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GEOTECHNICAL INVESTIGATION
EVELEIGH STREET, REDFERN
PEMULWUY PROJECT

FOR

DEICORP PTY LIMITED

PROJECT NO. 17772/8146B
REPORT NO. 10/0811

AUGUST 2010

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1. INTRODUCTION

This report presents the results of a geotechnical investigation for the proposed residential/commercial/retail development at Eveleigh Street, Redfern, known as the Pemulwuy Project. We understand the development is to comprise three separate structures which include two six storey buildings and a series of two storey townhouses. There will be underground parking, below one building at Site B. The latter will involve excavating to a maximum depth of about 9 metres below the existing groundsurface. The other structures are to be built essentially at the existing ground level.

The purpose of the investigation was to:

- determine the subsurface conditions at the site,
- provide comments on the foundation conditions,
- recommend foundation design parameters,
- comment on the temporary and permanent support of the proposed excavation,
- comment on the rock excavation,
- comment on the effect of the proposed excavation on the existing rail line immediately to the east of Site C,
- provide information on temporary batters,
- provide pavement design parameters and
- comment on construction aspects of the proposed works.

The work was undertaken at the request of Mr. G. Colbran of DeiCorp Pty Limited. SMEC Testing Services has also prepared separate reports for this site including an Acid Sulphate Assessment and Material Characterisation Assessment.

2. SITE CONDITIONS

The site is located between Lawson Street to the south, Vine Street to the north, Louis Street to the West and the Railway Corridor to the east. It is irregularly shaped with over all plan dimensions of some 200m x 400m. There is a fall of approximately 9m down towards the north.

The three proposed structures will be located as detailed below:

Site A - Located at the eastern end of the block, formed by Lawson, Eveleigh, Caroline and Abercrombie Streets. The existing development comprises two storey terraces to the south of Caroline Lane. The northern part of the site has been recently cleared of the previous development, it is grassed.

Site B - Bounded by Louis, Vine, Eveleigh and Caroline Streets. The majority of the area has been cleared and is grassed. There are a number of existing two storey terraces along Louis Street and a two storey block of units in the south western corner.

Site C - A triangular shaped block bounded by the Railway Corridor and Eveleigh Street. Again most of the area has been cleared and is grassed. There is an existing two storey building at the northern end. A relative high retaining wall supports the eastern side of Site C above the railway lines to the east.

3. GEOLOGY

The Sydney geological series sheet, at a scale of 1:100,000 show the site is underlain by Triassic Age Ashfield Shale of the Wianamatta Group near to the contact with Quaternary Age alluvial deposits. These are underlain by Triassic Age Hawkesbury Sandstone. Rocks within the Ashfield Shale formation typically comprise dark grey and black shale and laminite. The alluvial deposits comprise marine sands that were deposited as transgressive dunes. Hawkesbury Sandstone comprises medium to coarse grained quartz sandstone.

No rock outcrops were observed on the site.

4. FIELDWORK

Twenty boreholes numbered BH1 to BH20 were drilled to depths of between 3.9 and 20.0 metres at the locations shown on Drawing No. 10/0811. They were drilled between July 12 and 19, 2010. BH1, BH2, BH3, BH6, BH7, BH8 and BH9 were advanced using a Hydropower drilling rig owned and operated by Terratest Pty Limited. These locations were nominated by the client. The fieldwork was directed by one of our experienced senior technical officer who chose the borehole locations and logged the subsurface conditions encountered. In order to determine soil strengths Standard Penetration Tests (SPTs) were periodically carried out in each of the boreholes. When the rock was of sufficient strength, it was cored with a diamond encrusted cutting shoe. BH4, BH5 and BH10 to BH20 were drilled using the SMEC Testing Services (STS) Christie drilling rig. Dynamic Cone Penetrometer (DCP) testing was carried out adjacent to these holes. This testing provided a measure of the strength of the soils encountered. These were drilled by our senior technical officer.

Approximate inferred ground surface elevations for the borehole are given in Table 1.

Standpipe piezometers were installed in boreholes, BH1 to BH4, BH6 to BH9 and BH12. Piezometers are used to measure the groundwater level.

The subsurface conditions encountered are recorded on the borehole logs given in Appendix A. Photographs of the rock core retrieved are given in Appendix A together with a description of the terms used on the logs. Point Load Indices strength testing was carried out on selected samples of the rock cores. The results are given in Appendix B. Also CBR test results for the near surface materials are included in Appendix B.

Table 1 – Approximate Ground Surface Elevations at Borehole Location

BOREHOLE	APPROXIMATE RL
1	28.5
2	27.1
3	24.0
4	28.0
5	26.5
6	26.8
7	23.8
8	20.7
9	25.3
10	24.2
11	25.8
12	26.4
13	20.0
14	21.5
15	23.4
16	25.0
17	27.5
18	26.0
19	26.0
20	24.6

5. SUBSURFACE CONDITIONS

We have assumed the subsurface conditions encountered in the boreholes are representative of the site.

In making an assessment of the subsurface conditions across a site from a limited number of boreholes there is the possibility that variations may occur between test locations. The data derived from the site investigation programme are extrapolated across the site to from a geological model and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. No matter how comprehensive the investigation may be, it is not always possible to detect all subsurface anomalies and variations that may be present.

The subsurface conditions on the site consist of minor filling, sands and silty clays overlying weathered shale and sandstone. Details are given below:

TOPSOIL AND FILL: Topsoil and/or fill are present to depths of 0.3 to 1.4 metres.

SAND: Observed in most holes to depths varying from 1.2 to 3.0 m. The strength varied from very loose to medium dense.

SILTY CLAYS: These are present to depths of 2.5 to 4.9 metres. The strength of these materials range between soft and hard.

SHALE/LAMINITE: Weathered shale and laminite was observed in all boreholes. Other than BH3 and BH8 it was observed to the depths of drilling. Fresh rock was found in the cored boreholes between depths of 7.9 m and 14.0 m The shale is of extremely low strength when first encountered and becomes high strength with depth.

SANDSTONE: Fresh sandstone was encountered in BH3 and BH8 below a depth 11.7 and 17.3 metres. The rock is high strength and generally massive.

When water is used in the drilling process it can mask the real water level present. The groundwater depths were measured in the piezometers on various occasions. The depths recorded are given in Table 2

Table 2 – Ground Water Level Measurements

Borehole	Date	Depth to Water level below Ground Surface
1	19/07/10 20/07/10 22/07/10	10.4 10.6 10.5
2	15/07/10 19/07/10 20/07/10 22/07/10	8.4 8.7 8.9 8.8
3	19/07/10 20/07/10 22/07/10	5.3 5.3 5.4
4	19/07/10 20/04/10 22/07/10	Dry Dry Dry
6	20/07/10 22/07/10	6.9 7.0
7	19/07/10 20/07/10 22/07/10	7.3 7.1 6.3
8	19/07/10 20/07/10 22/07/10	3.6 3.6 3.6
9	22/07/10	5.7
12	19/07/10 20/07/10 22/07/10	4.6 4.6 4.0

The results suggest that ground water is likely to be encountered during the proposed excavations.

No groundwater was encountered during the angering of the boreholes drilled using the STS rig.

6. EXCAVATION CONDITIONS AND SUPPORT

Essentially the following comments relate to Site B where the vast majority of the proposed excavation will be undertaken.

The construction of the basement will involve excavating near to the property boundaries. It is of course important that the excavation is adequately supported at all times and that it does not endanger the adjacent properties of infrastructure.

Conventional earth moving equipment, such as excavators, should be capable of removing the soils and some of the jointed rock to a depth of some 4 to 9 metres. Below these depths, rock excavation will more than likely require some form of assistance. Care should be taken when using this equipment not to damage adjacent buildings. Based on the subsurface conditions observed in the boreholes and general experience in this geological environment, it is expected that excavation on this site may encounter some medium and high strength shale at depth. It is important that the excavation contractor has equipment capable of removing this rock.

Excavators alone without assistance from a breaker will probably not be able to remove any significant amount of the rock below the jointed rock. Hydraulic breakers mounted on an excavator or jack hammers will be required to break up the majority of the rock before it can be removed using an excavator. Other forms of excavation that may be required include ripping, sawing and grinding.

Particular care will be required to ensure that buildings or other developments on adjacent properties are not damaged when excavating the rock. At their closest point some buildings will be close to the excavation. Some of the larger structures on the adjacent properties may be founded directly on the shale. Buildings founded directly on rock can often be susceptible to damage from vibrations transmitted directly through competent rock.

It is extremely difficult to definitively predict the affect of the above type of excavation on adjacent buildings. There are various relations available that have been used to carry out such predictions, but these do not easily take account of the natural variability of rock.

There have been many cases in Sydney where predictions based on experience of the above relationships have been proved inaccurate and adjacent structures have been damaged. For these reasons the following comments should only be taken as a guide. Particular care must be exercised when removing the rock and onsite guidance by a vibration specialist will likely be necessary during the early part of the excavation.

When excavating rock close to buildings in adjoining properties a specialist should be employed to monitor onsite vibrations and advise the permissible size of excavation equipment that can be used. If a specialist is not engaged, rock should not be excavated closer than 20 metres to adjoining buildings or railway infrastructure.

Saw cutting should be carried out before any rock breaking is commenced. It would be appropriate before commencing excavation to undertake a dilapidation survey of any adjacent structures that may potentially be damaged. This will provide a reasonable basis for assessing any future claims.

Because of the proximity of the proposed excavation to some of the property boundaries, temporary support will be required for the soils and rock. Reinforced concrete piles with shotcrete infill are probably the most cost-effective option for providing this support. The piles may be drilled and fixed into the material below the base of the excavation. This will provide one fixing point. Where the pile toe is fixed in the rock a passive pressure of 600 kPa may be adopted for the design with a minimum embedment of 1 metre in medium strength or stronger rock. Additional support may be provided using rows of anchors.

These anchors should be installed in the underlying shale/laminite or sandstone which has a minimum strength of *very low*. The anchors can be proportioned using the following allowable bond strength.

Very Low Strength	- 150 kPa
Low Strength	- 300 kPa
Medium Strength	- 500 kPa
High Strength	- 1000 kPa

The anchor band length must be kept outside a line drawn at 45 degree up from the toe of the shoring piles. A minimum bond length of 3 metres is recommended.

It is vital that an experienced engineering geologist or geotechnical engineer observes that excavation as it progresses. At that time he will be able to recommend any additional support that is required for either temporary or permanent conditions.

When considering the design of the supports, it will be necessary to allow for the groundsurface slope, loading from adjacent structures and water pressure. Where the structures are within the zone of influence of the excavation, it will be necessary to adopt K_o conditions when designing the temporary support. Anchors or props can be used to provide the required support. If anchors extend into adjoining properties, it will be necessary to obtain the permission of the property owners. When props or anchors are used for support, a rectangular earth pressure distribution should be adopted on the active side of the support. The permanent basement support should be designed assuming K_o conditions.

The following parameters are suggested for the design of the temporary and permanent retaining wall system:

Soil & Extremely low or Very Low Strength Weathered Shale

Active Earth Pressure Coefficient (K_a)	=	0.4
At Rest Pressure Coefficient (K_o)	=	0.5
Total (Bulk) Density	=	20 kN/m^3

Shale (Low Strength or Greater)

Earth Pressure Coefficient	=	0.1 or horizontal pressure of 10 kPa (whichever is smaller)
Total (Bulk) Density	=	23 kN/m^3

7. FOUNDATIONS

Care will be required to ensure that all parts of a foundation of a particular structure bear on materials of similar stiffness. This will help reduce the potential for differential settlement.

Foundation should not bear in the existing fill, it appears to be an uncontrolled material. They also should not bear in the very loose natural sands, or in the soft natural insitu clay.

At Site A the proposed structure can either be supported on high level footings bearing in the underlying clays that have a minimum firm strength, or in the natural sands that are at least loose to medium strength. If higher load capacity is required piers bearing in the underlying shales can be used. Design parameters for these various materials are presented below.

