RO, iron stained clay VN E12723.4 AREA B&D PHASE 2 UPDATED.GPJ 8 2.5 37.0 SW becoming pale grey and massive D A 0.44 0.59 3.0 36.5 CORED BOREHOLE 3.5 36.0 D CBH91 terminated at 3.9m 4.0 weathering core-lift defect type JT joint method very rough rough smooth slickensided 10/1/98 water level on date shown fresh diatube slightly weathered moderately weathered highly weathered parting seam sheared zone casing used RO SO ΑS auger screwing AD auger drilling barrel withdrawn water inflow RR roller/tricone extremely weathered distinctly weathered SS sheared surface partial drill fluid loss distinctly weathered (covers MW and HW) claw or blade bit crushed seam graphic log/core recovery complete drill fluid loss NMLC NMLC core planarity coating strength NQ, HQ, PQ wireline core core recovered planar curved undulating clean stained veneer CN SN very low low medium VI. araphic symbols indicate material water pressure test result stepped (lugeons) for depth no core recovered high very high interval shown



Sheet

CBH94

Engineering Log - Borehole

Department of Commerce

Department of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

water outflow

ADT

Office Job No.:

E12723/4

VD

very dense

1 of 1

10.3.2005 Date started:

10.3.2005 Date completed: SD

Logged by:

AJB Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. Checked by: 40.50 MOLE 4WD Easting: R.L. Surface: drill model and mounting: AHD Northing bearing: datum: 125 mm hole diameter drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and graphic log samples, moisture condition additional observations method support tests, etc kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. depth metre: 5888 RL 123 ADT AEOLIAN SAND SM SILTY SAND: Medium to coarse, black to dark grey, NONE OBSERV trace roots and organics. 40 D-VD SF SAND: Medium to coarse grained, pale brown to 1 8,Hamme Bouncing red-brown, poorly graded. N*≐R Borehole CBH94 continued as cored hole _39 2 _38 <u>3</u> _37 COFFEY.GDT 30.06.05 36 5 E12723.4 AREA B&D PHASE 2 UPDATED.GPJ 35 6 _33 consistency/density index classification symbols and samples, tests method support undisturbed sample 50mm diameter soil description auger screwing* M mud undisturbed sample 63mm diameter based on unified classification s soft AD RR auger drilling* C casino firm disturbed sample roller/tricone penetration GEO 5.3 Issue 3 Rev.2 W CT HA DT standard penetration test (SPT) St moisture VSt very stiff SPT - sample recovered N' cable tool Nc SPT with solid cone hard hand auger friable Fb vane shear (kPa) moist diatube very loose W ٧L wet В blank bit pressuremeter 10/1/98 water level plastic limit loose Bs bulk sample V bit MD environmental sample liquid limit medium dense TC bit dense water inflow refusal *bit shown by suffix





CBH94

Engineering Log - Cored Borehole

Office Job No.:

E12723/4

Department of Commerce

Date started:

10.3.2005 10.3.2005

Principal:

Department of Corrective Services

Date completed: Logged by:

SD

Project:

Environmental/Geotechnical Investigation

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. AJB Checked by: 40.50 R.L. Surface: drill model & mounting: MOLE 4WD Easting: slope: AHD datum 125 mm Drilling fluid: Northing: bearing rock mass defects drilling information material substance defect description estimated defect recover weathering alteration MPa 8 spacing strenath type, inclination, planarity, roughness, coating, thickness rock type; grain characteristics, colour, mm core-lift D- diam structure, minor components graphi core re etral A- axial water Rad depth RL ĭ≟∓∏ particular general metre 40 1 Continued from non-cored borehole NO CORE ,0-20°,PL,RO,Clay,VN/CO PT,15°,IR,VRO,Clay,VN 39 SANDSTONE: Coarse grained, pale grey OBSERVED JT,40°,IR,VRO,Clay,VN PT,10°,IR,VR,Clay VN and pale yellow / brown, massive, with some dark grey siltstone clasts lenses. XW,JM,10°,IR,Siltstone PT,15°,IR,RO,VN JT,30°,IR,RO,VN D A_ 0.32 0.75 SANDSTONE: Coarse grained, pale grey NONE with red / brown and orange / brown, indistinctly laminated 0-20° trace siltstone XW,SM,15-40°,IR,Siltstone 38 laminae. Closed JT,15°,ST,Clay CO D A 1.14 1.15 3 SM,0°,PL,Sandy Clay,5mm SW/Fr SANDSTONE: Sandstone, medium grained, pale grey, distinctly laminated 0-20°, trace of carbonaceous laminae. _37 30,06,0 GDT 4 0.52 0.89 COFFEY CBH94 terminated at 4.2m _36 PHASE 2 UPDATED.GPJ 5 35 B&D 6 _34 CORED BOREHOLE 7 _33 core-lift water defect type
JT joint
PT parting method roughness FR SW MW HW very rough rough fresh slightly weathered 10/1/98 water level DT diatube auger screwing casing used AS moderately weathered highly weathered extremely weathered distinctly weathered (covers MW and HW) seam sheared zone sheared surface SM smooth ΑD auger drilling SZ SS CS barrel withdrawn water inflow RR roller/tricone partial drill fluid loss claw or blade bit СВ crushed seam graphic log/core recovery NMLC complete drill fluid loss coating CN clean SN stained strenath NQ, HQ, PQ wireline core core recovered planar very low GEO 5.5 CU curved low medium UN undulating stepped indicate material water pressure test result (lugeons) for depth no core recovered irregular very high interval shown

CBH122

Engineering Log - Borehole

Department of Commerce

ADT

Department of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Office Job No.: Date started:

Sheet

E12723/4

11.3.2005

11.3.2005 Date completed:

1 of 2

SG/SD Logged by:

VD

very dense

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. MM Checked by: GEMCO TRUCK Easting: slope: R.L. Surface: 42.6 drill model and mounting: AHD datum: hole diameter: 125 mm Northing bearing drilling information material substance pocket penetro-meter classification symbol consistency/ density index notes penetratio material structure and 8 samples, moisture condition additional observations graphic le support tests, etc kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. depth 5888 RL metre 123 BASE COURSE: CONCRETE PAVEMENT AP SUB BASE COURSE: SAND: Medium to coarse E + DUPS NONE OBSERVED AEOLIAN SAND 42 SPT trace of silt. 2,3,4 N*=7 becoming pale brown with depth. 1 SANDSTONE: Soil strength, extremely weathered, VD BEDROCK medium to coarse grained, pale brown/grey and Borehole CBH122 continued as cored hole 41 2 40 3 39 4 COFFEY.GDT 38 5 37 6 36 7 35 consistency/density index classification symbols and method support notes, samples, tests undisturbed sample 50mm diameter soil description vs very soft M mud auger screwing AD RR undisturbed sample 63mm diameter based on unified classification s soft auger drilling* casing U₆₃ firm roller/tricone penetration D disturbed sample system GEO 5.3 Issue 3 Rev.2 standard penetration test (SPT) St stiff W CT HA washbore SPT - sample recovered moisture VSt very stiff cable tool hard Nc SPT with solid cone D dry hand auger friable М moist DT diatube vane shear (kPa) W VL very loose pressuremeter 10/1/98 water level on date shown В blank bit Bs . bulk sample Wp plastic limit loose V bit MD medium dense liquid limit TC bit environmental sample water inflow dense refusal *bit shown by suffix



Borehole No. **CBH122**

Sheet 2 of 2

Office Job No.:

E12723/4 11.3.2005

drill model & mounting: GEMCO TRUCK

depth

metre

1

2

3_

4

5

6

7

hole diameter.

core-lift

drilling information

RL

_42

41

40

39

38

_37

36

35

diatube

auger screwing

claw or blade bit

auger drilling

roller/tricone

NMLC core

wireline core

回

NONE OBSERV

27.06.0

507

COFFEY

GP.

E12723.4 AREA B&D PHASE 2 UPDATED.

BOREHOLE

method

DT

AS

ΑD

RR

СВ

GEO 5.5

NMLC

NQ, HQ, PQ

Department of Commerce

125 mm Drilling fluid: material substance

recoven

graphic l

<u>8</u>

Engineering Log - Cored Borehole

Department of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

NO CORE: 1.35-1.52m.

carbonaceous laminae.

casing used

barrel withdrawn

graphic log/core recovery

core recovered

graphic symbols

indicate material

no core recovered

massive

material

Date completed: Logged by:

Date started:

11.3.2005 SG/SD

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area B. Checked by:

MM 42.6 Easting R.L. Surface: datum: AHD Northing: bearing rock mass defects defect description defect estimated Is₍₅₀₎ MPa weathering spacing strength type, inclination, planarity, roughness, coating, thickness alteration rock type; grain characteristics, colour, mm D- diam structure, minor components Rab etral A- axial 25828 particular general ı≽r∑∏ Continued from non-cored borehole -JT, 70°, PL, RO, CN. SW SANDSTONE: Coarse grained, pale grey, 0.39 0.3 --- PT, 0-15°, CU, RO, VN clay. -PT, 10°, ST, RO, CN. D A 0.17 0.17 -PT, 10°, IR, VRO, CO clay. becoming pale yellow with carbonaceous WW/WF Naminae SHALE: Dark grey SANDSTONE: Medium to coarse grained, — JT, 90°, PL, RO, VN clay. PT, 0-15°, CU, RO, VN clay. PT, 0-15°, CU, RO, VN clay. JT, 70°, PL, RO, CN. SW/FR banded pale grey and grey, distinctly laminated at 0 - 15 degrees, trace of `\PT, 0-15°, CU, RO, VN clay.
\PT, 0-15°, CU, RO, VN clay. 1.11 0.94 D CBH122 terminated at 4.35m PT, 0-15°, CU, RO, VN clay.

defect type JT joint PT parting

ritv

SS

CU

seam

sheared zone

planar curved undulating

stepped

sheared surface crushed seam

fresh

very low low

medium

high very high

SW MW HW

strength

slightly weathered moderately weathered highly weathered extremely weathered

distinctly weathered (covers MW and HW)

10/1/98 water level

on date shown

partial drill fluid loss

complete drill fluid loss

water pressure test result

(lugeons) for depth

interval shown

water inflow

roughness VR very ro

coating CN cle SN sta

VN

very rough rough

slickensided

smooth

clean stained



APPENDIX A

ENGINEERING LOGS – AREA D



Office Job No.:

Date started:

CBH9

Engineering Log - Borehole

NSW Department Of Commerce

NSW Department Of Corrective Services

Principal: Environmental/Geotechnical Investigation Project:

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D

Date completed:

25.10.2004 25.10.2004

E12723/03

AD/SG Logged by:

Checked by: DED

Easting: R.L. Surface: 34.5 P160 Truck drill model and mounting: Northing bearing: datum: AHD 100 mm hole diameter. drilling information material substance pocket penetro-meter penetratior consistency/ density index classification symbol notes material structure and g samples moisture condition additional observations graphic l method hoddus tests, etc kPa soil type: plasticity or particle characteristics, depth 2883 RL metre colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to medium grained, dark H grey brown, low plasticity clay (<5%), waste building materials (<5%). D MD AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, dark grey brown, SF Вs low plasticity clay (<5%). From 1-1.25m environmental sample. SPT 15,10,8 N*=18 Bs SAND: Fine to medium grained, pale yellow grey SF 2 brown, low plasticity clay (<5%). D SAND: Fine to medium grained, pale grey white, low SF τ From 2.5-2.7m environmental SPT plasticity clay (<5%). sample. <u>3</u> _31 D W L-MD 4 From 4-4.2m environmental SPT 5,5,10 N*=15 sample. D 5 V-bit refusal at 5.1m. Borehole CBH9 continued as cored hole _29 6 **COFFEY.GDT 01.12.04** _28 27 8 26 notes, samples, tests classification symbols and consistency/density index method support undisturbed sample 50mm diameter soil description VS very soft AS M mud auger screwing based on unified classification s soft auger drilling C casing undisturbed sample 63mm diameter RR W CT system penetration disturbed sample roller/tricone D Issue 3 Rev.2 standard penetration test (SPT) St stiff washbore very stiff SPT - sample recovered moisture VSt cable tool hard hand auge HA No SPT with solid cone D dry moist friable vane shear (kPa) DT diatube water VL very loose pressuremeter 8 V blank bit 10/1/98 water level Bs bulk sample Wp plastic limit 1. loose V bit on date shown MD medium dense TC bit environmental sample W liquid limit water inflow *bit shown by suffix refusal VD very dense water outflow e.g. ADT





Office Job No .:

Date started:

CBH9

Sheet

2 of 2

Engineering Log - Cored Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

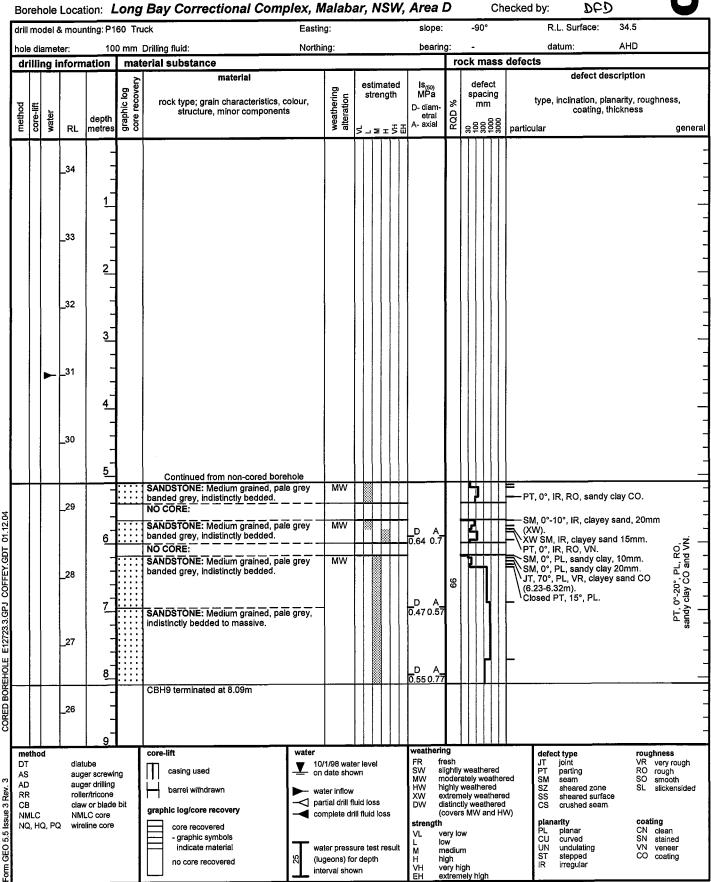
Date completed:

25.10.2004 25.10.2004

E12723/03

Logged by:

AD/SG



Engineering Log - Piezometer

Co	offe	y (ìe	os	cience	B P	ty I	Ltd	ACN	056 33	5 516		•	Borehole	No.	CBH10 MW1		
Εı	Engineering Log - Piezometer												Sheet Office Job No.		1 01 1			
_	lient: NSW Department Of Commerce											Date star		25.10.2004				
>rir	Principal: NSW Department (ent C	of Co	orrec	tive Services		Date con	nplete	d: 25.10.2004		
oro	ject:				Envi	ron	me	nta	I/Ged	oteci	hnica	l Investigation		Logged b	oy:	AD		
Зог	rehol	le L	.oc	atio	n: Lon g	g Ba	ay (Cor	rectio	onal	Com	plex, Malabar, NSW, Area L	D	Checked	by:	DCD C		
frill	mode	el &	mo	untir	ng: P160 T	uck				Eas	ting:	slope:	-90°		R.L	. Surface: 35.7		
	dian	_			100mm					_	thing:	bearing:	<u>-</u>		date	um: AHD		
ar	illing ទ	_	for	mat			_			ma		substance			×			
method	v penetration		noddns	water	notes samples, tests, etc	w det	ell ails	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle charac colour, secondary and minor comp	cteristics, conents.	moisture condition	consistency/ density index	structure and additional observations		
			N		E D				_			FILL: TOPSOIL: SILTY SAND: Fine to me grained, dark grey-black, low liquid limit s	silt.	М		FILL		
				f	D			_35	-			FILL: CLAYEY SAND: Fine to medium gr grey and dark brown, low plasticity clay.	LL: CLAYEY SAND: Fine to medium grained, dark	k				
				-	SPT	网	易		1			FILL: CLAYEY SAND: Fine to medium grained, brown and grey and black and yellow, low plasticity		-		From 1-1.2m environmental		
					4,5,10 N*=15				-	\bowtie		clay.				sample.		
						["]		_34	<u>2</u>	\bowtie								
				_	D									-w				
		$\ $] :						**					
				-	SPT		<u> </u>		_	 	SP	SAND: Fine to medium grained, dark bro	own, low	-	L	AEOLIAN DUNE OR BEACH		
					4,4,9 N*=13		} :	_33	3			plasticity clay (<5%).				DEPOSIT From 2.5-2.7m environmental sample.		
				Ī	D		<u> </u>		<u> </u>							Jampio.		
							 			SP	SAND: Fine to medium grained, dark bro		_					
					D] :	_32	_		35	black, low plasticity clay (<5%).	wii aliu					
				}	SPT				4									
					5,4,5 N*=9				4									
					D	l F		_31	_									
		\coprod	1	_					5			Borehole CBH10 MW1 terminated at 5m						
									-			25.511010 CENTIO WITT TOTAL MARCOL AL OIL						
		$\ \ $						30	4									
								<u> </u>	6									
									1									
									_									
								29	<u></u>									
									7									
									4									
								_28	ا									
	hod						ID22		8		notes a	amples, tests clas	ssification s	vmbols and	<u> </u>	consistency/density index		
method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V bit				auger screwing* auger drilling* roller/tricone washbore cable tool hand auger diatube support C casing N r penetration 1 2 3 4 no resistance ranging to					ging to usal	əl	U ₅₀ D N N* NC V P Bs R	undisturbed sample 50mm diameter disturbed sample bas standard penetration test (SPT) SPT - sample recovered SPT with solid cone vane shear (kPa) pressure meter bulk sample www.	il description sed on unified stem pisture dry moist wet	n d classificatio	n ·	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose		
it g.	shown	ı by	V b TC suffi AD	bit x			– wa	ter infl ter ou	ow		E PID WS PZ	environmental sample PID measurement water sample piezometer				MD medium dense D dense VD very dense		

<i>-</i> опеу	offey Geosciences Pty Ltd Act				NGO FIY HM MON 000 000 010							Borehole	No.	CBH11 MW2
_	ne	er	ing L				_		ter	area		Sheet Office Jo Oate star		1 of 1 E12723/03 26.10.2004 d: 26.10.2004 AD
Client:					-					tive Services		Date con		d: 26.10.2004
rincipal:					•								•	AD
roject:										I Investigation		ogged b	-	DED C
					ay (Cor	recti			plex, Malabar, NSW, Area		Checked		Surface: 35.7
		ounti	ng: P160 Tr	ruck					sting: rthing:	slope: bearing:	-90°		datı	
ole diame Irilling i	_	rma	100mm tion	_	_					substance				7010
penetration	support	water	notes samples, tests, etc		ell iails	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle char colour, secondary and minor cor		moisture condition	consistency/ density index	structure and additional observations
123	N	_	E D			1	-			FILL: CLAYEY SAND: Fine to coarse and brown, low plasticity clay, sandstor to 120mm (<5%).	grained, grev	Т м		FILL
			D			_35	- - 1	⋘	SP	SAND: Fine to medium grained, pale y low plasticity clay (<5%).	rellow grey,	-	MD	AEOLIAN DUNE OR BEACH DEPOSIT
			SPT 6,9,13 N*=22			_34	<u>-</u>							From 1-1.3m environmental sample.
			D D				<u>-</u> 2		SP	SAND: Fine to medium grained, yellow grey-white, low plasticity clay (<5%).	and pale	-	L	
			SPT			33	- -							From 2.5-2.8m environmental sample.
			3,4,6 N*=10				<u>3</u>							sample.
		-	D D			_32	32 <u>4</u>		SP	SAND: Fine to medium grained, pale y low plasticity clay (<5%).	vellow grey,	- w	MD	
			SPT 6,8,10 N*=18							ion placticity day (5.6).				
			D			_31	- 5							
				-J [<u>.</u>							
			SPT 2,6,8 N*=14			_30	<u>-</u> 6		SC	Sandy CLAY: Medium to high plasticity medium sand. Borehole CBH11 MW2 terminated at 5		M/W	St	
						_29	- -							
							7							
						_28	<u>-</u>							
method AS auger screwing* AD auger drillling* RR roller/fricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit						ation 4 no rar ref	N r	•	U ₅₀ D N N* NC V P Bs R	undisturbed sample 50mm diameter disturbed sample standard penetration test (SPT) SPT - sample recovered SPT with solid cone vane shear (kPa) pressure meter bulk sample refusal	classification sy soil description based on unified system moisture D dry M moist W wet Wp plastic limi	classificatio		consistency/density Index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose
oit shown b	T by su	bit C bit Iffix DT				iter inf	flow		E PID WS PZ	envilorintental sample	W _L liquid limit			MD medium dense D dense VD very dense

CBH12

Engineering Log - Borehole

Sheet 1 of 2 Office Job No.:

Date started:

E12723/03 26.10.2004

Client: Principal: NSW Department Of Commerce

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by:

26.10.2004 AD/SG

Checked by:

DCD

Во	rel	hol	e l	-00	atio	n: Long	g Ba	y Co	rrec	tiona	I Complex, Malaba	ar, NSW, Are			Checke	d by		DC 0	,	
dril	l m	ode	l aı	nd	moui	nting: I	P160	Truck			Easting:	slope:	-90°				R.L	Surface:	34.5	
		iam					100 m	m			Northing	bearing:	-				dat	um:	AHD	
di	rilli		in	fo	rma	tion			mate		ıbstance				ر پ		<u> </u>	T		
method	notes samples, tests, etc							depth metres	graphic log	classification symbol	mate soil type: plasticity or p colour, secondary an	article characterist	tics, nts.	moisture condition	consistency/ density index	100 pocket 200 pocket	a a		structure and onal observations	1
VBIT	_	<u> </u>	_	N		E			$\otimes\!\!\!\otimes$		FILL: CLAYEY SAND: Fine brown-black, low plasticity of	to coarse grained	, dark	М		П	П	FILL		1
) 						D D	_34	- - 1	₩	SP	materials le bricks, tiles, pla SAND: Fine to medium gra plasticity clay (<5%).	stic.			MD			AEOLIAN D DEPOSIT	DUNE OR BEACH	
						SPT 5,8,10 N*=18	_33	-										From 1-1.3	m environmental	-
					-	D	_32	2		SP	SAND: Fine to medium gra low plasticity clay (<5%).	ined, pale yellow g	rey,	w				From 2.5-2	.6m environmental	1 1 1 1
	****					25 for 100mm		-			M hit makes -1					Ш		sample.		_
BOREHOLE E12723.3.GPJ COFFEY.GDT 01.12.04						N*=R	_31 _30 _29 _28	3 			V-bit refusal. Borehole CBH12 continued	as cored hole								
m GEO 5.3 Issue 3 Rev.2	method AS auger screwing* AD auger drilling* C casing RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT support M mud C casing penetratio 1 2 3 4 1 10/1/9 water water water water water *bit shown by suffix water water water water					mud casing enetratic 2 3 4 a ater 10/1/5 on da - water	no resist ranging t refusal 98 water te show	level	notes, samples, tests U ₅₀ undisturbed sample D disturbed sample N standard penetratic N* SPT - sample reco NC SPT with solid con V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sam R refusal	e 63mm diameter on test (SPT) vered e	soil des based o system moistur D di M m W w Wp p	cription n unified				consiste VS S F St VSt H Fb VL L MD D VD	ncy/density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense			

Coffey mm



Sheet

CBH12

Engineering Log - Cored Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

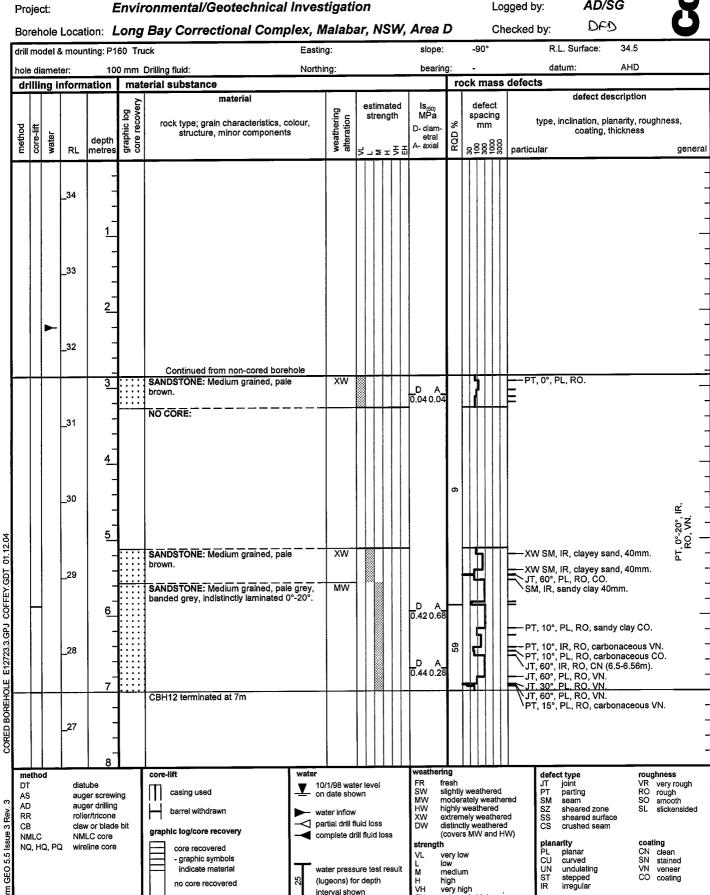
Environmental/Geotechnical Investigation

Office Job No.: Date started: Date completed: E12723/03 26.10.2004

26.10.2004

AD/SG

2 of 2



Engineering Log - Piezometer

	•				cience		-						•	Borehole Sheet	No.	CBH13 MW3
	ng	in	е	er	ing L	.og	-	Pi	<u>ezo</u>	me	ter			Office Jo	b No.:	E12723/03
lie	ent:				NSV	V De	pa	rtm	ent (Of C	omm	erce		Date sta	rted:	26.10.2004
riı	ncipa	al:			NSV	V De	pa	rtm	ent (Of C	orre	ctive Services		Date cor	nplete	d: 26.10.2004
ro	ject:	:			Env	iron	me	nta	I/Ged	otec	hnic	al Investigation		Logged I	оу:	AD
oı	reho	le L	.00	atio	n: <i>Lon</i>	g Ba	ay (Cor	recti	onal	Con	nplex, Malabar, NSW, Area L	ם כ	Checked	by:	DED.
j))	mode	el &	mo	unti	ng:P160 T	ruck				Ea	sting:	slope:	-90°	-	R.L	Surface: 36.1
	dian illing	_	_	ma	100mm					_	rthing:	substance	<u> </u>		dati	um: AHD
	_	_	Ī	u	notes								<u></u>		≽ŏ	
illeanoa	v penetration		support	water	samples, tests, etc	we		RL	depth metres		classification	material soil type: plasticity or particle charac colour, secondary and minor comp	cteristics,	moisture condition	consistency/ density index	structure and additional observations
•		-	N		E D			_36	-			FILL: CLAYEY SAND: Fine to coarse grayellow brown, low plasticity clay (<5%).	ained, pale	М		FILL
					D				- - 1	XXX	SP	SAND: Fine to medium grained, dark bro low plasticity clay (<5%).	wn-black,	-	L	AEOLIAN DUNE OR BEACH DEPOSIT
					SPT 2,2,5 N*=7			_35	-							From 1-1.3m environmental sample.
					D			_34	<u>2</u>		SP	SAND: Fine to medium grained, pale yell low plasticity clay (<5%).	low grey,	-		
					D				-		SP	SAND: Fine to medium grained, dark bro black and grey, low plasticity clay (<5%).			VD	
				_	SPT 25 for 100mm N*=R				3		:			W	MD	From 2-2.61m environmental sample.
					D			_33	- -					VV		
					SPT 5,8,9 N*=17			_32	<u>4</u> -							From 4-4.3m environmental sample.
					D D	E			- - -							
					D			_31	<u>5</u> -		SP	SAND: Fine to medium grained, pale gre intermediate plasticity clay.	y, low to		L	
					SPT 3,4,6 N*=10				- 6							From 5.5-5.8m environmental sample.
,								_30	- - -			Borehole CBH13 MW3 terminated at 5.9	me			
								_29	7]						
									- -							
ef	hod					SU	ppor	<u></u>	8		notes.	samples, tests cla	ssification s	ymbols and	<u> </u>	consistency/density index
SDR/TA			roll wa cal ha	ger d er/tri shbo ole to nd au	ol uger	C	casii enetra 2 3	ng I tion 4 no	N n resistance aging to usal	ł	U ₅₀ D N N* NC V	undisturbed sample 50mm diameter disturbed sample bas standard penetration test (SPT) SPT - sample recovered SPT with solid cone vane shear (KPa)	il descriptior sed on unified stem bisture dry	1		VS very soft S soft F firm St stiff VSt very stiff H hard
Т	showr	n bv	dia bla V b TC	itube ink bi bit bit	•	₹		date :	water lev shown low	el	P Bs R E PID WS	pressure meter bulk sample M refusal environmental sample PID measurement water sample				Fb friable VL very loose L loose MD medium dense D dense

Engineering Log - Piezometer

20	ffe	y (Эe	OS	cience	s Pt	y L	td	ACN (056 33	35 516				Borehole	No.	CBH14 MW4
		in	е	er	ing L			_	_			0.00	<u> </u>		Sheet Office Jo		
	ent:				NSM										Date sta		d: 27.10.2004
	ncipa						-					tive Services				•	AD
	ject:											al Investigation		D	Logged I		DFD C
	_						y c	ori	ecti		sting:	plex, Malabar,	slope:	-90°	Checked		. Surface: 34.5
	mode dian			unur	ng: P160 Ti	ruck					rthing:		bearing				um: AHD
	lling	_		mat	ion					_		substance				1	
	الم الم	- 1	support	water	notes samples, tests, etc	we deta		RL	depth metres	graphic log	classification	soil type: plastic	material city or particle dary and minor	characteristics, r components.	moisture condition	consistency/ density index	structure and additional observations
		٥	N		D SPT 1,1,2 N*=3	8888888		_34	- - 1			FILL: CLAYEY SAN black-dark brown, lo building materials (<	w plasticity cla	rse grained, ay (≺5%), waste	M		From 1-1.3m environmental sample.
				-	D D			_33	2	***	SP	SAND: Fine to medi dark grey, low plastic			 W	MD	AEOLIAN DUNE OR BEACH DEPOSIT
					SPT 4,8,9 N*=17			_31	3		SC	Sandy CLAY: Mediu			<u>-</u>	VSt	From 2.5-2.8m environmental sample.
					SPT 3,4,5 N*=9			_30	- -			Borehole CBH14 M\	N4 terminated	I at 4.45m			From 4-4.3m environmental sample.
								_29	<u>5</u> - -								
								_28	<u>6</u> - -								
								27	7 - -								
SORTAT	thod	n by	roll wa cat hai dia bla V to	ger di ler/trid shboi ole to nd au litube link bi oit bit	re ol iger	C	10/1 on o	tion 4 no rang refu	vater lev hown ow	,	notes, U ₅₀ D N N* NC V P Bs R E PID WS PZ	samples, tests undisturbed sample 50 disturbed sample standard penetration te SPT - sample recovere SPT with solid cone vane shear (kPa) pressure meter bulk sample refusal environmental sample PID measurement water sample piezometer	est (SPT) ed	classification soll descriptic based on unific system moisture D dry M moist W wet Wp plastic I W_ liquid lir	on ed classification		consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Office Job No.:

Date started:

Sheet

CBH15

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

ADT

water outflow

NSW Department Of Corrective Services

Environmental/Geotechnical Investigation

Date completed:

27.10.2004 27.10.2004

very dense

VD

E12723/03

Logged by:

AD

Project: DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: Easting: R.L. Surface: 35.5 drill model and mounting: P160 Truck Northing bearing: datum: AHD 100 mm hole diameter: drilling information material substance pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and graphic log samples additional observations method hoddns tests, etc kPa soil type: plasticity or particle characteristics, depth metres 5888 RL colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, dark brown-black, low plasticity clay (<5%). V BIT Ε D 0.<u>5</u> 35.0 observed SAND: Fine to medium grained, yellow brown and AEOLIAN DUNE OR BEACH D 1.0 pale grey, low plasticity clay (<5%). DEPOSIT From 1-1.3m environmental sample. 2,3,2 N*=5 1.<u>5</u> D 2.0 Borehole CBH15 terminated at 2m at v bit refusal. 2.<u>5</u> _33.d E12723.3.GPJ COFFEY.GDT 02.12.04 3.0 32.5 _32.0 3.<u>5</u> classification symbols and consistency/density index support notes, samples, tests AS AD undisturbed sample 50mm diameter soil description very soft N nil auger screwing* M mud undisturbed sample 63mm diameter based on unified classification s soft C casing auger drilling RR roller/tricone disturbed sample system firm penetration stiff standard penetration test (SPT) W washbore no resistance ranging to VSt very stiff moisture SPT - sample recovered СТ cable tool SPT with solid cone dry н hard HA hand auger friable Fb DT vane shear (kPa) М moist diatube ٧L W very loose В blank bit pressuremeter wet plastic limit loose V bit Bs bulk sample ٧ on date shown MD medium dense environmental sample WL liquid limit TC bit water inflow dense refusal

Office Job No.:

Date completed:

Date started:

Sheet

1 of 1

AD

Engineering Log - Borehole

Project:

NSW Department Of Commerce

NSW Department Of Corrective Services Principal:

Environmental/Geotechnical Investigation

Logged by:

27.10.2004

E12723/03

27.10.2004

DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: R.L. Surface: 35.5 drill model and mounting: P160 Truck Easting: slope: AHD 100 mm Northing bearing: datum: hole diameter: drilling information material substance pocket penetro-meter consistency/ density index penetratio structure and material classificati symbol samples, moisture condition additional observations graphic suppor tests, etc water kPa soil type: plasticity or particle characteristics, depth 8888 RL colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, dark Ε V BIT brown-black, low plasticity clay, waste building materials ie wire, steel, bricks (<5%). 0.<u>5</u> D 1.<u>0</u> From 1-1.3m environmental sample. 1.<u>5</u> _34.0 D SAND: Fine to medium grained, dark grey-pale grey, low plasticity clay (<5%). AEOLIAN DUNE OR BEACH L DEPOSIT 33.5 2.0 D 2.<u>5</u> 33.d From 2.5-2.8m environmental sample. E12723.3 GPJ COFFEY GDT 01.12.04 7,7,9 N*=16 3.<u>0</u> _32.5 MD D SAND: Fine to medium grained, grey brown, low plasticity clay (<5%). W 3.5 32.0 D **BOREHOLE** E(D) Borehole CBH16 terminated at 3.9m 4.0 consistency/density index classification symbols and notes, samples, tests method support undisturbed sample 50mm diameter soil description VS very soft AS auger screwing M mud based on unified classification ΑD auger drilling* C casing undisturbed sample 63mm diameter S soft firm penetration RR roller/tricone D disturbed sample system GEO 5.3 Issue 3 Rev.2 St stiff N standard penetration test (SPT) W washbore SPT - sample recovered CT cable tool moisture VSt very stiff Nc SPT with solid cone D dry hard HΑ hand auger Fb friable М moist DT diatube water vane shear (kPa) very loose pressuremeter wet В blank bit 10/1/98 water level Wp plastic limit loose Bs bulk sample on date shown V bit MD medium dense environmental sample liquid limit TC bit water inflow dense shown by suffix *bit refusal VD very dense water outflow ADT

Engineering Log - Borehole

Borehole No. CBH17

1 of 1 Sheet

E12723/03 Office Job No.: 27.10.2004

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by:

Date started:

27.10.2004 AD

DED

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: 35.0 R.L. Surface: slope: P160 Truck Easting: drill model and mounting: AHD 100 mm Northing bearing: datum: hole diameter: drilling information material substance consistency/ density index pocket penetro-meter structure and material 8 penetra samples, moisture condition additional observations method graphic support tests, etc water kPa soil type: plasticity or particle characteristics, depth 5885 colour, secondary and minor components. RL 123 FILL: CLAYEY SAND: Fine to coarse grained, dark V BIT grey and brown, low plasticity clay, waste building material ie crushed bricks and concrete, wire, steel D 1 From 1-1.3m environmental SPT N*=12 D FILL: CLAYEY SAND: Fine to coarse grained, 2 33 mottled red brown, grey brown and black, low to medium plasticity clay.