At Site B the depth of excavation varies from some 2 metres at the northern end to over 9 metres at the southern end. The results of the investigation suggest that at the north end there will be either natural sands or soft/firm natural clay exposed. Moving south there will be stronger clays and extremely low strength weathered shale exposed. At the southern end of the basement stronger shales will be encountered. For the reasons noted above it may be appropriate to consider structurally breaking the building at a number of locations to help minimise the potential difficult settlements, unless all parts of the building bear on rock of the same stiffness.

At Site C it will be necessary to use piers bearing below the adjacent railway retaining wall on the eastern side of the site. This will then necessitate the use of similar piers elsewhere on the same site. It is unlikely that high level footings will be practical for Site C.

The following details recommended allowable bearing pressures for the potential founding materials at this site.

FOOTINGS

Founding Material	*Allowable Bearing Pressure*	*Comments*
Firm to stiff clay	100 kPa	New controlled fill compacted in thin layers to a least 95% Standard compaction, within 2 % of the optimum moisture content
Stiff clay	150 kPa	
Very stiff or hard clay	200 kPa	
Extremely low strength shale	700 kPa	Class V Rock
Low strength shale	1 MPa	Class IV Rock
Medium strength shale	1.5 MPa	Class III Rock
High strength shale or Sandstone	3.5 MPa	Class II Rock

PIERS

Founding Material	*Allowable Bearing Pressure*	*Comments*
Very stiff or hard clay	450 kPa	Minimum length to diameter ratio of 4, Allowable shaft adhesion 20 kPa
Extremely low strength shale	700 kPa	Class V Rock, Allowable shaft adhesion 70 kPa
Low strength shale	1 MPa	Class IV Rock, Allowable shaft adhesion 100 kPa
Medium strength shale	1.5 MPa	Class III Rock, Allowable shaft adhesion 150 kPa
High strength shale or sandstone	3.5 MPa	Class II Rock, Allowable shaft adhesion 350 kPa

The differential settlement between a slab bearing on say 2 metres of firm clay and footing/piers bearing in Class II or III rock has been calculated. Assuming a heavy slab loading of 20 kPa the calculated differential settlement would be in the order of 10 to 15 mm. For a 0.6 m wide footing bearing in the same soil with an applied loading of 100 kPa the differential settlement would be in the order of 15 to 20 mm.

The above recommended bearing pressures are appropriate for the preliminary design of the Lawson Street bridge extension. Once the details of the bridge extension are finalised additional boreholes will be required at each abutment, as well as possible at some of the intermediate pier locations.

The allowable bearing pressures given above for the rock have been determined using the procedures given by Pells et al, in their paper titled "Design Loadings for Foundations on Shale and Sandstone in the Sydney Region," published in the Australian Geomechanics Journal, 1998.

In order to ensure the bearing values given can be achieved, care should be taken to ensure the bases of all excavations are free of all loose material prior to concreting. It is recommended that all footing excavations be protected with a layer of blinding concrete as soon as possible, preferably immediately after excavating, cleaning, inspection and approval. The presence of groundwater needs to be considered when pouring concrete. Piers excavations should be concreted immediately after cleaning and inspection. They must not be left open over night.

8. GROUND WATER

The monitoring of the piezometers suggest that ground water may be encountered during excavation. There will be some unknown long term flows, though they are not expected to be excessive. It will be necessary to install one or more permanent sumps and pumps in the basement to control these flows.

Given that the measured groundwater levels are within the weathered rock horizon it is considered unlikely that any temporary lowering of the ground water level due to the proposed excavation will have any significant affect on adjacent development.

For design purposes in regards to any need to seal (tank) the lower northern end of the excavation below Site B, a ground water level fluctuation of 1 metre above the measured depths can be assumed.

9. BATTER SLOPES

In the short term dry cut slopes should remain stable at a 45 degree angle. In the long term dry cut or controlled fill slopes formed at 2(H) to 1(V) should remain stable. Slopes at this angle will be subject to erosion unless protected by topsoil, vegetation and diversion drains at the crest. An angle of 4(H) to 1(V) or flatter is typically required in order to use mowers to maintain the slope.

10. PAVEMENT DESIGN PARAMETERS

Samples of the near surface sands were tested in the laboratory. The results are given in Appendix B. The tested CBR values are table below:

BH	Depth (m)	CBR
2	0.1 to 0.6	35
7	0.2 to 1.0	15
10	0.3 to 0.8	25
12	0.2 to 0.8	15

A design CBR of 10 is recommended for the sand subgrade. If clay is exposed in the final subgrade further testing will be required as the design CBR could be significantly lower than 10. A pavement design will be prepared at a later date once the traffic loading and pavement layout is finalised.

It is important during construction of the pavement that adequate provisions are made for both surface and subsurface water.

The subgrade materials should be compacted to a minimum density ratio of 100% of the Standard maximum dry density. Compaction should be verified by proof rolling and insitu density tests. Base and subbase course materials should be compacted and tested to a minimum density ratio of 98% of the Modified maximum dry density. The level of compaction should be verified by insitu density testing.

The pavement should comply with the City of Sydney requirements.

11. CONSTRUCTION ACTIVITIES

Material excavated from this site is suitable for use as temporary support of construction equipment provided it is placed in thin layers and well compacted. No deleterious material should be used as fill.

If fill is to be used for the permanent support of structures it must be placed in a controlled manner. All vegetation, existing uncontrolled fill and any soft natural soils should be removed. The exposed subgrade should be inspected by a geotechnical engineer and proof rolled if required by the engineer. Any soft areas detected should be excavated and filled as below.

Controlled fill should be placed in thin layers, not exceeding 200 mm loose thickness and compacted to a density ratio in the range of 95% to 102% of the Standard maximum dry density, at a moisture content within 2% of the optimum for the material. All filling should be undertaken using Level 1 testing and inspection as outlined in AS3798, "Guidelines on Earthworks for Commercial and Residential Developments".

The clayey soils exposed on site, either natural soil or fill, are reactive. They are susceptible to shrinkage and swelling due to changes in moisture conditions. If any structure or pavement is to be placed above these soils they should be covered as soon as practical to minimise the potential shrinkage and cracking, or swelling

12. EARTHQUAKE DESIGN SITE FACTORS

Based on the subsurface conditions observed we have determined the site factor(s) as specified in (AS 1170.4-1993) and the site sub-soil class as specified in (AS1170.4-2007).

The s value is 1.0 and the subsoil class is D_e – shallow soil site.

13. POTENTIAL AFFECT OF CONSTRUCTION ADJACENT TO RAILWAY CORRIDOR

There are two obvious potential affects of the proposed works on the adjacent railway line. These are discussed below:

Damage Due to Excavation

The only significant excavation being undertaken is on Site B. At its closest this will be over 30 metres away from the railway corridor. We consider that if the recommendation given in this report are followed and care is taken during the works, then there is little likelihood that the excavation will have any significant affect on the railway infrastructure.

Damage to Retaining Wall on East Side of Site C

Placing any additional loading on the ground supported by the railway retaining wall on the east side of Site C, could damage this wall. The present proposal is to support the new building at Site C using piers that found below the level of the adjacent railway. This will ensure that no additional loading will be applied to the wall, The boreholes in this area demonstrate that the rock at the proposed founding level and sufficient capacity to support these piers. It is generally fresh high strength rock. In this case the proposed construction on Site C should have little affect on the railway retaining wall.

We understand that Railcorp require a geotechnical engineer to assess the present condition of the wall. Also a monitoring programme needs to be prepared. This assessment will be undertaken at a later date once access is available so the front face of the wall can be inspected. Access on to the Railway Corridor will be necessary. As part of the assessment it may be necessary to drill boreholes close to the rear face of the existing structure. This will assist in assessing the likely construction of the wall. Finally, it will be important to obtain railway records of the wall design, if they are available.

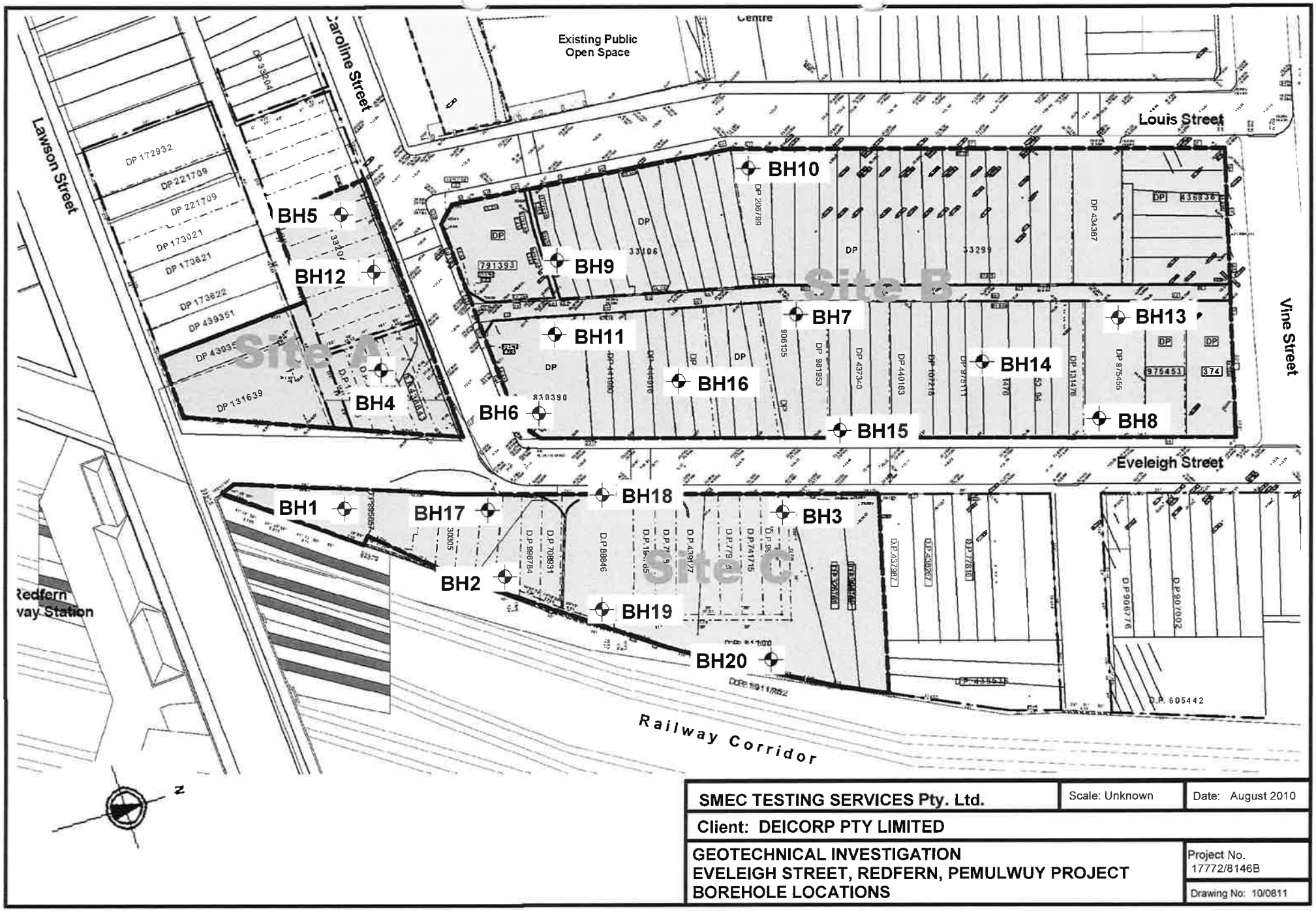
In summary we see no obvious reason why the proposed construction of the Pemulwuy Project will have any significant adverse affect on the adjacent railway infrastructure.

14. FINAL COMMENTS

During construction should the subsurface conditions vary from those inferred above we should be contacted to determine if any changes should be made to our recommendations.

Given the variable soil and rock conditions that will be exposed during the excavation it is recommended that the exposed bearing surfaces should be inspected by a geotechnical engineer to ensure the bearing values given above have been achieved.