FILL: CLAYEY SAND: Fine to coarse grained, mottled red, dark brown and orange brown, low to medium plasticity clay. From 2.5-2.8m environmental SPT sample. 9,2,2 N*=4 3 _32 D SAND: Fine to medium grained, grey-brown and dark grey, low to medium plasticity clay (<5%). MD AEOLIAN DUNE OR BEACH DEPOSIT D 4 From 4-4.3m environmental SPT sample. 6,6,9 N*=15 5 30 SAND: Fine to medium grained, brown, low W plasticity clay (<5%). GDT 01.12.04 D 6 29 COFFEY Borehole CBH17 terminated at 6.5m E12723.3.GPJ 7 28 consistency/density Index classification symbols and method support notes, samples, tests undisturbed sample 50mm diameter soil description very soft AS auger screwing M mud N nil undisturbed sample 63mm diameter based on unified classification s soft AD RR auger drilling C casing U₆₃ firm penetration D disturbed sample system GEO 5.3 Issue 3 Rev.2 stiff standard penetration test (SPT) W washbore moisture VSt very stiff CT HA SPT - sample recovered cable tool SPT with solid cone н hard hand auger Fb friable DT vane shear (kPa) М moist VL very loose wet blank bit pressuremeter 10/1/98 water level Bs bulk sample Wp plastic limit loose V bit on date shown MD medium dense environmental sample liquid limit TC bit dense water inflow refusai *bit shown by suffix VD very dense water outflow ADT

Office Job No .:

Date started:

Sheet

CBH18

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Date completed: Logged by:

27.10.2004

E12723/03

27.10.2004

AD

DFD Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: R.L. Surface: 34.6 P160 Truck Easting: drill model and mounting: 100 mm bearing: datum: AHD Northing hole diameter: drilling information material substance pocket penetro meter penetration classification symbol notes material structure and graphic log samples, additional observations method support tests, etc water kPa soil type: plasticity or particle characteristics, depth metres 9889 colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, grey V BIT Ε pale brown, low plasticity clay. D 0.<u>5</u> FILL: CLAYEY SAND: Fine to coarse grained, grey and pale brown with mottled red brown sandstone D 1.0 pieces up to 50mm, low plasticity clay. From 1-1.3m environmental 3,3,3 N*=6 1.<u>5</u> D AEOLIAN DUNE OR BEACH MD SAND: Fine to medium grained, grey brown and DEPOSIT yellow, low plasticity clay (<5%). D 2.0 _32.5 Е Borehole CBH18 terminated at 2.4m 2.5 32.0 01.12.04 E12723.3.GPJ COFFEY.GDT 3.0 31.5 3.<u>5</u> _31.0 notes, samples, tests classification symbols and consistency/density index method support undisturbed sample 50mm diameter soil description ٧S very soft auger screwing* M mud undisturbed sample 63mm diameter based on unified classification soft AD RR auger drilling* C casing system firm disturbed sample roller/tricone penetration GEO 5.3 Issue 3 Rev.2 St stiff W standard penetration test (SPT) washbore no resistance VSt very stiff CT HA DT moisture cable tool SPT - sample recovered SPT with solid cone hard dry Nc hand auger М moist Fb friable vane shear (kPa) diatube В blank bit pressuremeter W VL very loose 10/1/98 water level Wp loose plastic limit V bit on date shown Bs bulk sample MD medium dense liquid limit environmental sample TC bit water inflow dense *bit shown by suffix VD very dense water outflow

0	пеу	G(:0 \$	cience	5 P(y L	-ticl	ACN	U56 33	ხ 516			Borehole	No.	CBH19 MW5
Ξr	ngi	ne	er	ing L	.og	-	Pie	ezo	me	ter			Sheet Office Jo	b No.:	
	nt:									omme	erce		Date sta	rted:	27.10.2004
rin	cipal:			NSV	V De	pai	rtm	ent (Of Co	orrec	tive Services		Date con	npleted	d: 27.10.2004
roj	ect:			Env	iron	me	nta	I/Ged	oteci	hnica	l Investigation		Logged b	оу:	AD
or	ehole	Lo	catio	n: <i>Lon</i> g	g Ba	ay (Cori	recti	onal	Com	plex, Malabar, NSW, Aı	rea D	Checked	l by:	DED
ill r	nodel	& m	ounti	ng:P160 T	ruck				Eas	sting:	slope:	-90°		R.L	Surface: 35.4
_	diame Iling i		rma	100mm					_	thing:	bearing substance	: -	_	dati	um: AHD
Ϊ			IIIIa	notes					1110		substance			××	
	benetration	support	water	samples, tests, etc	we deta		RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle o colour, secondary and minor	characteristics,	moisture condition	consistency/ density index	structure and additional observations
1		N		E		公					FILL: CLAYEY SAND: Fine to coar brown and dark grey, low plasticity		M		FILL
				D	SHARK HARACAS		_35.0 _34.5	0. <u>5</u>							
				SPT 5,9,12 N*=21	TREASER	388888	_34.0	1. <u>0</u> -		SP	SAND: Fine to medium grained, graclay (<5%).	ey, low plasticity	_	MD	AEOLIAN DUNE OR BEACH DEPOSIT From 1-1.3m environmental sample.
				D			_33.5	2.0 - - - - 2.5		SP	SAND: Fine to medium grained, ye dark brown, low plasticity clay (<5%				
			\	SPT 5,7,10 N*=17			_32.5	2. <u>5</u> - - - 3. <u>0</u>		SP	SAND: Fine to medium grained, pa and yellow brown, low plasticity cla	ale grey brown y (<5%).	- w		From 2.5-2.8m environmental sample.
				D			_32.0	3. <u>5</u>				•			
SORITAT	anod	ar w ca ha di bi V	uger d iller/tri ashbo able to and a atube ank b bit C bit	nger ool	pe 1	on wat	ng 4 noi rang × refu	vater lev shown ow	•	notes, s Uss D N N* NC V P Bs R E PID WS PZ	amples, tests undisturbed sample 50mm diameter disturbed sample standard penetration test (SPT) SPT - sample recovered SPT with solid cone vane shear (kPa) pressure meter bulk sample refusal environmental sample PID measurement water sample plezometer	classification soil descriptic based on unific system moisture D dry M moist W wet Vyp plastic li Wt liquid lin	on ed classificatio		consistency/density index VS very soft S soft F firm St stiff VSt very sliff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

	Geo	science:	B Pty I	Ltd	ACN (056 33	5 516			Borehole	No.	CBH19 MW5
										Sheet		
Engin	<u>iee</u>	ring L	og -	<u>Pi</u>	ezo	me	ter	· · · · · · · · · · · · · · · · · · ·		Office Jo		2 of 2 <u>E12723/03</u> 27.10.2004 E: 27.10.2004 AD
Client:		NSN	/ Depa	rtm	ent C	of Co	omme	erce		Date sta	rted:	27.10.2004
Principal:		NSN	/ Depa	rtm	ent C	of Co	rrec	tive Services		Date con	npleted	: 27.10.2004
Project:		Envi	ronme	enta	I/Ged	tecl	hnica	l Investigation		Logged I	oy:	AD
Borehole I	Locati	on: Long	g Bay (Cori	rectio	onal	Com	plex, Malabar, NSW, Al	rea D	Checked	by:	DED
rill model &	moun	ing: P160 Tr	uck			Eas	ting:	slope:	-90°		R.L.	Surface: 35.4
ole diamete drilling in		100mm					thing:	bearing substance	j: <u>-</u>		datu	m: AHD
T T		notes							 ····		××××××××××××××××××××××××××××××××××××××	
neurod 7 penetration	support water	samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle colour, secondary and minor	characterístics,	moisture condition	consistency/ density index	structure and additional observations
120	N	SPT 4,9,12 N*=21		_31.0 _30.5 _30.0	4. <u>5</u> 5. <u>0</u> 5. <u>5</u> 7. <u>0</u> 7.0		SP	SAND: Fine to medium grained, pand yellow brown, low plasticity cla (continued) Borehole CBH19 MW5 terminated	y (< 5%).	W	MD	From 4-4.3m environmental sample.
ethod S D D R A T		ore cool auger e	suppor C casi	ation 4 nor	7.5 8.0 N ni		notes, s U ₅₀ D N N* NC V P Bs R	amples, tests undisturbed sample 50mm diameter disturbed sample standard penetration test (SPT) SPT - sample recovered SPT with solid cone vane shear (kPa) pressure meter bulk sample refusal	classification soil description based on unifies system moisture D dry M moist W wet	n		consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose

Office Job No.:

Date started:

Sheet

1 of 1

Engineering Log - Borehole

NSW Department Of Commerce

NSW Department Of Corrective Services

Principal: Project:

Environmental/Geotechnical Investigation

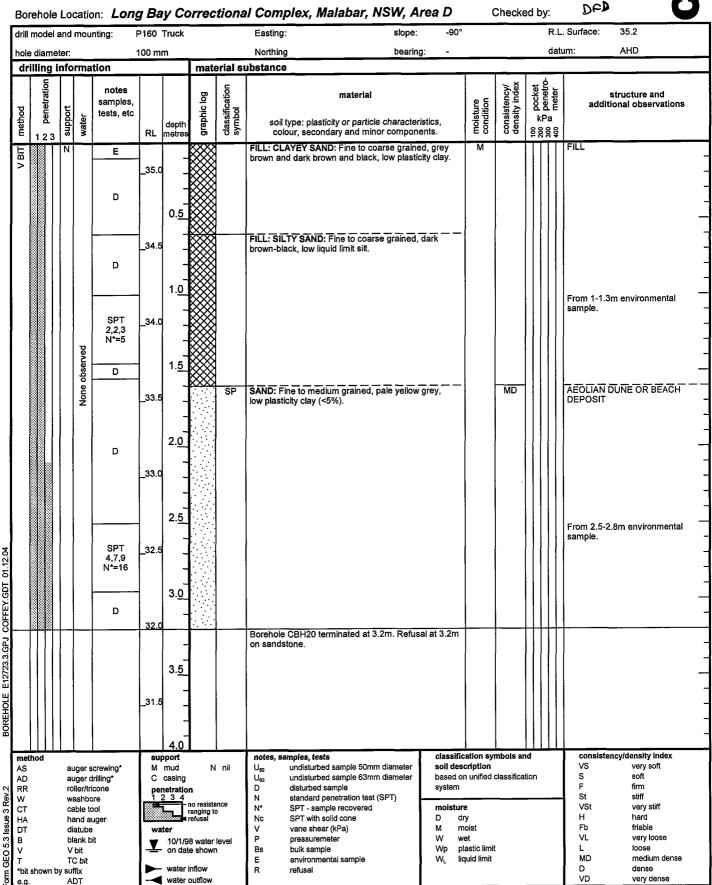
Date completed:

27.10.2004 27.10.2004

E12723/03

Logged by:

AD



Borehole No. CBH21

Sheet 1 of 1

Office Job No.:

Date completed:

Date started:

E12723/03

27.10.2004

27.10.2004

Engineering Log - Borehole

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

ADT

Logged by:

AD

VD

very dense

DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: R.L. Surface: 35.6 P160 Truck Easting: slope: drill model and mounting: bearing: datum: AHD Northing hole diameter: 100 mm drilling information material substance consistency/ density index pocket penetro-meter penetratio notes structure and samples, classificat additional observations graphic tests, etc symbol kPa soil type: plasticity or particle characteristics, depth metre 5885 colour, secondary and minor components. RL 123 FILL: CLAYEY SAND: Fine to coarse grained, grey V BIT Ε 35. brown, low plasticity clay. D 0.5 SAND: Fine to medium grained, grey and brown, AEOLIAN DUNE OR BEACH L 35.0 low plasticity clay (<5%). DEPOSIT ח 1.0 From 1-1 3 environmental sample. SPT 6,6,8 N*=14 observed 1.<u>5</u> SAND: Fine to medium grained, yellow and pale MD grey, low plasticity clay (<5%). 2.0 33.5 D From 2.5-2.8m environmental 33.0 SPT COFFEY.GDT 01.12.04 3.0 Borehole CBH21 terminated at 3.25m. Refusal on F12723 3 GP.I 3.5 32.0 classification symbols and consistency/density index notes, samples, tests method support undisturbed sample 50mm diameter soil description VS very soft auger screwing mud AS based on unified classification soft AD RR auger drilling* C casing undisturbed sample 63mm diameter firm roller/tricone penetration D disturbed sample Issue 3 Rev.2 w standard penetration test (SPT) St stiff washbore VSt very stiff СТ SPT - sample recovered moisture hard HA hand augei Nc SPT with solid cone D dry Fb friable vane shear (kPa) DT diatube w VL very loose GEO 5.3 blank bit В 10/1/98 water level Bs bulk sample Wρ plastic limit loose V bit on date shown MD medium dense environmental sample W_L liquid limit TC bit ter inflow refusal *bit shown by suffix

CBH22

1 of 1

Engineering Log - Borehole

Office Job No.:

Sheet

E12723/03

NSW Department Of Commerce

Date started:

27.10.2004

Principal:

Date completed:

27.10.2004

NSW Department Of Corrective Services

Logged by:

AD

Project:

TC bit

*bit shown by suffix

water inflow

water outflow

Environmental/Geotechnical Investigation

DED Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Checked by: R.L. Surface: 34.0 P160 Truck Easting: drill model and mounting: Northing bearing: datum: AHD 100 mm hole diameter: material substance drilling information consistency/ density index pocket penetro-meter classification symbol penetratio notes structure and samples additional observations graphic method support tests, etc water soil type: plasticity or particle characteristics, depth metre 5885 colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, dark Е 띪 grey-black, low plasticity clay. D 0.<u>5</u> FILL: CLAYEY SAND: Fine to coarse grained. yellow grey and brown, low plasticity clay. D 1.0 From 1-1.3m environmental 10,10,14 N*=24 1.<u>5</u> D AEOLIAN DUNE OR BEACH SAND: Fine to medium grained, pale grey brown, MD DEPOSIT low plasticity clay (<5%). 2.0 _32.0 D 2.<u>5</u> From 2.5-2.8m environmental COFFEY.GDT 01.12.04 7,9,9 N*=18 _31.d 3.<u>0</u> D Borehole CBH22 terminated at 3.3m 30.5 3.<u>5</u> SOREHOLE consistency/density index notes, samples, tests classification symbols and method support undisturbed sample 50mm diameter soil description ٧S very soft auger screwing* M mud based on unified classification soft undisturbed sample 63mm diameter AD RR auger drilling* roller/tricone C casing firm disturbed sample penetration St stiff w standard penetration test (SPT) washbore VSt very stiff moisture СТ cable tool SPT - sample recovered hard SPT with solid cone dry HA DT hand auger No moist Fb friable vane shear (kPa) diatube water pressuremeter w wet VL. very loose В blank bit 10/1/98 water level loose plastic limit V bit Bs bulk sample Wρ

environmental sample

liquid limit

MD

medium dense

very dense

Engineering Log - Borehole

Borehole No. CBH23

Sheet

1 of 1 E12723/03

Client:

NSW Department Of Commerce

Office Job No.: Date started:

27.10.2004

dense

very dense

VD

Principal:

NSW Department Of Corrective Services

27.10.2004 Date completed:

Project:

Environmental/Geotechnical Investigation

AD

*bit shown by suffix

ADT

Checked by:

Logged by:

DED

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D R I Surface 32.7 drill model and mounting: P160 Truck Easting: AHD 100 mm Northing bearing: datum: hole diameter: drilling information material substance pocket penetro-meter classification symbol consistency/ density index notes material structure and graphic log samples, moisture condition additional observations penet method support tests, etc water kPa soil type: plasticity or particle characteristics, depth 2888 RI colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, Ε BH orange brown, low plasticity clay. 32.5 0.<u>5</u> D 32.0 FILL: CLAYEY SAND: Fine to coarse grained, D 1.0 brown, low plasticity clay, waste building materials ie steel, plastics, concrete (<5%). From 1-1.3m environmental sample. observed SPT _31.5 4,4,6 N*=10 None (1.<u>5</u> ח 31.0 FILL: CLAYEY SAND: Fine to coarse grained, dark brown and yellow, low plasticity clay, waste building materials ie conjute paperwork, wire, bricks (<5%). 2.0 D 30.5 2.<u>5</u> SPT 19,18,25/100mm N*=R GDT 01.12.04 Borehole CBH23 terminated at 2.7m. Refusal on 3.0 E12723.3.GPJ COFFEY 29.5 3.5 BOREHOLE consistency/density index notes, samples, tests classification symbols and method support soil description undisturbed sample 50mm diameter very soft AS auger screwing mud AD RR auger drilling* C casing U₆₃ undisturbed sample 63mm diameter based on unified classification s soft roller/tricone penetration D disturbed sample system firm GEO 5.3 Issue 3 Rev.2 W CT HA stiff St standard penetration test (SPT) washbore SPT - sample recovered moisture VSt very stiff cable tool SPT with solid cone н hard hand auger М Fb friable DT diatube vane shear (kPa) moist ٧L very loose pressuremeter wet В blank bit 10/1/98 v Wp plastic limit loose Bs bulk sample V bit on date shown MD environmental sample liquid limit medium dense TC bit water inflow

refusal

water outflow

Office Job No.:

Date started:

Sheet

CBH24

Engineering Log - Borehole

1 of 1

Client:

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Environmental/Geotechnical Investigation

Date completed:

27.10.2004 27.10.2004

E12723/03

Project:

Logged by:

AD

		_					rrec	tiona	l Complex, Malaba		rea D		Checke	d by		DFD 31.1
drill mod			nour			Truck			Easting:	slope:						
hole diar		_			00 m	m	mot	vial e	Northing Ibstance	bearing	<u> </u>				dat	um: AHD
drilling method 1	periori	Ę	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	mat soil type: plasticity or p colour, secondary an	d minor compone	nts.	moisture condition	consistency/ density index	200 x pocket	a	structure and additional observations
V BIT	_	N		E D	_31.0	0. <u>5</u>			FILL: CLAYEY SAND: Fine yellow grey brown, low plas materials ie terracotta, brick	ticity clay, waste b	ouilding oncrete.	M				FILL
				D SPT 2,2,3 N*=5	_30.0	1. <u>0</u>			FILL: CLAYEY SAND: Fine brown, low plasticity clay. T boulders up to 50mm (<5%	races of sandston	d, grey ne					From 1-1.3m environmental sample.
				D	_29.5	1. <u>5</u>		SC	SAND: Fine to medium gra	ined, grey brown,	low		MD			AEOLIAN DUNE OR BEACH
				D	_29.0	2. <u>0</u>			plasticity clay (<5%). Borehole CBH24 terminate	d at 2.2m						DEPOSIT
					_28.5	2. <u>5</u>										
					_28.0	3. <u>5</u>										
method AS AD RR W CT HA DT B V T		roll was cat has dia bla V b	ger di er/tric shbos ole to nd au tube nk bi	re ol iger	M C per	ter 10/1/9		level	notes, samples, tests U ₅₀ undisturbed sample U ₆₃ undisturbed sample N standard penetratic N* SPT - sample recor NC SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sam	e 63mm diameter on test (SPT) vered e	soil des based or system moisture D dr M m W w Wp pl	n unified o	classificat			consistency/density Index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense

Engineering Log - Borehole

Borehole No. CBH65

Sheet

Date started:

1 of 1

Office Job No.:

E12723/03 2.11.2004

2.11.2004

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Logged by:

AD

νD

very dense

*bit shown by suffix

ADT

water outflow

Checked by:

Date completed:

DFD

Borehole Location: Long Bay Correctional Complex, Malabar, NSW, Area D Easting: R.L. Surface: 36.5 Mitsi Truck slope: drill model and mounting: Northing datum: AHD bearing: 100 mm hole diameter: drilling information material substance pocket penetro-meter classification symbol notes structure and additional observations g moisture condition samples, penetr graphic method support tests, etc water kPa soil type: plasticity or particle characteristics, depth metre 5885 RL colour, secondary and minor components. 123 FILL: CLAYEY SAND: Fine to coarse grained, V BIT E brown to dark brown, low plasticity clay. FILL: CLAYEY SAND: Fine to coarse grained, pale grey/pale brown, low plasticity clay. 36.0 0.5 1.0 35 5 Vone observed 1.<u>5</u> MD AEOLIAN DUNE OR BEACH _35.d SAND: Fine to medium grained, mottled pale grey, DEPOSIT orange, brown, low plasticity clay (<5%). 2.0 E 2.5 Borehole CBH65 terminated at 2.5m E12723.3.GPJ COFFEY.GDT 01.12.04 _33.5 3.<u>0</u> 3.<u>5</u> consistency/density index notes, samples, tests classification symbols and method support vs undisturbed sample 50mm diameter soil description very soft auger screwing* mud based on unified classification AD RR W undisturbed sample 63mm diameter auger drilling* C casing firm disturbed sample roller/tricone penetration 1 2 3 4 GEO 5.3 Issue 3 Rev.2 standard penetration test (SPT) St stiff washbore very stiff CT HA DT VSt cable tool SPT - sample recovered moisture hard SPT with solid cone hand auger No dry М moist Fb friable vane shear (kPa) diatube water В pressuremete w wet VL. very loose blank bit 10/1/98 water leve loose Bs bulk sample Wp plastic limit MD medium dense liquid limit environmental sample TC bit ater inflow dense

Sheet

CBH99

Engineering Log - Borehole

Client: Department of Commerce

Principal: De

Department of Corrective Services

Project: Environmental/Geotechnical Investigation

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Office Job No.:
Date started:
Date completed:

E12723/4

16.3.2005

16.3.2005

Logged by: CFW

1 of 3

Checked by: MM

	model					O TRI			Easting:	Malabar, NSW, A			Checke			MM Surface:	34.5	
	diame			•	100 m				Northing	bea	ring:				datu	m:	AHD	
	lling i		rma				mate	rial su	ıbstance									
method	v penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	soil type: pla	material asticity or particle charac condary and minor comp	cteristics,	moisture condition	consistency/ density index	100 pocket	a		structure and	
ADT HA	123	N		SPT 12,14,23 N*=37	_34	1 2 3		SM	FILL: SAND: Fin clay. Grading to medisome coarse where the coarse where t	um grained, becoming dite sandstone gravel. LAY: Mottled orange/grene grained, grey/brown, se grained sandstone gr	ark grey, with	M	D-VD			AEOLIAN	SAND	
			1	SPT 2,22,Hamm Bouncing N*=R	_30 er _29	5		SW		nedium grained, yellow/t		w	VSt			RESIDUAL	SOILS	
met AS AD RR W CT HA	hod	a ro w c	uger oller/ti ashb able t		M C pe	7 7 8 support mud casing proper traition 2 3 4 4		i nil	U ₆₃ undistu D disturb N standa N* SPT -	tests urbed sample 50mm diamet urbed sample 63mm diamet led sample urd penetration test (SPT) sample recovered ith solid cone	er soil de based d system moistu	re dry				VS S F St VSt H	ncy/density in very sof soft firm stiff very stif hard	t
DT B V T	shown	d b V T by si	iatub Iank I ' bit C bit	e ¯	▼	ater 10/1/9	8 water te showi	level	P pressu Bs bulk sa	nmental sample	W V	noist vet blastic lim iquid limit				Fb VL L MD D VD	friable very loo loose medium dense very del	dense



Office Job No.:

Date started:

Sheet

CBH99

2 of 3

Engineering Log - Borehole

Department of Commerce Client:

Principal:

Department of Corrective Services

Project:

Environmental/Geotechnical Investigation

16.3.2005 16.3.2005

E12723/4

Date completed: Logged by:

CFW

NA NA

Bor	reho	ole	Loc	atio					tiona	al Facility, Malabar, NSW, Ar			Checke			MM	
drill	mod	del a	ind i	moui	nting: (GEMC	O TRI	UCK		Easting: slope:							34.5
	dia			_		100 m	m	r		Northing bearing	ng:				datum	: <i>F</i>	/HD
ar			110	rma	tion	_	 	mate		ubstance	·		V	٨.	_		
method	1 2		support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characte colour, secondary and minor compor	eristics, nents.	moisture condition	consistency/ density index	100 pocket 200 pocket 300 popenetro-	8 6 a	addition	acture and al observations
ADT	88888888		N				-		МН	CLAYEY SILT: Low liquid limit, light grey/w some fine grained sand. (continued)	hite, with	W	VSt		R	ESIDUAL SO	DILS
						_26	-		СН	CLAY: High plasticity, grey, with some silt, carbonaceous lenses.	trace of						
					SPT		9										į
					6,12,17 N*=29	_25											¥,
						:	1 <u>0</u> -										- :: -
					SPT 10,10,15 N*=25	_24	-										
							11_										
						_23	12										
_			Н		SPT		' <u>~</u>		ļ	Borehole CBH99 continued as cored hole				1	+		
					22/140mm N*=R		_			Bolohole GEN 100 continued at containing		8					
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							13	1									
							'=_	1									
						_21	-]									
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							14										
							'-]									- - -
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							-	1									
							1 <u>5</u>	1									
							-	1									
						_19	-	-									
						Γ	-	1									
L							16	<u>L</u>									
me AS	thod	ı	aı	ıger s	screwing*		ipport mud	1	l nil	notes, samples, tests U _{so} undisturbed sample 50mm diameter	soil des					VS	/density index very soft
AD	ı		aı	iger o	irilling* icone		casing netration			U ₆₃ undisturbed sample 63mm diameter D disturbed sample	based of system	n unified	classifica	ation		S F	soft firm
W			W	ashbo able to	ore	1	2 3 4	na resist	ance	N standard penetration test (SPT) N* SPT - sample recovered	moistur	e			\dashv	St VSt	stiff very stiff
НА			ha	and a	uger			ranging (refusal	10	Nc SPT with solid cone V vane shear (kPa)	D di	ry noist				H Fb	hard friable
DT B			bl	atube ank b		w		98 water		P pressuremeter	W w	et				VL	very loose loose
V T			T	bit C bit				te show	n	Bs bulk sample E environmental sample		lastic limi quid limit				L MD	medium dense
RR W CT HA DT B V T *bit e.g	t shov	wn b		ffix DT			waterwater			R refusal	I				_	D VD	dense very dense



CBH99

Sheet

3 of 3

very high extremely high

Office Job No.:

E12723/4

Department of Commerce

Engineering Log - Cored Borehole

Date started:

16.3.2005

Principal:

Department of Corrective Services

Date completed:

16.3.2005 **CFW**

Project:

Environmental/Geotechnical Investigation

Logged by:

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D. Checked by: MM drill model & mounting: GEMCO TRUCK Easting: R.L. Surface: 34.5 Northing: bearing datum: AHD 100 mm Drilling fluid: hole diameter: drilling information material substance rock mass defects defect description graphic log core recovery estimated defect IS₍₅₀₎ MPa weathering strength spacing rock type; grain characteristics, colour, alteration type, inclination, planarity, roughness, mm core-lift D- diam method structure, minor components coating, thickness water etral A- axial depth 80808 RL particular general metres ≥≖₹≣ 26 9_ 25 10_ 24 11 23 12 Continued from non-cored borehole COFFEY NO CORE: 12.1-12.32m. SANDSTONE/SILTSTONE: Fine grained, HW 22 grey stained orange brown, indistinctly bedded, highly fractured. D A_ GЫ −JT, IR,RO, 75°, SN orange ≻JT, IR, RO, 75°, SN orange ¬JT, IR, RO, 75°, SN orange 8 E12723.4 AREA B&D PHASE 2 UPDATED. 13 Typically recovered as a to coarse gravel and cobbles NO CORE: 13.3-13.5m. _21 SANDSTONE/SILTSTONE: Fine grained, HW 0.3 0.27 grey stained orange brown, indistinctly bedded, highly fractured. 14 D D A 0.22 0.17 _20 NO CORE: 14.6-15.1m. CORED BOREHOLE 15 CBH99 terminated at 15.1m 19 weathering defect type roughness method 10/1/98 water level on date shown joint parting seam very rough rough smooth slickensided diatube VR RO slightly weathered moderately weathered highly weathered casing used AS auger screwing auger drilling AD SZ SS CS sheared zone barrel withdrawn water inflow RR roller/tricone extremely weathered sheared surface partial drill fluid loss distinctly weathered (covers MW and HW) claw or blade bit crushed seam graphic log/core recovery complete drill fluid loss NMLC. NMLC core planarity coating strength NQ, HQ, PQ wireline core core recovered planar curved undulating CN clean SN stained VN veneer very low low medium ٧L GEO 5.5 graphic symbols indicate material water pressure test result stepped irregular CO (lugeons) for depth high no core recovered

interval shown

CBH100

Engineering Log - Borehole

1 of 2 Sheet

E12723/4 Office Job No.:

Client:

Department of Commerce

Date started:

16.3.2005

Principal:

ADT

e.g

water outflow

Department of Corrective Services

Date completed:

16.3.2005

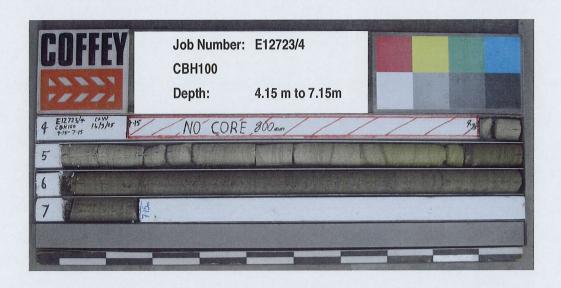
very dense

Environmental/Geotechnical Investigation

Logged by:

CFW

Project: Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D. Checked by: MM R.L. Surface: 34.5 GEMCO TRUCK slope: Easting: drill model and mounting: AHD datum: hole diameter: 100 mm Northing bearing: drilling information material substance consistency/ density index pocket penetro-meter notes penetratio structure and material 8 samples, moisture condition classificat additional observations graphic support method tests, etc kPa water soil type: plasticity or particle characteristics, depth RL colour, secondary and minor components. 5 8 8 9 123 FILL: SANDY SILT: Brown, with some Ε 100mm thick topsoil and grass at angular/subangular medium grained gravel. M 30mm black plastic pipe discovered 34 FILL: CLAYEY SAND: Fine to medium grained, yellow, with some coarse grained, extremely weathered sandstone gravel. at 0.3m during hand augering. 1 ALS D6, DUB D6 SPT **₽**DT 7,8,8 N*=16 33 D AEOLIAN SAND SAND: Fine to medium grained, dark grey, mottled SW SPT yellow, with some organic material. 13,20,18 N*=38 2 32 3 SPT W becoming light grey. L 4,4,5 N*=9 RESIDUAL SOIL CLAYEY SAND: Fine to medium grained, clay is of B&D PHASE 2 UPDATED GPJ COFFEY GDT 27,06.05 4 medium plasticity. Borehole CBH100 continued as cored hole 30 5 _29 6 28 7 27 classification symbols and consistency/density index notes, samples, tests method support very soft undisturbed sample 50mm diameter soil description VS. auger screwing M mud AS based on unified classification auger drilling* casing undisturbed sample 63mm diameter AD RR W CT HA DT B firm disturbed sample roller/tricone penetration GEO 5.3 Issue 3 Rev.2 standard penetration test (SPT) St stiff washbore VSt very stiff cable too N* SPT - sample recovered moisture hard dry hand auger Nc SPT with solid cone moist Fb friable vane shear (kPa) diatube pressuremeter VL very loose blank bit w wat 10/1/98 water leve plastic limit Bs bulk sample Wp medium dense liquid limit MD environmental sample TC bit E water inflow refusal D dense *bit shown by suffix



Office Job No .:

Date started:

CBH100

Sheet

2 of 2

E12723/4 16.3.2005

Department of Commerce

Engineering Log - Cored Borehole

Principal:

Department of Corrective Services

Project:

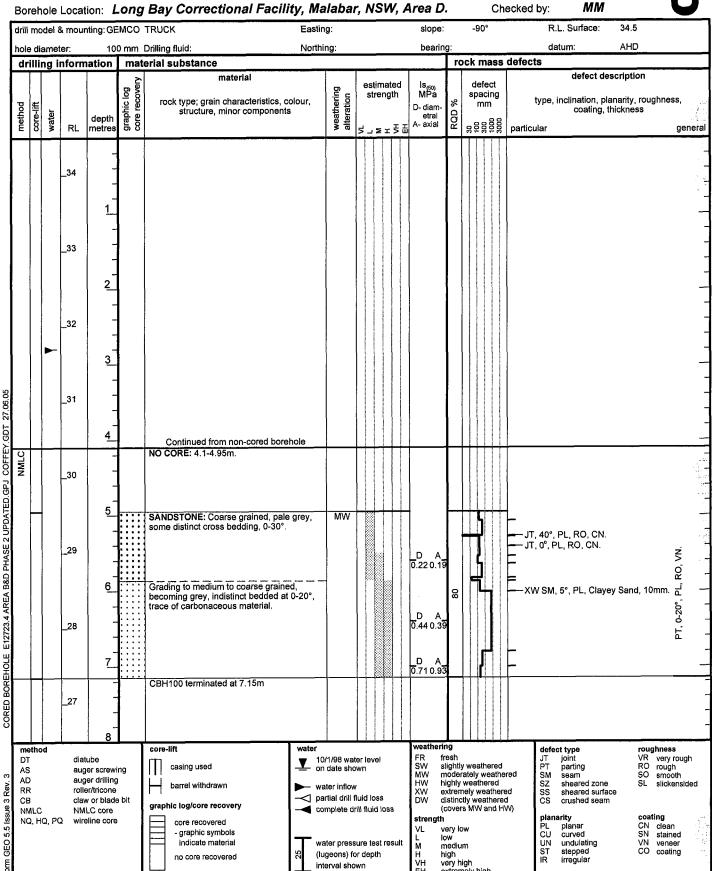
Environmental/Geotechnical Investigation

Date completed: Logged by:

16.3.2005 **CFW**

Checked by:

MM





CBH105

Engineering Log - Borehole

Principal:

Department of Commerce

Department of Corrective Services

Environmental/Geotechnical Investigation Project:

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Office Job No.: Date started:

Date completed:

Sheet

E12723/4

1 of 3

18.3.2005

18.3.2005

CFW Logged by:

MM

Checked by: R.L. Surface: 35.1 drill model and mounting: MOLE TRUCK Easting: slope: Northing datum: AHD hole diameter: 100 mm bearing: drilling information material substance consistency/ density index pocket penetro-meter classification symbol penetratio notes structure and 8 samples, additional observations method graphic Support tests, etc kPa soil type: plasticity or particle characteristics, depth metres 5888 RL colour, secondary and minor components. 123 TOPSOIL: Dark brown, with some roots.

FILL: SAND: Fine to medium grained, yellow/grey, with some subrounded coarse grained, highly Е Topsoil and grass at surface. weathered sandstone gravel. ADT Tree roots at 1m. _34 FILL: SILTY SAND: Medium grained, brown/grey, SPT 7,7,5 N*=12 with some subrounded, medium to coarse grained sandstone gravel, trace of subangular, fine and medium grained brown gravel. FILL: SAND: Fine grained, grey, with some medium grained, moderately weathered white sandstone _33 gravel and medium plasticity clay. SANDY SILT: Medium to high plasticity, dark brown, sand medium to fine grained sand, with some roots VS-S ALLUVIUM? and high plasticity clay. 3 32 E12723.4 AREA B&D PHASE 2 UPDATED.GPJ COFFEY.GDT 27.06.05 4 AEOLIAN SAND MD SAND: Fine to medium grained, grey. 5 30 <u>6</u> _29 7 _28 RORFHO! F classification symbols and consistency/density index notes, samples, tests method support mud undisturbed sample 50mm diameter soil description VS very soft auger screwing AS based on unified classification s soft auger drilling* C casing undisturbed sample 63mm diameter system netration 2 3 4 disturbed sample RR roller/tricone standard penetration test (SPT) St stiff W washbore VSt very stiff СТ SPT - sample recovered moisture hard HA DT SPT with solid cone hand auger No D dry Fb friable vane shear (kPa) moist diatube pressuremeter W VL very loose В blank bit 10/1/98 water level plastic limit loose V bit Bs bulk sample Wp MD medium dense WĹ liquid limit environmental sample TC bit Е water inflow D dense refusal *bit shown by suffix VD very dense water outflow

Date completed:

CBH105

Engineering Log - Borehole

Department of Commerce

Department of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Sheet 2 of 3 Office Job No.:

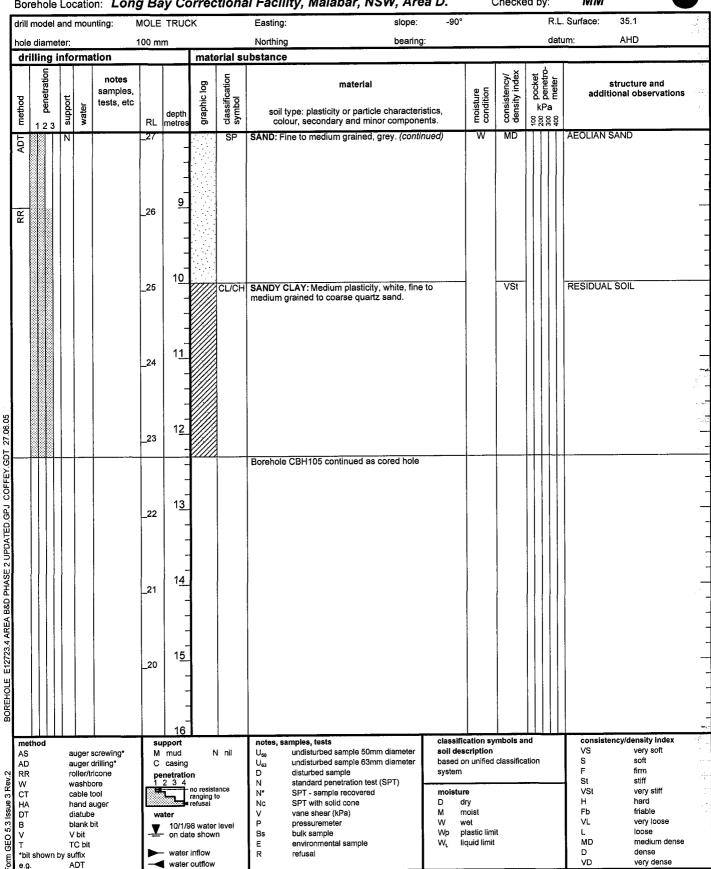
E12723/4

18.3.2005

18.3.2005 Date started:

CFW Logged by:

MM Checked by:





CBH105

Sheet

3 of 3

Office Job No .:

E12723/4

Department of Commerce

Engineering Log - Cored Borehole

18.3.2005 Date started:

Principal:

Department of Corrective Services

Date completed:

18.3.2005

Project:

Environmental/Geotechnical Investigation

Logged by:

CFW

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Checked by: MM drill model & mounting: MOLE TRUCK Easting: R.L. Surface: 35.1 100 mm Drilling fluid: Northing: bearing datum: AHD hole diameter: drilling information material substance rock mass defects defect description estimated recoven IS₍₅₀₎ MPa <u>6</u> weathering strength spacing alteration type, inclination, planarity, roughness, rock type; grain characteristics, colour, structure, minor components mm core-lift D- diam method coating, thickness ROD water grapt etral A- axial depth 82828 RI. IJ≅ェ₹⊞ particular metres general 9 26 10_ 25 11 24 GDT. 12 23 COFFEY Continued from non-cored borehole NO CORE: 12.3-12.33m.
SANDSTONE: Fine grained, pale grey/brown, indistinctly bedded at 5°, occasional thin carbonaceous laminations. XW PT, PL, SO, 30°. HW E12723.4 AREA B&D PHASE 2 UPDATED.GPJ -SM, 40mm gravel infill. D A_ 13_ 22 JT, PL, SO, 70°. 55 PT, PL, RO, CN. Grading to medium grained, pale grey/brown, cross bedded at 15 degrees. 0.13 0.05 PT, PL, RO, CN. PT, PL, RO, CN. PT, PL, RO, CN. 1<u>4</u> Extremely Weathered Seam, 20mm. -PT, PL, SO, CN. 21 0.09 0.11 T, PL, SO, VN (PT, PL, SO, CN. CBH105 terminated at 14.3m 15 20 CORED defect type

JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface weathering roughness method VR very rough RO rough SO smooth SL slickenside 10/1/98 water level on date shown diatube fresh slightly weathered moderately weathered highly weathered casing used AS auger screwing AD auger drilling SZ SS CS slickensided barrel withdrawn water inflow RR roller/tricone extremely weathered distinctly weathered (covers MW and HW) partial drill fluid loss claw or blade bit crushed seam graphic log/core recovery complete drill fluid loss NMI C NMLC core planarity coating strength NQ. HQ. PQ wireline core core recovered planar curved undulating CN SN VN CO clean stained veneer very low low medium ٧L ÇÜ graphic symbols indicate material water pressure test result stepped irregular (lugeons) for depth high very high extremely high

interval shown

Sheet

CBH108

E12723/4

1 of 2

Engineering Log - Borehole

Department of Commerce Client:

Department of Corrective Services Principal:

Project:

Environmental/Geotechnical Investigation

Long Bay Correctional Facility Malahar NSW Area D

Date completed: Logged by:

Date started:

Office Job No.:

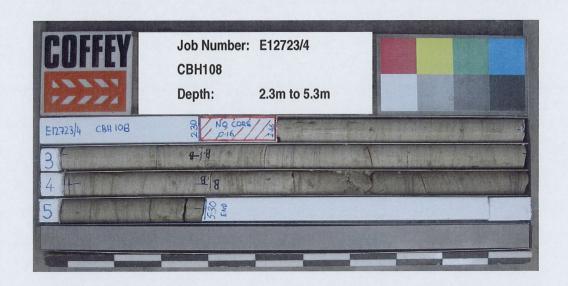
14.3.2005 14.3.2005

CFW

Checked by: мм

	Bor	ehole	e Lo	catio	on: Long	g Ba	y Co	rrec	tiona	l Facility, Malaba	r, NSW, Area	D.		Checke	d by:		MM		
ſ	drill	mode	and	mou	nting: I	MOLE	TRUC	K		Easting:	slope:	-90°			F	R.L. S	urface:	32.1	
	hole	diam	eter:			100 m	m			Northing	bearing:	:			d	atum	1:	AHD	
	dri	lling	info	rma	tion			mate	rial su	bstance							· · · · · ·		
	method	b penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	soil type: plasticity o	aterial r particle characteris and minor componel	atics, nts.	moisture condition	consistency/ density index	100 pocket 200 pocket 300 pocket		additi	structure and onal observation	s
	ADT		N			_32	-			FILL: SANDY SILT: Brow fibro sheeting.	n, with some fragme	ents of	D				ILL		-
i i				NONE OBSERVED		_31	_ _ _ _ _ _	X ////////////////////////////////////	SC	CLAYEY SAND: Medium yellow and grey, low to m	to coarse grained, pledium plasticity fine	pale es.	М	MD		R	RESIDUAL	SOIL?	- - - -
				S		_30	2												_
ı							-			Borehole CBH108 contin	ued as cored hole					\prod			_
							- - 3												- -
						_29													-
7 30.06.05						_28	<u>4</u>												
PHASE 2 UPDATED.GPJ COFFEY.GDT 30.06.05							5												
JPDATED.GPJ						_27	3												- - -
3&D PHASE 2 (_26	6												-
BOREHOLE E12723.4 AREA B&D						_25	7						;						- - -
OREHOLE E							-												- -
ш							8												
1 GEO 5.3 Issue 3 Rev.2	Met AS AD RR W CT HA DT B V T		a w c h d b V	uger oblier/tr vashbo able to and a latube lank b bit C bit	ore ool uger	M C pee 1	ter 10/1/9	n no resista ranging to refusal 8 water e showr	ievel		ation test (SPT) covered one)	W we	cription n unified unified y y oist	classifica			consister VS S F St VSt H Fb VL L MD D	ncy/density Index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense	
Form	e.g.	shown		DT.		—		outflow		TO TOTAGE							VD	very dense	





CBH108

Sheet

2 of 2

Office Job No .:

E12723/4

Department of Commerce

Engineering Log - Cored Borehole

Date started:

14.3.2005

Principal:

Department of Corrective Services

Date completed:

14.3.2005

Project:

Environmental/Geotechnical Investigation

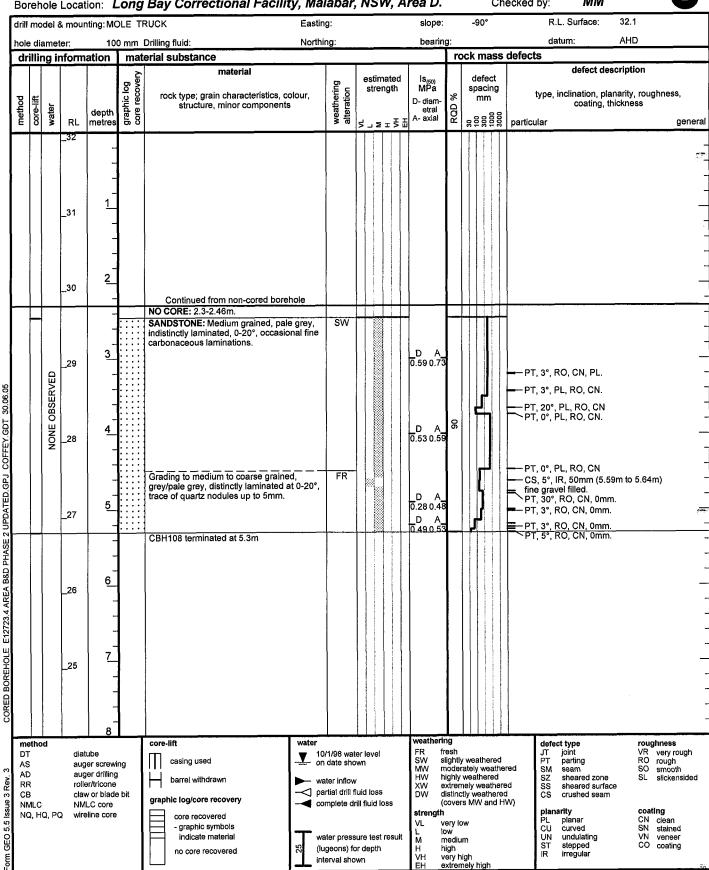
Logged by:

CFW

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Checked by:

MM



CBH109

Engineering Log - Borehole

Department of Commerce

Principal:

Department of Corrective Services

Environmental/Geotechnical Investigation Project:

Office Job No.: Date started:

Date completed:

Sheet

E12723/4 14.3.2005

14.3.2005

CFW Logged by:

MM Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D. Checked by: R.L. Surface: MOLE TRUCK Easting: 33.7 drill model and mounting: AHD 100 mm Northing bearing: datum: hole diameter drilling information material substance pocket penetro-meter classification symbol consistency/ density index penetratio structure and graphic log samples, moisture condition additional observations support method tests, etc kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. depth 9889 RL TOPSOIL: SAND: Medium grained, dark grey, with TOPSOIL AEOLIAN SAND OBSERVE ADT some roots.
SAND: Medium grained, grey. 33 NONE Borehole CBH109 continued as cored hole 1 32 2 _31 3 30 BOREHOLE E12723,4 AREA B&D PHASE 2 UPDATED.GPJ COFFEY.GDT 30.06.05 4 29 5 28 6 27 7 _26 consistency/density index classification symbols and notes, samples, tests undisturbed sample 50mm diameter soil description very soft auger screwing AS AD RR W CT HA DT M mud undisturbed sample 63mm diameter based on unified classification s soft casing U₆₃ auger drilling firm disturbed sample standard penetration test (SPT) system penetration GEO 5.3 Issue 3 Rev.2 St stiff washbore moisture VSt very stiff N' SPT - sample recovered cable tool SPT with solid cone D dry Н hard hand auger Fb friable М moist diatube vane shear (kPa) VL very loose pressuremeter B V blank bit 10/1/98 water level bulk sample Wp plastic limit loose V bit MD medium dense TC bit environmental sample liquid limit water inflow *bit shown by suffix refusal VD very dense water outflow ADT



CBH109

Engineering Log - Cored Borehole

Office Job No.:

Sheet

E12723/4

2 of 2

Client

Department of Commerce

Date started:

14.3.2005

Principal:

Department of Corrective Services

Date completed:

14.3.2005

Project:

Environmental/Geotechnical Investigation

Logged by:

CFW

Borehole Location: Long Bay Correctional Facility, Malabar, NSW, Area D.

Checked by: MM

R.L. Surface: 33.7 drill model & mounting: MOLE TRUCK Easting: datum: Northing bearing hole diameter: 100 mm Drilling fluid rock mass defects drilling information material substance defect description material defect estimated Is₍₅₀₎ MPa <u> 60</u> weathering spacing strength type, inclination, planarity, roughness, alteration rock type; grain characteristics, colour, graphic l core rec core-lift D- diammm method coating, thickness structure, minor components RQD water etral - axial depth 30000 RL particular general metre ı≅ı≩⊞ 33 Continued from non-cored borehole SANDSTONE: Coarse grained, pale grey NMLC and pale orange-brown, distinctly laminated 0.07 0.12 0-60 OBSERVED 32 NO CORE: 1.63-1.73m.

SANDSTONE: Coarse grained, pale grey and pale orange-brown, distinct laminated D A_ 0.2 0.16 S MΝ -JT, 60°, PL, RO, CN. 2 80, ٦ NO CORE: 2.13-2.28m. 82 -SM, 0°, PL, Sandy Clay, 40mm. SANDSTONE: Medium grained, grey and JT, 0-20°, pale grey, indistinct laminations 0-20°, trace D A_ 0.77 0.68 of carbonaceous material and quartz 31 nodules (5mm). PT, 0°, PL, RO, CN. 3 D A_ -PT, 15°, CU, RO, CN. -PT, 0°, PL, RO, CN 30 GDT CBH109 terminated at 3.8m 4 COFFEY PHASE 2 UPDATED.GPJ 29 5 28 B&D I 6 27 26 defect type
JT joint
PT parting
SM seam VR very rough RO rough SO smooth SL slicken roughness method 10/1/98 water level on date shown DT diatube SW MW HW slightly weathered moderately weathered highly weathered casing used auger screwing AS SM auger drilling AD slickensided barrel withdrawn sheared zone water inflow RR roller/tricone SS extremely weathered sheared surface partial drill fluid loss distinctly weathered (covers MW and HW) claw or blade bit crushed sean graphic log/core recovery complete drill fluid loss NMLC NMLC core coating CN clean SN stained aritv NQ, HQ, PQ wireline core core recovered planar curved undulating very low low medium VL GEO 5.5 graphic symbols indicate material water pressure test result veneer stepped irregular (lugeons) for depth high no core recovered very high extremely interval shown

Coffey m

Engineering Log - Borehole

Client:

NSW Department Of Commerce

NSW Department Of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Office Job No.: Date started:

Date completed:

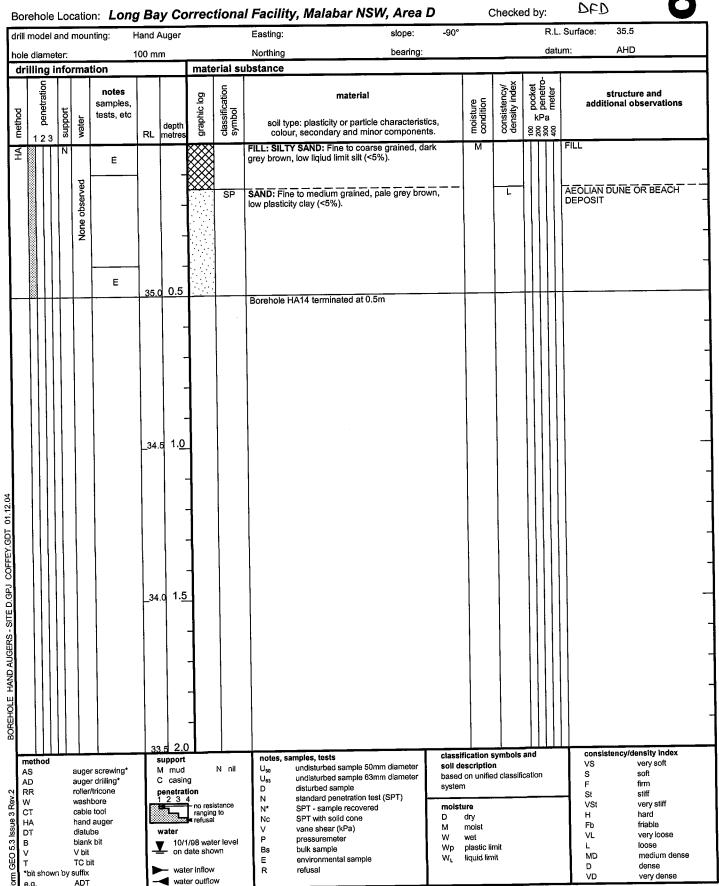
Sheet

E12723/03 12.10.2004

12.10.2004

1 of 1

AD Logged by:





Engineering Log - Borehole

Principal:

Project:

Borehole No.

1 of 1

HA15

MD

VD

liquid limit

medium dense

very dense

dense

Sheet

E12723/03 Office Job No.:

12.10.2004 Date started:

12.10.2004 Date completed:

AD Logged by:

Borehole Location: Long Bay Correctional Facility, Malabar NSW, Area D

Bs

Ε

water inflow

water outflow

V bit

TC bit

ADT

*bit shown by suffix

bulk sample

refusal

environmental sample

NSW Department Of Commerce

NSW Department Of Corrective Services

Environmental/Geotechnical Investigation

DED Checked by:

31.8 R.L. Surface: -90° Hand Auger Easting: slope: drill model and mounting: AHD datum: bearing: 100 mm Northing hole diameter: material substance drilling information pocket penetro-meter consistency/ density index classification symbol penetratio notes structure and material <u>6</u> moisture condition additional observations samples, graphic tests, etc kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. depth \$ 2 8 8 RL FILL: SILTY SAND: Fine to coarse grained, dark grey brown, low liqued limit silt (<5%). Ε AEOLIAN DUNE OR BEACH M SAND: Fine to medium grained, pale grey brown to L DEPOSIT yellow, low plasticity clay (<5%). _31.5 Ε 0.5 Borehole HA15 terminated at 0.5m _31.0 1.<u>0</u> BOREHOLE HAND AUGERS - SITE D.GPJ COFFEY.GDT 30. 30.0 consistency/density index notes, samples, tests support very soft method soll description VS undisturbed sample 50mm diameter M mud auger screwing* soft based on unified classification undisturbed sample 63mm diameter U₆₃ D casing AD RR auger drilling firm system disturbed sample roller/tricone penetration stiff St standard penetration test (SPT) W washbore very stiff VSt moisture SPT - sample recovered N* СТ cable tool hard dry SPT with solid cone Nc HA DT hand auger Fh friable moist М vane shear (kPa) diatube very loose VL pressuremeter B 10/1/98 water level on date shown blank bit Wp plastic limit



HA16

Engineering Log - Borehole

NSW Department Of Commerce Client:

NSW Department Of Corrective Services Principal:

Environmental/Geotechnical Investigation Project:

Office Job No.:

Sheet

E12723/03 12.10.2004

Date started: Date completed:

12.10.2004

AD

1 of 1

Logged by: DED

ill r	model	and	mou	•	Hand A	_			Easting:	1	90°			. Surface:	35.2
	diame				100 m	m			Northing	bearing:			datı	um:	AHD
ari	Iling benefication 3	upport		notes samples, tests, etc	RL	depth metres	aphic log	classification symbol	mate soil type: plasticity or p. colour, secondary and	article characteristics,	moisture condition	consistency/ density index	100 pocket 200 d penetro- 300 meter	additi	structure and onal observations
<u>C</u>		N	None observed	E	_35.0	-		SP	SILTY SAND: Fine to mediu low liquid limit silt.	m grained, dark brown,	M			AEOLIAN I DEPOSIT	OUNE OR BEACH
					_34.	1.0			Borehole HA16 terminated refusal on Sandstone Bedro						
AS AD RF W CT HA DT B V T) ? [auge roller wash cable hand diatu blank V bit TC b	tool auger be bit	M C pp 11	/ater 10/1	on no resis ranging refusal	r level	notes, samples, tests U ₅₀ undisturbed sampl D disturbed sample N standard penetrati N* SPT - sample reco Nc SPT with solid con V vane shear (kPa) P pressuremeter Bs bulk sample E environmental san R refusal	e 50mm diameter e 63mm diameter bas syston test (SPT) wered e D M W Wp		n d classific		consist VS S F St VSt H Fb VL L MD D VD	very soft soft firm stiff very stiff hard friable very loose loose medium dense very dense

Engineering Log - Borehole

HA17

Sheet

1 of 1

Client:

NSW Department Of Commerce

Principal:

NSW Department Of Corrective Services

Project:

Environmental/Geotechnical Investigation

Borehole Location: Long Bay Correctional Facility, Malabar NSW, Area D

Office Job No.: Date started:

Checked by:

E12723/03 12.10.2004

Date completed:

12.10.2004

Logged by:

AD

DED

								rrec	tiona	l Facility, Malabar NS			Oil	еске			Surface: 22.8	
drill ı				nour		Hand A	-			Easting:	slope:	-90°					Surface: 32.8	j
hole				_		100 m	n			Northing	bearing:					datu	iii. ANU_	
dri		_	nfo	ma	ion	_		mate		bstance			T.	_ x	ۇ ب			
method	1 penetration		support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or partic colour, secondary and mi	nor components.			consistency/ density index	100 pocket	a	structure additional obs	ervations
BOREHOLE HAND AUGERS - SITE D.GPJ COFFEY.GDT 01.12.04	1 2	3	8 2	None observed	E	_32.9	0.5		SP	SAND: Fine to medium grained low plasticity clay (<5%). Borehole HA17 terminated at 0 refusal on Sandstone Bedrock.	pale grey brown	1,	M	L			AEÓLIAN DUNE OR DEPOSIT	BEACH -
m GEO 5.3 Issue 3 Rev.2	/ T		ı'n by	rolle wash cabl	k bit t oit	l	water 10a on wa	ng ation 4 no re rangi	iter level own w	notes, samples, tests U ₅₀ undisturbed sample 5 U ₆₃ undisturbed sample 6 D disturbed sample N standard penetration N* SPT - sample recove Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sampl R refusal	3mm diameter test (SPT) red	W w	eription n unified e y oist	l classifi			S SI F fill St S V VSI V H h Fb fill VL V L MD n	sity index ery soft oft rm tiff ery stiff ard tiable ery loose pose the dium dense tense ery dense

Engineering Log - Borehole

Sheet

1 of 1

Office Job No.:

E12723/03

Client:

NSW Department Of Commerce

Date started:

12.10.2004

Principal:

NSW Department Of Corrective Services

Date completed:

12.10.2004

Project:

Environmental/Geotechnical Investigation

Logged by:

AD

3or	eho	ole	Lo	catio	n: Long	g Ba	y Co	rrec	tiona	l Facility, Malabar NSW, A	Area D		hecke			DED		<u>_</u>
irill	mod	lei:	and	mour	nting: I	land A	Auger			Easting: sl	ope: -90°					Surface: 33.7		
_	dia					100 mi	m				earing:				datu	m: AHD)	_
dr	_		nfo	rma	ion			mate		bstance		Γ						_
method	l	s penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle char colour, secondary and minor cor	acteristics, nponents.	moisture condition	consistency/ density index	100 pocket	8 6 8 6 8	additional c	ure and observations	
₹			N	_	E				SP	SAND: Medium to coarse grained, pale low plasticity clay (<5%).	grey brown,	М	L			AEOLIAN DUNE DEPOSIT	OR BEACH	
				None observed		33.5	_											
				_	Е					Borehole HA18 terminated at 0.3m. H	and Auger							
							_			refusal on Sandstone Bedrock.	and rage.]		
							0. <u>5</u>											-
							-	{										
						_33.	d _											
							-	1										
							10	1										
							1.0	1										
						_32	.5											
							1. <u>5</u>											
								-										
						_32	2.0	$\frac{1}{2}$										
								1										
							2.0	,			-1	iffice 41 a c	cumbal:	and		consistencyle	density index	_
A	neth	od		auge	r screwing* r drilling*	;	support M mud C casin	ng	N nil	notes, samples, tests U _{so} undisturbed sample 50mm die U ₆₃ undisturbed sample 63mm die D disturbed sample	ameter soil d ameter based system	i ification lescriptio d on unific m	n			VS S F	very soft soft firm	
۷	RR V CT HA			wash cable			penetra 1 2 3	4 - no res rangin refusa	istance g to	N standard penetration test (SP N* SPT - sample recovered Nc SPT with solid cone	T) moist D M	ture dry moist	_			St VSt H Fb	stiff very stiff hard friable	
E	OT 3 /			diatu blani V bit TC b	c bit	Ι.		1/98 wat date sho		V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample	W Wp W _L	wet plastic li liquid lin				VL L MD	very loose loose medium dense	
		how	vn by	suffix ADT		<u> </u>	➤ wat ▼ wat	er inflow er outflo		R refusal						D VD	dense very dense	_

Sheet

1 of 1

Engineering Log - Borehole Client:

Office Job No.:

E12723/03 12.10.2004

NSW Department Of Commerce

Date started:

12.10.2004

Principal:

NSW Department Of Corrective Services

Date completed:

AD

Project:

Environmental/Geotechnical Investigation

Logged by:

DED Borehole Location: Long Bay Correctional Facility, Malabar NSW, Area D Checked by: R.L. Surface: 34.3 Easting: slope: Hand Auger drill model and mounting: AHD datum: Northing bearing: 100 mm hole diameter: material substance drilling information pocket penetro-meter consistency/ density index classification symbol notes structure and material penetrati <u>6</u> moisture condition additional observations samples, graphic poddns tests, etc kPa soil type: plasticity or particle characteristics, colour, secondary and minor components. depth 5885 RL 123 EOLIAN DUNE OR BEACH SAND: Fine to coarse grained, dark grey brown, low DEPOSIT plasticity clay (<5%). E None observed SAND: Fine to coarse grained, pale grey yellow brown, low plasticity clay (<5%). _34.0 E 0.5 Borehole HA19 terminated at 0.5m. Hand Auger refusal on Sandstone Bedrock. 1.0 BOREHOLE HAND AUGERS - SITE D.GPJ COFFEY.GDT _33.0

	met	hc	od											
	AS					aı	iger s	crewing*						
	AD				auger drilling*									
Ŋ	RR			roller/tricone										
<u>ر</u> ق	W			washbore										
3.	СТ					Ca	able to	ool						
e	НΑ			hand auger										
SS	DΤ					ď	atube	1						
67	В					bl	ank b	it						
5	v					V bit								
GEO 5.3 Issue 3 Rev.2	Т					T	C bit							
O	*hit	٠,			h		cuffix							

ADT

*bit shown by suffix

	2.0		
suj	port		
М	mud	N	nii
С	casing		
	netratio 2 <u>3</u> 4		
	<u></u>	no resista ranging to refusal	ce
wa	ter		

10/1/98 water level

E R

on date shown

water inflow

water outflow

_32.5

notes, s	amples, tests
U _{so}	undisturbed sample 50mm diameter
U ₆₃	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
ν	vane shear (kPa)
Р	pressuremeter
Bs	bulk sample

environmental sample

refusal

_

Wp

escription	vs	very soft
on unified classification	S	soft
n	F	firm
	St	stiff
ure	VSt	very stiff
dry	Н	hard
moist	Fb	friable
wet	VL	very loose
plastic limit	L	loose
liquid limit	MD	medium dense
	D	dense
	VD	very dense

consistency/density index

HA20

Engineering Log - Borehole

Sheet Office Job No.: 1 of 1

Client:

NSW Department Of Commerce

■ water outflow

Date started:

E12723/03 12.10.2004

Principal:

NSW Department Of Corrective Services

Date completed:

12.10.2004

Project:

Environmental/Geotechnical Investigation

Logged by:

AD

Borehole Location: Long Bay Correctional Facility, Malabar NSW, Area D

Checked by:

DE D

B0	re	ho	le I	_00	atio	n: <i>LON</i> g	Ba	y Co	rrec	นอกล	l Facility, Malaba	r NSW, Area L			hecke	и Бу		UF 17	
dril	l m	ode	el a	nd r	nour	nting: 1	land /	Auger			Easting:	slope:	-90°				R.L		3.0
hol							00 m	m			Northing	bearing:					dati	um:A	HD
dı	rill		_	fo	ma	ion			mate	erial su	bstance					_			
method		ν penetration		support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	soil type: plasticity o colour, secondary a	aterial r particle characteristic and minor components	s	moisture condition	consistency/ density index	200 y pocket	а	addition	octure and al observations
₹				N	served	E				SP	SAND: Fine to coarse graph plasticity clay (<5%).			M 	L			AEOLIAN DUI	NE OR BEACH
BOREHOLE HAND AUGERS - SITE D.GPJ COFFEY.GDT 01.12.04		hoc			None observed		_32.	0 1.0 0 1.5			Borehole HA20 terminate refusal on Sandstone Ber	drock.	classifi		ymbols a	ind			y/density index
3EO 5.3 Issue 3 Rev.2	AS AD RR V CT HA OT B V			tbys	auger oller/ washl cable	tool auger be bit	NO F1 NO NO NO NO NO NO NO N	mud casing senetrati 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	on no resi ranging refusal /98 wate ate sho) to er level wn	U _{so} undisturbed san U ₆₃ undisturbed san D disturbed samp	ration test (SPT) ecovered cone a)	moistu D M W Wp		d classific	ation		VS S F St VSt H Fb VL L MD D	very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense

HA21

Engineering Log - Borehole

Sheet

1 of 1

Client:

NSW Department Of Commerce

Office Job No.: Date started:

E12723/03 12.10.2004

Principal:

NSW Department Of Corrective Services

Date completed:

12.10.2004

Project:

Environmental/Geotechnical Investigation

Logged by:

AD

		_					rrec	tiona	l Facility, Malabar N		-90°		Checke		_	Surface: 34.6	
ill mo			nour	•		Auger			Easting:	slope:	-30				datu		
ole dia					100 mi	m	100 ml -	ulal a:	Northing Ibstance	bearing:					uall	IIII. AFI	
וש	o penetration ع	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	materi soil type: plasticity or pa colour, secondary and	rticle characteristics	s,	moisture condition	consistency/ density index	100 pocket	а	additional (ure and observations
		N	Vone observed	E	_34.5	_		SP	SAND: Fine to coarse grained plasticity clay (<5%).			M	L			AEOLIAN DUNE DEPOSIT	OR BEACH
			2		_34.0	-			Borehole HA21 terminated at refusal on Sandstone Bedroo		ır.						
					_33.	1.5											
meth AS AD RR W CT HA DB V T *bit s e.g.		i by s	auger roller/ washi cable hand diatut blank V bit TC bi	tool auger be bit		water 10/1	g ion 1 1 1 no resi ranging refusal /98 wate ate shore	or level wn	notes, samples, tests U ₅₀ undisturbed sample U ₆₃ undisturbed sample D disturbed sample N standard penetratio N* SPT - sample reco Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sam R refusal	e 63mm diameter on test (SPT) vered	moistu D W Wp	scription on unifie	d classifi			consistency/o VS S F St VSt H Fb VL L MD D VD	density index very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense

APPENDIX B – AREA B

OTHER CONSULTANTS ENGINEERING LOGS



PUBLIC

BOREHOLE NO. 1

PROJECT: LONG BAY GOAL

LOCATION: PROPOSED WAREHOUSE

CONTRACTOR: GEOTECH CENTREDRILLER: G.KELLY

DATE: 4.1.90

SURFACE RL:

RIG TYPE: GEMCO 210B

DEPTH (m)	WATER	ВІТ	SAMPLE OR TEST	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
- 0			,	FILL		FILL SAND Dark Brown, Loose & Damp .8
- 1 -		YEE	SPT 8.3.4 N = 7	SP (v)		SAND (Medium Grained) Brown, Loose & Damp
- 2						Grey Brown, Loose & Saturated END at 2.3
_	4,1.90					Vee Bit Refusal on Extremely Weathered Sandstone
- 3						
-						
- 4						
-						
- 5						
- 6			,			
_						
- 7	·					
_						
- 8						
,						
- 9			·			
10						
S U D SPT.		isturbed urbed dard per		V: Vim 1: lub		WATER DRILLING SUPERVISOR: O. FERGUSON PROJECT ENGINEER: D. SARIAN SHEET OF SHEETS LONG BAY1 SCALE 1:50

PUBLIC WORKS

BOREHOLE NO. 2

PROJECT: LONG BAY GOAL

LOCATION: PROPOSED WAREHOUSE

CONTRACTOR: GEOTECH CENTRE DRILLER: G.KELLY

DATE: 4.1.90

SURFACE RL:

RIG TYPE: GEMCO 210B

· · · · · · · · · · · · · · · · · · ·	WATER	ВІТ	SAMPLE OR TEST	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
- O				FILL		FILL SAND & COKE (19mm), SOME RUBBLE Dark Brown, Loose & Damp .8
- 1		YEE	SPT 8, 3, 4 N = 7	SP (v)		SAND (Medium Grained) Brown, Loose & Damp
- 2	4.1.90			ļ		Grey Brown.Loose & Saturated END at 2.1
-						Vee Bit Refusal on Extremely Weathered Sandstone.
- 3						
- 4						
-						
- 5						
-						
- 6 -,						
- 7 _:						
-						
- 8 -						
- 9					: :	
-						
U. D.	SAMPLunc	listurbed turbed		v: via 1: lab		WATER DRILLING SUPERVISOR O. FERGUSON PROJECT ENGINEER: D. SARIAN SHEET OF SHEETS LONG BAY2

	PUBLEC NORESS
--	------------------

BOREHOLE NO. 3

PROJECT: LONG BAY GOAL

LOCATION: PROPOSED WAREHOUSE

CONTRACTOR: GEOTECH CENTREDRILLER G KELLY

DATE: 4.1.90

SURFACE RL:

RIG TYPE : GEMCO 210B

(m)	тн	WATER	ВІТ	SAMPLE OR TEST	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, rema	arks
_					FILL		FILL SAND & COKE (19mm), SOME BUILDING RUBBLE. Dark Brown, Loose & Dry.	.в
- : -	1		YEE	SPT N = B	SP (v)		SAND (Medium Grained) Brown, Loose & Damp	
- 2	2	4.1.90					Grey Brown, Loose & Saturated END at	2.0
- .		4.1.90					Vee Bit Refusal on Extrenmely Weathered Sandstone	
. 3	3							
•								
- 4	4							
•								
Ė	5							
	ا ر	,						
•	5	٠.						
	7	*						
•								
•		-		:				
. 8	3							
•								
. و	3							
<i>.</i>	`		-					
	S.		isturbed	TEST	v: vie 1: leb	ual oratory	WATER DRILLING SUPERVISOR D. FERGUSON PROJECT ENGINEER: D. SARIAN	<u> </u>
				netration test ration test			SHEET OF SHEETS LONG BA	ЕҮ

BOREHOLE NO. 4

PROJECT: LONG BAY GOAL

LOCATION: PROPOSED WAREHOUSE

CONTRACTOR: GEOTECH CENTREDRILLER: G.KELLY

DATE: 4.1.90

SURFACE RL:

RIG TYPE: GEMCO 210B

DEPTH (m)	WATER	ВІТ	SAMPLE OR TEST	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
- 0				FILL		FILL Extremely Weathered Sandstone .5
 -				SP (v)		SAND, Light Brown, Loose & Damp .8
- 1 - 1		YEE	SPT 444 N = B	SP (v)		SAND (Medium Grained) Grey Brown, Loose & Damp
	-	 -	<u> </u>			Loose & Saturated END at 1.7
- 2	4.1.90					Vee Bit Refusal on Extremely Weathered Sandstone
- - -						
- 3						
- .						•
- 4			·			
- -						
- 5						
- 6						
-						
- 7				·		
			İ			
	1					
- 8						
_					ŀ	
 . <u>-</u>						
- 9						
: 						
					1	
- 10	SAMPL	F OR	TEST	V : V1	ium)	WATER
D. SP	dis sta	disturbed sturbed indard pe			ioratory	WATER DRILLING SUPERVISOR: D. FERGUSON PROJECT ENGINEER: D. SARIAN SHEET OF SHEETS LONG BAY4 SCALE 1:50



BOREHOLE NO. 5

PROJECT: LONG BAY GOAL

LOCATION: PROPOSED WAREHOUSE

CONTRACTOR: GEOTECH CENTREDRILLER: G.KELLY

DATE: 4.1.90

SURFACE RL:

RIG TYPE: GEMCO 210B

DEPTH (m)	WATER	BIT	SAMPLE OR TEST	SOIL GROUP	GRAPHIC LOG							ESCR						
- 0			TEST				Soil	type,	colo	ur,	consi	stency,	gra	insize	, mo	oisture,	re mark s	;
						VEE	BIT	REFU	SAL	ON	MODE	RATELY	WE.	ATHER	ED :	SANDST	ONÉ	
-																		
- 1							•											
									•									
- ' .																		
- 2													-	×			•	
_												-						
_																		
- 3																		
_																		
- 4.																		
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1																		
5																		
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- 6										*								
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•																		
. 7																		
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8																		
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-					·													•
- 9		:																
								•			,							
10 s	AMPL	E OR	TEST	V: Via	uel		WATE	R			וופת	I ING S	Uper	Meor	Λ r	EDOLL	· ·	 -
υ	und	isturbed		1 : lab	oratory 		٠,									ERGUS SARIAN		
SPT.	stan	dard pen	netration test			Y	Water t				SHEI SCAL	ET _(OF .	SHE			S BAYE	i

M

PUBLIC WORKS DEPARTMENT GEOMECHANICS LABORATORY

BOREHOLE NO. 1

PROJECT : MALABAR COMPLEX OF PRISONS

DATE: 21. 7.86

LOCATION : SECURITY TOWER No. 10

SURFACE RL. :

CONTRACTOR : GROUND TEST P. L. DRILLER : BRIAN L'AMB RIG TYPE : PIONEER P 160

DEPTH	Ì		1	1 162	1 P. L.	DRILLER: BRIAN L'AMB RIG TYPE: PIONEER P 160
(m) ()	RATER	BIT	SAMPLE OR TEST	SOIL	GRAPHIC LOG	PROFILE DESCRIPTION type, colour, consistency, grainaize, moisture, rem
				1 A		REINFORCED CONCRETE (RECENTLY POURED)
<u>-</u> 1				1 B		REINFORCED CONCRETE
- 2				2		BRICKWORK CONSTRUCTION
-3				3		HAWKESBURY SANDSTONE, MED. GRAINED, MASSIVE, WHITE IN COLOUR
-4						END BORE AT 3.8
	SAMPL	E OR	TEST	·		
U D MPT	undia: distur stenda	turbed rbed and peni	miration test		>	DRILLING SUPERVISOR: S. CELOTTO PROJECT ENGINEER: S. CELOTTO SHEET 1 OF 1 SCALE 1:50



SPT standard penetration test

CPT cone penetration test

PUBLIC WORKS DEPARTMENT GEOMECHANICS LABORATORY

BOREHOLE NO. 2

PROJECT : MALABAR COMPLEX OF PRISONS

DATE :

21.7.86

LOCATION: SECURITY TOWER No. 10

SURFACE AL. :

SHEET 1 OF 1

SCALE 1: 50

CONTRACTOR : GROUND TEST P. L. DRILLER : RDIAN LAMB OTG TYPE - PIONEED - PIAN

DEPTH (m)	MATER	віт	SAMPLE OR TEST	SOIL SAOUP	GRAPHIC LDG	PROFILE DESCRIPTION type, colour, consistency, grainsize, moisture, remarks
- 0 - -				1A.		REINFORCED CONCRETE (RECENTLY POURED) 0.
_ 1			-	1B		REINFORCED CONCRETE 1.
_ 2				2		BRICKWORK CONSTRUCTION 2
3				3		HAWKESBURY SANDSTONE, MED. GRAINED, MASSIVE, WHITE IN COLOUR
					·	END BORE AT 3.9
				·		
-						
-						
-						
-						
-					·	
- - - -						
	un	IPLE O disturb sturbed	OR TEST			MATER Mater table Mater inflow Mater inflow DRILLING SUPERVISOR: S. CELOTTO PROJECT ENGINEER: S. CELOTTO SHEET 1 OF 1

JEFFERY AND KATAUSKAS PTY, LTD.

BOREHOLE LOG

Borehole No.

14.

Job N Date		5070 _ 28·5·87		1		Method: SPIRAL AU HYDRA POWE		R.L. Su Datum:		39.65m SITE
Groundwater record	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	لم Hand و Penetrometer Readings	Remarks
ORY ON OMPL			_		SM	FILL: ashes and sand SILTY SAND: fine to median			·	-
TION		<i>N>>//</i>		/ /	3707	grained, dark brown, trace clay		(4)	. -	•
FTER Hours	Δ.S.	4,11/75mm HAMMER	ユー			SANOSTONE: medium grained, light arev.				ESTIMATED BIT REFUSA
	D.5.	BOUNCING	-			SANOSTONE: medium grained, light grey, extremely weak then highly weathered, very weak			-	MODERATI 'TC' BIT RESISTANC
			2-			as above, but arange brown, highly weathered extremely weak with weak iron cemented bands.			-	MODERATION BE
	D.5.		-			as obove, but light grey, moderately weathered, weak to medium strong.			-	MODERAT TO HIGH RESISTAN
	D.5.		3- - 3.5m-						- - -	•
						END OF BOREHOLE			-	
			4-					,	F	-
			-				·		-	
			5			•				
			-						- -	
			6-						-	

Borehole No.

16

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT
Project: PROPOSED NEW BUILDING
Location: KATINGAL AREA, LONG BAY GAOL

ation:	KATINO	GAL.	ARE	Α,	LONG BAY GAOL, N.	5.W.			
	5070 2 28·5·87	, <u> </u>	, ·····		•				42.95m SITE
Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	A Hand Denetrometer Readings	Remarks
		-			FILL grovelly sond, fine groined, dark grey some silt with with wire netting, concrete fragments hylon sheeting	M			POORLY - COMPACTED
D.5.	N>>/3	بر - -		.50	SAND: fine to medium grained, light brown then orange brown, some silt	M	۷		-
	2,3,813311	2 -			SANDSTONE: medium grained, light orange brown, highly weathered, weak		·		ESTIMATEO 'V' BIT REFUSAL MODERATE TO HIGH 'TC' BIT RESISTANCE
D.5.		.3 -			very weak bond, grey brown as obove, but light grey, moderately weathered, medium				MODERATE 'TC' BIT RESISTANCE MODERATE TO HIGH 'TC' BIT
D.S.		4.0				·			RESISTANCE
					END OF BOREHOLE			-	
		5-						- - -	•
		6-						- -	
٠		1						- - -	
	No. e: O. S.	No. 5070	No. 5070 Js 28.5.87 FIELD TESTS O.5. 2,5,8/30mm 2 O.5. 3	No. 5070 Js 28.5.87 FIELD TESTS O.5. 2,5,8/30mm 2 O.5. 2,5,8/30mm 2 O.5. 3	No. 5070 Js 28.5.87 FIELD TESTS Pobth (m.) Classification D.5. 2,5,8/30mm 2 Classification	No. 5070 JS 28.5.87 HYDRAPOWE. FIELD TESTS Hida O DESCRIPTION FILL: gravelly sond, fine groined, dark grey some sit with wire netting, concrete fragments nylon sheeting SP SAND fine to medium groined, light forwing some sit SANDSTONE: medium grained, light orange brown, some sit SANDSTONE: medium grained, light orange brown, inghly weathered, weak D.S. O.S. 3 O.S. As above, but light grey weak bond, grey brown as above, but light grey weathered, medium strong.	Method: SPIRAL AUGER HYDRAPOWER RIG FIELD TESTS STORE DESCRIPTION FILL grovelly sond, fine gromed light brown then orange brown, some silf with orange brown, highly weathered, weak D.S. N>718 D.S. SAND-Time to medium gromed light brown then orange brown, highly weathered, weak SAND-STONE: medium gromed, hight orange brown, highly weathered, weak Very weak bond, grey, moderately weathered, medium gray, moderately weathered, medium strong.	Method: SPIRAL AUGER R.L. Su E: 28.5.87 Method: SPIRAL AUGER RIG Datum: BY HYDRA POWER RIG DATUM:	Method: SPIRAL AUGER R.L. Surface: 28:5.87 Method: SPIRAL AUGER R.G. Datum: Page 1

BOREHOLE LOG

Borehole No.

17.

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING

	Project: PROPOSED Location: KATINGAL Job No. 5070 J.5					LONG BAY GAOL, N.	5.W.			
Job Dat		5070 J 28·5·87	· <u>.</u> 5			Method: <i>SPIRAL AU</i> HYORA POWE		R.L. Su Datum:		40:19m SITE
Groundwater	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	Hand Penetrometer Readings	Remarks
			_	$\times\!\!\times\!\!\times$	50	FILL: gravelly sand SAND: fine to medium	M	MD		-
	0.5.	N = 16 9,7,9/25n	- J			grained, orange brown some silt				ESTIMATED 'V' BIT REFUSAL
		HAMMER BOUNCING				SAND STONE: medium grained, light grey, highly weathered, weak as above, but moderately weathered, medium, strong some ironstaining				MODERATE 'TC' BIT RESISTANCE HIGH'TC' BIT RESISTANCE
			2-			as above, but mainly light grey, moderately weathered, weak			-	MODERATE TO HIGH 'TC' BIT RESISTANCE
	D.5.		3·03m 3 -				-			
			-		٠	END OF BOREHOLE			-	
			4-						- - -	- -
		·	-						-	
			57				·		- - -	
			6-						- - -	•
									- - -	

Borehole No. 104.

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT

PROPOSED Project: SPECIAL PURPOSE PRISON Location:

LONG BAY GAOL, MALABAR . N.S.W 5212 15 Job No. Method: SPIRAL AUGER R.L. Surface: 40.5m APPROX. 28.7.87 Date: JACRO RIG Datum: STAN DARD Hand Penetrometer Readings Groundwater Classification Graphic Log Consistency/ Rel. Density (E) FIELD Moisture Condition Samples DESCRIPTION Remarks **TESTS** Unified Depth (kPa. FILL: silty sand, fine to medium grained, brownish grey with some gravels APPEAR5 POORLY COMPACTED N = 12 AFTER 0.5. I 3,4,8 SM SILTY SAND: fine to medium MD grained, brown with some clay 2 SANDY CLAY: low plosticity, yellow brown and light grey, fine to medium grained sand SANDSTONE fine to medium grained, whitish brown and light grey, highly weathered weak. N > 7 7/20mm CL MCZPI ESTIMATED V' BIT REFUSAL HIGH'TC' BIT RESISTANCE 2.5m 0.5. BOUNCING 3 END OF BOREHOLE 4 5 6

Borehole No.

105

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT SPECIAL PURPOSE PRISON PROPOSED Project: LONG BAY GAOL, MALABAR. N.S.W Location: 5212 15 R.L. Surface: 38.1 metres APPR Method: SPIRAL AUGER Job No. 28.7.87 STAN DARD Date: JACRO RIG. Datum: Hand Penetrometer Readings Unified Classification Consistency/ Rel. Density Groundwater Graphic Log Depth (m.) FIELD Moisture Condition DESCRIPTION Remarks Samples **TESTS** record kPa. ORY FILL: silty sand, fine to medium groined, grey with some grovels. APPEARS POORLY COMPLETION COMPACTED ESTIMATED'V' BIT REFUSAL HIGH 'TC' BIT SANDSTONE: fine to medium grained, brawnish white and light grey, highly weathered, very weak AND BOUNCING 1.2m RESISTANCE 0.5. END OF BOREHOLE 2 3 5

APPENDIX B – AREA D

OTHER CONSULTANTS ENGINEERING LOGS



DP-1

CLIENT MORRISON WHITTEN & NICEY PTY.LTD.DATE 6/3/86

PIT No. 1

SITE

LONG BAY HOSPITAL

CONTRACT No. SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL APPROX 35.5

				Sampling	and In-situ	Testing
	Depth (metres)	Description of Strata	S	mpling	Dynamic P	netrometer
			Тур•	Depth	Depth	Blows/150mm.
	S.L.	FILLING - dense medium grained grey sand with sandstone, road metal and ash	D	0.30		
	- 0.50	FILLING - dense medium grained	В	0.50		
	0.60	gravel sized slag with reddish brown medium grained sand and rootlets	D	0.55		
	-		D	1.00		
	1.40	SAND - dense medium grained light grey sand				
	1.50	CEMENTED SAND - dense dark brown medium grained cemented sand	D	1.50		
			D	2 00		
		SAND - dense light yellowish brown, medium grained sand	D	2.00		
	2.70	·	D	2.50	Í	
	2.70		D	2.70		
-						
		TEST PIT DISCONTINUED	AT 2.7	O METRES.		
-						
F						
-			,			
L						

EQUIPMENT Backhoe

TECHNICIAN

Willey

PIT SIZE 3 m x 0.5 m

WATER LEVEL No free ground water observed REMARKS

Disturbed Sample

B Bulk Sample

U Undisturbed Sample



CLIENT MORRISON WHITTEN & NICEY PTY. LTD DATE

6/3/86

PIT No. 2

LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL

Approx. 34.5

		Sampling and in-situ Testing							
Danes	December of the	ļ	,	·					
Depth (metres)	Description of Strata	·	mpling		netrometer				
		Туре	Depth	Depth	Blows/150mm.				
S.L. 0.25	TOPSOIL - dark brown silty sand with rootlets								
		2B	0.50						
-	CAMP	D	1.00						
-	SAND - medium dense very light brown, medium grained sand, grading to dense with depth	D	1.50						
		D	2.00						
2.40	SANDSTONE - medium strong very light brown medium grained sandstone	D .	2.40						
	REFUSAL AT 2.40 METRES.		,						
-		 			·				
-									
					÷				

EQUIPMENT Backhoe TECHNICIAN PIT SIZE 5 m x 3 m

Willey

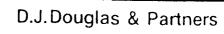
SAMPLE TYPE

D Disturbed Sample

B Bulk Sample

U Undisturbed Semple

WATER LEVEL No free ground water observed REMARKS



CLIENT MORRISON WHITTEN & NICEY PTY. LTDDATE 6/3/86

PIT No. 3

SITE

LONG BAY HOSPITAL

CONTRACT No.

SS1/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL Approx. 35.6

		Approx. 35.6								
Depth	Description of Co.			and in-alt						
(metres)	Description of Strata		mpling		Penetrometer					
		Туре	Depth	Depth	Blowe/150mm.					
S.L. 0.40	TOPSOIL - dark grey silty medium grained sand with rootlets									
		2B	0.50							
	SAND - dense light grey, medium grained sand	D	1.00							
1.40	SAND - dense dark brown medium grained weakly cemented sand	D	1.50							
	SAND - dense yellowish brown medium grained sand	D	2.00							
- 2.50	TEST PIT DISCONTINUED AT 2.5	D O METE	2.50							
	DUE TO EXCESSIVE CAVING.	O META	<u>E5</u> ,							
					·					
t										
		-								
L										

EQUIPMENT

REMARKS

WATER LEVEL

Backhoe $3 m \times 0.5 m$

TECHNICIAN

No free ground water observed

Willey

Disturbed Sample

U Undisturbed Semple

CLIENT MORRISON WHITTEN & NICEY PTY. LTD.DATE 6/3/86

PIT No. 4

A SEE

SITE LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL Approx. 36.0

	<u> </u>		γ		Арргох	
	Depth	Description of Strata			and In-altu	
	(metres)	Description of Strata		mpling		enetrometer
	C I		Тур•	Depth	Depth	Blows/150mm.
	S.L.	FILLING - dense dark brown silty medium grained sand with rubble, scrap metal and concrete		·	·	
	0.70		2B ₂	0.70		
	_	SAND - very dense light grey medium grained sand	D	1.00		
	- 1.60 1.75	SAND - dense dark brown weakly cemented medium grained sand	D	1.50		
		SAND - very dense yellowish brown medium grained sand	D	2.00		
	- 2.50	medium graffied sand	D	2.50		
		TEST PIT DISCONTINUED AT 2	2.50 ME	TRES.		
		DUE TO EXCESSIVE CAVIN	1G.			
-	-					
	:					
						·

EQUIPMENT Backhoe PIT SIZE 3 m x 1 m

REMARKS

WATER LEVEL . No free ground water observed

TECHNICIAN Willey

Disturbed Sample

U Undisturbed Sample



DP-5

CLIENT MORRISON WHITTEN & NICEY PTY. LTD.DATE

6/3/86

PIT-No. 5

SITE

LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL Approx. 33.5

Depth (metres) Description of Strate Sempling Dynamic Penetr. Type Depth Depth Depth Blow S.L. FILLING - medium dense dark grey silty sand with sandstone concrete bricks and scrap metal 2.60 REFUSAL AT 2.60 METRES.				Sampling	and in-situ	Testing
FILLING - medium dense dark grey silty sand with sandstone concrete bricks and scrap metal 2.60 REFUSAL AT 2.60 METRES.	scription of S	Strata	s	ampling	Dynamic F) en etrometer
FILLING - medium dense dark grey silty sand with sandstone concrete bricks and scrap metal 2.60 REFUSAL AT 2.60 METRES.			Тур•	Depth	Depth	Blows/150mn
silty sand with sandstone concrete bricks and scrap metal 2.60 REFUSAL AT 2.60 METRES.						
2.60 REFUSAL AT 2.60 METRES.						
2.60 REFUSAL AT 2.60 METRES.						
2.60 REFUSAL AT 2.60 METRES.	medium dense	e dark grey			·	
2.60 REFUSAL AT 2.60 METRES.	nd with sands nd scrap meta	stone concre al	ete			
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.	•					ļ
REFUSAL AT 2.60 METRES.					-	
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.		•				<u> </u> -
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.						
REFUSAL AT 2.60 METRES.		•		1		
REFUSAL AT 2.60 METRES.	·					:
		•		1		i .
		IISAI. AT 2 60	METTORC			:
	ILLI O.	OJAL AI 2.00	MEIRES.			!
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				!		
	-					
			,			
,						

EQUIPMENT Backhoe

PIT SIZE

TECHNICIAN.

Willey

D Disturbed Sample

WATER LEVEL No free ground water during digging.

B Bulk Sample

REMARKS Free ground water observed at 2.50 m after $\frac{1}{2}$ hour.

3 m x 1 m

U Undisturbed Semple



DP-6

CLIENT MORRISON WHITTEN & NICEY PTY. LTD.DATE

6/3/86

PIT No. 6

SITE

LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL Approx. 32.5

			Sempling	and in-eltu	Teeting
Depth	Description of Strata	Sa	mpling	Dynamic P.	enetrometer
(metres)		Тур•	Depth	Depth	Blows/150mm
S.L.					
-		В	0.50		
•		D	1.00		
	FILLING - dense dark grey silty				
-	sand with bricks, concrete, scrap metal, cloth and plastic	D	1.50		
-	metal, Cloth and plastic		•		
-					
		D	2.00		
				•	
- [D	2.50		
2,60	SANDSTONE - medium strong very				; ; ;
\$: \$	light brown sandstone				
	REFUSAL AT 2.60 METRES	•			
_		ļ	•		
		1			
			·	,	
			,		,
· 					
		<u>_</u>			

EQUIPMENT Backhoe TECHNICIAN Willey

PIT SIZE 3 m x 1 m

WATER LEVEL REMARKS

Free ground water observed at 2.50 m. Water level at 2.50 m after 1 hour.

D Disturbed Sample

B Bulk Sample

U Undisturbed Sample



CLIENT MORRISON WHITTEN & NICEY PTY. LTD.DATE

6/3/86

PIT No. 7

LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL Approx.

	20170 20170 2017			Approx	
			Sampling	and in-eitu	[•sting
Depth	Description of Strata	Sa	mpling	Dynamic Pe	netrometer
(metres)		Тур•	Depth	Depth	Blows/150mm.
S.L.					
	FILLING - dark brown silty sand				
	with sandstone, road metal				
0.50				The second secon	
				!	
	SAND - light yellowish brown				
·	medium grained sand				
- 1.50					
					•
				,	
-	TEST PIT DISCONTINUED AT 1.5	O METR	ES.		
		·			
-	·				
-		1			we
				,	
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		. [
		1 1			
	·	i :			
		<i>^-</i>			
-					
				·	
_					•
	1				
		l			

EQUIPMENT Backhoe

TECHNICIAN Willey

 $3 m \times 1 m$

WATER LEVEL No free ground water observed REMARKS

Disturbed Sample

U Undisturbed Sample



CLIENT MORRISON WHITTEN & NICEY PTY. LTDATE

6/3/86

PIT No. 8

SITE

LONG BAY HOSPITAL

CONTRACT No.

SSI/9508

LOCATION ANZAC PARADE, LONG BAY

SURFACE LEVEL

Approx. 31.5

<u></u>	Mario Panale, Edno Bal	T	_	Appro	
D		ļ		and in-eitu	
Depth (metres)	Description of Strata		mpling		enetrometer
		Тур•	Depth	Depth	Blows/150mm.
S.L.				``	
		В	0.50		
-		D .	0.50		
		_			
		D	1.00		1
	FILLING - dark brown silty sand				,
-	with scrap metal, bricks, bottles, sandstone, plastic	D	1.50		
			•		
-		D	2.00		
		-			: :
2.40					
_	SAND - light grey medium grained sand	D	2.50		1
2.60	Sano			·	
					!
-	TEST PIT DISCONTINUED AT	.60 ME	TRES,		
	DUE TO EXCESSIVE CAV	NG.			
-		ļ			
-					
			•		
-					
					, ,
					<u> </u>

EQUIPMENT Backhoe

TECHNICIAN Willey

PIT SIZE 3 m x 1 m

D Disturbed Sample

WATER LEVEL Free ground water observed at 2.10 m. B Bulk Sample REMARKS Water level at 2.10 m after 1 hour 50min U Undleturbed Semple

LOCATION			PEN	ETRAT	ION	RESIS	TANCE	BLOV	VS / 15	0 mm.		
DEPTH (m)	DP -1	DP -2	DP -3	DP -4	DP - 5	9Q	DP - 8	DP - 9	DP -10	DP -11	DP -12	
0.00 - 0.15	4	1	4	10	3	8	10/ _{20r}	nm 4	4	1	4	
0.15 - 0.30	6	3	14	9	4	-5		8	7	4	2.	1
0.30 - 0.45	6	5	14	12	6	6		8	7	4	2	
0.45 - 0.60	6	3	13	20	3	7		11	9	3	1	
0.60 - 0.75	11	4	11	10	3	7		12	20/ ₈₀	3	2	
0.75 - 0.90	6	4	8	10	3	10		12		3	2	
0.90 - 1.05	7	4	7	18	1	11		13/50)	8	2	
1 · 05 - 1 · 20	4 ·	4	6	17	2	11				7	2	
1 · 20 - 1 · 35	7	4	9	14	3	9				4	3	
1:35 - 1:50	5	5	12	10	3	8				4	5	
1:50 - 1:65	5	. 6	11	9/ 30mm	8	6				4	7	
1.65 - 1.80	5	6	9		7	5				4	4	
1.80 - 1.95		·										·
1.95 - 2.10												
2 · 10 - 2 · 25												
2.25 - 2.40								-				
2.40 - 2.55												
2.55 - 2.70												
2 · 70 - 2 · 85					····							
2.85 - 3.00												
3.15 - 3.30			·									
3.30 - 3.45											,	
3.45 - 3.60												
3.60 - 3.75												
3 · 75 - 3 · 90												
3.90 - 4.05												
4.05 - 4.20								i				
4.20 - 4.35												

AUSTRALIAN STANDARD AS 128 9XXXXX F3 3

RESULTS OF DYNAMIC

PENETROMETER

TESTING

SITE ANZAC PARADE, LONG BAY

CLIENT MORRISON WHITTEN AND NICEY PTY. LTD.

REPORT No. 9508

DATE 6/3/86



This Laboratory is regstered by the National Association of Testing Authorities Australia. The fest(s) reported herein have been performed in accordance with its terms of registration.

GROUND TEST PTY LIMITED

SURFACE ELEVATION	DATUM			\dashv		R	ORI	ΕН	 ()	_ ′	AA?	∑ −2	3		
	ZIMUTH	-		1			<u> </u>	- 1			110	. Z	כ		FIGURE 2A
DRILL TYPE X2 POWER AUGER	ATE	25.	5.81	٩	ROJE	ст		1 - H	OSPI	TAL/	LONG	BAY	GAC)L	SHEET 1 OF
		9	ELEV'N	TYPE	×	(mm)	(m)	(%)		SSIFIC	ATION		STR	ENGTH DATA	OTHER
STRATIGRAPHY		GRAPHIC LOG	DEPTH	AMPLE .	SAMPLE LOST, DISTUMBED	BLOWS/ DISTANCE (mm)	DRY (Mg/m²)	NATURAL MOISTURE CONTENT	LIMIT	PLASTICITY INDEX	LINEAR &	% FINES (No. 200)	TYPE OF TEST	PARAMETER Su,(kPa) C,(kPa) Ø,(degree	i i
SILTY SAND (Topsoll) some organi	CS	」。 [小]	F° -	I w	اقا	80.0	100	236	72	EΞ	_ ⊅ &	198~		D Include	
dark grey-black	,	Ĭ,	-												·
SAND /SILTY SAND (SP)			-				-								0.7m during augering
medium grained, brown moderately dense	, wet,	******	1												
some thin rust brown ('Indurated') layers			Ē.												
. (induiated) layers			F	SP 1		29					i	3			·
- - -			2	Ľ	×							,			
<u>.</u> - -			-								·				
grey trace silt/clay, moderately dense			_												
- SANDY CLAY (CL)	1.	7	3	SP 2		20									
light and dark grey, q sandy (fine-medium gra	qulte ined)		- - -												
CLAYEY SAND light grey with trace some darker grey claye patches, very dense	yellow		- - - - -		-	٠	•								
			- -	SP 3	₩ 2	47 210						17			
			-						}	İ					
			- 5 -												v. stiff dril
•			-						1	.	ĺ				ling (near) V Bit
SANDSTONE (HW-XW)															Refusal V Bit Refusal
grey and yellow, medium-fine grained			_6									l			€ 5.6m
medium-i me graffied			-												
			-									ļ			
· ·			- - 7												·
· ·			-											Attemote	SPT @ 7.3m
			-											but cave @ 5m	In of hole
			-											·	
			- 8			1									
(grey silty clay, v.			-									ļ			
stiff-hard, retrieved orange)											.				* .
			9												
	•		-												·
· — — — — — — —			10							_			\perp		<u></u>
· · · · · · · · · · · · · · · · · · ·	 													GOLDI	R ASSOCIATES

SURFACE ELEV	ATION VERTICAL	DATUM AZIMUTH			1	÷	BC	RE	ЕН	OL	E.	No.	25	2		FIGURE	2B
DRILL TYPE	X2 POWER AUGER	DATE	25.5	.81	PR				- но	SPITA	\L/L	NG E	BAY G	AOL		SHEET 2	of 2
***************************************	STRATIGRAPHY		GRAPHIC LOG	ELEV'N. DEPTH	SAMPLE TYPE	DISTURBED XX	BLOWS/ DISTANCE (mm)	DRY DENSITY ^{(Mg/m³})	NATURAL MOISTURE (%) CONTENT		PLASTICITY IS INDEX	UNEAR & S	% FINES TA	TYPE OF TEST	PARAMETE Su,(kPo) C,(kPo) Ø,(degre	RS	R
SANDSTO	NE (XW) HW-MW light grey and yello	w	-	10			•										
•	3 3 , ,			12	1												
				13													
- END OF	2000 MC & 15 O			14 - - - - - - - - - - - - - - - - - - -												No TC "refusal	e
- END OF	BORING @ 15.0m															depth pible wiparticudrillinon the	oss- th lar q ric
												-					
-																	
				-	<u>.Ll</u>	<u>.</u>		L	<u> </u>		 -		1	1	GOI	DER ASSOCI	IATES

	ERTICAL 2 POWER AUGER	AZIMUTH DATE	25	5.81	 	80 15			Ξ H							FIGUR
	2 POWER AUGER	DATE	25.	5.81	1,	EXX			- но							
	STRATIGRAPHY	· · · · · · · · · · · · · · · · · · ·	GRAPHIC LOG	ELEV'N. DEPTH	SAMPLE TYP	SAMPLE LOST, SO	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE (%) CONTENT		PLASTICITY W	UNEAR & STA	% FINES (No. 200)		PARAMETEI Su,(kPa) C,(kPa) Ø, (degree	RS
SANDY PEAT	black-v. dark brown peat, sllt and some smelly, wet, v. sof	sand,		-0	AS 1	×			42	0rga	nic	onte	nt .	=	6 %	▼ 0.8m
SAND (SP)	brown, medium grain loose, wet	ed, very			SP 2		4	-								ing ing
SANDY CLAY SANDY CLAY	wet			2					•			•				
	CH/CL , some fine firm-stiff	sand,		3	SP 3		13			27	13	6		* pp	150-200	kFa
0440 (05)	CL			4					-							
SAND (SP)	siliceous, grey and grey, medium graine moderately dense	dark d,		5	SP 4		- 31						-			
~	very dense grading sandstone	to XW		- - - - - - - - -			·		·						• •	
CLAY (CL)	silty clay XW sands some sandy layers	tone		• • • • •											•	
		•		- / - - - - -				:		:						
				8 												
,	thin layers 0.2-0.3 brown, indurated sa	peaty nd		- 9 - 9 							•					
				-									ı		•.	