Laurie Ihnativ, BE, MEngSc, MBA
Manager, SMEC Testing Services Pty Limited



SMEC TESTING SERVICES Pty. Ltd.	Scale: Unknown	Date: August 2010
Client: DEICORP PTY LIMITED		
GEOTECHNICAL INVESTIGATION **EVELEIGH STREET, REDFERN, PEMULWUY PROJECT** **BOREHOLE LOCATIONS**	Project No. 17772/8146B	
	Drawing No: 10/0811	

NOTES RELATING TO GEOTECHNICAL REPORTS

Introduction

These notes have been provided to outline the methodology and limitations inherent in geotechnical reporting. The issues discussed are not relevant to all reports and further advice should be sought if there are any queries regarding any advice or report.

When copies of reports are made, they should be reproduced in full.

Geotechnical Reports

Geotechnical reports are prepared by qualified personnel on the information supplied or obtained and are based on current engineering standards of interpretation and analysis.

Information may be gained from limited subsurface testing, surface observations, previous work and is supplemented by knowledge of the local geology and experience of the range of properties that may be exhibited by the materials present. For this reason, geotechnical reports should be regarded as interpretative rather than factual documents, limited to some extent by the scope of information on which they rely.

Where the report has been prepared for a specific purpose (eg. design of a three-storey building), the information and interpretation may not be appropriate if the design is changed (eg. a twenty storey building). In such cases, the report and the sufficiency of the existing work should be reviewed by SMEC Testing Services Pty Limited in the light of the new proposal.

Every care is taken with the report content, however, it is not always possible to anticipate or assume responsibility for the following conditions:

- Unexpected variations in ground conditions. The potential for this depends on the amount of investigative work undertaken.
- Changes in policy or interpretation by statutory authorities.
- The actions of contractors responding to commercial pressures.

If these occur, SMEC Testing Services Pty Limited would be pleased to resolve the matter through further investigation, analysis or advice.

Unforeseen Conditions

Should conditions encountered on site differ markedly from those anticipated from the information contained in the report, SMEC Testing Services Pty Limited should be notified immediately. Early identification of site anomalies generally results in any problems being more readily resolved and allows re-interpretation and assessment of the implications for future work.

Subsurface Information

Logs of a borehole, recovered core, test pit, excavated face or cone penetration test are an engineering and/or geological interpretation of the subsurface conditions. The reliability of the logged information depends on the drilling/testing method, sampling and/or observation spacings and the ground conditions. It is not always possible or economic to obtain continuous high quality data. It should also be recognised that the volume or material observed or tested is only a fraction of the total subsurface profile.

Interpretation of subsurface information and application to design and construction must take into consideration the spacing of the test locations, the frequency of observations and testing, and the possibility that geological boundaries may vary between observation points.

Groundwater observations and measurements outside of specially designed and constructed piezometers should be treated with care for the following reasons:

- In low permeability soils groundwater may not seep into an excavation or bore in the short time it is left open.
- A localised perched water table may not represent the true water table.
- Groundwater levels vary according to rainfall events or season.
- Some drilling and testing procedures mask or prevent groundwater inflow.

The installation of piezometers and long term monitoring of groundwater levels may be required to adequately identify groundwater conditions.

Supply of Geotechnical Information or Tendering Purposes

It is recommended tenderers are provided with as much geological and geotechnical information that is available and that where there are uncertainties regarding the ground conditions, prospective tenders should be provided with comments discussing the range of likely conditions in addition to the investigation data.

APPENDIX A

BOREHOLE LOGS & EXPLANATION SHEETS

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date: July 12, 2010
Logged: JH

BOREHOLE NO.: BH 1

Sheet 1 of 5

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			ASPHALT: 50 mm, brick paver 50, weak concrete to 0.75 m FILL			
			SAND: dark brown, fine to coarse grained, some fines, pieces of brick FILL	SM	GENERALLY LOOSE	M
	SPT 1.0-1.45 m 2, 3, 4 N=7	1.0	SAND: brown, fine grained, trace of fines	SP	LOOSE	M
		2.0				
	SPT 2.5-2.95 m 2, 2, 2 N=6					
		3.0	SILTY CLAY: light brownish grey and orange brown, medium to high plasticity, trace of fine sand	CL-CH	STIFF	M
			Becoming silty clay, light grey and red brown, high plasticity, bands of ironstone gravel, blocky texture		BECOMING VERY STIFF	
	SPT 4.0-4.45 m 6, 11, 14 N=25	4.0				
		5.0	SHALE: brown and red brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
			V BIT REFUSAL AT 5.4 M STANDPIPE PIEZOMETER INSTALLED FOR CORE LOG DETAILS REFER TO CORE LOG SHEET			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH — Checked By: LWI

BOREHOLE NO.: BH 1
Sheet 2 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
H W C A S I N G			1.0	For non core log details refer to non core log sheet												
			2.0													
			3.0													
			4.0													
			5.0													
				Start coring @ 5.40 m												
NMLC CORING		80%		No Core												
			6.0	Shale: light grey with pockets of red brown ironstone gravel, blocky texture PP=500	CW											

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW | Project / STS No.: 17772/8146B | **BOREHOLE NO.: BH 1**

Project: Eveleigh Street, Redfern | Date: 13, July 2010

Location: Refer to Drawing No: 10/0811 | Logged: JH | Checked By: LWI | Sheet 3 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C O R I N G				Shale: light grey with pockets of red brown ironstone gravel, blocky texture PP=500	CW											
			7.0	SHALE: dark grey with red brown, staining along fracturs	HW											6.91-7.0 m Cz, Ir, Fe 7.03-7.08 m 3xPt,Pl, Rf, Fe 7.27 m, Sm, 0 Deg., Cy 20mm 7.27-7.62 m, Numerous Pt, & microfractures open & tight Fe 7.62-7.69 m, Sm Cy 70 mm
		100%														7.69-7.89 m, Cz, Fe, Cy bands 7.90 m, Pt, Ir, Rf, Fe
			8.0	LAMINITE: interlaminated dark grey shale and light grey sandstone	MW											8.0 m, Jt, 50 Deg, Jr, Rf, Fe 8.03 m, Cz, 0 Deg., Ir, Rf, Fe 8.03-8.13, Jt, Ir, Cy tight 8.30 m, Jt, 5 Deg., Ir, Rf, Fe
				No Core 8.54-8.78 m												
			9.0	LAMINITE: interlaminated dark grey shale and light grey sandstone	MW											8.78-8.90 m, Cz, Ir, Fe 8.90 m, Jt, 45 Deg., Ir, Rf, Fe 8.95-9.25 m, Numerous Jt, 0-90 Deg., Ir, Rf, Fe 9.25-9.29 m, Cz, Fe 9.29-9.33 m, Sm, clay 40 mm 9.33-9.45 m, numerous, Jt, 0 Deg., Ir, Rf, Fe 9.59 m, Pt, 0 Deg., Ir, Rf 9.63-9.71 m, Numerous, Pt, 0 Deg., Ir, Rf 9.70 m, Cz, 50 mm 9.80-10.0 m, 3xPt, Pl, Rf
			10.0													10-10.15 m, Cz, Ir 10.28-10.30 m, Cz, Ir 10.42-10.52 m, Cz, Ir 10.70 m, Pt, 0 Deg., Ir, Rf
			11.0		FR											11.01 m, Jt, 40 Deg., Ir, Rf 11.10- 11.20 m, Jt, 85 Deg., Ir, Rf 11.30-12.00 m, Numerous Pt, 0 Deg., Pl, Ir, Rf
			12.0													

Notes:

Contractor: Terratest

Equipment: Hydro Power

Hole Diameter (mm): 100

Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 1
Sheet 4 of 5

DRILLING				MATERIAL STRENGTH										DISCONTINUITIES		
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORE		100%	13.0	LAMINITE: interlaminated dark grey shale and light grey sandstone	MW										12.03 m, 0 Deg., Ir, Rf 12.15 m, Pt, 0 Deg., Un, Sm 12.22 m, Pt, 0 Deg., Ir, Rf 12.30 m, Pt, 0 Deg., Ir, Rf 12.54 m, Pt, 0 Deg., Ir, Rf 12.77 m, Pt, 0 Deg., Ir, Rf 12.84 m, Pt, 0 Deg., Ir, Rf
					FR										
			14.0												13.53 m, Jt, 20 Deg., Ir, Rf
		100%	15.0												
	Loss of Circul-ation @ 16m		16.0												15.52 m, Jt, 25 Deg., Ir, Rf 15.85 m, Jt, 70 Deg., Ir, Rf
	Total Water Loss														
	50% Return		17.0	SHALE: dark grey with very thin lamination of light grey siltstone											17.05 m, Jt, 25 Deg., Ir, Rf
			18.0												18.96 m, Jt, 45 Deg., Ir, Rf

Notes:

Contractor:
Equipment:
Hole Diameter (mm):
Angle from Vertical (°):

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date : 13, July 2010
Logged: JH
Checked By: LWI

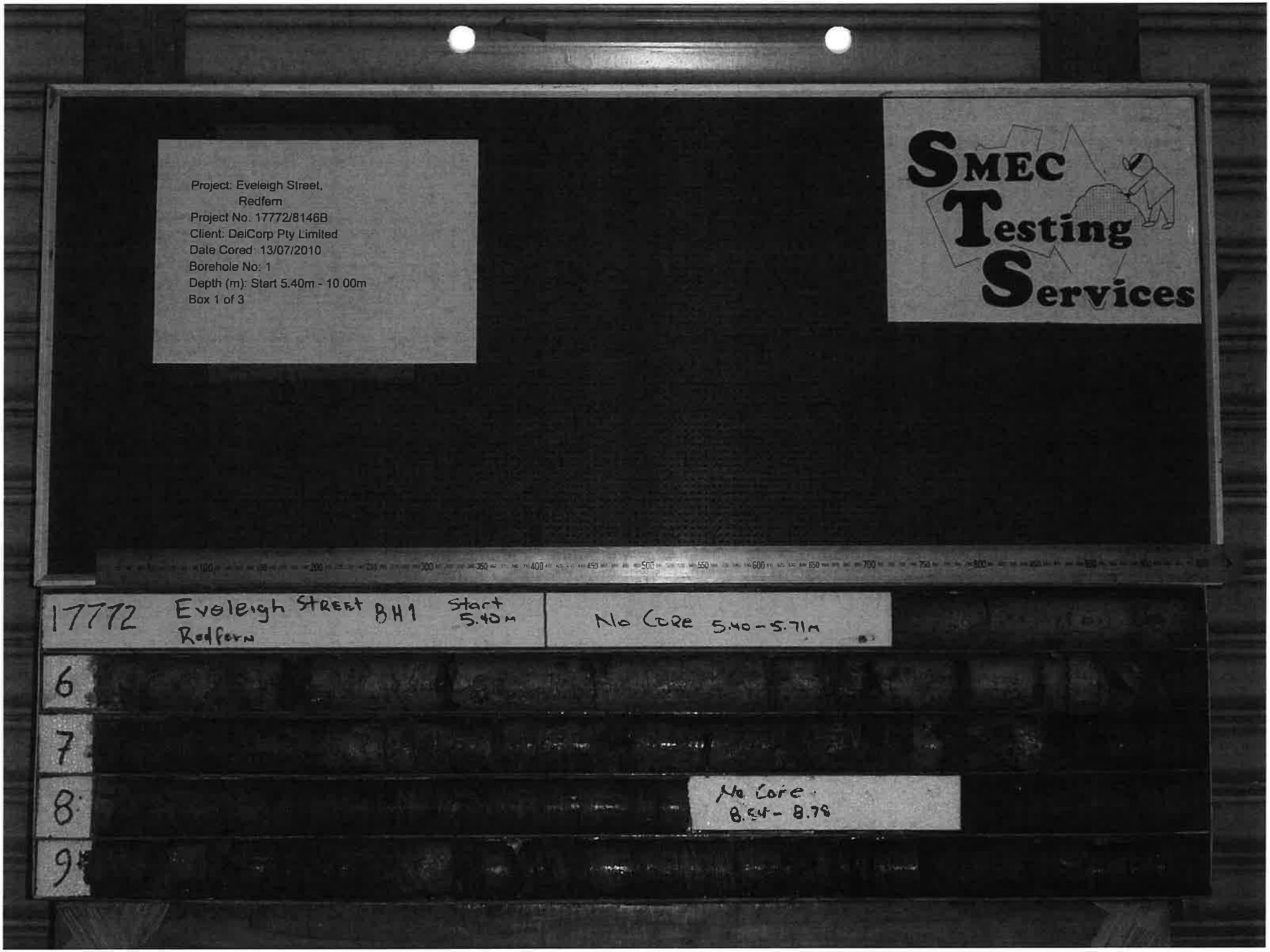
BOREHOLE NO.: BH 1
Sheet 5 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
			19.0	SHALE: dark grey with very thin lamination of light grey siltstone	FR											18.42 m, Jt, 5 Deg., Ir, Rf 18.53 m, Jt, 15 Deg., Ir, Rf 18.63 m, Jt, 15 Deg., Ir, Rf 19.66 m, Pt, 0 Deg., Ir, Rf
			20.0													19.99 m Jt, 90 Deg., Ir, Rf
			21.0	BOREHOLE DISCONTINUED AT 2.0 M												
			22.0													
			23.0													
			24.0													