BORE HOLE No. 26 KEPEK SIIE PLAN SURFACE ELEVATION DATUM FIGURE 2D INCLINATION AZIMUTH VERTICAL SHEET 2 OF 2 DRILL TYPE X2 POWER AUGER 25.5.81 DATE 31181 - HOSPITAL/LONG BAY GAOL DRY DENSITY (Mg/m²) SAMPLE TYPE CLASSIFICATION DATA STRENGTH DATA OTHER 6 FINES (No. 200) TYPE OF TEST ELEV'N. NATURAL MOISTURE (CONTENT PLASTICITY INDEX PARAMETERS STRATIGRAPHY Su,(kPa) C,(kPa) Ø,(degrees) LIMIT SILTY CLAY (CL) grey, some sandy layers 12 SANDSTONE (XW) grey, medium grained some ironstone 13 V Bit Ref usal € 13.5m (HW-MW) grey and yellow -14 Very stiff drilling @ 14.5m - 15 END OF BORING @ 15m GOLDER ASSOCIATES

SURFACE ELEVATION INCLINATION VERTICAL DRILL TYPE 1/2 COLUMN	AZIMUTH	-				E H							FIGURE SHEET 1
DRILL TYPE X2 POWER AUGER	DATE	25.5,81	(.0			- HO							
STRATIGRAPHY		ELEV'N. TO DEPTH TO D	SAMPLE TYPE	BLOWS / DISTANCE (mm)	DRY (Mg/m) DENSITY	NATURAL MOISTURE (%) CONTENT		PLASTICITY INDEX	LINEAR & CO	FINES (No. 200)		PARAMETE Su,(kPa) C,(kPa) Ø,(degree	RS
SANDY PEAT/LOAM v. dark brown		,											
SAND (SP) yellow brown, loose medium-fine grained	•	- 1						:					
light grey/white			SP.	11									
· · · · · · · · · · · · · · · · · · ·		2											duri auge
yellow brown layers, some silt	, wet,								-				
		3	SP .2	16									
SILTY/SANDY CLAY (CH/CL)	-	- 4	SP 💥	3								·	
grey, quite silty, s sand, very moist, fi	some fine rm-stiff 		3	10									
- SANDY CLAY grey brown				,						,			
SAND (SP)		1 6											No SPT's sible be 5.5m dep
moderately dense												To a simple of the second	due to ca
		7											
		8											
SANDY CLAY (CL) grey, red brown and banded/mottled	yellow	,										•	
		L/L 10 _	$\perp \perp$	⅃	<u> </u>	<u> </u>	<u>L. </u>	<u> </u>			.	<u> </u>	<u></u>

BORE HOLE No. 27 SURFACE ELEVATION DATUM FIGURE 2F VERTICAL INCLINATION AZIMUTH SHEET 2 of 2 DRILL TYPE X2 POWER AUGER DATE 25.5.81 PROJECT 31181 - HOSPITAL/LONG BAY GAOL SAMPLE TYPE SAMPLE LOST, CONTURBED XXX CLASSIFICATION DATA STRENGTH DATA OTHER ELEV'N PARAMETERS DEPTH PLASTICITY INDEX NATURAL MOISTURE (CONTENT UNEAR SHRINKAGE % FINES (No. 200) STRATIGRAPHY Su,(kPa) C,(kPa) Ø,(degrees) TYPE SANDY CLAY (CL) grey, red brown and yellow banded CLAYEY SAND (SC) grey/yellow Very slow drilling @ 13m V Bit Ref usal @ 14.1m Augered to 15m with TC END OF BORING @ 15m BIT GOLDER ASSOCIATES

SURFACE ELEVATION BORE HOLE No. 28 DATUM FIGURE 2G INCLINATION VERTICAL AZIMUTH SHEET 1 OF 1 DRILL TYPE X 2 POWER AUGER DATE PROJECT 31181 - HOSPITAL/LONG BAY GAOL 25.5.81 SAMPLE TYPE SAMPLE TYPE BLOWS/ DISTANCE (mm) DRY DENSITY (Mg/m²) CLASSIFICATION DATA STRENGTH DATA GRAPHIC LOG OTHER ELEV'N PARAMETERS NATURAL MOISTURE (CONTENT PLASTICITY INDEX STRATIGRAPHY % FINES (No. 200) DEPTH' LIOUID 9 Su,(kPa) C,(kPa) Ø,(degrees) TEST SILTY SANDY PEAT dark grey brown/black SAND (SP) light (siliceous) grey and rust brown, medlum grained 11 - 2 light yellow grey, moderately dense, trace slit 17 during light yellow grey, some augering black specks, wet SP 💢 27 5 tried SPT € 5.8m but hole caved-in € seems grey 5.0m CLAYEY SAND (SC) yellow grey SAND (SP) firm drilling wet penetration possibly thin clay layers _14 Not much retrleved on augers when rods pulled up. Therefore ass ume sand stratigraphy to E.O.B. € 15m 15m

GOLDER ASSOCIATES

REFER SITE PLAN

_ F	SURFACE ELEVATION INCLINATION VERTICAL	DATUM					В	ORE	ΞΗ	OL	.Ε	No	. 29	3		FIGURE 2H
H	DRILL TYPE X2 POWER AUGER	DATE	26.	5.81	P	ROJE	cr :	31181	- HC	SPIT	CAL/I	A2 -	- 2 ^C	GAO	L	SHEET 1 OF 1
	STRATIGRAPHY		GRAPHIC LOG	- ELEV'N , - DEPTH *	SAMPLE TYPE	SAMPLE LOST, SON	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL (%) MOSTURE (%) CONTENT		PLASTICITY SE INDEX	LINEAR & OIL	% FINES ATAD	TYPE OF 12	PARAMETEI Su,(kPa) C,(kPa) Ø,(degree	RS
	SILTY PEATY SAND black-v.dk. highly organic medium-fine grainer dark grey. SOME SIIT. rust broclayey-yellow brown brown banded, medium mostly friable END OF BOREHOLE @ 1.5m GROUNDWATER NOT ENCOUNTERED	own n		1	AS1	X						-				V Bit Refusa @ 0.7m Slow auger progress - jerky TC Bit Ref- usal @ 1.5m
	LOCATION REFER SITE PLANS SURFACE ELEVATION INCLINATION VERTICAL DRILL TYPE X2 POWER AUGER	DATUM AZIMUTH DATE	26	.5.81	PR	OJE			E Н			1A2.	-30	>		FIGURE SHEET OF
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N., - DEPTH*	SAMPLE TYPE	SAMPLE LOST, DISTURBED	BLOWS/ DISTANCE (mm)	DRY (Mg/m ³) DENSITY	NATURAL MOISTURE (%) CONTENT		PLASTICITY INDEX	LINEAR & ST SHRINKAGE & Z	, <u>o</u>		NGTH DATA PARAMETER Su,(kPa) C,(kPa) Ø,(degreen	IS .
	TOPSOIL slity sand, dk. gre rootlets, organics, wet SANDSTONE (MW-HW) Ilght grey/white some thin brown banders of BOREHOLE @ 1.5m GROUNDWATER NOT ENCOUNTERED	v.moist/		- 2												V Bit Refusa @ 0.6m TC Bit Refusa
	LOCATION REFER SITE PLAN SURFACE ELEVATION INCLINATION VERTICAL DRILL TYPE X 2 POWER AUGER	DATUM AZIMUTH DATE		.5.81	P.F	ROJE			E H		4	A2	-31	GAC)L	FIGURE SHEET OF
- [STRATIGRAPHY		GRAPHIC LOG	ELEV'N DEPTH metres	SAMPLE TYPE	SAMPLE LOST, DISTURBED	BLOWS/ DISTANCE(mm)	DRY DENSITY (Mg/m³)	MATURAL MOISTURE (%) CONTENT	CLASS	PLASTICITY ST INDEX	UNEAR ROS	% FINES TA		PARAMETER Su,(kPa) C,(kPa) Ø,(degreen	ıs
	TOPSOIL silty sand, black/b highly organic SILTY SAND (SM) dark gr dark rust brown, in sand SANDSTONE (MW-HW) light grey/white/ye medium grained END OF BOREHOLE @ 1.5m GROUNDWATER NOT ENCOUNTERED	ey durated		1												V Bl† Refusa -0 0.9m TC Bl† Ref usal 0 1.5m
L															GOLD	ER ASSOCIATES

SURFACE ELEVATION	DATUM		· · · · ·	-	Р	OR.	E H		E	Nia	21	<u> </u>		
INCLINATION VERTICAL DRILL TYPE X2 POWER AUGER	AZIMUTH	-		1_						142	- 32	<u>.</u>		FIGURE 2J SHEET 1 OF 1
DRILL TYPE X2 POWER AUGER	DATE	26.5	.81	PRO	DJECT		31 - F					GA(OL.	SHEET OF
STRATIGRAPHY		GRAPHIC LOG	ELEV'N. DEPTH	SAMPLE TYPE	BLOWS/	DRY (Mg/m²)	NATURAL MOISTURE (%) CONTENT		¥1	LINEAR SOLLY	% FINES PATE (No. 200)	TYPE OF 1815	PARAMETEI Su,(kPa) C,(kPa) Ø,(degree	RS
FILL ash and sand, black		T	- 0 — :							T		T		
SILTY SAND (SP) grey, fine-med	lum grain	-												
CLAYEY SAND (SC) brown, some v. dk-b layers, (Indurated s	lack		. 1											1.3m during augering
	wet													₽
SANDSTONE (XW-HW) yellow brown and	grey		- 2	SPI Z			ī		-					Hard. abras-
END OF BOREHOLE @ 2.5m		1 =			-								<u> </u>	TC Bit Ref- usal @ 2.5m
			. 3							-				
		F	-						·					
		E	;. A											
LOCATION REFER SITE PLAN		l -	, 4	 	<u> </u>	<u> </u>				-			· · · · · ·	-
LOCATION REFER SITE PLAN SURFACE ELEVATION	DATUM			1	B	ORF	ΞH	ŌΙ	F	No	33	₹.		FIGURE
				┨		O_{1}	-	\smile \sqsubseteq	، سا	IYU.		,	1	LIGOUE 1
NCLINATION VERTICAL	AZIMUTH					<u></u>	,	·		1A2	<u>-33</u>	} 		SHEET OF
	AZIMUTH DATE	26.	5.81	PRO			- ноs	·		1A2				SHEET OF
		8	ELEV'N y DEPTH*	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER SU,(kPa) C,(kPa) Ø,(degrees	OTHER
SILTY PEATY SAND	DATE	TF	ELEV'N	TYPE	₩ ê		- ноs	SPITA	AL/LO	A2 ONG E	YAE	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER
DRILL TYPE X 2 POWER AUGER STRATIGRAPHY	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER
STRATIGRAPHY SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER S P Bit Refusal- # 1.6m
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW)	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER S P Bit Refusal-
STRATIGRAPHY SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	▼ Bit Refusale
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, so	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER S P Bit Refusal- # 1.6m
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	ELEV'N	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	metres	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	metres	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	metres	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	metres	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa
SILTY PEATY SAND dark brown, organics SAND (SP) grey white, moist fine-medium grained dark brown, clayey SANDSTONE (HW-MW) light grey/white, son yellow, medium grained	DATE	TF	metres	r P.E.			- ноз	SPIT/	AL/LO	ATION O	BAY G	SAOL	NGTH DATA PARAMETER Su,(XPO) C.(XPO)	OTHER ▼ Bit Refusale ● 1.6m ▼ TC Bit Refusa

STRATIGRAPHY STRATICAL S		INCLINATION VE	RTICAL	DATUM AZIMUTH		- ,					Ξ Η			G	42.	-31	_	FIGURE 2K
FILL sand, sandstone gravels and cobbles and slift, grey brown and white mixed SAND (SP) grey brown light grey, medium grained, moist, mod. dense 2 black, some slift (indurated sand) V Bit Refusal & S. Information (indurated sand) SANDSTONE (HW-MW) light grey/white, friable Stiff going some softer patches TC Bit Refusal & A. Bm END OF BORPHOLE & 4. Bm	id Si	X 2	Z POWER AUGER	DATE	T	E .	J. J.						SSIFIC	ATION	DATA	STR	ENGTH DATA	OTHER
FILL sand, sandstone gravels and cobbles and slift, grey brown and white mixed SAND (SP) grey brown light grey, medium grained, moist, mod. dense 2 black, some slift (Indurated sand) SANDSTONE (HW-MW) light grey/white, friable SANDSTONE (HW-MW) Figure 1 SANDSTONE (HW-MW) SANDSTONE (HW-MW) SANDSTONE (HW-MW) SANDSTONE (HW-MW) SANDSTONE (HW-MW) SANDSTONE (HW-MW) TO Bit Ref- WEAL # 3 A Bm TO BIT Ref- WEAL # 3 A Bm			STRATIGRAPHY		GRAPHIC LO	r .	SAMPLE TI	SAMPLE LOST, DISTURBED	BLOWS/ DISTANCE (DRY DENSITY ^{(Mg}	NATURAL MOISTURE (CONTENT	LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (No. 200)		PARAMETER	s
SAND (SP) grey brown light grey, medium grained, moist, mod. dense 2 black, some silt (indurated sand) SANDSTONE (HW-MW) light grey/white, friable Stiff going some softer patches TC Bit Ref- T		FILL	and cobbles and s	silt, grey		0												
black, some silt (Indurated sand) V Bit Ref- usal @ 3.1m Ilight grey/white, friable Stiff going some softer patches TC Bit Ref- patches	1	SAND (SP)	grey	brown		F 1												
black, some silt (Indurated sand) V Bit Ref- usal @ 3.1m Ilight grey/white, friable Stiff going some softer patches TC Bit Ref-	!		light grey, mediu molst, mod. dense	m grained,			-											•
V Bit Ref- usal @ 3.1m SANDSTONE (HW-MW) light grey/white, friable Stiff going some softer patches TC Bit Ref-		-				2												during augering
SANDSTONE (HW-MW) light grey/white, friable Stiff going some softer patches TC Bit Ref-	· I													-			·	
Some softer patches TC Bit Ref-		SANDSTONE		friable		3												— usal @ 3.1m
TC Bit Ref-						4										,	٠	some softer
[END OF BOREHOLE @ 4.8m						- - -			•			-				-		
	ļ	END OF BORE	OLE @ 4.8m		****	- - 5												TC Bit Ref- usal @ 4.8m
						• • • • • • • • • • • • • • • • • • •				-								
		. ' • ·				•	-		-									
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	- 1									-							·	
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KEFEK SILE PLAN

	LOCATION SURFACE ELEV		FER SIT	E PLAN	<u> </u>	DATUM			-		R)BE	ΞН	\bigcirc I		NIO	シ E	•		
	INCLINATION DRILL TYPE		RTICAL	AUCER		AZIMUTH	24	-	1			1101	- HOS	O L		GA	2-	3 <i>5</i>		FIGURE 2L SHEET 1 OF 1
			FUNER	AUGER		DATE	T	E	W	NO JE			- HOS		SSIFICA	TION			NGTH DATA	
			STRATIGE	РАРНУ			GRAPHIC LOG	DEPTH metres	SAMPLE TYP	SAMPLE LOST, DISTURBED	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m²)	NATURAL MOISTURE (°CONTENT		PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (No. 200)		PARAMETE	RS
	FILL		silty s cobbles brown	and, so	me san grey/	idstone 'dark		F 0 -												
	E SAND (S	SP)	dark ru	st brow	ey bro	lurated)													·	V Bit Ref-
	SANDSTO			low/bro	wn and	grey		- 1												usal @ 1.0m =
	- END OF B	OREH	DLE @ 1.	3m				- 1.3 -												usal@1.3m
E								2							-					
i commente de la comm	- - - - - -			٠									-	-						
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THOD BACKHOE - JCB DATE OUNDWATER 1.6m DATE STRATIGRAPHY		5.81						1	•	•	PI	FIGURE 3A
	25.		PAN	MPLE	DATA	MOIST.	DENSITY	CLA	SSIFIC	ATION	DATA	
STRATIGRADUV	~~.	5.81							T-	พ้		•
JINA HONACHI	٦٥٥	ELEV'N DEPTH metres	TYPE	SAMPLE LOST,	BLOWS PER O-3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT.(%)	LIMIT	PLACTICIT	LINEAR SHRINKAG Percent	% FINES (< No.200)	TEST RESULTS REMARKS
LL - approximately: 80% silt, sand with some grass, rootlets and other organics 20% bricks, building rubble etc. (black-dark grey, smelly) LTY SAND (SP) brown, fine to medium grained seems moderately dense NDY/SILTY CLAY (CL) grey with brown mottling seems firm-stiff		2-		9	0		-			S		1.6m Pit tended to cave- in during excavation No backhoe refusal

OCATION REFER SITE PLAN				1	T	FC	TI	PIT) .	~	00			-,
SURFACE ELEV. DATUM				_	ı.	LO	1 1			·	. 1	PZ			and the second
METHOD BACKHOE - JCB	DATE		.5.81					DENSITY	CLA	SSIFIC	ATION I	DATA			
SROUNDWATER 2.3m approx.	DATE	25.	5.81	ш	LOST	PER	Σ'n	AL JRE %)	42	ξ×	AGE.	(S)		TEST	RESULTS
STRATIGRAPHY		ပို	DEPTH metres	ΤΥP	SAMPLE LOST DISTURBED	BLOWS 0-3 MET	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT.(%)	LIMIT	PLASTI	LINEAR SHRINKAGE Percent	% <u>FINES</u> (< No.200)		REM	ARKS
FILL - approximately: 50% bricks, brickbats, tiles parts of brickwalls, etc. 20% timber (bed frames, cupletc). 10% metal - plumbing pipes, springs, etc. 20% sand, dark grey brown (Fill difficult to excavate mainly due to pipes, uncompassome voids evident) wet sandier BAND (SP) some silt, grey, seems moder	octed,		2										*	_ 2.3m during	excavation

SURFACE ELEV. DATUM				T	ES	T	PIT		3	T	P 3	FIGURE 3B
METHOD BACKHOE - JCB DATE	25.5	.81	SAN	APLE	DATA	MOIST.	DENSITY	CLA	SSIFIC	ATION	ATAO	
GROUNDWATER Not Encountered DATE	25.	5.81							1		· 6	
STRATIGRAPHY	707	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT. (%)	LIMIT	PLACTICITY INDEX	LINEAR SHRINKAGE,	% FINES: (< No.200)	TEST RESULTS REMARKS
FILL - approximately: 70% sand and silt, yellow grey with some dark grey brown (topsoil and indurated sand) 20% sandstone cobbles and boulders, concrete slabs to lm wide 10% timber and bits of metal, eg pipe rubble (Pit slightly smelly, Fill seems loose except on surface)		2-										
- <u>SANDSTONE - XW-MW light grey</u> (MW)	*******	3				-						ackhoe refusal 3.1m

LOCATION REFER SITE PLAN	·····			Т	FS	T	PIT	. /		TF	> /		
SURFACE ELEV. DATUM				-			1 1 1		+	- 11	+	<u>`</u>	
METHOD BACKHOE - JCB DATE		5.81				MOIST.	DENSITY	CLA	SSIFIC	ATION	DATA		· · · · · · · · · · · · · · · · · · ·
GROUNDWATER Not Encountered DATE	25.	5.81	w	LOST	E SE	Ĺζ	AR JRE %)	₽⊢	Σ×	AR CAGE	S 6	1	TEST RESULTS
STRATIGRAPHY	700	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DENSITY	NATURAL MOISTURE CONT. (%)	LIGUID	PLASTICITY INDEX	LINEAR SHRINKAGI Percent	% FINES (< No. 200)		REMARKS
FILL - approximately: 70% sand and silt, very dark grey/ black										-			
25% bricks, brickbats and concrete slabs to 0.5m wide 5% timber, cloth rags, organics, etc.	:	1-1					•						
(Pit slightly smelly, fill seems loose except on surface)													
. ·		2 -											
SANDSTONE (HW-MW) grey													Backhoe refusal
(MW)		1										-	@ 2.4m
		3-			,								
					:								
		-											

DEPTH OF PIT: 2.4m

SURFACE ELEV. DATUM				T	ES	T	PIT	5)	Ţ	P5	FIGURE 30
METHOD BACKHOE - JCB DATE	25.	5.81	SA	MPL	DATA	MOIST.	DENSITY	CLA	SSIFIC	ATION	DATA	
GROUNDWATER 1.4m DATE	25	5.81		E S	ង្គសិ	۲۵	S R P	_	≿	. W	s Q	TEST PECHAN
STRATIGRAPHY -	700	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DENSITY Mg/m³	NATURAL MOISTURE CONT.(%)	LIMIT	PLACTICITY INDEX	LINE AR SHRANKAGE Percent	% FINES (< No.200)	TEST RESULTS REMARKS
FILL - approximately:		-		<u></u>					u.	- "		
50% silty sand 50% bricks and sandstone boulders/ cobbles												
approximately:		1									,	Caveing in of pit
80% bricks, sandstone boulders and concrete slabs to 0.7m wide wet 20% timber, metal and some organic matter		2-					-	•				During excavation
(Pit quite smelly)		-										
Possibly sandstone below 2.7m depth	?	3-					·	-	•			Backhoe refusal Not certain due to collapse of pit from 1.4m
		11111										

#113 - 1

SURFACE ELEV. DATUM METHOD BACKHOE - JCB DATE 25.5.81 GROUNDWATER Not Encountered DATE 25.5.81 STRATIGRAPHY SUBJECT OF THE PLAN SAMPLE DATA MOIST, DENSITY CLASSIFICATION DATA CLASSIF	LOCATION REFER SITE PLAN			•	TFS	T	PIT	, F		TF	26	
GROUNDWATER Not Encountered DATE 25.5.81 STRATIGRAPHY 9 ELEV'N DEPTH Metres 80% sand - yellow, grey and dark brown with some black (indurated) layers 20% granular fill eg sandstone boulders to 0.3m wide, brickbats 1 1 1 1 1 1 1 1 1 1	SURFACE ELEV. DATUM			<u> </u>		· · ·						
FILL - approximately: 80% sand - yellow, grey and dark brown with some black (indurated) layers 20% granular fill eg sandstone boulders to 0.3m wide, brickbats lot of rags and other smelly organic matter SAND (SP) yellow grey SANDSTONE (MW) Backhoe refusal @ 2.3m						MOIST.	DENSITY	CLA		ATION	DATA	
FILL - approximately: 80% sand - yellow, grey and dark brown with some black (indurated) layers 20% granular fill eg sandstone boulders to 0.3m wide, brickbats lot of rags and other smelly organic matter SAND (SP) yellow grey SANDSTONE (MW) Backhoe refusal @ 2.3m	GROUNDWATER Not Encountered DATE	25.	5.81	ш		\ <u>}</u>	목품양	ايو	ξ×	A GE	S (S	TEST RESULTS
FILL - approximately: 80% sand - yellow, grey and dark brown with some black (indurated) layers 20% granular fill eg sandstone boulders to 0.3m wide, brickbats lot of rags and other smelly organic matter SAND (SP) yellow grey SANDSTONE (MW) Backhoe refusal @ 2.3m	STRATIGRAPHY	997	DEPTH	TYP	BLOWS O-3 MET	DRN DENS	MOIST CONT.	LIOU	PLAST	LINE/ SHRINK perce	% FIN	REMARKS
3-	80% sand - yellow, grey and dark brown with some black (indurated) layers 20% granular fill eg sandstone boulders to 0.3m wide, brickbats lot of rags and other smelly organic matter SAND (SP) yellow grey		2				-					
			3-									•

DEPTH OF PIT: 2.3m

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SURFACE ELEV. DATUM				T	ES	T	PIT	7	7	T	P7		FIGURE 3D
METHOD BACKHOE - JCB DATE	25.	5.81	SAI	MPLE	DATA	MOIST.	DENSITY	CLA	SSIFIC	ATION	DATA		
GROUNDWATER 2.1m approx. DATE	25.	5.81								1.5			
STRATIGRAPHY	, LOG	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DENSIT Mg/m	NATURAL MOISTURE CONT.(%)	LIMIT	PLACTICITY INDEX	LINEAR SHRINKAGE Percent	% FINES (< No.200)		TEST RESULTS REMARKS
FILL - approximately: 90% sand - grey and yellow, some black/grey (organic topsoil) layers moist, trace bricks etc. 10% organics (black) and other granular material, eg bricks		1-		Ę.	3				4	v,			·
		-							·				
sandier		2-										- -	Very sloppy materia below 2.1m
Salidier		3-							-				Pit caveing in @ 2.5m
seems natural lime sand		11111											
				_									No backhoe refusal

LOCATION REFER SITE. PLAN				Т	FS	T I	PIT	Ω		TF	λ	•
SURFACE ELEV. DATUM				1.		1 1	11			' '	-	part of the second of the seco
		5.81					DENSITY		SSIFIC	ATION I	DATA	
GROUNDWATER 2.7m approx. DATE	25.	5.81	E	LOST BEO	P.E.	<u></u>	SE S	2-	Σ×	AGE, nf	ES 00)	TEST RESULTS
STRATIGRAPHY	106	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DENS DENS Mg /n	NATURAL MOISTURE CONT. (%)	LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE, percent	% FINES (< No. 200)	REMARKS
FILL - approximately 80%-90% sand - grey and yellow with some dark grey/black layers seems moderately dense 10%-20% granular fill, eg timber, sandstone cobbles, rags, and metal rubble, smelly		2		•						S		
SANDSTONE (XW-HW) yellow and white, medium grained Possibly large floater though		3-										2.7m Backhoe refusal

DEPTH OF PIT: 3.8m

SURFACE ELEV. DATUM			· · · · · · · · · · · · · · · · · · ·	1	T	ES	T	PIT	- (}	T	79	1	FIGURE 3E
METHOD BACKHOE - JCB	DATE	25.5	.81	SA	MPU	E DATA	MOIST.	DENSITY	CLA	SSIEIC	ATION	DATA		
GROUNDWATER 3.0m	DATE	25.5	.81											. •
STRATIGRAPHY		106	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DENSIT Mg/m	NATURAL MOISTURE CONT.(%)	LIMIT	PLACTICITY INDEX	LINEAR SHRINKAGE, Percent	% FINES (< No.200)	TE	ST RESULTS REMARKS
FILL - approximately										<u>a</u>	S			
90% sand - organe brown, fine grained 10% granular rubble, eg timbe bricks, sandstone cobbles, ef	r.		-					-		-		-		•
a lot of rags, timber and oth smelly organics @ 1.9m	er					·								
SANDY CLAY/CLAYEY SAND brown (possibly fill)			2-										Side belo	es of pit vertica ow 2.0m
peaty zone, many roots, dark brown @ 3.0m			3-	7.78247.7	-								Dumi	ing augusta
			1										Slop	ing augering opy black materia rieved below 3.0m
			1										No b	eackhoe refusal ff digging too)

DEPTH OF PIT: 4.0m

LOCATION REFER SITE PLAN SURFACE ELEV. DATUM		-		-	ΓES	T	PIT	10)	TP	10	
METHOD BACKHOE - JCB	DATE	25 5	5 81						<u> </u>			
GROUNDWATER 3.1m	DATE				LE DATA	 				ATION		:
STRATIGRAPHY		POO	ELEV'N DEPTH metres	TYPE SAMPLE LOST	BLOWS PER O-3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT. (%)	LIGUID	PLASTICITY INDEX	LINEAR SHRINKAGE,	% FINES (< No. 200)	TEST RESULTS REMARKS
FILL - approximately: 80% sand - mostly dark gre medium grained 20% bricks, timber, concre blocks to 1½m wide, bits o reinforcing wire etc.	te		2				•					
SAND (SP) dark brown, some silt, ind sand, seems original topso 3.0 to 3.2m			3-		•							Sides of pit near vertical below 2.5m 3.1m No backhoe refusal

SURFACE ELEV. DATUM			1		ES	T	PIT		11	7	PII		FIGURE 3F
METHOD BACKHOE - JCB DATE	25	.5.81	SAN	APLE	DATA	MOIST.	DENSITY	CLA	SSIEIC	ATION	DATA		
GROUNDWATER 3.2m DATE	. 25	5.81					. 101						
STRATIGRAPHY	700	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, CISTURBED	BLOWS PER 0-3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT.(%)	LIGUID	PLACTICITY INDEX	LINEAR SHRINKAGE, Percent	% FINES (4 No.200)		TEST RESULTS REMARKS
FILL - approximately:									a	- O		-	
70% sand - dark grey/black 30% building rubble, eg timber, tyres, many steel or iron water pipes, concrete slabs to by wide, bricks, corrugated iron, rags and other miscellaneous fill (smelly)		-					-			-			
		2									-		
		3-1										*	3.2m Mainly black slop retrieved below 3.3m
Seems original topsoil (black peaty sand)		-										•	No backhoe refusal

from 4.0 to 4.2m
DEPTH OF PIT: 4.2m

LOCATION REFER SITE PLAN SURFACE ELEV. DATUM			•	T.	ES	T	PIT	1	2	TF	12	
METHOD BACKHOE - JCB DATE	25.5	5.81				·	DENSITY					
GROUNDWATER Not Encountered DATE	25.5	. 81							~			TEST RESULTS
STRATIGRAPHY	106	ELEV'N DEPTH metres	TYPE	SAMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURE CONT. (%)	LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE percent	% FINES ((No.200)	REMARKS
FILL - approximately: 70% sand - dark grey brown 30% metal pipes (similar to type used in scaffolding), wire screens, sheet iron		2										Backhoe unable to dig thru metal pipe and sheeting iron tangle

SURFACE ELEV. DATUM				T	ES	T	PIT	1	3	TP	13	FIGURE 3G
METHOD BACKHOE - JCB DATE	2	5.5.81	SAI	MPLE	DATA	MOIST.	DENSITY	CLA	SSIFIC	ATION	DATA	
ROUNDWATER Not Encountered DATE	2	5.5.81										
STRATIGRAPHY	L06	ELEV'N DEPTH metres	TYPE	SUMPLE LOST, DISTURBED	BLOWS PER 0-3 METRES	DRY DENSI Mg/m	NATURAL MOISTURE CONT. (%)	LIOUID	PLACTICITY INDEX	LINEAR SHRINKAGE, Percent	% FINES (< No.200)	TEST RESULTS REMARKS
TOPSOIL silt and sand, dark grey brown/ black, organic	1		1	-	<u> </u>	<u> </u>			α	5		· · · · · · · · · · · · · · · · · · ·
SILTY SAND (SM) dark grey some rust brown indurated layers					!							
SANDSTONE (HW-MW)												_ Backhoe refusal @ 0.7m
	"	1-										
		1 :										
•] :									-	
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		2-						1		.		
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DEPTH OF PIT: 0.7m

OCATION REFER SITE PLAN			1	T	FC	T	PIT	1	1	<u>ش</u>	. 1				
URFACE ELEV. DATUM			L	1.	LJ	1 1		14	+	11	14			*	
ETHOD BACKHOE - JCB DATE		.5.81	SA	MPLE		MOIST.	DENSITY	CLA	SSIFIC	ATION I	DATA				
ROUNDWATER 3.4m DATE	25	.5.81	111	LOST ED	P.F.	μ'n	4 E &	٦	ξ×	F SE	S 6	ļ ·	TEST	RESULTS	s
STRATIGRAPHY	רספ	ELEV'N DEPTH metres	TYPE	SAMPLE LOST DISTURBED	BLOWS PER O.3 METRES	DRY DENSITY Mg/m³	NATURAL MOISTURI CONT. (%)	LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE, percent	% FINES	- -		MARKS	
FILL - approximately: 70% sand (silty), very dark grey- black and dark brown layered, moist 20% sandstone cobbles, boulders and similar granular fill 10% organics (topsoil, black, grass, smelly vegetation etc)		2 -					•					¥	3. 4m	khoe refu	

DEPTH OF PIT: 3.6m

SURFACE ELEVATION 41.2 DATUM INCLINATION Vertical AZIMUTH DRILL TYPE Gemco DATE				BO:			E H	OL	Ε	No	1	1		FIGURE 2A SHEET 1 OF 1
DATE Gemco DATE	8.10	-				Long								
STRATIGRAPHY	GRAPHIC LOG		SAMPLE TYPE	SAMPLE LOST, SOON	BLOWS/300 DISTANCE (mm)	DRY DENSITY (Mg/m²)	NATURAL MOISTURE (%) CONTENT		PLASTICITY SS INDEX		% FINES (No. 200)		PARAMETE Su,(kPa) C,(kPa) Ø,(degree	RS
FILL SILTY SAND, grey slightly organic Some bricks, concrete pieces Loose	XXX		SP	1	9									TC Bit auger
SILTY SAND (SP) Dark grey & brown moist organic SANDSTONE MW-SW Medium grained, light grey		2	AS	2			-							
Grey with occas. thin brown and orange streaking		4	אורכ - וככ ו	0		Joi 0 2	nts m 0° to	odera hori	tely z., c	to wi lean.	dely	spac	ed	NMLC rock coring
Grey with thin darker grey streaking		5	NMLC-RC2	٥		-10	mm sa	ndy c	lay f	illed	joir	its		
END OF BORING @ 5.8m GROUNDWATER NOT ENCOUNTERED		- 6												
					•									
				-										

LOCATION Refer Site Plan

SURFACE ELEVATION 37.1 DATUM Std.

INCLINATION Vertical AZIMUTH - Gemco DATE 8.10.79 PROJECT Long Bay

BORE HOLE NO. 2

FIGURE 2B

SHEET 1 OF 1

DRILL TYPE GEMCO	DATE	8.10	.79	PRO	JJEC	T L	ong B	ay							
		G		H.	Ø	o 🗐	Æ	(%)	CLAS	SSIFICA	TION C			NGTH DATA	OTHER
STRATIGRAPHY		GRAPHIC LOG	ELEV'N DEPTH	SAMPLE TYPE	DISTURBED	BLOWS / 300 DISTANCE (mm)	DRY (Mg/m³) DENSITY	MOISTURE (CONTENT	LIMIT	PLASTICITY INDEX	UNEAR &	% FINES (No. 200)	TYPE OF TEST	PARAMETERS Su,(kPa) C,(kPa) Ø,(degrees)	
FILL (SAND) Dark grey, slightly org Light grey, some darker loose	r grey		F 1	SP AS	1 2	7									
SILTY SAND Dark brown, slight (SP) fine grained, yellow brown moist - orange-brown grey brown SANDSTONE MW Light grey Becoming MW	tly_organic		2	AS AS SP	3 4 5 5	6/150	- Refu	sal 22	2			2			80% passing 0.425mm
END OF BOREHOLE @ 4.0m GROUNDWATER NOT ENCOUNTERED			5												

LOCATION Refer Site Plan BORE HOLE No. 3 FIGURE 20 DATUM Std. SURFACE ELEVATION 37.1 Vertica1 AZIMUTH SHEET 1 OF 1 INCLINATION 8.10.79 Long Bay PROJECT Gemco DATE DRILL TYPE OTHER DRY (Mg/m²) DENSITY CLASSIFICATION DATA STRENGTH DATA SAMPLE TYPE SAMPLE LOST, XXX DISTURBED XXX BLOWS / 300 DISTANCE (mm) PARAMETERS ELEV'N NATURAL MOISTURE (CONTENT PLASTICITY INDEX FINES No. 200) DEPTH Su,{kPa} C,(kPa} Ø,(degrees STRATIGRAPHY LIMIT %_ 0 TC auger SILTY SAND (SP) grey. slightly organic Orange-brown fine grained SP 1 15/100 SANDSTONE HW-MW yellow & orange, medium grain softer <u>₩ 12</u>.10.79 2 MM grey F 3 v. hard pieces

PROJECT Long Bay STRATIGRAPHY STRATICRAPHY STRATIGRAPHY STRATIGRAPHY STRATIGRAPHY STRATIGRAPHY	SURFACE ELEV			Std.		-		B	DRE	Ξ H	OL	E	Νo.	. 4	· ^		FIGURE 2D
SILTY SAND (SP) fine grained, dark grey slightly organic (topsoil) loose grey-brown SAIDSTOILE IM light grey, some yellow ELEVIN, J. H. J.	DRILL TYPE	Vertical			70	PE	10.1F						4	 	4		SHEET 1 OF 1
SILTY SAND (SP) fine grained, dark grey slightly organic (topsoil) loose grey-brown light grey moist-wet SAND (SP) fine grained, dark grey slightly organic (topsoil) SP 1 7 SP 1 7 SP 1 7 SAND (SP) fine grained, dark grey slightly organic (topsoil) SP 1 7	UNICE ITPE	Gemco	VAIE 8	T	/9 F						CI A	SSIFIC	TION	ΑΤΔ	STRF	NGTH DATA	OTHER
SILTY SAND (SP) fine grained, dark grey slightly organic (topsoil) loose grey-brown light grey moist-wet SANDSTONE IM light grey, some yellow END OF BOREHOLE @ 3.0m TC Auger TC Auger TC Auger Auger TC Auger TC Auger Water lev		•		20,1	ELEV'N.	TYPE	⊗⊗ ⊭ e	300 E (mm	(M9/m	% - -	CEM		86			PARAMETER	s
SILTY SAND (SP) fine grained, dark grey slightly organic (topsoil) loose grey-brown light grey moist-wet SANDSTONE FM light grey, some yellow END OF BOREHOLE @ 3.0m TC Auger TC Auger TC Auger Water lev		STRATIGRAPHY		GRAPHIC	metres	SAMPLE	SAMPLE LDS DISTURBE	BLOWS/ DISTANC	DRY	MOISTURA CONTENT	LIMIT	PLASTICI INDEX	LINEAR	% FINE!	TYPE OF TEST	Su,(kPa) C,(kPa) Ø,(degrees	,
Toose Toos	SILTY SA	WND (SP) fine grained,	dark grey	: '	F° –					·							TC Auger
Toose Toos	•	slightly organic (topsoil)					·										
grey-brown light grey moist-wet SANDSTORE MN light grey, some yellow END OF BOREHOLE @ 3.0m Water lev	•				E												
SANDSTONE IM Iight grey, some yellow	. – -	 			E ₁	SP	1	7			ļ '						
- light grey moist-wet - SANDSTONE IN light grey, some yellow - 2 - 2 - 2 - 3 - END OF BOREHOLE @ 3.0m - 4 - 183m	- -	grey-brown		1	F.			<u> </u>					i			'	
SANDSTONE IN light grey, some yellow 2 END OF BOREHOLE @ 3.0m Water lev 1.83m		light grey moist-wet			Ę												12.10.7
END OF BOREHOLE @ 3.0m - Water lev	SANDSTO	IE IM			Ė									_			
END OF BOREHOLE @ 3.0m Water lev	- -	light grey, some yellow			-2									·			
-	. -				F												
-	-				Ē												
-	- -				E												
1.83m 8.00am 9.	- END OF E	BOREHOLE @ 3.0m		\dagger	-3	 	 	 				 	-				Water level
	-	1 ·			F												1.83m 8.00am 9.10.
	•				E										٠.		
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LOCATION Refer Site Plan

LOCATION Refer Site Plan BORE HOLE No. 5 FIGURE 2E SURFACE ELEVATION DATUM Std. 34.9 INCLINATION Vertical SHEET 1 OF 1 8.10.79 PROJECT Long Bay DRILL TYPE Gemco DATE DRY (Mg/m³) DENSITY OTHER CLASSIFICATION DATA STRENGTH DATA GRAPHIC LOG PARAMETERS ELEV'N. % FINES (No. 200) PLASTICITY INDEX DEPTH STRATIGRAPHY Su,(kPa) C,(kPa) Ø,(degrees) TYPE metres 0 ND dark grey, fine grained, slightly organic SILTY SAND TC Bit Auger NMLC rock 0.43 Joints moderately wide y spaced @ 200 to horiz. SANDSTONE MW-SW coring grey & orange & brown banded 볼 12.10.79 Q NMLA 0 Water level 0.83m 8.00am 9.10.79 BORING ENDED @ 2.0m

LOCATION RE SURFACE ELEVATION	efer Site Plan N 34.7 Vertical	DATUM AZIMUTH	Std	ļ			ВС	DRE	E H(OL	E	No.	6 141	-6		FIGURE 2F
DRILL TYPE	Gemco	DATE	9.1	0.79	PR	OJE	CT L	ong Ba	ay							
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N. y DEPTH *	SAMPLE TYPE	SAMPLE LOST,	BLOWS / 300 DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE (%) CONTENT	CLA	PLASTICITY SE INDEX	LINEAR & ST	6		NGTH DATA PARAMETEF Su,(kPa) C,(kPa) Ø,(degree	is
SILTY SAND V. fin	(SP) dark grey-black & r ne grained	ust-brown		0 —									-		·	V-bit auger
_ Too	ose			1	SP	1	5		4				3			92% passing 0.524mm
_	ange & rust brown waterloo rock') akly cemented ose	v.wet		- - 2 -	SP	2	7				-		1.4			93% passing 0.425mm
SAND (SP) pal fir	le yellow brown, ne grained			- - - 3	Jr	;;; .	,									5gomi
mod	derately dense				SP	3	16		-							
SILT (OH)	organic,black (CL) grey				AS	4		-								
SILTY SAND	coming sandy (SP) dium grained ght brown			5												
	parse grained			6	SP	5	19/	250 '	3 duncir	ng' R	efusa	1				
				7												
CLAYEY SAN	(CL) grey ND stiff, dark by own-b	lack,organ	G 7	***************************************	AS	6		_	35							organic content 13%
SANDSTONE	HW-XW			9	SF	7		' Bo	uncing	' ref	usal	df S	PŤ			TC Auger
					Δ	5 8										

URFACE ELEVATION	33.1 Vertical	DATUM		1.			В	ORI	EH	IOL	E	No		7	_	FIGURE 2
RILL TYPE	Gemco	DATE		0.79	F	ROJ	ЕСТ	Long	Bay				91	+1-	/	SHEET 1 (
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N DEPTH	SAMPLE TYPE	SAMPLE LOST, SON	BLOWS/300 DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOSTURE (%) CONTENT		PLASTICITY ISS	LINEAR & OLD	% FINES (No. 200)		PARAMETE Su,(kPa) C,(kPa) Ø,(degree	RS
orga	SP) V. Dark gr nic grained	ey-black		F°-												V. Bit au
Dark weak	brown-grey y cemented ('	 Waterloo Rock	- ('.	1	SP	1	11/18	0								
SAND (SP) fine light	grained brown	v.wet	 	2												
				<u>-</u>	SP	2	8	-			·					
CLAYEY SAND (grey loose		rown		3 - - - -	AS	3		-							·	
SANDY CLAY (C	L) CLAYEY SAND	(SC)		£ - - 4	SP	4	8	-	•							
Firm — — Grey	& light brown,	some organic	:s	- - - - -	ĀS	5			-					PP	qu, 150	k a
SANDSTONE HW-	(M				<u>SP</u>	6 7	7/150	'Bou	ncing	Ref	ısal				-	TC Bit
• · · · · · · · · · · · · · · · · · · ·				- 6												
getti	ng harder			6.9	AS	7				•						
GROUNDWATER NO				-												
				- - -				-								
				-												
				- -											·	
																

BORE HOLE No. 8 SURFACE ELEVATION DATUM 32.8 Std. FIGURE 2H INCLINATION **Vertical** AZIMUTH SHEET 1 OF 1 DRILL TYPE Gemco 7.10.79 DATE PROJECT Long Bay DRY (Mg/m²)
DENSITY (Mg/m²)
NATURAL (%)
CONTENT STRENGTH DATA CLASSIFICATION DATA OTHER BLOWS/300 DISTANCE (mm) PARAMETERS FINES No. 200) DEPTH STRATIGRAPHY GRAPHIC Su,(kPa) C,(kPa) Ø,(degrees) 9 CINIT CINIT SILTY SAND (SP) V.dark grey-black, V Bit augered. organic. organic SANDY SILT (OL) black, organic content 6.5% AS 1 12.10.79 SP 2 56 loose organic content 9% - 2 v. wet SILTY SAND(SP) grey, CLAYEY SAND AS 3 Tricon roller - 3 SANDY CLAY (CL) SP 4 7 17 grey 16 29 54 PP qu,100 89% passing v. moist 0.425mm firm CLAYEY SAND (SC) SP 5 29 3 82% passing dense 0.425mm 5 SANDSTONE XW Joints widely spaded grey, occas. darker grey J streaking 4 6 7 2 2 8 J 2 . - 8 9 Joints moderately widely-closely spaced 9 772 END OF BORING @ 9.7m

LOCATION

Refer Site Plan

SURFACE EL	Refer Site Plan EVATION 32.8	DATUM	Std.	-	\dashv		R	ORF	ΞΗ		F	NΔ		٦	. [ELCU	מר מי
INCLINATION		AZIMUTH	-		1		· ت		- , i i			(GAI) 1-9		FIGUE	RE 21
DRILL TYPE	Gemco	DATE	8.10	.79	<u> </u>	ROJ	ECT	Long	Bay							JIICEI	. 01
			ğ	ELEV'N.	TYPE		(mm)	Ag/m}	(%)		SSIFIC/	ATION 88			PARAMETER		THER
	STRATIGRAPHY		GRAPHIC LOG	DEPTH metres	SAMPLE	SAMPLE LOST, DISTLABLED	BLOWS / DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE CONTENT	LIOUID	PLASTICITY INDEX	LINEAR & SHRINKAGE A	% FINES (No. 200)	TYPE OF TEST	Su.(kPa) C.(kPa) Ø.(degrees		
FILL	Silty Sand, dark grey		X	F° -	T	<u> </u>	1 40 6	0.0	220		a. ≟		8~	FF		<u> </u>	t auger -
• •	slightly_organic Grey - light brown	 -	K	E												10 81	Lauger -
SANDYS	ILT (OL)	· · · · · · · · · · · · · · · · · · ·	K														1
-	v. dark grey-black organic			1	SP	1	3									= 1	2.10.79
	moist-wet loose			-	_												
	(brown-black)			- - -	AS	2											1
SAND (SI	Highly organic	······································		<u>-</u> 2	<u> </u>							,					
	medium - coarse grain light brown-grey			<u>-</u> -	SP	3	10	-]
CLAYEY S	SAND (SC) grey	moist-wet	1/2	- -	_			-									1
	medium-fine grain loose	110 13 C-WGC	./.	- - 3													1
			//	- -													
				-													
	moderately dense			-		1	10	j									1
	•		!	- 4 -	SP	4 ∵∴	13		-								4
				•													1
							.	-									• •
	moderately dense			5													4
	. •				_	_											1
	•				SP	5	25								٠		1
	light grey brown medium grain			6										-			1
	3																. 1
													Ì				- 1
				7	-	::									•	-	. 1
							29	solid	cone								1
SANDY CLA	AY (CL), bands of stiff grey	grey clay	7	-					.	1	•		.]
i	grey firm-stiff	·		ţ	AS	6]
				8													
				. [.]
			4														
			/ F	9				}									
			<u>/</u> F														
SANDSTONE	HW-XW																1
		1	_ E	10								_	_				
																Water 10.9.7	0.85m 9

LOCATION Refer Si]		_	· – -			,	. ,	\circ			
	2.8 DATUM	Std.		-		BC)KE	E H	UL	E I	NO.	9	Cont	.	FIGURE 2J
inclination Verti				+-							4	41-	7_		SHEET OF 1
DRILL TYPE Gemco	DATE	8.10	.79				ong Ba								T oruge
		700	ELEV'N.	TYPE	SAMPLE LOST,	BLOWS/ DISTANCE(mm)	DRY DENSITY (Mg/m³)	E (%)		SIFICA	TION I			NGTH DATA	is
STRATI	GRAPHY	GRAPHIC LOG	ד	MPLE	IPLE 15	OWS/	iY NSITY	NATURAL MOISTURE CONTENT	LIMIT	PLASTICITY INDEX	LINEAR SHRINKAGE	% FINES (No. 200)	TYPE OF TEST	Su,(kPa) C,(kPa) Ø,(degrees	
		8	metres	å	3 5	<u> </u>	2 2	₹ ¥8	ַ בֿבֿ	ਕ.₹	34	%_	F#		
•			10												"
			E												1
	11.7 MI		E												
getting ha	rder Hw-MW		- 11												1 -1
<u> </u>			E												
END OF BORING @ 11.	Em.	+	11.5	\vdash											-
END OF BORING & IT.	Sin		Ė												
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SURFACE ELEVATION 34.0 approx.	DATUM	Sto]. ————	-		סע	אלנ	EH	UL		VO.	/ I) , ,,	` '	FIGURE 2K
DRILL TYPE Gemco	AZIMUTH DATE 9	.10	.79	-	ROJE	CT	Long	Bav				GA	/-/		SHEET 1 OF 1
MILE TIPE GUILLO	DAIE 7			_											
STRATIGRAPHY		GRAPHIC LOG	ELEV'N. , DEPTH metres	SAMPLE TYPE	SAMPLE LOST, SON	BLOWS/ DISTANCE (mm)	DRY (Mg/m³)	NATURAL MOISTURE (%) CONTENT	LIMIT	PLASTICITY INDEX	LINEAR & OF	ES 200)		PARAMETE Su,(kPa) C,(kPa) Ø,(degree	RS
FILL Silty Sand and small gr bits of paper, plastic dark brown	avel etc.	K	F° —												V. Bit auger
dark grey (organic)			1	SP	1	10							-		√ 12.10.79
Ash - grey and silty sand			- - -												=
SAND (SP) fine grained light grey-brown mod. dense	wet		- 2 - -	SP	2	14/2	00 'в	uncin	g' re	fusal		•			
CLAYEY SILT (ML) fine sand light grey-yellow SANDY CLAY firm	v. stiff		3	AS	3					-					TC auger
- SANDSTONE HW-XW						-	-								
			- 4 - -												
			5 5 5 - 5.4	ĀS	4							-			
END OF BORING @ 4.5m			-								-				
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SURFACE ELEVA		DATUM AZIMUTH			1	מ	ノベロ	EH	UL		NO.	GAI	- //		FIGURE SHEET	
DRILL TYPE	Vertical Gemco		9.10	. 79	PRO	JECT L	ong B	ay							J.,	<u> </u>
			g		a ⊗	(Fig.	/m ⁾	(%)	CLAS	SIFICA	TION			NGTH DATA		HER
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N , DEPTH * metres	SAMPLE TYPE	BLOWS/ DISTANCE (mm)	DRY (Mg/m³) DENSITY	NATURAL MOISTURE (%) CONTENT	LIQUID LIMIT	PLASTICITY INDEX	LINEAR & SHRINKAGE	% FINES (No. 200)	TYPE OF TEST	Su,(kPa) C,(kPa) Ø,(degree		
FILL	Silty sand, & concr & bricks	ete blocks	X	0												
		au ataa1		<u> </u>	-							ļ				
- Unable to	penetrate concrete	or steel		Ē												
-				2												· -
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														GOLDE	R A880	CIATES

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SURFACE ELEVATION 33.5	DATUM	Std.				BO	RE	H	OL	E	No.	12	2		FIGURE 2M
INCLINATION Vertical	AZIMUTH			_							9	41-	-12		SHEET 1 OF1
DRILL TYPE Gemco	DATE	9.10.	79	PR			ng Ba								
		907	ELEV'N	TYPE	**	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL MOISTURE (%) CONTENT	CLAS	SSIFIC/	MOIT/			PARAMETE	
STRATIGRAPHY		GRAPHIC LOG	DEPTH *	SAMPLE TH	PLE LOS	DWS/	Y WSITY	FURAL STUR STENT	LIQUID	PLASTICITY INDEX	LINEAR &	% FINES (No. 200)	TYPE OF TEST	Su,(kPa) C,(kPa) Ø,(degree	
		8	metres	8	٥	DIS DIS	2 G	8 <u>8</u> 8	23	5,5	38	ુ%	ĔĔ	پې (degree	
- SILTY SAND (SP) grey-dark grey sl. organic	,	1	F°												V Bit Auger
i organic			<u>.</u>												
SAND ('Waterloo Rock') dark brown-rust brown,			Ę.												
dark brown-rust brown,	weakly		Ė 1												
SAND (SP) fine grained	v. wet														12.10.79
yellow-brown			 												=
			Ę.												
F			2			V D	# D-4	uc - 1							
SANDSTONE HW-XW		1.	ţ			v. B	it Ref	usdi							TC Bit auger
<u> </u>		-	Ė												
Ł		1:	Ė,												-
			- 3 -												
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			3.8											-	
- END OF BORING @ 3.8m			4												
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SURFACE ELEVATION	Refer Site Pla 33.8	DATUM		·			B	OR	ΞΗ	OL	E.	No	13	3	,	FIGURE 2N
DRILL TYPE	Vertical Gemco	AZIMUT: DATE	8.1	1.79		ROJ		Long					74	(-1	3	SHEET 1 OF1
	ucineo		T	F						CLA	SSIFIC	ATION	DATA	етра	NGTH DATA	1 07::50
	STRATIGRAPHY			DEPTH metres	SAMPLE TYP	SAMPLE LOST, SO	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m²)	NATURAL MOISTURE (%) CONTENT	CIMIT	PLASTICITY INDEX		% FINES		PARAMETER Su,(kPa) C,(kPa) Ø,(degreen	is
SILTY SAND (SP sligh Fine () grey & darker tly organic grained	grey		0-												V Bit Auger
INDURATED SAND ('Wate	brown-black erloo' Rock') / cemented				NMLC-RC1 S	<u> </u>	18							,	·	<u>\$</u> 12.10.79
SAND (SP)orange med. c	grained	inclusion		2												
SANDY CLAY (CL)				3			-									
				4	-						•			V Bi	t Refusal	
SANDSTONE XW Grey, @ 100	some grey s	streaking		5	- 80 2		Jo ho	ints rizon	modera tal	tely	wide	ly sp	aced			NMLC rock coring
HW END OF BORING @				6	NMC		Jo	ints	close	y sp	aced					Water level
				7						-			TATAL PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY AND ADDRESS OF THE PROPERTY ADDRESS OF			1.35m 8.00am 9.10.79
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SURFACE ELEVATION	N 36.6		Std		1		BC	RE	EH	OL	E	No.	1	4.			GURE 2A
INCLINATION DRILL TYPE Ge	Vertical mco 2108	DATE 6	5.12	. 79	PR	OJE	ст	Long	Bay H	losp i t	al		,A/-	- 14		SHE	ET OF
Since the de			ī		۳۱	X	Ê		(%)			ATION I			NGTH DAT	A.	OTHER
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N , DEPTH metres	SAMPLE TY	SAMPLE LOST,	BLOWS/ DISTANCE (mm)	DRY (Mg/m²) DENSITY	NATURAL MOISTURE (CONTENT	LIGUID	PLASTICITY INDEX	LINEAR &	% FINES (No. 200)	TYPE OF TEST	PARAMETE Su,(kPa) C,(kPa) Ø,(degre	l·	
	ty sand, bricks, and ble	concrete	X	F° —													
SAND (SP)							-										
Gre	y			<u> </u>													
Rus	† brown			[- -	SP		14/30										
Yel	low - brown			2	35	'	14/30	-									
<u> </u>	•			- - -													
	nge brown e-med grained			3				tvi	Bit R	afue=		5.2m					
END OF BORI GROUNDWATER	NG @ 3.2m NOT ENCOUNTERED			-						1 430		1.2					
				4													
LOCATION Refe	er Site Plan				T												
SURFACE ELEVATION		DATUM	Std		_	-	B	OR	EH	10L	-E				_	1	GURE
	ertical emco 210B	DATE	6.12	.79	P	ROJI	ECT	Long	Bay l	Hospi.	tal	<u></u>	A1.	- 15	2	SH	EET OF
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N.	SAMPLE TYPE	SAMPLE LOST, STORED OISTURBED	BLOWS/ DISTANCE (mm)	DRY (Mg/m²)	NATURAL (%)		, LL	LINEAR SOLTS	A FINES		PARAMET Su,(kPc C,(kPc	ERS	OTHER
	lty Sand, loose rk grey-black		X	¥ ° -													
	ose - med.dense ne grained ey																
Ru:	st brown ('Waterloo R	ock†)			SF		9/30	- - 0									
				2	-	-			1 7	'Bi+	Refu	ısal	2.2	m			
END OF BOR GROUNDWATE AUGERING	ING @ 2.2m R NOT ENCOUNTERED DUR	ING		-													
- - - - -				3													
				F											,		

LOCATION	Refer Site Plan				Ī									<u></u>	T	
SURFACE ELEVAT		DATUM	Std	• _	1	ĺ	ВО	RE	. H(DL	E	Vo.	16	5		FIGURE 28
INCLINATION	Vertical	AZIMUTH			1		_ :					9				SHEET OF
DRILL TYPE	Gemco 210B .	DATE	6.12	.79	PRO	JEC1	T L	ong B	ay Hos	plta	1					
	STRATIGRAPHY		GRAPHIC LOG	ELEV'N T DEPTH T meires	SAMPLE TYPE	DISTURBED XX	BLOWS/ DISTANCE (mm)	DENSITY (Mg/m³)	NATURAL MOISTURE (%) CONTENT	CLAS	PLASTICITY SE INDEX	UNEAR SO SHRINKAGE Z	6		NGTH DATA PARAMETER Su,(kPa) C,(kPa) Ø,(degree	IS
f	oose - mod. dense Ine grained range brown	·.		0							·					
				2	SP I		12/30		uncin Bit]' Re Refus	fusal	2.2m				
	RING @ 2.2m ER NOT ENCOUNTERED			<u> </u>												
LOCATION SURFACE ELEVA	Refer Site Plan TION 35.6 Vertical	DATUM AZIMUTH	S†d.				ВС	RE	E H	OL	E	No. GA	1	7	,	FIGURE SHEET OF
DRILL TYPE	Gemco 210B	DATE 6	.12.	79	PRO	DJEC	ст ј	ong	Ваў Но	spi†	al					
	STRATIGRAPHY		GRAPHIC LOG.	ELEV'N DEPTH	SAMPLE TYPE	DISTURBED XX	BLOWS/ DISTANCE (mm)	DRY DENSITY (Mg/m³)	NATURAL (%) MOISTURE (%)		¥.	LINEAR & OIL	% FINES TA		PARAMETE Su,(kPa) C,(kPa) Ø,(degre	RS
	Silty Sand Jark grey black		K	-												V Bit augered
- - - - - - -	Grey Occas. bit of refuse				SP	1	14/30	0								
į () Mod. dense Grey-brown Fine grained	Grey orang	e	2												
		π⊝ist-we	et	3	SP	2	22/3	0								during - industrial durin
				4												
				5				171	Eit R	efus:	al e	5 .8m				v.slow drilling
FND OF F	RORING # 5.8m	· · · · · · · · · · · · · · · · · · ·	+	+ 6	+	-	-	+-]	-	+	-	+	+	GOLDE	R ASSOCIATES

SURFACE ELEVATION 34 5										_	1	
	. DATUM	Std.		BOF	RE H	IOL	E.	No.	1	8	ŀ	FIGURE 2C
INCLINATION VOTTICAL	AZIMUTH		<u> </u>		RE H		-	G	A1-	18		SHEET! OF!
DRILL TYPE Gemco 2108	DATE (5.12.79	PROJE		Long Ba							SHEET OF T
		T _a F	₩ (X	€ 4	(%)	CLA	SSIFIC	ATION	DATA	STR	NGTH DATA	A OTHER
STOATICE ACTIVE		ORAPHIC LOS	TYPE SI	BLOWS/ DISTANCE (mm) DRY (M./)) JH +		È	18	<u>"ĝ</u>		PARAMETE	
STRATIGRAPHY		A PER IN	SAMPLE TY	TANK	DENSITY NATURAL MOISTURE CONTENT	8-	PLASTICITY INDEX	UNEAR &	% FINES (No. 200)	TYPE OF TEST	Su,(kPa) C,(kPa)	
		eg metres	SAM	DR. DR.	P	LIOUID	58	N S R	8-	TES	Ø, (degree	:1
- FILL SIITY Sand		$ \mathcal{M}^{\circ} $				T		ī	<u> </u>			
dark grey						-						TC Bit Augered
Silty Sand, bricks, co	oncrete	K										
blocks, metal & plasti	c waste							ļ				
<u>L</u>		$K \in \{1, 1\}$			1							
ļ.												
- SAND (SP)		 										
loose fine grained									ļ			
yellow grey		2	SP I	10/3-0								
<u> </u>												During
Ļ	sloppy											Drilling 3
<u>.</u>	STOPPY	;: 										
		1: E,			١	<u> </u>						
orange brown	·	3	SP 2		ouncing!	Refu	sal			Ret	usal of	'V' BIT
END OF BOIRNG @ 3.1m									ļ }			
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				•	į.		,		•	' '	l	1
LOCATION Refer Site Plan									·		T	
SURFACE ELEVATION 34.0 approx.	DATUM	Sto]	BOF	RE H	IOL	E	No.	10	7	ľ	FIGURE
INCLINATION Vertical	AZIMUTH		<u></u>					GA				SHEET OF
DRILL TYPE Gemco 2108	DATE	7.12.79	PROJE	CT Lo	ng Bay I	losp i t	aí					
											1	and the second second
		Tol	₩ IIX	ê j		CLA	SSIFIC	ATION	DATA	STRE	ENGTH DATA	A OTHER
STRATIGRAPHY		S ELEV'N.	TYPE SST, SST BEO SST	CE (mm)	AL (%)						PARAMETE	RS
STRATIGRAPHY		APHIC LOG	>	TANCE (mm)	NSITY TURAL ISTURE (%)						PARAMETER Su,(kPa) C,(kPa)	RS
STRATIGRAPHY		CRAPHIC LOG ELEVIN TO DEPTH	SAMPLE TYPE SAMPLE LOST, SAMPLE	BLOWS/ DISTANCE (mm)	DENSITY NATURAL MOISTURE (%) CONTENT		PLASTICITY 15	UNEAR & OI SHRINKAGE & Z	% FINES TAD	1	PARAMETE	RS
STRATIGRAPHY - FILL Sand, some bricks		DEPTH DEPTH	>	BLOWS/ DISTANCE (mm)	NATURAL MOISTURE (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
		BLEV'N. TO DEPTH TO Metres	>	BLOWS/ DISTANCE (mm)	NATURAL (%) MOISTURE (%)						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks		O ELEV'N TOEPTH	>	BLOWS/ DISTANCE (mm)	DENSITY NATURAL NATURAL (%)						PARAMETER Su,(kPa) C,(kPa)	RS
		ELEV'N. TO DEPTH TO Metres	>	BLOWS/ DISTANCE (mm)	DENSITY TO THE STATE STA						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks		BLEV'N TOEPTH TO	>	BLOWS/ DISTANCE (mm)	DENSITY						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks		DEPTH DEPTH	>	BLOWS/ DISTANCE (mm)	DENSITY						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks		BLEV'N. TOEPTH T	>	BLOWS/ DISTANCE (mm)	DENSITY						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks			SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	DENSITY						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks			SAMPLE TY SAMPLE USST, DISTURBED	000 DISTANCE (mm)	DENSITY Y WATURAL (%) MATURAL (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks			SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	DENSITY TO THE NATURAL (%) MOSTURE (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks			SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	NATURAL (%) MOSTURE (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks - loose			SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	DENSITY						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks - loose - sand (SP)	wet		SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	DENSITY TO THE NATURAL (%) MOSTURE (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks - loose	wet		SAMPLE TY SAMPLE USST, DISTURBED	BLOWS/ DISTANCE (n	DENSITY Y						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks - loose - sand (SP) - fine grained	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	BLOWS/ 000 PISTANCE (n	NATURAL (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	During \$\frac{\nabla}{2}\$
- FILL Sand, some bricks - loose - sand (SP) - fine grained	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	BLOWS/ DISTANCE (n	DENSITY TO THE MATURAL (%) MATURAL (%) CONTENT						PARAMETER Su,(kPa) C,(kPa)	RS
- FILL Sand, some bricks - loose - sand (SP) - fine grained	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	BLOWS/ 000 PISTANCE (n	DENSITY						PARAMETER Su,(kPa) C,(kPa)	During \$\frac{\nabla}{2}\$
- FILL Sand, some bricks - loose - sand (SP) - fine grained	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	810WS/ 018TANCE(n	DENSITY OF INSTITY Y OF INSTITY O	OINOTI TIONID	PLASTICITY NDEX	UNEAR 9	% FINES (* NO. 200)		PARAMETER Su,(kPa) C,(kPa)	During \$\frac{\nabla}{2}\$
FILL Sand, some bricks loose SAND (SP) fine grained Grey brown	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	810WS/ 018TANCE(n	DENSITY OF INSTITY Y OF INSTITY O	TIONID	PLASTICITY NDEX	UNEAR 9	% FINES (* NO. 200)		PARAMETER Su,(kPa) C,(kPa)	During \$\frac{\nabla}{2}\$
- FILL Sand, some bricks - loose - sand (SP) - fine grained	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	810WS/ 018TANCE(n	DENSITY OF INSTITY Y OF INSTITY O	OINOTI TIONID	PLASTICITY NDEX	UNEAR 9	% FINES (* NO. 200)		PARAMETER Su,(kPa) C,(kPa)	During \$\frac{\nabla}{2}\$
FILL Sand, some bricks loose SAND (SP) fine grained Grey brown	wet	2	SAMPLE TY - SAMPLE TY SAMPLE OST, OISTURBED	810WS/ 018TANCE(n	DENSITY OF INSTITY Y OF INSTITY O	OINOTI TIONID	PLASTICITY NDEX	UNEAR 9	% FINES (* NO. 200)		PARAMETER Su,(kPa) C,(kPa)	During \frac{\sqrt{2}}{2}

INCLINATION Vertical	AZIMUTH	Std	7	ن 	OIV	ΕH	IOL	- <u>C</u>	No	. Z	20 -20		FIGURE 20
DRILL TYPE Gemco 210B	DATE	7.12.79	PI			Bay Ho:	spita	<u> </u>		N 1-			SHEET OF
STRATIGRAPHY		DEPTH DEPTH	SAMPLE TYPE	SAMPLE LOST, SSS. DISTUMBED XX BLOWS / DISTANCE (mm)	DRY DENSITY (Mg/m²)	NATURAL MOISTURE (%) CONTENT		λLI	LINEAR & OITS	% FINES PATE (No. 200)		PARAMETER Su ₁ (kPa) C,(kPa) Ø,(degrees	
FILL Sand, ash some bricks, timber and other building wa Organic, black - dk.	ste grey												
		2	SP	1 8/30)D								
SAND (SP) fine grey SANDY CLAY (CL)	sloppy	3	CD.	2 5	!Bour	- : 1	Det						During Ţ
grey		1% F	AS		5007	cing'	.		t Re			_	·
END OF BORING @ 3.5m		4											

LOCATION Refer Site Plan BORE HOLE No. 21 SURFACE ELEVATION 33.2 approx. DATUM Std. **FIGURE** INCLINATION Vertical AZIMUTH SHEET I OF I DRILL TYPE Gemco 210B DATE 7.12.79 PROJECT Long Bay Hospital DRY DENSITY (Mg/m²) CLASSIFICATION DATA % STRENGTH DATA ELEV'N. NATURAL MOISTURE (CONTENT % FINES (No. 200) PARAMETERS STRATIGRAPHY TYPE OF TEST Su.(kPa) C.(kPa) Ø.(degrees) FILL Sand, gravel some bricks, ash, and other TC Bit building rubble augered thru. dark grey SP 1 4/300 SAND/CLAYEY SAND (SC) sloppy During fine-med grained Augering V Bit augered SILTY CLAY (CL-CH) v. stiff si.moist SP 2 30/3b0 m sl∠ PL Grey, thin black band SANDY CLAY (CL) v. stiff hard grey SP 3 38/300 5 v.stiff drilling 8 Grey & darker grey si organic tyt Bit Refusal @ 8.4m END OF BORING @ 8.4m 9

Refer Site Plan LOCATION SURFACE ELEVATION DATUM BORE HOLE No. 22 33.8 Std. INCLINATION FIGURE 2F Vertical AZIMUTH DRILL TYPE SHEET ! OF ! Gemcio 210B DATE 5.12.79 PROJECT Long Bay Hospital CLASSIFICATION DATA STRENGTH DATA GRAPHIC LOG ELEV'N. OTHER % FINES (No. 200) STRATIGRAPHY PARAMETERS LIMIT Su,(kPa) C,(kPa) Ø,(degrees) SILTY SAND loose, dark grey, sl. organic CLAYEY SAND SPI 12/300 SAND (SP) Mod dense Fine grained During Drilling wet Grey-brown SP 2 17/300 AS 3 CLAYEY SAND (SC) Fine grained \$P 4 51/300 Grey, some brown SANDY CLAY/CLAYEY SAND Stiffer Drilling END OF BORING @ 10.4m 'V' Bit Refusal @ 10.4m

LOCATION Refer Site Plan BORE HOLE No. 23 SURFACE ELEVATION DATUM Std FIGURE INCLINATION AZIMUTH Vertical SHEET! OF DRILL TYPE Gemco 210B DATE 5.12.79 PROJECT Long Bay Hospital CLASSIFICATION DATA 8 STRENGTH DATA OTHER GRAPHIC LOG ELEV'N PLASTICITY INDEX NATURAL MOISTURE (CONTENT PARAMETERS % FINES (No. 200) STRATIGRAPHY DEPTH LIOUID SILTY SAND (SM) loose fine grained black. sl. organic some rootlets 18/300 f 7.12.79 -During Augering ______ mod. dense SΡ 14/3do grey brown sloppy SILTY CLAY (CL-CH) AS 3 stlff grey, brown sl.red mottled q.molst m > PL SP 11/300 4 (CL) grey sl.moist m ~ PL SP 5 25/300 AS 6 CLAYEY SAND (SC) Fine grained Grey, sl.brown mod. dense END OF BORING € 10.7m 'V' Bit Refusal @ 10.7m GOLDER ASSOCIATES

LOCATION Refer Site Plan BORE HOLE No. 24 SURFACE ELEVATION 33.0 DATUM Std FIGURE 2H INCLINATION Vertical AZIMUTH SHEET! OF I DRILL TYPE Gemco 210B 5.12.79 Long Bay Hospital DATE PROJECT DRY DENSITY (Mg/m²) STRENGTH DATA OTHER ELEV'N. NATURAL MOISTURE (CONTENT , FINES No. 200) STRATIGRAPHY Su,(kPa) C,(kPa) Ø,(degrees) SILTY SAND (SM-SP) Fine grained v. loose Dark brown-black. si. organic 1/300 7.12.79 grey, brown sloppy During SP 2 7/150 Augering SANDY CLAY (CL) m > PL Grey, fine sandy grained SP 3 13/300 AS 4 Stiffer CLAYEY SAND (SC) Drilling mod. dense fine grained dark grey-sl. bluish grey AS 5 SANDSTONE (XW-HW) 'V' Bit Refusa @ 8 9m 'TC' Bit Refusal @ 10.5m END OF BORING @ 10.5m GOLDER ASSOCIATES

						. & ENVIRONMENTAL	BOREHOLE	BH1
PRO.	JECT			COR	RECTION	ONAL CENTRE	DATE: 1/11/01	
,	4 TION		REA 1				SURFACE RL:	
	TRAC	TOR:	SAXO	V	Ţ	DRILLER: P. CLOSE	RIG TYPE: EXPLORER N	IKI
PTH m)	WATER	ВіТ	SAMPLE or TEST	SOIL	GRAPHIC LOG		SOIL DESCRIPTION	
,					XXX	Soli type, colour	, consistency, grainsize, moisture	, remarks
	H.			FILL		FILL - SILTY SAND vand grass roots; uncontrolled (very loo	with clayey silt lumps, some (Organics
	N.G.E	TC			XXXX \/	SANDSTONE;	se); ary.	0.3
-				ROCK		medium to coarse graweak; light grey and y	ained; moderately weathered; ellow-brown.	FND
								END at 0.6
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						·		- -
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	1.							.]
								· =
		1						=
SAMI	PLE Of	? TEST		visuai		WATER DRILL	ING SUPERVISOR: C. KARW	
.Disto .Star	urbed ndard	Penet	ration Tes on Test	aborato t	- 1	DIVILL	ECT COORDINATOR: C. KARW	/AJ

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NSW DEPARTMENT OF PUBLIC WORKS GEOTECHNICAL & ENVIRONMENTAL AND SERVICES

BOREHOLE

BH2

PROJECT: LONG BAY CORRECTIONAL CENTRE

DATE: 1/11/01

HT93(m)	WATER	ВІТ	SAMPLE or TEST	SOIL GROUP	GRAPHIC LOG	Jose Description	
- 0	Encountered			FILL		FILL - SILTY SAND with some gravel-sized sandstone fragments mantled by a thin layer of silty topsoil with grass roots;	
,				FILL		light grey-brown; uncontrolled (very loose); dry. becoming dark grey to black; contains coke fragments and ash.	0
	Groundwater	TC		SM (v)	XX	SILTY SAND;	0
	- 1			ROCK	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	dark brown; loose; moist. SANDSTONE:	0
1	2				<u> </u>	highly weathered; very weak to weak; light grey, yellow, orange and brown.	+ 1
						NOTE: Slow, hard drilling for a TC bit below 1m - rock ground down to a silt powder. No refusal.	<u>. I.</u>
2							
	ADI C. C.						-
Una Dis Sta	IPLE OI listurb turbed ndard	ed Pene:		visual laborata t	- 1	WATER DRILLING SUPERVISOR: C. KARWAJ PROJECT COORDINATOR: C. KARWAJ SHEET 1 OF 1 SHEETS	

2		W DEPAR PUBLIC D SERVIC	CRS			& ENVIRONMENTAL	BOREHOLE	ВНЗ
PRO	JECT	: L(ONG B	AY C	DRRECTI	ONAL CENTRE	DATE: 1/11/01	
			REA				SURFACE RL:	
CON.	TRAC	TOR:	SAX	ON	·	DRILLER: P. CLOSE	RIG TYPE: EXPLORER MI	KI
EPTH (m)	WATER	BIT	SAMPLI OF TEST	. 30			SOIL DESCRIPTION	
0						Soll type, colour	, consistency, grainsize, maisture,	remarks
1	Y	тс		FILL		FILL - SILTY SAND ocontains occasional fracharcoal/slag; coarse (0.5-0.7mm) 1.2m - 1.3	with some graveland grass reagments of wood, plastic, gravel/cobbles in pockets	
				SP/SM (v)		SAND with some silt; fine to medium grained; wet. (possibly fill)	; dark grey-brown; medium de	
				ROCK		SANDSTONE; extremely weathered to light grey with some ye	highly weathered; extremely llow, orange and brown.	2.8i weak;
	1	1			\-\-	NOTE E		END at 3.80
Und Dist Star Con	ilsturt turbec ndard e Pen	l Penet etratio	ration 1 on Test		atory	WATER DRILL ✓ Water Table PROJE	ING SUPERVISOR: C.KARWECT COORDINATOR: C.KARW	No 'A.J