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 13/07/2010
Borehole No: 1
Depth (m): Start 5.40m - 10 00m
Box 1 of 3
SMEC
Testing
Services
17772 Eveleigh Street BH1 Start 5.40m
Redfern
No Core 5.40 - 5.71m
6
7
8
No Core
8.54 - 8.78
9


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 13/07/2010
Borehole No: 1
Depth (m): 10.00m - 15.00m
Box 2 of 3
SMEC
Testing
Services
17772
10
BH1
11
12
13
14


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 13/07/2010
Borehole No: 1
Depth (m): 15.00m - 20.00m End
Box 3 of 3
SMEC
Testing
Services
17772
15
DH 1
16
17
18
19

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 12, 2010
Logged: JH

BOREHOLE NO.: BH 2

Sheet 1 of 5

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: brown, fine to medium grained sand, scattered pebble TOPSOIL/FILL	SM	FIRM	M
	SPT 1.0-1.45 m 3, 2, 2 N=4	1.0	SILTY CLAY: brown, some fine to coarse sand, low plasticity FILL	CL	SOFT	M
			SILTY SAND: black, fine grained sand	SM	VERY LOOSE	M
			SILTY SAND: yellow brown, fine to medium grained sand	SM	VERY LOOSE	M
			SILTY CLAY: reddish/dark brown, medium plasticity, scattered ironstone gravel	CL	STIFF	M
		2.0				
	SPT 2.5-2.95 m 4, 8, 12 N=20		SILTY CLAY: light grey with bands of ironstone gravel, medium plasticity	CL	VERY STIFF	M
		3.0	Becoming silty clay, reddish brown with grey, medium to high plasticity, bands of ironstone gravel	CH		M
	SPT 4.0-4.45 m 12, 16, 10R @ 4.35 m	4.0	SHALE: red brown, completely weathered with bands of grey clay		EXTREMELY LOW STRENGTH	M
		5.0	V BIT REFUSAL AT 4.8 M FOR CORE LOG DETAILS REFER TO CORE LOG SHEETS			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH — Checked By: LWI

BOREHOLE NO.: BH 2
Sheet 2 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
H W C A S I N G			1.0 2.0 3.0 4.0	For non core log details refer to non core log sheets												
				Start coring at 4.8 m												
N M L C C O R I N G		100%	5.0	SHALE: light and dark grey, friable exhibiting soil like properties	CH											4.80-5.32 m, Numerous micro fractures, open and tight 0-90 Deg.
				SHALE: grey and red brown	HW											5.32-5.52 m, Sm, Cy
				CLAY: light grey, completely weathered shale, medium to high plasticity	CW											
				SHALE: light grey, soil like properties	CW											5.75 m, Pt, Pl
			6.0	SHALE: dark grey with continuous and discontinuous sandstone laminations	HW/ MW											5.96 m, Pt, Ir, Rf, Fe

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 2
Sheet 3 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C C O R I N G		100%	7.0	SHALE: dark grey with continuous and discontinuous sandstone laminations	HW MW											6.03 m, 2xPt, Ir, Rf, Fe 6.13 m, Jt, 0 Deg., Ir, Rf, Fe 6.20 m, 2xJt, 0 Deg., Ir, Rf, Fe 6.30 m, Jt, 0-90 Deg., Ir, Rf, Fe, Tight 6.34 m, Pt, 0 Deg., Pl, Fe 6.49-6.58 m, 4xPt, 0 Deg., Ir, Rf 6.70 m, Jt, 5 Deg., Ir, Rf, Fe, 10 mm 6.82 m, Pt, 0 Deg., Ir, Rf 6.89 m, Jt, 40 Deg., Ir, Rf 7.03 m, Cz, 0 Deg., Cy, 10 mm
				LAMINATE: dark and light grey, with laminated dark grey shale and light grey, sandstone, fine grained laminations @ 0 Deg	MW SW											7.25 m, Sm, 0 deg., Cy, 5 mm 7.30 m, Cz, 0 Deg., 5 mm, Fe 7.53 m, Pt, Jt, 0-90 Deg., Ir, Rf, Fe 7.65-7.80 m, Numerous micro fractures tight, Fe
			8.0	LAMINATE: grey bedding (laminations) @ 10 - 40 Deg.	FR											7.95-8.20 m, 3xJt, 50 Deg., Ir, Rf, Fe 8.25 m, Jt, 40 Deg., Ir, Rf, Fe, tight 8.36 m, Pt, 15 Deg., Ir, Rf 8.54 m, Jt, 10 Deg., Ir, Rf 8.60 m, Pt, 10 Deg., Ir, Rf 8.74 m, Pt, 15 Deg., Pl, Sm 8.84 m, Pt, 15 Deg., Pl, Sm 8.90 m, Pt, 0 Deg., Ir, Rf
		100%	9.0													8.95 m, 9.0 m, Pt, 10 Deg., Ir, Rf, Fe 9.04 m, Pt, 10 Deg., Ir, Rf 9.15 m, Pt, 10 Deg., Ir, Rf 9.34 m, Pt, 10 Deg., Ir, Rf
			10.0													10.92-11.02 m, 5xJt, 0-70 Deg., Ir, Rf
			11.0													11.09 m, 2xJt, 0 & 30 Deg., Ir, Rf 11.18 m, Jt, 0-10 Deg., Un, Rf 11.60 m, Jt, 0 Deg., Ir, Rf 11.70 m, Pt, 0 Deg., Ir, Rf 11.80-12.0 m, 5xPt, 0 Deg., Ir, Rf
			12.0													

Notes:

Contractor: Terratest
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW | Project / STS No.: 17772/8146B | **BOREHOLE NO.: BH 2**

Project: Eveleigh Street, Redfern | Date : 13, July 2010

Location: Refer to Drawing No: 10/0811 | Logged: JH | Checked By: LWI | Sheet 4 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORING		100%	13.0	LAMINITE: grey bedding (laminations) @ 10 - 40 Deg.	FR											12.05 m, Pt, 0 Deg., Pl, Sm 12.10 m, Pt, 0 Deg., Pl, Sm 12.25 m, 2xPt, 0 Deg., Pl, Sm 12.41 m Pt, 0 Deg., Pl, Sm 12.58 m, Pt, 0 Deg., Ir, Rf 12.76 m, Pt, 0 Deg., Pl, Sm 13.05 m, Jt, 45 Deg., Ir, Rf 13.03-14.5 m, Jt, 80 Deg., Ir, Rf, Clean 13.03 m -14.05 m, Jt, 30 Deg., Ir, Rf, Clean 13.53 m, Pt, 0 Deg., Ir, Rf 13.67 m, Pt, 0 Deg., Ir, Rf
		100%	14.0													14.43 m, Pt, 0 Deg., Pl, Sm 14.58 m, Pt, 0 Deg., Ir, Sm 14.88 m, Pt, 0 Deg., Pl, Sm 15.09 m, Pt, 0 Deg., Pl, Sm 15.21 m, Pt, 0 Deg., Pl, Sm 15.40 m, Pt, 0 Deg., Pl, Sm 15.94 m, Pt, 0 Deg, Pl, Sm
		100%	17.0	SHALE: grey	FR											17.04 m, Pt, 0 Deg., Pl, Sm 17.28-17.65 m, Jt, 85 Deg., Ir, Sm, Clean 17.65 m, Jt, 5 Deg., Ir, Rf 17.80 m, Pt, 90 Deg., Jt, 50 Deg, Ir, Rf
			18.0													

Notes:

Contractor: Terratest

Equipment: Hydro Power

Hole Diameter (mm): 100

Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

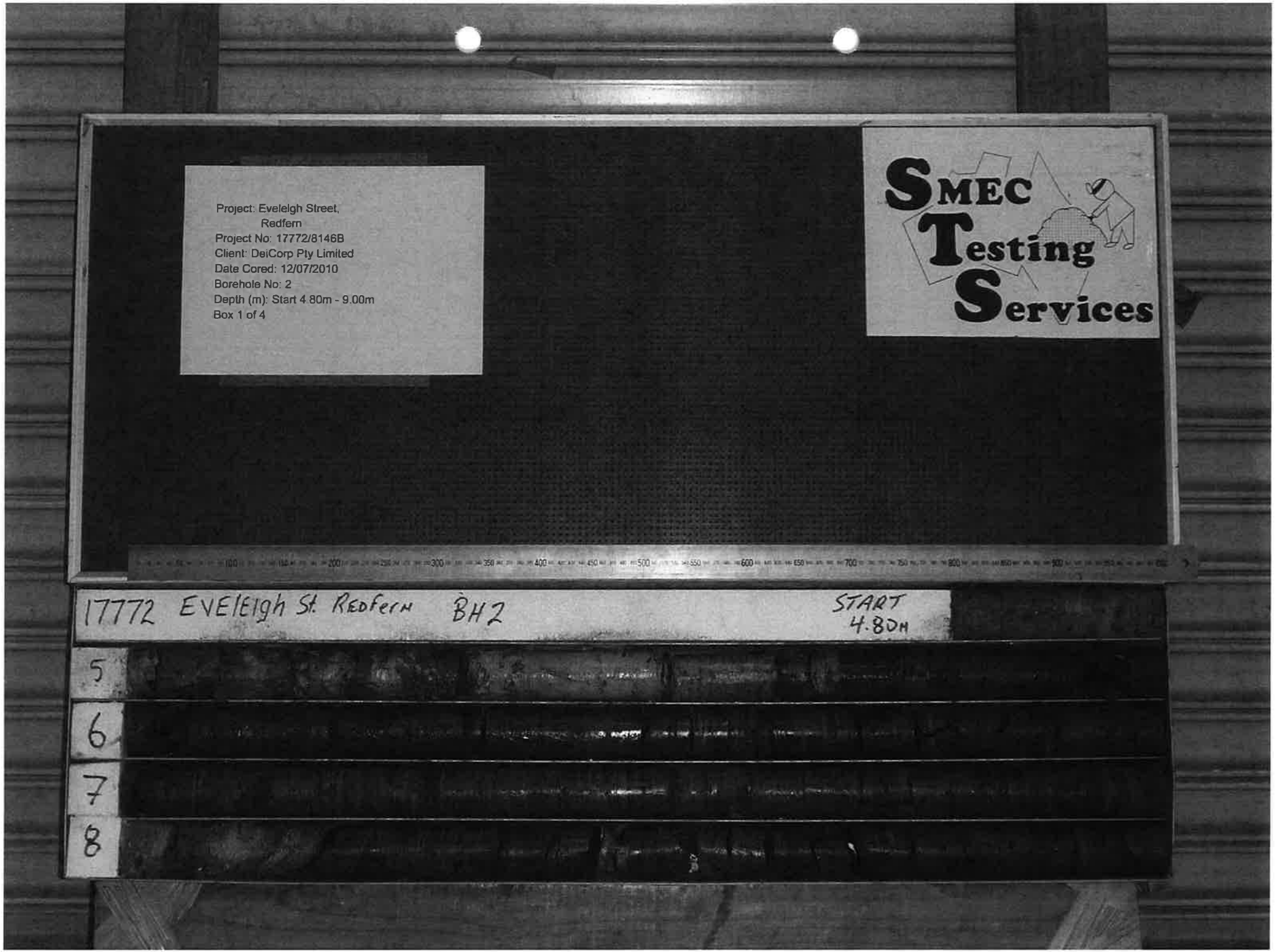
BOREHOLE NO.: BH 2
Sheet 5 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORING		100%	19.0	SHALE: grey	FR										18.89 m, Pt, 0 Deg., Ir, Rf 19.55 m, Jt, 30 Deg., Ir, Rf
			20.0												
			21.0												
			22.0												
			23.0												
			24.0												