DC:	~	PUBLIC ID SERVI				. & ENVIRONMENTAI	BOREHOLE	BH4
	JECT ATION	: L(ONG BA' NREA 1	Y COR	RECTI	ONAL CENTRE	DATE: 1/11/01	
		TOR:		A.I		DD#	SURFACE RL:	
	1	1				DRILLER: P. CLOSE	RIG TYPE: EXPLORE	R MKI
EPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL			SOIL DESCRIPTION	· · · · · · · · · · · · · · · · · · ·
0				-		Soil type, color	ur, consistency, grainsize, mol	sture, remarks
						FILL - SILTY SAND	with occasional gravel and	
						rare pieces of plast	ic and glass, coarse grave one fragments at 0.4m an	
							Controlled (very Jacob)	
			,	FILL				
		ТС						•
1					XX			
					XXX			
				k				
	~							
L				FILL		FILL - cobbles and b grey-brown; wet.	oulders in sandy matrix;	
						NOTE: TC bit refusal	at 1.8 m depth - interpreted	END at
						on a boulder within fil	II.	, to be
			.					
	-			-				
								•
SAN	APLE 0	R TEST	I .	: visual		WATER DRII	LINO CUSTO	
Dis	listurb turbec	1	1:	loborat	- 1	011110	LING SUPERVISOR: C.K JECT COORDINATOR: C.K	ARWAJ
<u>S</u> †a	indard	Penet	ration Tes	st		CUE	ET 1 OF 1 SHEETS	ARWAJ

: visual

l: laboratory

WATER

Water Table

DRILLING SUPERVISOR: C. KARWAJ

PROJECT COORDINATOR: C. KARWAJ

SHEETS

SHEET 1 OF 1

SCALE

SAMPLE OR TEST

SPT....Standard Penetration Test CPT....Cone Penetration Test

U......Undisturbed

D......Disturbed

NSW DEPARTMENT
OF PUBLIC WORKS
AND SERVICES

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE

BH7

PROJECT: LONG BAY CORRECTIONAL CENTRE

LOCATION: AREA 1 DATE: 1/11/01

SURFACE RL:

DEPTH	WATER		SAMPLE	50"	00	DRILLER: P. CLOSE RIG TYPE: EXPLORER MKI	
(m)	WATER	BIT	TEST	SOIL GROUP	GRAPHIC LOG	OOL DESCRIPTION	
0	 		· · · · · · · · · · · · · · · · · · ·	<u> </u>	XXX	Soli type, colour, consistency, grainsize, moisture, remarks	
				FILL		FILL - SILTY SAND with traces of clay and gravel;	
					XXX	dark grey-brown; very loose; moist.	
	red				XX		c
	ınte				\bowtie	FILL - gravel and cobbles in a silty sand and sand	
	Encountered				XXX	gravel is coke/slag blue metal and condate.	
					\otimes		
	Groundwater	TC		FILL		then black; uncontrolled (very loose to loose); moist to very moist with wet pockets below 0.7m.	
1	Indv					Delow 0.7m.	
.	3rot						
	No.						
	2						
	ļ			ROCK	- /-/		- 1.
-				-	<u> </u>	SANDSTONE; moderately weathered; medium strong; light grey. END a	
					-	NOTE: TC bit refusal at 16m No groundwater	at 1.
						The state of the s	
			1			below 0.7m is in a wet state.	
:							
	-						
				ſ			
							i
			ļ				
							•
				}			
Und	listurb	R TEST		: visual laborata	ry	WATER DRILLING SUPERVISOR: C. KARWAJ	
Dist Sta	hurbed ndard	j Peneti	ration To			✓ Water Table PROJECT COORDINATOR: C. KARWAJ	
Con	e Pen	etratio	n Test	• •		- Woter Inflow SHEET 1 OF 1 SHEETS	

000	AN AN	ID SERV				AL & ENVIRONMENTAL	BOREHOLE	BH8
ר ער 1 ער	JECT ATION	: L	ONG E	BAY C	ORREC	TIONAL CENTRE	DATE: 1/11/01	
	TRA <u>C</u>		AREA	•			SURFACE RL:	
	TRAC	TUK:	SA	XON		DRILLER: P. CLOSE	RIG TYPE: EXPLORER MK	1
EPTH (m)	WATER	BIT	SAMPL	.E so	IL GRAP	ніс	SOIL DESCRIPTION	·
			TEST	GR	DUP LOC	;		
0						X XI	, consistency, grainsize, moisture, r	remarks
ĺ						FILL - SAND with silt	t and gravel; own; uncontrolled (very loose);	
				FIL	ړ ₩	dry,	(very loose);	
Ì					\otimes	\otimes		
						\bigotimes		
l					- 💢	×		
					\bowtie	FILL - gravel and cobb	les in sandy matrix.	<u>C</u>
				FILL	· 💥	grey-brown; medium de	ense; moist with wet pocket at (0.8m.
							e e	
						FILL - SILTY SAND to	CLAYEY SILTY SAND;	,1
						black; unontrolled (loose	e); very moist to 1.5m then we	t.
	~			FILL				
	1	C						
				ļ	\bowtie		·	
1				SP/SM (v)		SAND with some silt;		2.
				 		medium grained; grey-br	own; loose; wet.	2.3
			-	CL/SC (v)		dark chocolate brown; fi	CLAYEY SILTY SAND with som	ne roots;
		SP	3,5/110	,}	· · ·		moist to very moist.	0.0
			N = R			INDURATED SAND (coff	ee rock);	2.6
						dark chocolate brown; de Strong H2S odour.	ense; moist.	
	1.							
			-		7. /			3.10
ŀ				SC/CI (v)		CLAYEY SAND/SANDY	CLAY;	3.10
					=<=/	light grey; stiff; very mois	t.	3.35
				ROCK		SANDSTONE;		0.00
	 	+-			_\-/	highly weathered; extreme light grey and yellow-brow		ND at 3.60
								_
SAME	LE OR	TECT						
.Undi	rte uk sturbe urbed	1651 od		v i visuo i loboro	ol otory	WATER DRILLI	NG SUPERVISOR: C. KARWA.	1
.Stan	dord	Penet	ration T	est		Water Table PROJE	CT COORDINATOR: C. KARWA	J
•COI 16	rene	tratio	o∩ Test			Water Inflow SHEET SCALE 8-Nov-01 10:22	1 OF 1 SHEFTS	

0.40

0.60

0.85

1.10

D......Disturbed SPT....Standard Penetration Test CPT....Cone Penetration Test

SAMPLE OR TEST

U......Undisturbed

🟏 Water Table - Water Inflow

WATER

DRILLING SUPERVISOR: C. KARWAJ PROJECT COORDINATOR: C. KARWAJ SHEET 1 OF 1 SHEETS SCALE 1 :20

v : visua!

l: laboratory

NEW DEPARTMENT OF FUBLIC WORKS AND SERVICES GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE

BH10

PROJECT: LONG BAY CORRECTIONAL CENTRE

LOCATION: AREA 1 DATE: 1/11/01

SURFACE RL:

EPTH (m)	WATER	ВІТ	SAMPLE or TEST	SOIL	GRAPHIC LOG	SOIL DESCRIPTION	
0						Soil type, colour, consistency, grainsize, moisture, remarks	
	Encountered			SP/SM (v)		SAND with some silt, fine gravel and grass roots; mid grey; loose; dry.	
		тс		SM (v)	1/1	SILTY SAND with some gravel and traces of organics;	0
	Groundwater		ı			dark grey-brown; loose to medium dense; very moist. SANDSTONE;	0
	roun			ROCK	三:二	highly weathered very weak.	
1	No G			ţ	<u> </u>	light grey and yellow-brown.	
-	_				7-7-4	END	at 1
						LND	<u>u. 1</u>
				1			
							÷
2			.			•	
							-
							_
							-
							-
SAM	PLE OF	TEST					:
Undi Dist	lsturb urbed	ed	1:1	visual oborato	1	WATER DRILLING SUPERVISOR: C. KARWAJ	
Star	ndora	Penat.	ration Tes n Test	t	Y	PROJECT COORDINATOR: C. KARWAJ SHEET 1 OF 1 SHEETS	

PPA	<u> </u>	ID SERVI				. & ENVIRONMENT	AL BOREHOLE	BH11
	JEC I A TION	: L(ONG BAY	COR	RECTI	ONAL CENTRE	DATE: 1/11/01	· · · · · · · · · · · · · · · · · · ·
			SAXO				SURFACE RL:	
	T	TOK:		N T		DRILLER: P. CLOSE	RIG TYPE: EXPLORER	MKI
OEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL GROUP	GRAPHIC LOG		SOIL DESCRIPTION	
0				ļ		Soli type, co	lour, consistency, grainsize, moistur	e, remarks
				FILL		FILL - SAND with	silt and graval	
				FILL		mid to dark grey;	uncontrolled (loose); dry.	
	N.G.E	тс						
	z				1	SANDSTONE;		0
				ROCK	17.7.7	very weak to wea	o moderately weathered; k; light grey and yellow-brown.	
L							- , www. y one washown,	
1		T				NOTE: TC bit refus	al at 0.07-	END at 0.
•						20010140	ar at 0.67m depth.	
								· •
					-			
		-						
•							. *	
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1	1		-					
								. •
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						•		_
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						. •		-
								· .
SAM	PLE OF	TEST						· · · · · · · · · · · · · · · · · · ·
Undi	sturb urbed	ed	v :	vi s uai aborata	- 1	WATER DR	ILLING SUPERVISOR: C. KARY OJECT COORDINATOR: C. KARY	
			ration Tes		7 🔪	Water Table PR	O IECT 00000000	•

GEOTECHNICAL & ENVIRONMENTAL

BOREHOLE

BH12

LONG BAY CORRECTIONAL CENTRE PROJECT:

LOCATION: AREA 2 DATE: 2/11/01

DEPTH (m)	WATER	ВІТ	SAMPLE or TEST	SOIL GROUP	GRAPHIC LOG	SOIL TYPE: EXPLORER MKI	
-				FILL		Soli type, colour, consistency, grainsize, moisture, remarks FILL - SAND with silt, gravel and grass roots; gravel is sandstone fragments; yellow-brown and grey-brown; uncontrolled (loose); dry.	
1			SPT 3,4,4 N = 6	1 1	*****	SAND with trace of silt; medium grained; golden yellow-brown; loose; moist to very moist with depth.	0.
	Encountered						
1	No Groundwater	C		SP (v)			
		SP	T 3,5,5				
			N = 10				-
SAM	PLE OR	TEST		: visual	1	becoming medium dense to dense. WATER DRILLING SUPERVISOR: C. KARWAJ	

LOC	JECT: ATION TRAC	ı: H	IALFWAY	HOUS	Ε	ONAL CENTRE DATE: 25.01.02 SURFACE RL: DRILLER: P.CLOSE RIG TYPE: EXPLORER MK.1	
DEPTH (m)	WATER	віт	SAMPLE or TEST	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	
5 6				SP (v)		(continued from previous sheet) SAND with a trace of silt; medium grained; grey brown; medium dense; wet.	
7		Vee				- becomes interbedded with silty clay lenses.	7.10-
<u> </u>			D	SP (v)		ORGANIC (PEATY) CLAYEY SAND;	8.30
9			D	SC (v)		black and dark grey; stiff; very moist. END at NOTE: Vee bit refusal at 9.0m on what is inferred to be	9.00-
10						a moderately weathered sandstone.	
U D SPT		urbed bed ord Pe		v : vist i : labor Test		WATER Water Table Water Inflow Water Inflow Water Inflow Water Inflow DRILLING SUPERVISOR: M.ASHOVER PROJECT COORDINATOR: C.KARWAJ SHEET 2 OF 2 SHEETS SCALE 1 :25	

BH2

0.25

1.00

Water Inflow

SCALE

1 :25

CPT....Cone Penetration Test

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NSW DEPARTMENT OF FUBLIC WORKS AND SERVICES BH₂ BOREHOLE PROJECT: LONG BAY CORRECTIONAL CENTRE DATE: 25.01.02 HALFWAY HOUSE LOCATION: SURFACE RL: CONTRACTOR: SAXONS DRILLER: P.CLOSE RIG TYPE: EXPLORER MK.1 SAMPLE DEPTH SOIL DESCRIPTION SOIL GRAPHIC WATER BIT or TEST GROUP LOG Soil type, colour, consistency, grainsize, moisture, remarks 5 --- (continued from previous sheet) ---SILTY SAND with clay; light grey; medium dense; very moist to wet. 5.50 CLAYEY SAND with SILTY CLAY interbeds; black and dark grey banded; Vee medium dense/stiff; very moist. SC/OH D 6 ROCK SANDSTONE; END at 6.60 highly weathered; very weak. NOTE: Vee bit refusal at 6.6m. 10 SAMPLE OR TEST WATER DRILLING SUPERVISOR: M.ASHOVER I: laboratory U......Undisturbed PROJECT COORDINATOR: C.KARWAJ D.....Disturbed Water Table SPT....Standard Penetration Test SHEET 2 OF 2 SHEETS CPT....Cone Penetration Test Water Inflow SCALE 1 :25 g:\is\watertec\geotech\pcad\borelogs\gh22a.dgn - 30-Jan-02 10:43

GEOTECHNICAL & ENVIRONMENTAL

Borehole No.

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING KATINGAL Location: AREA, LONG BAY GAOL. N.S.W. Job No. 5070 JS Method: SPIRAL AUGER R.L. Surface: 37.12 m 20.5.87 Date: HYDRAPOWER RIG Datum: SITE Hand Penetrometer Readings Groundwater Unified Classification Graphic Log Consistency/ Rel. Density FIELD E Samples Moisture Condition DESCRIPTION **TESTS** Remarks record Depth kPa. FILL: Gravelly sand, fine FILL M to medium grained, blown, some silt. Gravel of some sin. Gravel of some fragments. Occasional fragments of brick, concrete and timber to cobble? size APPEARS POOR TO MODERATE COMPACTION 14 10 75m チ TEST ABONDONED OBSTRUCTION IN HOLE 2 3 Nc = 4 NC : YALUE 6 7 PROBABLY AFFECTED BY 0~ OBSTRUCTION 10 CPT IN HOLE CONE (TESTA) A.7m) Nc = 10 M-W 12 100 TEST ABONDONED-5 5M SILTY SAND: fine to IN HOLE (MD) medium grained, gray ALLUVIUM LHOLE COLLARSED
TO 52M WHEN brown AUGERS 0.5. WITHDRAWN FROM 6.2m) NC: - 10mm ATTEMPTED BUT OBSTRUCTION 12 mm IN HOLE AT 5.2m

The same of

-

THE NEW

Borehole No.

2/3

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT PROPOSED NEW BUILDING

Project:

Job i Date		5070 _ 20·5·87	, <u>s</u>	т	T	Method: SPIRAL AL HYDRA POWE		R.L. Su Datum:		37·12 m SITE
Groundwater	Samples	FIELD TESTS	J Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	ب Hand ت Penetrometer Readings	Remarks
			_		SM	SILTY SAND. fine to medium grained, grey brown.	N	(MD)		LOW-MODERA ORILLING RESISTANCE
		-	_		CL/ 5C	SANDY CLAY / CLAYEY SAND: medium plasticity,	MC>PL	(51-VS7)	<u> </u>	5.5 mm
			8-			SAND: medium plasticity, fines, mainly fine grained sond, grey			- -	- 60mm
	Δ.5.		- -						- -	50mm
			-						-	
			9-		-				-	T 100mm
					-				F	85mm
		`	10 —		-				<u> </u>	70
			,,		5M	SILTY SAND: fine to medium grained, brown	N ·	(MD)	-	70mn
						,			-	25mm
			//-						-	20mm
			- - -						-	
			-			•			-	15mm
			12-							10mm
	ŀ								-	30mm
			-		SM SM	INTERBEDDED PEAT and SAND: Peat; fibrous and	M	מוא		MODERATE
			13	/ V V		silty, dark brown, dense. Sand; silty, fine to medium grained, grey			-	ORILLING RESISTANCE

3/3

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT PROPOSED NEW BUILDING Project: Location: AREA, KATINGAL LONG BAY GAOL. N.S.W. Job No. 5070 15 Method: SPIRAL AUGER R.L. Surface: 37.12m 20.5.87 Date: HYORAPOWER RIG Datum: SITE Hand Penetrometer Readings Unified Classification Groundwater Graphic Log Consistency/ Ref. Density FIELD Depth (m.) Moisture Condition DESCRIPTION Samples Remarks **TESTS** record kPa. VVV OL / 5M INTERBEDDED PEAT OND SAND Δ.S. MODERATE os above, peat predominates DRILLING RESISTANCE W W W VERY LOW INTERBEDDED PEATOND MC >PL V.st DRILLING CLAY: Peot; dark brown, RESISTANCE silty. Clay, low _ 5mm plosticity, grey bedding < 100 mm 16 Omm T 20mm 40 mm 18 VVX 10mm 19 30mm A FEN MODERATE BANOS Becomes. mainly clay 60mm D.S. 20 _ Possibly_ SAND AT BASE OF HOLE 20:5m END OF BOREHOLE

BOREHOLE LOG

2.

Clie Proj Loc		PUBLI PROPOS KATINA	SEQ	NEN	BU	EPARTMENT ULDING LONG BAY GAOL. N.	5.W.			
Job Date	No. e:	5070 20·5·87	15		 	Method: SPIRAL AU HYORA POWE		R.L. Su Datum		35.55 m SITE
Groundwater	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	Hand Denetrometer Readings	Remarks
					•	FILL: topsoil LIOOmm) over brown fine to medium grained, sond	M	V.L		FILL
 HOLE COLLAP- SED ON 28.5.81	D.5.	$N_{C} = \frac{1}{2}$ $N_{C} = \frac{4}{5}$ $\frac{5}{6}$ $\frac{6}{5}$ $\frac{5}{5}$	1 2 3 A 5		50	SAND: medium grained, light brown, trace silt as above, grey brown	M-W W	M O		DUNE SANDI ALLUVIUM

I

D.5.

NC=

Borehole No.

3

MODERATE RESISTANCE

LOW RESISTANCE <u>_7</u>/3

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING Location: AREA , KATINGAL LONG BAY GAOL. N.S.W. 5070 15 Job No. Method: 5PIRAL AUGER R.L. Surface: 33.26 m 20.5.87 Date: HYDRA POWER RIG Datum: SITE Hand Penetrometer Readings Groundwater Unified Classification Graphic Log Consistency/ Ref. Density FIELD Depth (m.) Moisture Condition Samples DESCRIPTION Remarks **TESTS** record kPa. 5M SILTY SAND: fine to (V.L) ALLUVIUM medium grained, dork brown, peoty W (4) 28·5·87 D.5. Nc = 4 MO 6 <u>8</u> 2 CL CLAY: medium plasticity, banded light grey and orange brown MCZPL (5+) MODERATE RESISTANCE 0.5. 3 SPI SAND : fine to medium √ = /7 W/MCZA MOIST AND: tine to medium grained, light brown, some silt, interbedded with clay, medium plasticity, light grey and arange brown Some peaty sand around tim LOW 3,7,10 RESISTANCE 4 W. W Clay band, as above MODERATE RESISTANCE 5 mainly sond, as above LON RESISTANCE

clay band, as above

Borehole No.

Client: PUBLIC WORKS DEPARTMENT PROPOSED NEW BUILDING Project: Location: KATINGAL AREA , LONG BAY GAOL. N.S.W. 5070 15 Job No. Method: SPIRAL AUGER R.L. Surface: 33.26m 20.5.87 Date: HYDRAPOWER RIG Datum: SITE Hand Penetrometer Readings Groundwater Unified Classification Graphic Log Consistency/ Ref. Density Depth (m.) FIELD Moisture Condition DESCRIPTION Remarks **TESTS** record kPa. SILTY SAND fine to medium grained, grey 5M (MD) ALLUVIUM RELATIVE DENSIT brown ASSESSED ONLY LOW DRILLING RESISTANCE 10-_Probably _. CL clay band MC >PL (5+) MODERATE RESISTANCE Probably. 50 CLAYEY SAND: fine to M MODERATE medium grained, grey brown RESISTANCE WITH LOW BANDS 13

Borehole No.

Client: PUBLIC WORKS DEPARTMENT Project: NEW BUILDING PROPOSED Location: KATINGAL LONG BAY GAOL. N.S.W. AREA, 5070 15 Job No. Method: SPIRAL AUGER R.L. Surface: 33.26 m 20.5.87 Date: HYDRA POWER RIG Datum: SITE Hand Penetrometer Readings Groundwater Unified Classification Graphic Log Consistency/ Ref. Density (E) FIELD Moisture Condition Samples DESCRIPTION Remarks **TESTS** record Depth kPa. 50/ CLAYEY SANDISAND: (MD) ALLUVIUM with some clay, fine (RELATIVE DENSITIES ASSESSED ONLY) to medium grained, light grey 16 as above, but with a few brown organic bonds os obove, with interbedded PEAT, fibrous brown 17.8m END OF BOREHOLE /8 AUGER REFUSAL 19 20

4

1/2

BOREHOLE

Client: PUBLIC WORKS DEPARTMENT Project: NEW BUILDING PROPOSED Location: KATINGAL AREA , LONG BAY GAOL. N.S.W. 5070 15 Job No. Method: SPIRAL. AUGER R.L. Surface: 33.88m 20.5.87 Date: HYDRA POWER RIG Datum: SITE Hand Penetrometer Readings Unified Classification Groundwater Graphic Log Consistency/ Rel. Density FIELD Depth (m. Moisture Condition Samples DESCRIPTION Remarks **TESTS** record kPa. Topsoil: peaty sand, ALLUVIUM dork brown -5P SAND: fine to medium M 4 ON 5.P.T grained, brown some 511+ RODS 22.5.87 W Nc = 4 0.5. SM SILTY SAND: fine to MO <u>6</u> medium grained, dark brown organic 9 2. CLAY: low plasticity, light grey and orange brown, trace sond CL MC>PL 57. 3 N=8 D.5. 190-280 2,3,5 5M SILTY SAND: fine to medium grained, brown MO D.S. *5* Nc = 13 bomm CLAY: low plasticity, light grey, trace to some fine sand. CL MC=PL 6 ZOmm 10 mm

4

2/2

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING AREA , Location: KATINGAL LONG BAY GAOL. N.S.W. 5070 15 Job No. Method: SPIRAL AUGER R.L. Surface: 33.88m 20.5.87 Date: HYDRAPOWER RIG Datum: SITE Hand Penetrometer Readings Unified Classification Groundwater Consistency/ Rel. Density Graphic Log FIELD Depth (m.) Condition Samples DESCRIPTION Remarks Moisture TESTS record kPa. c _ CLAY: Os obove MC=PL (5+) 0.5. - 5m END OF BOREHOLE 8 9 10 12 13

BOREHOLE LOG

Job I Date		5070 J 21.5.87	5	 	Y	Method: SPIRAL AL HYDRA POWE		R.L. Su Datum		34·20m SITE
record	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	الم Hand ع Penetrometer Readings	Remarks
ľ	D.S. Δ.S.	$Nc = \begin{bmatrix} 5 \\ 6 \\ 7 \end{bmatrix}$ $N = 16$ $8, 9, 7$ $Nc = \begin{bmatrix} 5 \\ 8 \\ 12 \end{bmatrix}$	7 2 3 4 5		SP SP CLISC	TOPSOIL: silty sand, fine to medium grained, dark brown around to medium grained with strong organized with strong organized with strong organized with strong organized work organized to medium grained, yellow brown PEAT: black fibrous with strong organized down organized organized to sand fine to medium plasticity, light grey with interbedded loyers of sond fine to medium grained, yellow brown	M M MC > PL (MC > OL) (W)	5 to F V.St to H (MO)	220 3300 > 600	
			6			as above, clay becoming medium to high plasticity with depth			-	Omm

6.

BOREHOLE LOG

						· · · · · · · · · · · · · · · · · · ·				
Pro	ent: oject: cation:	PROPO	SED	NEN	1 BL	EPARTMENT ULDING LONG BAY GAOL. N.	5.W.			
Joi Da	No.	5070 22·5·8		γ		Method: SPIRAL AU HYDRA POWEI		R.L. Su Datum		35.83m SITE
Groundwater	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	بر ای Hand ای Penetrometer Readings	Remarks
28.5.8 ON RODS AFTER AT A.5m	D. S.	<pre></pre>			5P 	Topsoil: silty sand, fine to medium grained, dork grey SAND: fine to medium grained, white Grading to SILTY SAND: fine to medium grained, dark brown and yellow brown Grading to SAND: fine to medium grained, yellow CLAYEY SAND/SANDY CLAY: fine to medium grained medium plasticity, light, grey	M .	L. V.St to H/MO	90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 40mm - 20mm - 10mm
			-6-1			END OF BOREHOLE				
			-						- - -	

7.

1/2

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING Location: KATINGAL LONG BAY GAOL. N.S.W. AREA , Job No. 5070 15 Method: SPIRAL AUGER 35.68m R.L. Surface: Date: 21.5.87 HYORAPOWER RIG Datum: SITE Hand Penetrometer Readings Unified Classification Groundwater Graphic Log Consistency/ Rel. Density (E) FIELD Samples DESCRIPTION Condition Remarks **TESTS** Moisture Depth (record kPa. FILL: silty sond, fine to medium grained with gravel POORLY COMPACTED dork grey brown T SAND: fine to medium 5P 7 grained, white SILTY SAND . Fine to medium N=6 SM D.5. growed with weakly cemented from indurated zones, dork brown Groding to SAND: fine to medium 3,3,3 50 grained, yellow brown 2 N=8 D.5. BOREHOLE COLLAPSED 2,4,4 01 COMPL 3 w ON RODS AFTER 5.P.T N=3as above, becoming VL D.5. AT 3.8m 4. 1,2,1 5 Grading to N= /7 CLAYEY SAND : fine to 50 MO D.5. medium grained, light grey with interbedded layers of sond, fine 6,7,10 to medium grained, yellow brown and CLAY medium to high plasticity, yellow brown 60mm 4 90mm

7 2/2

BOREHOLE LOG

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING Location: KATINGAL AREA , LONG BAY GAOL. N.S.W. Job No. 5070 .15 Method: SPIRAL AUGER R.L. Surface: 35.68m 21.5.87 Date: SITE HYDRAPOWER RIG Datum: Hand Penetrometer Readings Unified Classification Groundwater Consistency/ Rel. Density Graphic Log Depth (m.) FIELD Moisture Condition DESCRIPTION Samples Remarks **TESTS** record kPa. 50mm 50 L-MO CLAYEY SAND: fine to medium grained, no interbedded clay or sond layers evident 70mm 125mm 8 30mm 9.0 END OF BOREHOLE 10-// -12 13

Borehole No.

8

Clien Proje Loca	ect:	PROPOS	ED	NEN	BU	EPARTMENT ILOING LONG BAY GAOL, N.S	5.W.			
Job I Date		5070 _ 22·5·87				Method: <i>SPIRAL AUC</i> HYDRAPOWER		R.L. Su Datum:		34·95m SITE
Groundwater	Samples	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	Hand Denetrometer Readings	Remarks
ON COMPL- ETION	D.5. D.5.	N > 16 3,5, 11/150n HAMMER BOUNCING	1		50	FILL: sity sond, fine to medium gravel SAND: fine to medium grained, light grey CLAYEY SAND: fine to medium grained grey and light grey Grading to SANDSTONE: fine to medium grained, extremely weak, with Iran Indurated sitty sand Zones arange brown SANDSTONE: fine to medium grained, with Iran Indurated, highly weathered, weak yellow brown becoming light grey OS above, but moderately weathered medium strong, light grey	M N N N N N N N N N N N N N N N N N N N			POORLY COMPACTED ESTIMATED'V' BIT REFUSAL LOW 'TC' BIT RESISTANCE WITH OCCASIONAL MODERATE BANDS. MODERATE 'TC' BIT RESISTANCE MODERATE 'TC' BIT RESISTANCE
	Δ.5.		4·5m-			END OF BOREHOLE				
			5							

Client: PUBLIC WORKS DEPARTMENT

Project: PROPOSED NEW BUILDING

Location: KATINGAL AREA, LONG BAY GAOL. N.S.W.

Job No. Date:	5070 _ 28·5·87	' <i>s</i>			Method: SPIRAL AU HYORA POWEI		R.L. Su Datum:		34.53m SITE
Groundwater record Samoles	FIELD TESTS	Depth (m.)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition	Consistency/ Rel. Density	x Hand p Penetrometer Readings	Remarks
				50	FILL: gravelly sond, fine to medium grained, dark brown SAND: fine to medium grained, light grey brown	0-M			POORLY COMPACTE ALL UVIUN
TER hours D.S	N>>22 10,13,9/30m	1.		SM	SILTY SAND: fine to medium grained, dork brown	M	MD-D	-	•
		3	1	5 <i>P</i> <i>5C</i>	SAND: fine to medium grained, brown, some silt, some clayey bands	w		- - - -	
0.5	. N=28 . 6,12,16	4-		50	CLAYEY SAND fine to medium grained, light brown				•
	Nc = 20/75 m HAMMER BOUNCING							- - -	
		6-/						- - - - -	•

Borehole No.

15

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING Location: KATINGAL AREA , LONG BAY GAOL. N.S.W. Job No. 5070 15 Method: SPIRAL AUGER R.L. Surface: 34.53m 28.5.87 Date: HYORAPOWER RIG Datum: SITE Hand Penetrometer Readings Groundwater Unified Classification Consistency/ Rel. Density Graphic Log FIELD Depth (m.) Moisture Condition DESCRIPTION Samples Remarks **TESTS** kPa. 50 CLAYEY SAND: OS OBOVE ESTIMATED 'V' - BIT REFUSAL SANDSTONE: medium groined, light grey brown, highly weathered, very weak MODERATE TO HIGH 'TC' BIT RESISTANCE 8 to weak. LOW 'TC' BIT RESISTANCE 9.0m END OF BOREHOLE 10. 12. 13

BOREHOLE LOG

19

Client: PUBLIC WORKS DEPARTMENT Project: PROPOSED NEW BUILDING AREA , Location: KATINGAL LONG BAY GAOL. N.S.W. 5070 15 Job No. R.L. Surface: Method: 5PIRAL AUGER 36.20m 28.5.87 Date: HYDRA POWER RIG Datum: SITE Hand Penetrometer Readings Unified Classification Groundwater Graphic Log Consistency/ Rel. Density <u>E</u> FIELD Moisture Condition DESCRIPTION Samples Remarks **TESTS** record Depth kPa. FILL: sond, medium grained, some silt with some brick and sand stone frogments (ESTIMATED) 5P SAND: medium grained, light brown SPT ATTEMPTED MODERATE TO HIGH 'TC' BIT SANDSTONE: medium grained, light brown, moderately weathered, weak to medium strong REFUSAL ON SANDSTONE RESISTANCE as abore, but weak 0.5. MODERATE 'TC' BIT 3 RESISTANCE as above, but medium MODERATE 4 strong, light grey TO HIGH D.5. RESISTANCE 4.5m END OF BOREHOLE 5

APPENDIX C

LABORATORY TEST RESULTS



Geotechnical | Resources | Environmental | Technical | Project Management

Unit 8, 12 Mars Road, Lane Cove West,NSW,2066 Ph: (02) 9911 1000 Fax (02) 9911 1001

california bearing ratio test results

client: DEPARTMENT OF COMMERCE job no:

E12723/3

principal:

laboratory:

SYDNEY

project: ENVIRONMENTAL & GEOTECHNICAL INVESTIGATION

report date:

November 23, 2004

location: LONGBAT CORRECTIONAL COMPLEX - MALABAR, NSW test report :

test procedure:

AS1289 6.1.1

labo	rato	ry compaction	method :	AS1289 5.1.1			
sam	ple r	number :		AREA B - CBH8	AREA D - CBH9		
dep	th:		m	0.6-1.6	0.6-1.8		
loca	ition:	:		-	-		
date	san	npled:		-	-		
date	tes	ted:		19/11/04	19/11/04		
mat	erial	description:		(SP) SAND: fine to medium, grey.	(SP) SAND: fine to medium, brown.		
max	dimur	m dry density:	t/m	1.81	1.71		
opti	mum	n moisture con	itent: %	11.0	13.3		
field	d mo	isture content	%	5.6	9.7		
reta	ined	on 19mm AS	sieve: %	0	0		
+1:	9mm	n material inclu	ıded:	Not Applicable	Not Applicable		
	3	dry density	t/m ³	1.80	1.71		
	before soaking	density ratio	%	99.0	100.0		
	fore s	moisture con	itent %	11.8	13.1		
	pe	moisture rati	o %	107.0	98.0		
test	ing	dry density	t/m	1.79	1.70		
R. te	soaking	density ratio	%	99.0	99.0		
C.B.R.	after	moisture con	itent %	14.0	15.2		
	nun	nber of days s	oaked:	4	4		
	sur	charge:	kg	4.5	4.5		
	moi	isture content		13.7	16.0		
	afte	ertest %	remaining sample	13.9	15.1		
	swe	ell after soakin	ng: %	0.5	0.5		
	pen	netration:	mm	2.5/5.0	2.5/5.0	<u>.</u>	
	C.I	B.R. value:	%	20/25	20/20		

remarks:

Samples supplied by the client on the 5/11/04.



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document shall not be reproduced except in full.

NATA Accredited Laboratory No. 431

Authorised Signature:

Garry Collins
Senior Technical Officer

Date: 23 November 2004

Geotechnical | Resources | Environmental | Technical | Project Management

Unit8, 12 Mars Road, Lane Cove West, NSW, 2066 Ph: (02) 9911 1000 Fax (02) 9911 1001

test results

client :

DEPARTMENT OF COMMERCE

job no:

E12723/3

principal:

location: LONGBAY CORRECTIONAL COMPLEX - MALABAR, NSW

laboratory:

SYDNEY

project: ENVIRONMENTAL & GEOTECHNICAL INVESTIGATION

report date: test report:

23 November, 2004

test procedure : AS1289.5.1.1

test date :

9/11/04

test procedure, : AS1289.5.1.1			test date :	9/11/04	
SAMPLE	STANDARD MAXIMUM DRY DENSITY	STANDARD OPTIMUM MOISTURE CONTENT	MATERIAL RE	TAINED 1 SIEVE	
IDENTIFICATION	(t/m3)	(%)	(%)		
AREA A - Bulk Sample (0.2-0.5m)	1.80	12.3	o		:
AREA B - CBH8 (0.6-1.6m)	1.81	11.0	o		
AREA D - CBH9 (0.6-1.8m)	1.71	13.3	o		

remarks : Samples supplied on the 5/11/04.



The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include the requirements of ISO/IEC 17025 and are traceable to national standards of measurement. This document shall not be reproduced except in full.