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Evelelgh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 12/07/2010
Borehole No: 2
Depth (m): Start 4.80m - 9.00m
Box 1 of 4
SMEC
Testing
Services
17772 EVELeigh St. REDFERN BH2
START
4.80M
5
6
7
8


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 12/07/2010
Borehole No: 2
Depth (m): 9.00m - 14.00m
Box 2 of 4
SMEC
Testing
Services
BH2
17772
9
10
11
12
13


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 12/07/2010
Borehole No: 2
Depth (m): 14.00m - 20.00m End
Boxes 3 & 4 of 4
SMEC
Testing
Services
BH2
14
17772
15
16
17
18
19
BH2 END 20.00m

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 12, 2010
Logged: JH

BOREHOLE NO.: BH 3

Sheet 1 of 5

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to medium grained sand FILL	SM	LOOSE	M
			SILTY CLAY: yellow brown, medium plasticity	CL	FIRM TO STIFF	M
	SPT 1.0-1.45 m 2, 2, 4 N=6	1.0	SILTY CLAY: light grey with red brown, high plasticity, scattered ironstone gravel	CH	STIFF	M
		2.0	SILTY CLAY: light grey, medium to high plasticity, trace of fine sand RESIDUAL	CL-CH	HARD	D-M
	SPT 2.5-2.95 m 6,11,15 N=26					
		3.0	SHALE: light grey and red brown, completely to highly weathered shale		EXTREMELY LOW STRENGTH	
			V BIT REFUSAL AT 3.4 M STANDPIPE PIEZOMETER INSTALLED			
		4.0				
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 3
Sheet 2 of 5

DRILLING				MATERIAL STRENGTH												DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)				
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000			Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
H W C A S I N G			1.0														
			2.0	For non core log details refer to non core log sheets													
			3.0														
				Start coring @ 3.4m													
N M L C C O R I N G		100%	4.0	SHALE: light grey and red brown, exihibiting soil like properties, completely weathered	CW												3.40-3.52 m, Sm, Cy, 120 mm 3.52-3.65 m, Numerous Pt, Jt, 0 Deg., Ir Rf, Fe
				SHALE: red brown and grey, friable	HW												3.65 m, Sm, Cy, 50 mm 3.70-3.80 m, Numerouos Pt, Jt, 0 Deg., Ir, Rf, Fe, Cy 3.80 m, Sm, Cy, 50 mm 3.90-4.00 m, Sm, Cy, 100 mm
				LAMINITE: grey brown and light grey into laminated shale, very fine grained sandstone, zone of non staining friable	HW												4.23 m, Sm, Cy, 40 mm 4.57 m, Pt, 5 Deg., Ir, Rf, Cl 4.81-4.84 m, Sm, Cy, 30 mm 4.89 m, Pt, 0 Deg., Ir, Rf, Fe
			5.0														4.95-5.25 m, Jt, 90 Deg., Ir, Rf, Cy 5.25 m, Sm, Cy, 30 mm 5.31 m, Sm, Cy, 20 mm 5.35 m, Sm, Cy, 20 mm 5.46 m, Sm, Cy, 50 mm
				LAMINITE: dark grey and light grey with laminated slab, very fine grained sandstone, friable	HW MW												5.6-6.05 m, Numerous Pt, Pl & Ir, Rf, Fe
			6.0														

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date : 13, July 2010
Logged: JH — Checked By: LWI

BOREHOLE NO.: BH 3
Sheet 3 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
		100%	7.0	LAMINATE: dark grey and light grey with laminated slab very fine grained sandstone friable	HW MW											6.15 m, Pt, 0 Deg., Tight, Fe 6.25 m, Jt, 10 Deg., Ir, Rf 6.30 m, Jt, 10 Deg., Ir, Rf 6.50-6.56 m, Sm, Cy, 60 mm 6.60 m, Jt, 10 Deg., Ir, Rf, Cy 6.71 m, Sm, Cy, 30 mm
				Note: Core breaking apart when transferring to box												7.12 m, Sm, Cy, 30 mm 7.42 m, Pt, 0 Deg., Pl, Sm, Fe 7.44 m, Jt, 80 Deg., Ir, Rf, Cl
			8.0													8.20-8.35 m, Jt, 90-45 Deg., Ir, Rf, Cl
					FR											8.40 m, Pt, 0 Deg., Pl, Sm, Cl 8.69 m, Pt, 0 Deg., Pl, Sm, Cl
			9.0													9.17 m, Pt, 0 Deg., Pl, Sm, Cl
		100%														
			10.0													10.35 m, Pt, 0 Deg., Pl, Sm, Cl
			11.0													11.30 m, Pt, 0 Deg., Pl, Sm, Cl
				SHALE: dark grey with scattering of very fine lamination of very fine grained sandstone												11.57 m, Pt, 0 Deg., Pl, Sm, Cl
			12.0													

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWJ

BOREHOLE NO.: BH 3
Sheet 4 of 5

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
		100%	13.0	SHALE: dark grey with scattering of very fine lamination of very fine grained sandstone	FR											12.33 m, Pt, 0 Deg., Ir, Rf, Cl 12.45 m, Jt, 0-5 Deg., Un, Rf, Cl 12.66 m, Pt, 0 Deg., Ir, Rf, Cl 12.85 m, Jt, 30 Deg., Pl, Sm, Cl 12.90 m, Jt, 45 Deg., Ir, Rf, Cl 12.95 m, Jt, 0 Deg., Ir, Rf, Cl 13.14 m, Jt, 0 Deg., Ir, Rf, Cl
			14.0													13.40 m, Jt, 10 Deg., Ir, Rf, Cl 13.60 m, Jt, 25 Deg., Ir, Rf, Cl 13.65 m, Jt, 25 Deg., Ir, Rf, Cl 13.78-13.90 m, Cz, Clean 14.05 m, Jt, Ir, Rf, Cy
		100%	15.0													14.20 m, Jt, 15 Deg., Pl, Sm, Cl 14.26-14.30 m, Jt, 40 Deg., Ir, Rf, Cl 14.40 m, Jt, 45 Deg., Pt, 0 Deg., Pl, Sm, Cl 14.50 m, 2 x Jt, 10 Deg., Pl, Sm, Cl 14.60 m, Jt, 25 Deg., Un, Sm, Cl 14.65 m, Jt, 10 Deg., Ir, Rf, Cl 14.75 m, Jt, 15 Deg., Ir, Rf, Cl 14.90 m, Jt, 70 Deg., Ir, Rf, Cl 15.0 m, Jt, 70 Deg., Ir, Rf, Cl 15.16 m, Jt, 60 Deg., Ir, Rf, Cl
		100%	16.0													15.40 m, Jt, 30 Deg., Ir, Rf, Cl 15.50-15.60 m, 3 x Jt, 30-90 Deg., Ir, Rf, Cl 15.70-15.80 m, Cz, Cl 15.88 m, Jt, 2 x 45 Deg., Ir, Rf, Cl 15.91 m, Jt, 45 Deg., Pl, Sm, Cl 16.05 m, Jt, 45 Deg., Pl, Sm, Cl 16.24 m, Pt, 0 Deg., Pl, Sm, Cl
		100%	17.0	SANDSTONE: light grey, fine grained												16.50 m, Jt, 30 Deg., Pl, Sm, Cl 16.57 m, 2 x Pt, Ir, Rp, Cl 16.67 m, Jt, 20 Deg., Ir, Rf, Cl 16.89-16.96 m, Cz, Cl 17.14-17.23 m, Numerous Jt, 45-90 Deg., Ir, Rf, Cl 17.31 m, Jt, 30 Deg., Ir, Rf, Cl 17.33 m, Pt, 0 Deg., Ir, Rf, Cl 17.46 m, 2 x Jt, 0 Deg., Un, Rf, Cl 17.65-17.70 m, Cz, Cl 17.88 m, Pt, 0 Deg., Ir, Rf, Cl
			18.0	SANDSTONE: light grey/brown, fine to coarse grained												

Notes:

Contractor: Terratest
Hole Diameter (mm): Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 3
Sheet 5 of 5

DRILLING				MATERIAL STRENGTH										DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)		
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
W M L C C O R I N G			19.0	SANDSTONE: light grey, fine to coarse grained	FR										18.15 m, Pt, 0 Deg., Jr, Rf, Cl 18.20 m, Pt, 0 Deg., Pl, Rf, Cl 18.77 m, Pt, 0 Deg., Pl, Rf, Cl 18.92 m, Pt, 0 Deg., Pl, Rf, Cl 19.04 m, Jt, 0 Deg., Un, Rf, Cy 19.15 m, 2 x Pt, Pl, Sm, Cl 19.50 m, Pt, 0 Deg., Pl, Rf, Cl 19.71 m, Pt, 0 Deg., Pl, Ir, Rf, Cl
			20.0	BOREHOLE DISCONTINUED AT 20.0 M											
			21.0												
			22.0												
			23.0												
			24.0												

Notes:

Contractor: Terratest
Equipment: Edson RP70
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 14/07/2010
Borehole No: 3
Depth (m): Start 3.40m - 8.00m
Box 1 of 4
SMEC Testing Services
17772 Eveleigh Street BH3 Start 3.40m
Redfern
4
5
6
7


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DelCorp Pty Limited
Date Cored: 14/07/2010
Borehole No: 3
Depth (m): 8.00m - 13.00m
Box 2 of 4
SMEC
Testing
Services
17772
8
BH3
9
10
11
12


Project: Eveleigh Street
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 14/07/2010
Borehole No: 3
Depth (m): 13.00m - 18.00m
Box 3 of 4
SMEC
Testing
Services
13
14
15
16
17


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 14/07/2010
Borehole No: 3
Depth (m): 18.00m - 20.00m End
Box 4 of 4
SMEC
Testing
Services
17772
18
BH3
19
BH3 END 20.00m

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 15, 2010
Logged: JH

BOREHOLE NO.: BH 4

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY CLAY: dark brown, some fine sand, low plasticity TOPSOIL/FILL	CL	SOFT	M
			SAND: brown, fine grained sand, traces of some fines POSSIBLE FILL	SP	LOOSE	M
			SAND: yellow brown, fine grained	SP	LOOSE/MEDIUM DENSE	M
	SPT 1.0-1.45 m 3, 4, 6 N=10	1.0				
		2.0				
	SPT 2.5-2.95 m 3, 4, 7 N=11		SILTY CLAY: yellow brown, with red streaks, trace to some fines sand, low plasticity, scattered ironstone gravel	CL	STIFF	M
		3.0				
			SILTY CLAY: red brown and light grey, medium to high plasticity	CL-CH	STIFF	M
			SILTY CLAY: light grey, with red, high plasticity RESIDUAL	CH	VERY STIFF	M
	SPT 4.0-4.45 m 3, 9, 15 N=24	4.0				
			SHALE: light grey and red brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
		5.0				
			BOREHOLE DISCONTINUED AT 5.0 M STANDPIPE PIEZOMETER INSTALLED			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 15, 2010
Logged: JH

BOREHOLE NO.: BH 5

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to medium grained, trace of gravel and rubble FILL	SM	LOOSE	M
			SAND: brown, fine grained	SP	LOOSE	M
	SPT 1.0-1.45 m 3, 4, 5 N=9	1.0				
		2.0	SANDY CLAY/CLAYEY SAND: brown fine to medium grained sand, low plasticity	SC	STIFF	M
	SPT 2.5-2.95 m 4, 6, 8 N=14		SILTY CLAY: light grey with red brown, medium to high plasticity scattered ironstone gravel	CL-CH	STIFF	M
		3.0				
	SPT 4.0-4.45 m 5, 11, 21 N=32	4.0	SILTY CLAY: light grey with red brown, high plasticity RESIDUAL	CH	VERY STIFF TO HARD	M
			SHALE: light grey and red brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
		5.0	Near V Bit Refusal			
			BOREHOLE DISCONTINUED AT 5.0 M			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 19, 2010
Logged: JH

BOREHOLE NO.: BH 6

Sheet 1 of 4

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine grained scattered pebble TOPSOIL/FILL	SM	LOOSE	M
			SILTY SAND: yellow brown, fine grained POSSIBLE FILL	SM	LOOSE	M
			SAND: yellow brown, fine grained, pockets of clayey sand	SP	LOOSE	M
	SPT 0.8-1.25 m 4, 5, 4 N=9	1.0				
			SILTY CLAY: orange brown with grey, trace of fine sand, medium plasticity	CL	FIRM	M
		2.0	SILTY CLAY; red brown with grey, medium to high plasticity	CL-CH	STIFF	M
	SPT 2.3-2.75 m 3, 9, 13 N=22		SILTY CLAY: light grey, medium to high plasticity	CL-CH	VERY STIFF	M
		3.0				
			SHALE: grey with red brown, highly weathered		EXTREMELY LOW STRENGTH	D
	SPT 3.8-4.2 m 10, 23, 20 N=43	4.0				
			V BIT REFUSAL @ 4.40 M STANDPIPE PIEZOMETER INSTALLED			
		5.0				
			FOR CORE LOG DETAILS REFER TO CORE LOG SHEETS			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 19, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 6
Sheet 2 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
H W C A S I N G			1.0	For non core log details refer to non core log sheets												
			2.0													
			3.0													
			4.0													
				Start coring @ 4.40 m												
N M L C C O R I N G		100%	5.0	SHALE:red brown and grey, exhibiling soil like properties	CW											4.40-4.55 m, Sm Cy
				SHALE: dark grey with red brown, friable	HW											4.57-4.59 m, Sm, Cy, 70 mm 4.59-4.70 m, Numerous Pt, Ir, Rf, Fe 4.70-4.75 m, Sm Cy, 50 mm 4.78-4.91 m, Sm Cy, 130 mm 4.91-5.45 m, Numerous Jt & Pt, 0-5 Deg., Ir, Rf, Fe, Cy
				LAMINITE: interlaminated dark grey shale and light grey fine grained sandstone	HW MW											4.95-5.50 m, Cz, Ir, Fe, Numerous Pt 0-5 Deg., Ir, Rf, Fe
			6.0													5.92-6.0 m, Sm, Cy, 180 mm

Notes:

Contractor: Terratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 19, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 6
Sheet 3 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C				LAMINITE: interlaminated dark grey shale and light grey fine grained sandstone	HW MW											6.00-6.60 m, Numerous Jt & Pt, 0-5 Deg., Ir, Rf, Fe 6.37-6.40 m, Sm, Cy, 70 mm
C O R 1 N G		100%	7.0													6.72 m, Pt, 0 Deg., Ir, Rf, Cl 6.78 m, Jt, 0 Deg., Fr, Rf, Fe 6.82 m, Jt, 0 Deg., Ir, Rf, Fe 6.86 m, Jt, 0 Deg. Ir, Rf, Fe 6.94 m, Jt, 0 Deg., Ir, Rf Fe 7.0 m, Pt, 0 Deg., Ir, Rf, Fe 7.05 m, Jt, 0 Deg., Fr, Rf, Fe, 10 mm 7.08-7.48 m, Numerous Jt & Pt, 0 Deg., Ir, Rf, Fe, open and tight 7.58 m, Sm, Cy, 10 mm 7.68 m, Jt, 50 Deg., Ir, Rf, Cy 7.76 m, Pt, 0 Deg., Ir, Rf, Cy 7.85 m, Cz, 5 mm
			8.0													7.95 m, Jt, 0 Deg., Ir, Rf, Fe, 10 mm 8.04 m, Pt, 0 Deg., Ir, Rf 8.09 m, Sm, Cy, 5 mm
					FR											8.40 m, Jt, 90 Deg., Pl, Sm, Cl 8.42-8.94 m, Numerous Pt, 0 Deg., Pl, Sm, Cl
		100%	9.0													8.98-9.10 m, Jt, 85 Deg., Pl, Rf, Cl 9.14 m, Pt, 0 Deg., Pl, Sm, Cl 9.21 m, Jt, 50 Deg., Un, Rf, Cl 9.27 m, Jt, 10 Deg., Un, Rf, Cl 9.34 m, 2xPt, 0 Deg., Pl, Rf, Cl 9.41 m, Jt, 5 Deg., Un, Rf, Cl 9.50 m, Pt, 0 Deg., Ir, Rf, Cl 9.60 m, 3xPt, 0 Deg., Ir, Rf, Cl 9.73 m, 2xPt, 0 Deg., Ir, Rf, Cl 9.77 m, Jt, 10 Deg., Ir, Rf, Cl 9.85 m, Pt, 0 Deg., Ir, Rf, Cl
			10.0	Lamination dipping to 20 Deg.												9.95 m, 3xPt, 0 Deg., Ir, Rf, Cl 10.06 m, Jt, 40 Deg., Ir, Rf, Cl 10.09 m, Jt, 0 Deg., Ir, Rf, Cl 10.30 m, 2xJt, 15 Deg., Ir, Rf, Cl 10.43 m, Cz, Ir, Cl 10.59 m, Jt, 20 Deg., Fr, Rf, Cl 10.62 m, Jt, 75 Deg., Ir, Rf, Cl 10.63 m, Jt, 10 Deg., Ir, Rf, Cl 10.80 m, Jt, 0 Deg., Ir, Rf, Cl 10.92 m, Jt, 15 Deg., Pl, Sm, Cl
			11.0													10.98 m, 2xJt, 30 Deg., Pl, Sm, Cl 11.07 m, Jt, 0 & 45 Deg., Ir, Rf, Cl 11.15 m, Pt, Pl, Ir, Rf, Cl 11.20 m, Cz, 50 mm 11.33 m, Jt, 30 Deg., Ir, Sm, Cl 11.40 m, 2xJt, 30 Deg., Ir, Rf, Cl 11.47 m, Jt, 0 Deg., Ir, Rf, Cl 11.61 m, Pt, 0 Deg., Pl, Sm, Cl 11.72 m, Pt, 0 Deg., Pl, Ir, Cl 11.82 m, Pt, 0 Deg., Pl, Ir, Cl
			12.0													11.90-12.14 m, Jt, 70 Deg., Pl, Sm, Cl

Notes:

Contractor: Terratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Evelcigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 19, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 6
Sheet 4 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C C O R I N G		100%	13.0	LAMINITE: interlaminated dark grey shale and light grey fine grained sandstone	FR										12.20 m, Jt, 15 Deg., Ir, Rf, Cl 12, 25 m, 2xJt, 80 Deg., Ir, Rf, Cl 12.08 m, Pt, 0 Deg., Pl, Sm, Cl 12.34 m, 2xPt, 5 Deg., Pl, Sm, Cl 12.41 m, Pt, 5 Deg., Pl, Sm, Cl 12.44 m, Pt, 5 Deg., Pl, Sm, Cl 12.53 m, Pt, 5 Deg., Pl, Sm, Cl 12.57 m, Pt, 5 Deg., Pl, Sm, Cl 12.60 m, Jt, 5 Deg., Ir, Rf, Cl 12.65 m, Pt, 5 Deg., Pl, Sm, Cl 12.73 m, Pt, 5 Deg., Pl, Sm, Cl 12.95-14.62 m, Jt, 80-85 Deg., Ir, Rf, Cl 12.95-14.42 m, Numerous Pt, 0 Deg., Pl, Sm, Cl many drill induced
				SHALE: dark grey, scattered very thin light grey lamination at 0 Deg.											
			14.0												
			15.0												14.83 m, Pt, 0 Deg., Pl, Sm, Cl
				BOREHOLE DISCONTINUED AT 15.0 M											
			16.0												
			17.0												
			18.0												

Notes:

Contractor: Terratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street,
Redfern
Project No: 17772/81466
Client: DeiCorp Pty Limited
Date Cored: 19/07/2010
Borehole No: 6
Depth (m): Start 4.40m - 9.00m
Box 1 of 3
SMEC
Testing
Services
17772 Eveleigh St. BH6 Start
Redfern 4.40m
5
6
7
8


Project: Eveleigh Street
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 19/07/2010
Borehole No: 6
Depth (m): 9.00m - 15.00m End
Boxes 2 & 3 of 3
SMEC
Testing
Services
17772
9
BH6
10
11
12
13
17772
14
17772
BH6 End 15.00

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 16, 2010
Logged: JH

BOREHOLE NO.: BH 7

Sheet 1 of 4

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine grained sand, organic TOPSOIL	SM	VERY LOOSE	M
	B		SAND: yellow brown, fine grained	SP	VERY LOOSE	M
	SPT 1.0-1.45 m 1, 1, 1 N=2	1.0				
			CLAYEY SAND: brown, fine grained sand, low plasticity	SC	SOFT	M
			SILTY CLAY: brown, low plasticity	CL	FIRM	M
		2.0	SILTY CLAY: light grey with red brown, medium to high plasticity	CL-CH	STIFF	M
	SPT 2.5-2.95 m 6, 9, 13 N=22				VERY STIFF	
		3.0				
			SILTY CLAY: light grey, medium to high plasticity, blocky texture	CL-CH	VERY STIFF	M
	SPT 4.0-4.45 m 7, 10, 15 N=25	4.0				
			SHALE: light grey and grey, completely weathered		EXTREMELY LOW STRENGTH	
		5.0				
			SHALE: grey brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
	SPT 5.5-5.95 m 3, 15, 18 N=33					

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 16, 2010
Logged: JH

BOREHOLE NO.: BH 7

Sheet 2 of 4

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SHALE: grey brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
			V BIT REFUSAL AT 6.6 M STANDPIPE PIEZOMETER INSTALLED			
		7.0				
		8.0				
		9.0				
		10.0				
		11.0				
			FOR CORE LOG DETAILS REFER TO CORE LOG SHEETS			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date : 16, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 7
Sheet 3 of 4

DRILLING				MATERIAL STRENGTH												DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)				
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000			Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
HC WASJING				For non core log details refer non core log sheets													
				Start Coring at 6.6 m													
NMLC CORING		100%	7.0	SHALE: reddish brown and grey	CW												6.66 m, Jt, 70 Deg., Ir, Rf, Fe, Cy
				SHALE: dark grey, friable	CW HW												6.67 m, Jt, 50 Deg., Ir, Rf, Fe 6.80-6.86 m, Cz, Cy 6.90 m, Pt, 0 Deg., Ir, Rf, Fe 7.04-7.14 m, Numerous Jt, 0-30 Deg., Ir, Rf, Cy 7.20 m, Pt, Sm, Cy 7.34 m, Jt, 10 Deg., Ir, Rf, Fe, Cy 7.43 m, Pt, 0 Deg, Pl, Sm, Cy 7.61-7.68 m, Cz, Cy 7.76 m, Pt, 5 Deg., Pl, Sm, Cy 7.82 m, Pt, 0 Deg., Ir, Rf, Cy 7.94 m, Jt, 80 Deg., Ir, Rf, Cy 7.98 m, Sm, Cy 20 mm 8.10 m, Pt, Ir, Rf, Cy 8.15-8.24 m, Sm, Cy, 90 mm 8.34 m, Pt, 0 Deg., Pl, Sm, Cy 8.54 m, Jt, 10 Deg., Pl, Sm, Cy 8.60-9.05 m, Numerous, Jt, 10 Deg., Ir, Rf, Cy & Pt 0 Deg., Pl, Sm, Cl
			8.0														
			9.0	SHALE: dark grey	MW												9.10 m, Jt, 45 Deg., Un, Rf, Cl 9.14 m, Jt, 5 Deg., Ir, Rf, Cl 9.24-9.30 m, Jt, 45 Deg., Ir, Rf 9.45 m, Jt, 50 Deg., Pl, Rf, Cl 9.54-9.66 m, Cz 9.73-9.82 m, Numerous, Pt, 0 Deg., Pl, Sm 9.85 m, Jt, 40 Deg., Pl, Sm
		100%	10.0	SHALE: dark grey with scattered very thin lamination at 5 Deg	FR												10.0 m, Jt, 60 Deg., Ir, Rf, Cl 10.26 m, Pt, 5 Deg., Pl, Sm, Cl 10.35 m, Jt, 40 Deg., Ir, Rf, Cl 10.39 m, Pt, 0 Deg., Pl, Sm, Cl 10.82 m, Jt, 45 Deg., Ir, Rf, Cl 10.95 m, 2 x Jt, 60 Deg., Ir, Rf, Cl,
			11.0														11.72 m, 2 x Jt, 0 Deg., Ir, Rf, Cl
			12.0														