NATA Accredited Laboratory No. 431

Authorised Signature: Garry Collins Senior Technical Officer Date: 23 November, 2004

ACN 056 335 516
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Geosciences
Coffey

													Job No	E12723/04	
Point Load Strength Index Test Results	ndex Test	Results											Sheet	3 of 3	/
Client NSW DEPT. C	NSW DEPT. OF COMMERCE	u u											Office	SYDNEY	
Principal NSW DEPT. C	NSW DEPT. OF CORRECTIONAL SERVICES	ONAL SEF	WICES									:	Date	30/6/2005	
Project LONG BAY C	LONG BAY CORRECTIONAL COMPLEX	L COMPL.	ដ										By	SG	人
Location MALABAR													Checked		
Test Method AS 4133.4.1 -	AS 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes, Determination of Point Load Strength Index	s of Testing Strenath In	Rocks fc	ır Engine	ering Pun	oses,	Sampling Technique	NMLC1 Coffev	riple tube	NMLC triple tube diamond coring Coffey Sydney office indoor core storage area	core stora	de area	Sampling Date Testing Date	Date 10-16/03/2005	2005
	nounted)						Moisture Condition	Natural					Tested By		
Calibration Date 21/4/2004		;			Dia	Diametral Test	Loading Kale	20 V	Spino	Axial	Slock, and	Axial Block and Irregular Lump Tests	imo Tests		Č
Rock Type	Location	nepth (ii)	□ (iiii)	L (mm)	<u>₽</u>	l _{s(50)} (MPa)	Failure Mode	(mm)	(m)	(mm)	L (K)	l _s l _{s(50)} (MPa)	1	Failure Mode	Classification
Sandstone	CBH76	1.95	51	170	1.98	0.77	Parallel to bedding	51	38			-		Through substance	W
Sandstone	CBH76	2.95	21	400	2.63	1.02	Parallel to bedding	21	35		2.84 1.	1.25 1.2		Through substance	I
Sandstone	CBH76	3.95	51	920	1.97	9.76	Parallel to bedding	21	33					Through substance	M
The state of the s															

Coffey Geosciences Pty Ltd ACN 1056 335 516

oint Load														ON GOL	_	E12/23/04	1
	Point Load Strength Index Test Results	dex Test F	Results											Sheet	1 of	60	Λŧ
Client	NSW DEPT. OF COMMERCE	COMMERCE												Office	SYDNEY	NEY	7
Principal	NSW DEPT. OF CORRECTIONAL SERVICES	: CORRECTIC	NAL SER	VICES										Date	9/08	30/6/2005	} `
Project	LONG BAY CORRECTIONAL COMPLEX	RRECTIONAL	COMPLE	 *										By	SG		乀
Location	MALABAR													Checked	pe)
Test Method	AS 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes,	993 Methods	of Testing	Rocks for	Enginee	ring Purp	oses,	Sampling Technique	NMLC t	NMLC triple tube diamond coring Coffey Sydney office indoor core	diamond .	NMLC triple tube diamond coring Coffey Sydney office indoor core storage area	are area	Samp	Sampling Date 10-1 Testing Date 18/3	10-16/03/2005	
Test Machine	GSA (bench-mounted)	unted)	e de la companya de l	Š				Moisture Condition	Natural					Tested By			
Calibration Date	27/4/2004					Gia	Diametral Tests	Loading Kate	< 30 seconds	conas	Axial	Block and	Axial Block and Irregular Lumn Tests	Imn Tests			ě
Roc	Rock Type	Location	Depth (m)	(mm)	(mm)	<u>а</u> §	l _{s(50)}	Failure Mode	W (mm)	(mm)	(mm)	a (S)	l _s l _{s(50)} (MPa)	(8)	Failure Mode		Strengtn Classification
Sandstone		СВН91	0.95	51	90	1.89	0.73	Parallel to bedding	51	39	-	1.73 0	-		Through substance	9	×
Sandstone		CBH91	1.95	51	110	1.3	0.5	Parallel to bedding	51	33	•		0.63 0.63		Through substance	Φ.	¥
Sandstone	_	СВН91	2.95	51	110	1.13	0.44	Parallel to bedding	51	34					Through substance	gs.	≥
Sandstone		CBH91	3.85	51	220	0.54	0.21	Parallel to bedding	51	41					Through substance	95	7
Salidsione				5		t 5				•)	1

Point Load Strength Index Test Results														ON doc	E12723/04	K
NSW DEPT. OF COMMERCE STORES Date STORES	Point Load Strength Ir	idex Test R	esults											-		\ \
LONG BAY CORRECTIONAL SERVICES 100K BAY CORRECTIONAL SERVICES 100K BAY CORRECTIONAL SERVICES 100K BAY CORRECTIONAL COMPLEX 100K BAY CORRECTIONAL CORRECTIO		F COMMERCE													SYDNEY)
Fig. 1906 BAY CORRECTONAL COMPLEX MALL Maps		F CORRECTION	VAL SER	VICES											30/6/2005	ļC
MALABAR		JRRECTIONAL	COMPLE	 											SG	
A5 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes, Sampling Technique MMLC triple tube diamond coning Sampling Technique Colling Value of Micros Constitution of Point Load Shergel Habry Colling Value of Office Value of Shergel Habry Colling Value of Office Value of Shergel Habry Colling Value of Shergel Habry Colling Value of Shergel Habry Colling Value of Shergel Habry SG Shergel Habry Colling Colli														Checked	į	
Common C		1993 Methods of Point I and Sh	of Testing	Rocks fo	ır Engine	ering Pur	ooses,	Sampling Technique Storage History	NMLC	triple tube	diamond c	oring core stora	ide area		10-16/03/200)5
Attain Depth Cosalion Depth D L P Leading Rate < 30 seconds Attain Block, and Irregular Lump Tests (Type Localion Depth Cosalion Cost) (Vm) Cost Cost Cost Cost Cost Cost Cost Cost		ounted)		Š.				Moisture Condition	Natura					:	SG	
Tock Type Location Depth (mm) Location (mm) Location (mm) Location (mm) Axial Block, and Irregular Lump Tests Failure Mode W D L P Axial Block, and Irregular Lump Tests Failure Mode P L P Axial Block, and Irregular Lump Tests Failure Mode P L P Axial Block, and Irregular Lump Tests Failure Mode P L P Axial Block, and Irregular Lump Tests Failure Mode Axial Block, and Irregular Lump Tests Failure Mode P Axial Block, and Irregular Lump Tests Failure Mode Axial Block, and Irregular Lump Tests Axial Block,								Loading Rate	< 30 St	spuose						
Cock Type Location CPA D L P Lush Failure Mode P Lush Failure Mode Failure Mode RW D L P Lush Failure Mode Failure Mode P Lush Failure Mode Failure Mode P Lush P Lush D Lush Failure Mode P Lush A.75 Through substance CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance CBH94 <			Denth			Ωį	metral Te	sts			Axial, E	3lock, and	Irregular Lu	mp Tests		Strenath
CBH94 196 51 60 0.82 0.32 Parallel to bedding 51 30 . 154 0.79 0.75 Through substance CBH94 3.95 51 710 2.95 1.14 Parallel to bedding 51 35 . 2.86 1.15 1.15 Through substance CBH94 4.15 51 1.00 1.46 0.57 Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 29 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 . 1.22 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 . 1.22 0.65 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 . 1.22 0.65 0.65 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Through substance CBH94 (15 51 100 1.46 0.57) Parallel to bedding 51 20 0.61 Thro	Rock Type		E E	<u>الله</u>	L (mm)	or §	I _{s(50)} (MPa)	Failure Mode	Μ ω)	□ (iiii)	L (mm)				Mode	Classification
CBH94 2.95 51 170 2.95 1.14 Parallel to bedding 51 38 - 2.85 1.15 Through substance CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.81 Through substance CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 20 10 10 10 10 10 10 10 10 10 10 10 10 10	Sandstone	СВН94	1.95	51	99	0.82	0.32	Parallel to bedding	51	30					stance	N
CBH94 3.95 51 240 1.33 0.52 Parallel to bedding 51 35 - 2.06 0.91 0.89 Through substance CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.67 Through substance cBH94 4.15 100 1.46 0.57 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Through substance cBH94 4.15 Thr	Sandstone	CBH94	2.95	51	170	2.95	1.14	Parallel to bedding	51	38					stance	Ξ
CBH94 4.15 51 100 1.46 0.57 Parallel to bedding 51 29 - 1.22 0.65 0.61 Through substance	Sandstone	СВН94	3.95	51	240	1.33	0.52	Parallel to bedding	51	35				•	stance	2
	Sandstone	CBH94	4.15	51	100	1.46	0.57	Parallel to bedding	51	53					stance	N

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Client NSW DEPT. OF COMMERCE Principal NSW DEPT. OF CORRECTIONAL SE Project LONG BAY CORRECTIONAL COMPL Location MALABAR Test Method AS 4133.4.1 - 1993 Methods of Testin Determination of Point Load Strength II Test Machine GSA (bench-mounted) Calibration Date 27/4/2004 Rock Type Location Depth Rock Type CBH122 1.95 Sandstone CBH122 2.95 Sandstone CBH122 3.95 CBH122 3.95	NSW DEPT. OF COMMERCE	COMPLEX SERVIC COMPLEX Strength Index (m) (m) (1.95 2.95 3.95 4.30	CES CES cks for E									Sheet 2 of 2	
nod hine no Date Rock Rock no Date no	EPT. OF CORRECTIONAL BAY CORRECTIONAL 3.4.1 - 1993 Methods ination of Point Load S ench-mounted) 104 CBH122 CBH122 CBH122 CBH122 CBH122 CBH122 CBH122	L COMPLEX C COMPLEX Strength Index Strength Index (m) 1.95 2.95 3.95 4.30	CES									Office SYDNFY)
thod strong Book Strong	SAY CORRECTIONAL SAR 3.4.1 - 1993 Methods ination of Point Load S ench-mounted) 104 CBH122 CBH122 CBH122 CBH122 CBH122	of Testing Re Strength Inde> Depth (m) 1.95 2.95 3.95 4.30	ocks for E										 -
nod hine n Date Rock Rock one one	3.4.1 - 1993 Methods ination of Point Load S ench-mounted) 104 CBH122 CBH122 CBH122 CBH122 CBH122 CBH122	of Testing Rc Strength Inde> Depth (m) 1.95 2.95 3.95 4.30	ocks for Ei									By SG)
★	3.4.1 - 1993 Methods ination of Point Load S ench-mounted) 04 CBH122 CBH122 CBH122 CBH122 CBH122	of Testing Rc Strength Inde> Depth (m) 1.95 2.95 3.95 4.30	ocks for Ei									Checked	
ਨੂੰ	ench-mounted) 04 Location CBH122 CBH122 CBH122 CBH122			ngineering F	Jurposes,	Sampling Technique Storage History	NMLC trip Coffey Sy	ole tube di. dney offic	NMLC triple tube diamond coring Coffey Sydney office indoor core	NMLC triple tube diamond coring Coffey Sydney office indoor core storage area	area	Date	9005
ਨੂੰ						Moisture Condition Loading Rate	Natural < 30 seconds	spu				Tested By SG	
Rock Type Sandstone Sandstone Sandstone	Location CBH122 CBH122 CBH122]			Diametral Tests	1			Axial, Blc	Axial, Block, and Irregular Lump Tests	gular Lump) Tests	Strenoth
Sandstone Sandstone Sandstone Sandstone	CBH122 CBH122 CBH122 CBH122		(mm)	L P (kN)	l _{s(50)} (MPa)	Failure Mode	M (mm)		(mm) (kf	P I _s (kN) (MPa)	l _{s(50)} (MPa)	Failure Mode	Classification
Sandstone Sandstone Sandstone	CBH122 CBH122 CBH122				_	Parallel to bedding	51	45			0.3	Through substance	M/7
Sandstone	CBH122		51 7			Parallel to bedding	27	37	'	0.4 0.17	0.17	Through substance	7
Sandstone	CBH122			00.7 00	1.11	rarallel to bedding	20	S 8			0.94	Inrough substance	C / E
		_		240 1.62		Parallel to bedding	51	29			0.85	Through substance	≥

Point Load Strength Index Test Results	Point Load Strength I															3 /
NSW DEPT OF COMMENCE NSW DEPT OF COMMENCE Data 24/2005		ndex Test F	Results											Shee	1 of	ΛĒ
NAW DEPT. OF CORRECTIONAL SERVICES Service A Ser		F COMMERCE				:								Office		好 ,
MALABAR		F CORRECTION	NAL SER	VICES										Date	24/3/2005	ŀ
MALABAR MALABAR Sampling Technique MALC Fit/ple tube diamond coring Sampling Technique SAL (Description of Point Loading Hundred Technique MALC Fit/ple tube diamond coring Technique Techniqu		ORRECTIONA	L COMPLE	 x										B)	CFW	で、
As 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes, Sampling Technique MMLC triple tube diamond confing Determination of Point Load Strength Index Scrossy listory CSM (Abstract mounted) Luading Rate CSM (Abstract mounted) CSM (Abstract mounted) Luading Rate CSM (Abstract mounted) CSM (Abstrac														Chec	pey	
September Sept		1993 Methods of Point Load S	of Testing	Rocks for	or Engine	ering Puŋ	oses,	Sampling Technique Storage History	NMLC t	riple tube Svdnev of	diamond (core stora	ade area	Sam	<u>a</u>	
Control Cont		nounted)	n S					Moisture Condition	Natural				,	Test		
Ack Type Location Depth D L P (mm) (mm) (mm) (mm) (mm) (mm) (mm) (m	-					ij	metral Te	- 1	98 / /	collas	Axial	3lock and	Irregular	ump Test	S.	6
CBH105 12.90 567 22.0 0.13 0.03 0.13 Parallel to bedding 41 56 41 0.1 0.04 Through substance CBH105 13.55 56 110 0.03 0.13 Parallel to bedding 22 56 22 0.08 0.06 0.06 Through substance CBH105 12.60 50 2.00 0.38 0.15 Parallel to bedding 36 50 25 0.19 0.12 0.11 Through substance CBH109 12.60 50 0.00 0.38 0.15 Parallel to bedding 25 50 25 0.48 0.3 Through substance CBH109 12.60 50 0.00 0.38 0.15 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance CBH109 12.60 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Rock Type	Location	Depth (m)	<u>ا</u> ۵	 - -		s(50)		M (am)	0	L (mm)	P (NA)	s s	(50)	-	Strength Classification
CBH105 13.55 50 110 0.33 Quality Deadding 22 50 22 0.08 0.05 Innough substance CBH195 11.50 50 0.09 0.22 0.09 Parallel to bedding 25 50 0.9 0.14 Through substance CBH199 11.50 50 0.0 0.38 Quality Deadding 25 50 0.9 0.4 0.21 Through substance CBH199 14.20 50 0.0 0.34 Quality Deadding 28 50 28 0.32 0.18 Quality Deadding 28 50 0.9 0.32 0.18 Quality Deadding 28 50 0.9 0.32 0.18 Quality Deadding 28 50 0.9 0.32 0.18 Quality Deadding 28 50 0.9 0.32 0.18 Quality Deadding 28 50 0.9 0.32 0.18 Quality Deadding 28 0.32 0.18 Quality Deadding 28 0.32 0.18 Quality Deadding 28 0.32 0.18 Quality Deadding 28 0.32 0.18 Quality Deadding 28 0.32 0.18 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.32 Quality Deadding 29 0.33 Quality	Sandstone	CBH105	12.90	20	220	0.13		Parallel to bedding	41	20	41		-		ough substance	NF.
CBH99 12.06 50 200 0.38 0.15 Parallel to bedding 30 50 50 0.4 0.21 Through substance CBH99 14.20 50 60 0.54 0.22 Parallel to bedding 25 50 28 0.32 0.18 0.17 Through substance CBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 60 0.54 0.22 0.18 0.17 Through substance cBH99 14.20 0.18 0.17 Through substance cBH99 14.20 0.18 0.17 Through substance cBH99 14.20 0.18 0.17 Through substance cBH99 14.20 0.18 0.18 0.18 0.18 0.18 0.18 0.18 0.1	Sandstone	CBH105	13.55	5 5 5	110	0.33		Parallel to bedding	22	20	, 12				ough substance	7/7/
CBH99 13.60 50 60 0.75 0.3 Parallel to bedding 25 50 25 0.48 0.3 Through substance CBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 0.32 0.18 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 0.32 0.18 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.25 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.25 0.18 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.25 0.18 0.32 0.18 0.32 0.18 0.17 Through substance cBH99 14.20 50 60 0.54 0.32 0.18 0.32 0.32 0.32 0.32 0.32 0.32 0.32 0.32	Sandstone	CBH99 CBH99	12.60	25	200 200	0.38		Parallel to bedding	3 8	20 8	2 2 8				ough substance	1/1
CBH99 14.20 50 60 0.54 0.22 Parallel to bedding 28 50 28 0.32 0.18 0.17 Through substance	Sandstone	CBH99	13.60	20	09	0.75		Parallel to bedding	25	20	25				ough substance	7
		СВНЭЭ	14.20	20	09	0.54		Parallel to bedding	78	20	78 18				ough substance	7
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Point Load Strength Index Test Results Client NSW DEPT. OF COMMERCE														,	Job No E1	E12723/04	
	trength Ind	ex Test F	Results											, 03	Sheet 1 of	8	Λ €
	NSW DEPT. OF COMMERCE	COMMERCE													Office SY	SYDNEY) :
Principal N.	NSW DEPT. OF CORRECTIONAL SERVICES	CORRECTIC	NAL SER	VICES										_	Date 30/	30/6/2005	ł
Project L(LONG BAY CORRECTIONAL COMPLEX	RECTIONAL	L COMPLE	<u>ا</u> بد										_	By SG	(2))(
Location M.	MALABAR														Checked		
Test Method AS	AS 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes,	93 Methods	of Testing	Rocks for	- Enginee	ring Purp	oses,	Sampling Technique	NMLC ti	riple tube	NMLC triple tube diamond coring	NMLC triple tube diamond coring	rade are		Sampling Date 10.	10-16/03/2005	10
	GSA (bench-mounted)	roini Loau . inted)	ouengui iik	Y				Moisture Condition	Natural (2000)	o founds			ŝ				
Calibration Date 2/	27/4/2004				A CONTRACTOR OF THE CONTRACTOR	Diar	Diametral Test	Loading Kate) 20 SE	Splids	Axial	Axial. Block. and Irregular Lump Tests	d Irregula	ar Lump	ests		Ctronoth
Rock Type	, ype	Location	Depth (m)	(mm)	(mm)	G (§	l _{s(50)}	Failure Mode	W (mm)	((m)	(mm)	d ₹	ls (MPa)	l _{s(50)}	Failure Mode		Strength
Sandstone		CBH100	5.60	46		0.48	0.22	Parallel to bedding	46	34	(mm)		0.2	0.19	Through substance	nce	7
Sandstone		CBH100	6.50	51	350	1.14	0.44	Parallel to bedding	51	37	1	0.94	0.39	0.39	Through substance	uce	S
Sandstone		CBH100	7.10	21		1.84	0.71	Parallel to bedding	21	40		2.39	0.92	0.93	Through substance	uce	×

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Point Load Strength Index Test Results	ndex Test F	Sesults											Sheet 2 of 3	Λ €
Client NSW DEPT. C	NSW DEPT. OF COMMERCE	1											Office SYDNEY	>J .
Principal NSW DEPT. C	NSW DEPT. OF CORRECTIONAL SERVICES	NAL SEF	WICES										Date 30/6/2005	J C
Project LONG BAY C	LONG BAY CORRECTIONAL COMPLEX	L COMPL.	E										By SG)
Location MALABAR													Checked	
Test Method AS 4133.4.1 -	AS 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes, Defermination of Point Load Strength Index	of Testing	r Rocks fr	or Engine	ering Pur	poses,	Sampling Technique Storage History	NMLC t	riple tube	NMLC triple tube diamond coring Coffey Sydney office indoor core storage area	ring sore storac	e area	Sampling Date 10-16/03/2005 Testing Date 18/3/2005	2005
Test Machine GSA (bench-mounted)	rounted)						Moisture Condition	Natural			,			
Calibration Date 27/4/2004							Loading Rate	< 30 seconds	spuos					
		Denth				Diametral Tests	sts			Axial, Bl	ock, and I	Axial, Block, and Irregular Lump Tests	np Tests	Strength
Rock Type	Location	E E	<u>آ</u> ا	(mm)	면 (첫	l _{s(50)} (MPa)	Failure Mode	Mu)	(mm)	_ L (mm)	P Is KN) (MPa)	l _{s(50)}	Failure Mode	Classification
Sandstone	CBH109	0.90	51	70	0.17		Parallel to bedding	51	36		0.29 0.1		ļ	NF/F
Sandstone	CBH109	1.95	51	170	0.51		Parallel to bedding	51	37	- 0	.38 0.16	0.16	•	7
Sandstone	CBH109	2.90	51	620	1.98	0.77	Parallel to bedding	21	43	-				X
Sandstone	CBH109	3.75	21	170	0.59		Parallel to bedding	51	42				Through substance	W/7
			_									_	_	

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Client Load Strength Index Test Results Client NSW DEPT. OF COMMERCE Principal NSW DEPT. OF CORRECTIONAL SEI Project LOAG BAY CORRECTIONAL COMPL Location MALABAR Test Method AS 4133.4.1 - 1993 Methods of Testing Determination of Point Load Strength In Test Machine GSA (bench-mounted) Calibration Date 27/4/2004 Rock Type Location Depth Rock Type CBH108 2.95 Sandstone CBH108 3.90 Sandstone CBH108 4.95 Sandstone CBH108 5.20	Strength Index Test Results NSW DEPT. OF CORRECTIONAL SERVICES LONG BAY CORRECTIONAL COMPLEX MALABAR AS 4133.4.1 - 1993 Methods of Testing Rocks for Engineering Purposes, Determination of Point Load Strength Index GSA (bench-mounted) Depth Location Depth Lost MPactor Type Location Depth Location CBH108 2.95 51 140 1.52 0.53 CBH108 3.90 51 220 0.71 0.28 CBH108 5.20 51 60 1.27 0.44 CBH108 5.20 51 60 1.27 0.44	ults L SERVICE MAPLEX esting Rocl gath Index											Λ
hine na Date Nock Rock one one	F CORRECTIONA PRECTIONAL Co Or Point Load Strer ounted) CBH108 CBH108 CBH108 CBH108 CBH108 CBH108 CBH108 CBH108 5	L SERVICE NMPLEX esting Rocl										Sheet 3 of 3	E
hine nod Rock Rock one one	F CORRECTIONAL CORRECTIONAL Col 1993 Methods of 7 of Point Load Strer ounted) De CBH108 2. CBH108 3. CBH108 4. CBH108 5. CBH108 5.	L SERVICE MPLEX esting Rock										Office SYDNEY)
Ahine Ahine One One One One One	DRRECTIONAL CO 1993 Methods of 7 1994 Methods of 7 1995 Methods of 7 1996 Methods of 7 1997 Methods of 7 1998 Methods of	MPLEX esting Rock	S									Date 30/6/2005	JC
nod Indee In Date Rock One One One One	1993 Methods of 7 of Point Load Strer ounted) Location CBH108 CBH	esting Rock										By SG)
	1993 Methods of 7 of Point Load Strer ounted) Location CBH108 CBH108 CBH108 CBH108 CBH108 55	esting Rock gth Index										Checked	
ຽ	CBH108 3. CBH108 4. CBH108 5.)	ks for Engir	neering Pu	rposes,	Sampling Technique Storage History	NMLC to Coffey S	iple tube c	NMLC triple tube diamond coring Coffey Sydney office indoor core storage area	ing ore storage	area	Sampling Date 10-16/03/2005 Testing Date 18/3/2005	900
· · · · · · · · · · · · · · · · · · ·						Moisture Condition	Natural 7 30 seconds	, space)			
Rock Type Sandstone Sandstone Sandstone Sandstone				۵	Diametral Tests	Edaulig Nate) Dec 00 /	90100	Axial, Block,	ck, and Irr	and Irregular Lump Tests	o Tests	Ottonoth
Sandstone Sandstone Sandstone		D (mm)	m) (mm)	o Ŝ	l _{s(50)} (MPa)	Failure Mode	W (mm)	(mm)	(mm) A (S)	P Is (MPa)	l _{s(50)} (MPa)	Failure Mode	Classification
Sandstone Sandstone Sandstone				1.52	0.59	Parallel to bedding	51	38			ļ	Through substance	N :
Sandstone Sandstone			250	1.36	0.53	Parallel to bedding	- 2	32				Through substance	× .
Sandstone				7 .	0.20	rarailei to bedding	0	ر د	.; \	0.49		Illiough substance	- 1
				1.27	0.49	Parallel to bedding	51	35				I hrough substance	E

SYDNEY ANALYTICAL LABORATORIES

Office: PO BOX 48 ERMINGTON NSW 2115

Laboratory: 1/4 ABBOTT ROAD

SEVEN HILLS NSW 2147 Telephone: (02) 9838 8903

(02) 9838 8919

A.C.N.

003 614 695

A.B.N.

81 829 182 852

ANALYTICAL REPORT for:

COFFEY GEOSCIENCES PTY LTD

PO BOX 125 NORTH RYDE 2113

ATTN: PHILIP CARVA

JOB NO:

SAL15286

CLIENT ORDER:

E12723/3

DATE RECEIVED:

09/11/04

DATE COMPLETED:

19/11/04

TYPE OF SAMPLES: SOILS

NO OF SAMPLES:

2

NATA Accredited Laboratory

Number: 1884

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Issued on 26/11/04

Lance Smith

(Chief Chemist)

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ANALYTICAL REPORT

JOB NO: SAL15286

CLIENT ORDER: E12723/3

	SAMPLES	рН 1:5	Cl %	SO4 %
1 2	AREA B-CBH8/1.0 AREA D-CBH9/1.0	5.5 7.3	0.002 0.002	0.001 0.002
	od Code aration	0.1 WA1 P5	0.001 WA4 P5	0.001 WA6 P5

RESULTS ON DRY BASIS

SYDNEY ANALYTICAL LABORATORIES

ANALYTICAL REPORT

JOB NO: SAL15286

CLIENT ORDER: E12723/3

METHODS OF PREPARATION AND ANALYSIS

The tests contained in this report have been carried out on the samples as received by the laboratory.

P5 Sample dried, split and crushed to -150um

WA1 pH - 1:5 soil/water extract

Determined by APHA 4500B

WA4 Chloride - 1:5 soil/water extract

Determined by APHA 4110B

WA6 Sulphate - 1:5 soil/water extract

Determined by APHA 4110B

A preliminary report was faxed on 19/11/04

AS4419-NS Natural Soil or Soil Blend Analysis

Test Type

AS4419-NS (no Ige parts)

Order No

24236

Job No:

Reference

Client:

Sample Name Area D 85063a Sample No.

Date Received 12/11/2004 Total No Pages: 1 of 1

Coffey Geosciences Pty Ltd

James Russell

LANE COVE WEST NSW



2066



Sydney Environmental and Soil Laboratory

Specialists in Soil Chemistry and Agronomy

Sydney Environmental and Soil Laboratory Pty Ltd ABN 70 106 810 708 16 Chilvers Road Thornleigh NSW 2120 Australia Address Mail to PO Box 357 Pennant Hills NSW 1715 Telephone:(02) 9980 6554 Facsimile:(02) 9484 2427

Web: www.sesl.com.au

Email: sesl@sesl.com.au

Characteristic	Unit	Results:	Acceptance Range	Comments
Bulk Density	kg/L	1.2	>0.7	acceptable
Organic Matter Content				
By Loss On Ignition	% dry wt		3-15	
By Walkely-Black	% dry wt	2.33	3-15	slightly low
Wettability	mm/min	600.0	>5	acceptable
pH in water 1:5	pH units	7.5	5.5-7.5	acceptable
EC	mS/cm 1:5	0.09	< 1.2	acceptable
Ammonium	mg/L		NR	
Phosphorus	mg/kg	11.2	< 5 very P Sensitive	acceptable
Dispersibility			< 20 moderately P Sensitive	
in water 1:5	Category	3	1-2	dispersive
in CaCl ₂ 1:5	Category	1	1-2	acceptable
Toxicity Index	mm	<5	≥70	very low
N Drawdown Index	-		> 0	
Permeability	cm/hr	8.6	2-100	acceptable
Texture		light sandy clay loam		
Large Particles				
< 10mm	%			-
10-20mm	%		< 8	
> 20mm	%		<2	
Sieve - Top Dressing			_	
Minerals > 2mm	%		0	
Organic 2-5mm	%		< 15	
Organic > 5mm	%		2	

Summary and Recommendations

This soil appears to have some good physical properties and an acceptable chemistry, however the toxicity index shows the seedlings did not grow in this mix. We find this to be a strange result as no chemical properties are greatly outstanding and would result in toxicity to the seeds, therefore we are going to re-test this mix. Currently the mix would fail the requirements of the AS4419, due to other factors. The results do indicate that the soil is slightly dispersive, again we recommend applying gypsum at 200g/m² to improve the soils stability. Organic matter could also be applied to the soil as well composted green waste.

Method: AS4419- 2003

Test results apply to the sample submitted for analysis and do not necessarily imply that the product meets all the requirements of this standard.

Checked by Principal......

Simon Leake Date of Report 23/11/2004

Consultant......

C. Moore

AS4419-NS Natural Soil or Soil Blend Analysis

AS4419-NS (no Ige parts)

Order No

24236

Job No:

Reference

Sample Name Area B 85061a Sample No.

Date Received 12/11/2004 Total No Pages: 1 of 1

Client:

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Characteristic	Unit	Results:	Acceptance Range	Comments
Bulk Density	kg/L	1.3	>0.7	acceptable
Organic Matter Content	t			
By Loss On Ignition	% dry wt		3-15	
By Walkely-Black	% dry wt	2.00	3-15	slightly low
Vettability	mm/min	360.0	>5	acceptable
H in water 1:5	pH units	5.8	5.5-7.5	acceptable
≣C	mS/cm 1:5	0.03	< 1.2	acceptable
Ammonium	mg/L		NR	
[⊃] hosphorus	mg/kg	3	< 5 very P Sensitive	acceptable
Dispersibility			< 20 moderately P Sensitive	
in water 1:5	Category	3	1-2	slightly dispersive
in CaCl ₂ 1:5	Category	1	1-2	acceptable
Toxicity Index	mm	39	≥70	low
N Drawdown Index	-		>0	
Permeability	cm/hr	6.8	2-100	acceptable
Texture		sandy loam		
_arge Particles				
< 10mm	%			
10-20mm	%		<8	
> 20mm	%		<2	
Sieve - Top Dressing				
Minerals > 2mm	%		0	
Organic 2-5mm	%		< 15	
Organic > 5mm	%		2	

Summary and Recommendations

This soil has very good physical properties, however its chemistry is slightly unbalanced. This would cause it to fail the requirements of the AS4419 for Natural soil. The organic matter of the soil is slightly low, this could be improved by the addition of organic matter such as well composted green waste to the soil mix. Alternatively organic matter can be applied as mulch to the surface of the soil. The results also indicate this soil is slightly dispersive, this is related to the low Calcium content. We recommend applying gypsum to the soil at 200g/m², this will add Calcium to the soil aand therefore improve its stability.

Test results apply to the sample submitted for analysis and do not necessarily imply that the product meets all the requirements of this standard.

Checked by Principal.....

Simon Leake Date of Report

23/11/2004

Consultant.....

C. Moore

Soil Chemistry Profile

Test Type:

FS

Order No:

24236

Job No:

Reference

Sample Name: Area B Sample No:

85061

Date Received 12/11/2004 Total No Pages: 1 of 1

CLIENT:

Coffey Geosciences Pty Ltd

James Russell



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	Results (k Conclusions assume that sampling is representative.	This document sh	all not be reproduc	ea except in it
TEST	RESULT	COMMENTS			
pH in water 1:2	5.7	medium acidity			
pH in CaCl ₂ 1:2	4.5	very strong acidity			
EC mS/cm 1:2	0.06	very low	+		
Chlorides mg/kg					

CATION ANALYSIS

TEST	SOL	UBLE		EXCHANGEABL	
Unit	meq%	Comment ::::::::	meq%	% of ECEC	Comment
Sodium			.11	7.30	elevated
Potassium			.06	4.00	low - deficient
Calcium			.77	51.00	low - deficient
Magnesium			.51	33.80	high
Aluminium			.06	4.00	elevated
		ECEC	1.51		
	ma/ka	Ca/Mg	1.50		unbalanced

	ma va	
Phosphate as P	1.1	deficient - inadequate for all but some ntives
Ammonium as N	7.6	low
Nitrate as N	4.6	low
Sulphate as S	8	low
Iron	44.2	slightly low
Zinc	5.8	ad e quate
Copper	.9	low - possibly inadequate
Manganese	3.2	low
Boron		

Recommendations

This sample show very similar chemistry to the previous sample. The chemistry shows the soil to be deficient in major nuitrients, however this can be easiliy fixed with the addition of fertilisers. The soil has a medium to strong acidity. An application of lime at 500g/m² would be suitable to create more neutral conditions. The lime should then be followed by an application of the Patons No. 27 (RED) or equivalent at 50g/m². In this area it may also be suitable to apply a complete trace element mix at 10g/m2 to improve the balance of these in the soil.

kc/langeable Catione, ECEC: Method 15A1 Rayment & Higginson (1992) 2992). Phosphate: Method 9E1 Rayment & Higginson (1992). Ammonium, 1983). Boron: Method 12C2 Rayment & Higginson (1992). i, EC, Soluble Catione, Nitrate: Bradley et al (1983). Exc sloride: Vogel (1961). Aluminium: Method 3500 APHA (19 spper, Manganese + Zinc: Method 83-1 to 83-5 Black 49

Checked by Principal......

Simon Leake Date of Report

19/11/2004

C. Moore

Consultant....:

Soil Chemistry Profile

Test Type:

Order No:

24236

Job No:

Reference

Sample Name: Area D Sample No:

85063

Date Received 12/11/2004 Total No Pages: 1 of 1

CLIENT:

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ity eystem certified as complying with ISO 9002.

	Results	k Conclusions assume that sampling is representative.	This document shall not be reproduced except in full
TEST	RESULT	COMMENTS	
pH in water 1:2	7.8	slight alkalinity	
pH in CaCl ₂ 1:2	7.0	neutral	
EC mS/cm 1:2	0.17	very low - not saline	
Chlorides mg/kg			

CATION ANALYSIS

TEST	SOLUBLE		EXCHANGEABLE		
Unit	meq%	Convient	meq%	% of ECEC	Qomment
Sodium			.11	1.80	low - good
Potassium]	.09	1.40	low - deficient
Calcium			5.63	89.60	high
Magnesium			.45	7.20	very low
Aluminium					
		ECEC	6.28		
	mg/kg	Ca/Mg	12.50		unbalanced

	• •		
Phosphate as P	18.4	adequate for pasture	
Ammonium as N	6.4	low	
Nitrate as N	7.8	low	
Sulphate as S	11	low	
iron	52.9 slightly low		
Zinc	20.3	adequate	
Copper	8.5	adequate	
Manganese	5.9	adequate	
Boron			

Recommendations

This chemistry of this soil is slightly unbalanced. The pH is slightly alkaline and could be slightly acidified with an application of Iron Sulphur at 100g/m². This will also improve the Iron levels in the soil. The general nutrient levels are low and should be increased with the addition of fertiliser. We recommend applying Patons Nitroca or equivalent at 30-40g/m² as this should create optimal growth conditions in this soil.

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993). Exchangeable Cattone, ECEC: Method 15A1 Rayment & Higginson (1992) 4PHA (1992). Phosphate: Method 9E1 Rayment & Higginson (1992). Ammonium, Sulph Black (1983). Boron: Method 12C2 Rayment & Higginson (1992). PH, EC, Soluble Catione, Nitrate: Bracley et al (19 Chloride: Vogel (1961). Aluminium: Method 3500 Copper, Manganese + Zinc: Method 83-1 to 83-5/5

Checked by Principal.

Eport Simon Leake Date of F

Consultant..... C. Moore