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 16, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 7
Sheet 4 of 4

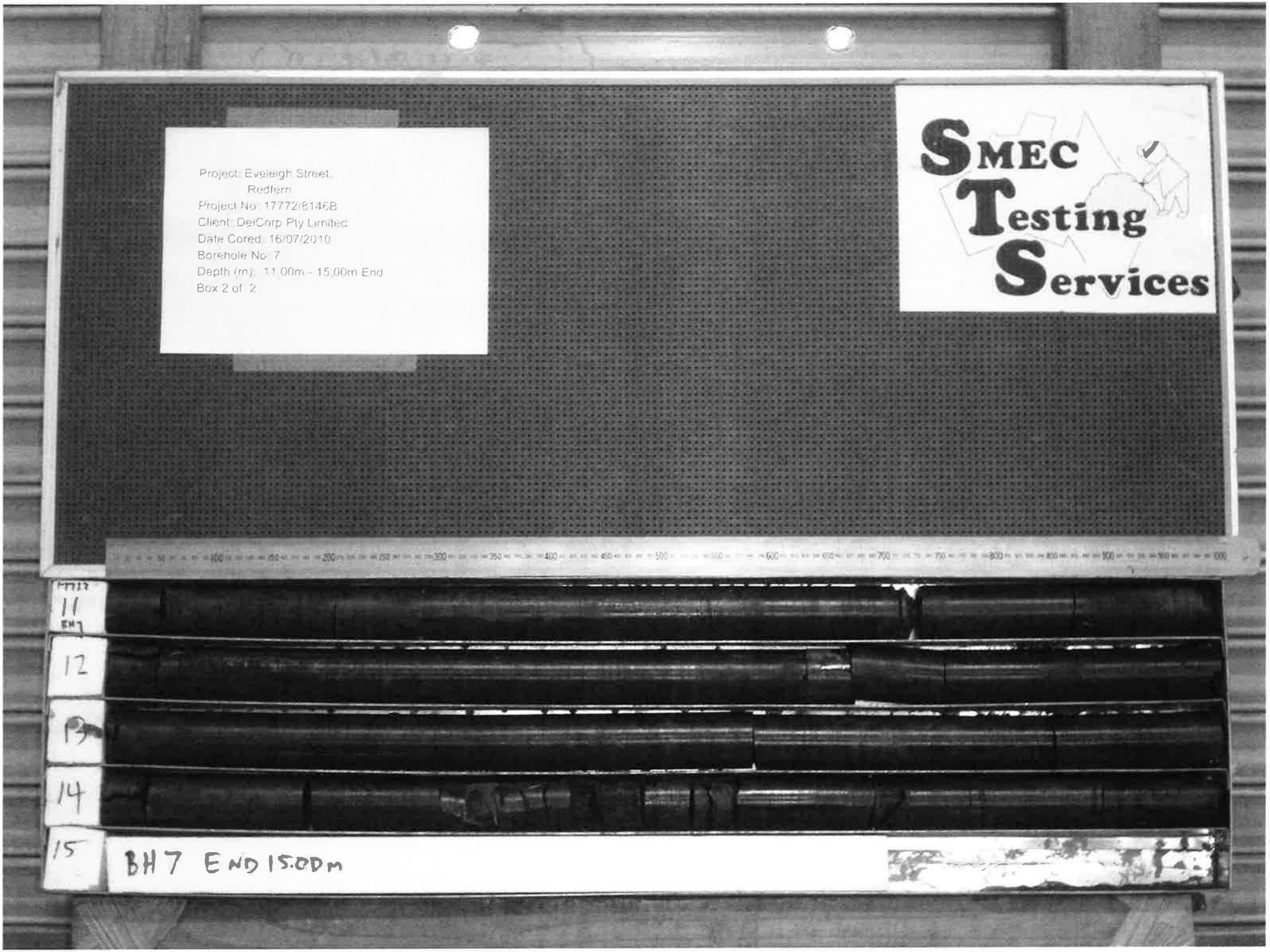
DRILLING				MATERIAL STRENGTH										DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)		
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C CORING		100%	13.0	SHALE: dark grey with scattered very thin lamination at 5 Deg.	FR										12.07 m, Jt, 0-5 Deg., Un, Sm, Cl
			14.0												14.30-14.64 m, Jt, 85 Deg., Ir, Rf, Cl 14.44 m, Jt, 0 Deg., Ir, Rf, Cl 14.49 m, Jt, 0 Deg., Ir, Rf, Rl 14.56 m, 2xJt, 0 Deg., Ir, Rf, Cl 14.68 m, Pt, 0 Deg., Pl, Sm, Cl 14.88 m, Pt, 0 Deg., Pl, Sm, Cl
			15.0												
			16.0	BOREHOLE DISCONTINUED AT 15.0 M											
			17.0												
			18.0												

Notes:

Contractor: Terratest
Hole Diameter (mm): Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 16/07/2010
Borehole No: 7
Depth (m): Start 6.60m - 11.00m
Box 1 of 2
SMEC Testing Services
17772 Eveleigh ST Redfern BH7
Start 6.60m
7
8
9
10


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 16/07/2010
Borehole No: 7
Depth (m): 11.00m - 15.00m End
Box 2 of 2
SMEC
Testing
Services
11
12
13
14
15
BH 7 END 15.00m

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 15, 2010
Logged: JH

BOREHOLE NO.: BH 8

Sheet 1 of 4

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY CLAY: dark brown, some fine sand, low plasticity TOPSOIL/FILL	CL	SOFT	M
			SILTY CLAY: red brown, medium plasticity FILL	CL	SOFT	M
			BRICK AND CONCRETE FOOTING			
			SAND: light grey, fine grained	SP	VERY LOOSE	M
	SPT 1.0-1.45 m 1, 0.5, 0.5 N=1	1.0				
			SANDY CLAY/CLAYEY SAND: orange/yellow brown, fine grained sand, low plasticity	SC	SOFT	M-VM
			Becoming			
		2.0	SANDY CLAY: brown, fine to medium grained sand, low plasticity	CL		M-VM
			SILTY CLAY: red brown, medium to high plasticity, trace of some fine sand	CL-CH	STIFF	M
	SPT 2.5-2.95 m 4, 6, 10 N=16		SILTY CLAY: light grey, medium plasticity	CL	STIFF BECOMING VERY STIFF	M
		3.0				
	SPT 4.0-4.45 m 10, 16, 22 N=38	4.0	SHALE: grey, completely weathered, exhibiting soil like properties, pockets of ironstone		EXTREMELY LOW STRENGTH	
		5.0				
			V BIT REFUSAL AT 5.20 M STANDPIPE PIEZOMETER INSTALLED FOR CORE LOG DETAILS REFER TO CORE LOG SHEETS			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 15, July 2010
Logged: JH — Checked By: LWI

BOREHOLE NO.: BH 8
Sheet 2 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
H W C A S I N G			1.0													
			2.0	For non core log details refer to non core log sheets												
			3.0													
			4.0													
			5.0	Start coring at 5.20 m												
N C M O L C R I G			6.0	SHALE: brownish grey with orange staining along joints and fractures	HW											5.25 m, Jt, 5 Deg., Ir, Rf, Fe 5.30 m, Pt, 0 Deg., Pl, Sm, Fe 5.54 m, Jt, 0 Deg., Ir, Rf, Fe 5.60 m, Sm, Cy, 15 mm 5.65-5.73 m, 3xJt, 5 Deg., Ir, Rf, Fe, Cy 5.84 m, Sm, Cy, 30 mm 5.92 m, Sm, Cy, 20 mm

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW | Project / STS No.: 17772/8146B | **BOREHOLE NO.: BH 8**

Project: Eveleigh Street, Redfern | Date: 13, July 2010

Location: Refer to Drawing No: 10/0811 | Logged: JH | Checked By: LWI | Sheet 3 of 4

DRILLING				MATERIAL STRENGTH										DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)		
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORING		100%	7.0	SHALE: brownish grey with orange staining along joints and fractures	HW										6.04-6.13 m, Numerous Jt, 0-90 Deg., Ir, Rf, Fe 6.24 m, Pt, Pl, Sm, Cl 6.33 m, Jt, 40 Deg., Ir, Rf, Cl 6.44 m, Pt, 0 Deg., Ir, Rf, Cy 6.50 m, Jt, 30 Deg., Pl, Sm, Cl 6.60-7.05 m, Numerous Jt, 0-90 Deg., Ir, Pl, Rf, Cl 7.08 m, Sm, Cy, 20mm 7.10-9.0 m, Numerous Jt & Pt, 0-20 Deg., Ir, Rf, Cy, Cl
		100%	8.0	SHALE: dark grey	MW										
		100%	9.0		FR										9.10 m, Pt, 0 Deg., Ir, Rf, Cl 9.11 m, Jt, 45 Deg., Ir, Rf, Cl 9.13 m, Pt, 0 Deg., Ir, Rf, Cl 9.29 m, Jt, 0 Deg., Ir, Rf, Cl 9.48 m, Pt 0 Deg., Pl, Sm, Cl 9.75 m, Pt, 0 Deg., Pl, Sm, Cl
		100%	10.0												10.26 m, 2xJt, 35 Deg., Ir, Rf, Cl 10.27 m, Pt, 0 Deg., Pl, Sm, Cl 10.76-10.88 m, Numerous, Pt, Jt, 0 Deg., Ir, Rf, Cl 10.90 m, Jt, 90 Deg., Un, Rf, Cl
			11.0												11.08-11.20 m, Cz, Ir, Rf 11.28 m, Pt, Pl, Sm 11.53 m, Pt, 0 Deg., Ir, Rf, Cl 11.55 m, Pt, 0 Deg., Ir, Rf, Cl 11.58-11.70 m, 5 x Jt, 0 Deg., Ir, Rf, Cy 11.62 m, Jt, 0 Deg., Ir, Rf, Cl 11.88 m, Jt, 0 Deg., Ir, Rf, Cl 11.92 m, Jt, 90 Deg., Tight
			12.0	SANDSTONE: light grey, fine to coarse grained											

Notes:

Contractor: Terratest

Equipment: Hydro Power

Hole Diameter (mm): 100

Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date : 15, July 2010
Logged: JH — Checked By: LWI

BOREHOLE NO.: BH 8
Sheet 4 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
N M L C CORING		100%	13.0	SANDSTONE: light grey, fine to coarse grained	FR											12.96-13.02 m, Sm, Cy, 60 mm 13.24 m, 2xJt, 5 Deg., Ir, Rf, Cl 13.31 m, Pt, 5 Deg., Ir, Rf, Cl
			14.0													13.96 m, Jt, 10 Deg., Ir, Rf, Cy
			15.0													14.70 m, Pt, 0 Deg., Ir, Rf, Cy 14.73 m, Pt, 0 Deg. Ir, Rf, Cy
				BOREHOLE DISCONTINUED AT 15.0 M												
			16.0													
			17.0													
			18.0													

Notes:

Contractor: Terratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street,
Redfern
Project No. 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 15/07/2010
Borehole No. 8
Depth (m): Start 5.20m - 10.00m
Box 1 of 2
SMEC
Testing
Services
17772 BH8 Start
Eveleigh St. Redfern 5.20 m
6
7
8
9


Project: Eveleigh Street
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 15/07/2010
Borehole No: 8
Depth (m): 10.00m - 15.00m End
Box 2 of 2
SMEC
Testing
Services
17772
10
BH 8
11
12
13
14

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 12, 2010
Logged: JH

BOREHOLE NO.: BH 9

Sheet 1 of 4

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to coarse sand and pebble and rubble FILL	SM	VERY LOOSE	M
	SPT 0.8-1.25 m 2, 3, 2 N=5	1.0	SAND: yellow brown, fine grained	SP	LOOSE	M
			SILTY CLAY: brown/orange brown, medium plasticity, scattered pebble	CL	FIRM	M
		2.0	SILTY CLAY: red brown, medium to high plasticity, scattered pebbles	CL-CH	STIFF	M
	SPT 2.3-2.75 m 5, 8, 11 N=19		SILTY CLAY: light grey with red brown, medium to high plasticity RESIDUAL	CL-CH	VERY STIFF	M
		3.0	SHALE: light grey and brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
			V BIT REFUSAL AT 3.5 M			
		4.0	FOR CORE LOG DETAILS REFER TO CORE LOG SHEETS			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Client: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811

Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 9
Sheet 2 of 4

DRILLING				MATERIAL STRENGTH										DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)		
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000	Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
HW CASING			1.0 2.0 3.0	For non core log details refer to non core log sheets Start coring at 3.50 m											
NMLC CORING		34.50%	4.0 5.0 6.0	SHALE: red brown and grey, exhibiting soil like properties	CW										3.5-3.95 m, Sm, Cy, 450 mm 4.06 m, Jt, 0 Deg., Ir, Rf, Cy 4.16 m, Jt, 0 Deg., Ir, Rf, Cy
				NO CORE - 4.18 - 5.47 m											5.47- 5.52 m, Cz, Fe
				LAMINITE: interlaminated grey brown shale, light grey very fine grained sandstone, friable	CW/ HW										5.57 m, Sm, Cy, 30 mm 5.68 m, Jt, 45 Deg., Ir, Rf, Fe, Cy 5.80-5.90 m, Sm, Cy, 100 mm 5.95 m, Jt, 30 Deg., Ir, Rf, Fe, Cy

Notes:

Contractor: Terratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Cyient: Deicorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No: 10/0811
Project / STS No.: 17772/8146B
Date: 13, July 2010
Logged: JH
Checked By: LWI

BOREHOLE NO.: BH 9
Sheet 3 of 4

DRILLING				MATERIAL STRENGTH											DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)			
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000		Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORING		100%		LAMINITE: interlaminated grey brown shale, light grey very fine grained sandstone, friable	CW HW											6.06 m, Jt, 0 Deg., Ir, Rf, Cy 6.20 m, Jt, 5 Deg., Ir, Rf, Fe, Cy 6.25 m, 2xJt, 45 Deg., Ir, Rf, Fe, Cy 6.38 m, Jt, 30 Deg., Ir, Rf, Fe 6.45 m, Jt, 50 Deg., Ir, Rf, Fe
				No Core 6.60-6.70 m												6.70-6.77 m, Cz, Ir, Fe, Cy
		91.5	7.0	LAMINITE: interlaminated, red grey brown shale and and light grey very fine grained sandstone friable	CW/ HW											6.81 m, Jt, 5 Deg., Ir, Rf, Fe, Cy 6.88 m, Jt, 5 Deg., Ir, Rf, Fe, Cy 6.96 m, Jt, 30 Deg., Ir, Rf, Fe, Cy 7.04 m, 2xJt, 20 Deg., Ir, Rf, Fe, Cy
				LAMINITE: interlaminated, dark grey shale and light grey sandstone, lamination at 45 Degrees	HW											7.15-7.40 m, Numerous, Jt, 0-45 Deg., Cz, Rf, Fe 7.67 m, Pt, 45 Deg., Pl, Rf, Cy
		100%	8.0	SHALE: dark grey, friable core jamming in slips and breaking apart on removal	HW/ MW											7.77-9.15 m, Friable shale, Numerous Jt & Pt and drill induced breaks 9.15-9.29 m, Sm, Cy, 140 mm 9.36 m, Jt, 0 Deg., Ir, Rf, Cy 9.41-9.44 m, Jt, 0-15 Deg., Ir, Rf, Cy 9.44-9.91 m, Sm, Cy, 570 mm
		100%	10.0	SHALE: dark grey with scattered very thin laminations	FR											9.91-10.16 m, Numerous, Pt, 0 Deg., Ir, Rf 10.25 m, Pt, 0 Deg., Pl, Sm, Cy 10.32 m, Pt, 0 Deg., Pl, Sm, Cy 10.39 m, Jt, 0 Deg., Ir, Rf, Cy 10.46 m, Jt, 0 Deg., Pl, Rf, Cy 10.50 m, Jt, 45 Deg., Pl, Sm, Cy 10.56 m, Jt, 50 Deg., Ir, Rf, Cy 10.61 m, Pt, 0 Deg., Pl, Sm, Cy 10.64 m, Pt, 0 Deg., Pl, Sm, Cy 10.72 m, Jt, 0 Deg., Ir, Rf, Cy 10.77 m, Jt, 0 Deg., Ir, Rf, Cy 10.89 m, Jt, 0-80 Deg., Ir, Rf, Cy 11.09-11.12 m, Jt, 0-60 Deg., Ir, Rf, Cy 11.20-11.43 m, Numerous, Jt, 0-90 Deg., Ir, Rf, Cy 11.51 m, Pt, 0 Deg., Pl, Sm, Cy 11.56 m, Pt, 0 Deg., Pl, Sm, Cy 11.62 m, Pt, 0 Deg., Pl, Sm, Cy
			11.0													
			12.0													

Notes:

Contractor: Terratest
Equipment: Edson 3000
Hole Diameter (mm): 100
Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols

SMEC Testing Services Pty Ltd — **GEOTECHNICAL LOG - CORED BOREHOLE**

Cyient: Deicorp NSW | Project / STS No.: 17772/8146B | **BOREHOLE NO.: BH 9**

Project: Eveleigh Street, Redfern | Date: 13, July 2010

Location: Refer to Drawing No: 10/0811 | Logged: JH | Checked By: LWI | Sheet 4 of 4

DRILLING				MATERIAL STRENGTH												DISCONTINUITIES	
						Estimated Rock Strength							Joint Spacing (mm)				
Method	Water	Recovery	Depth (m)	Rock Type (Colour, Grain Size, Structure & Minor Components)	Weathering	Extremely Low	Very Low	Low	Medium	High	Very High	Extremely High	20 40 100 300 1000			Visual	Additional Data (Joints, partings, seams, zones etc. Description, orientation, infilling, or coating, shape, roughness, thickness, other)
NMLC CORING			13.0	SHALE: dark grey with scattered, very thin laminations	FR												12.51 m, Pt, 0 Deg., PL, Sm, Cy 12.6 m, Pt, 0 Deg., PL, Sm, Cy
			14.0														14.26 m, Jt, 15 Deg., Ir, Rf, Cy 14.34 m, Jt, 45 Deg., Ir, Rf, Cy 14.59 m, Jt, 0 Deg., Ir, Rf, Cy 14.78 m, Jt, 30 Deg., Un, Rf, Cy 14.87 m, Jt, 5 Deg., Un, Rf, Cy 14.90 m, Jt, 5 Deg., Un, Rf, Cy
			15.0														14.94 m, Jt, 0 Deg., Ir, Rf, Cy
				BOREHOLE DISCONTINUED AT 15.0 M													
			16.0														
			17.0														
			18.0														

Notes:

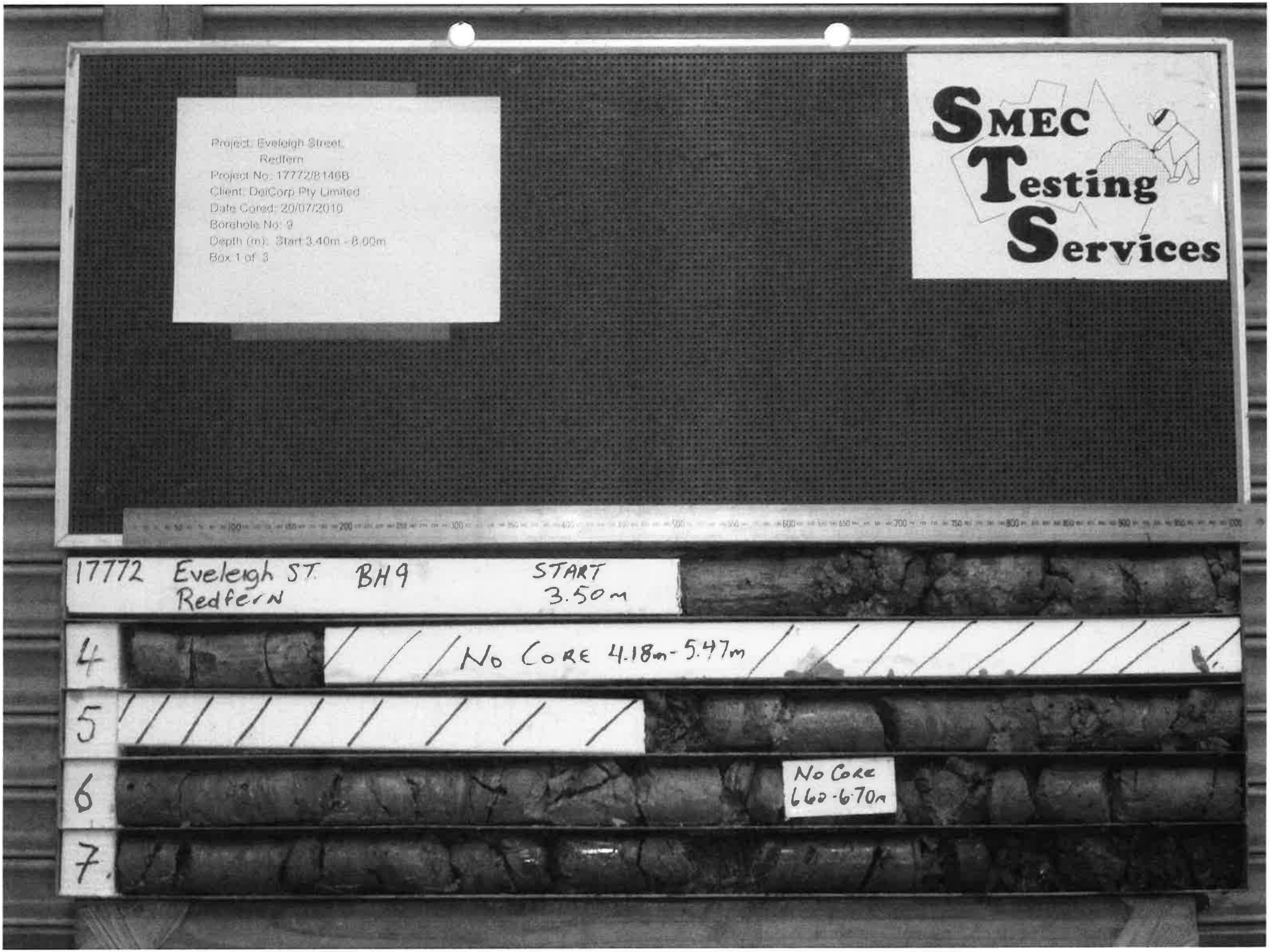
Contractor: Terratest

Equipment: Edson 3000

Hole Diameter (mm): 100

Angle from Vertical (°): 0

See explanation sheets for meaning of all descriptive terms and symbols


Project: Eveleigh Street
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 20/07/2010
Borehole No: 9
Depth (m): Start 3.40m - 8.00m
Box 1 of 3
SMEC Testing Services
17772 Eveleigh ST BH9
Redfern
START
3.50m
4
No Core 4.18m-5.47m
5
6
No Core
6.60-6.70m
7.


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 20/07/2010
Borehole No: 9
Depth (m): 8.00m - 13.00m
Box 2 of 3
SMEC
Testing
Services
17772
8
BH9
9
10
11
12


Project: Eveleigh Street,
Redfern
Project No: 17772/8146B
Client: DeiCorp Pty Limited
Date Cored: 20/07/2010
Borehole No: 9
Depth (m): 13.00m - 15.00m End
Box 3 of 3
SMEC
Testing
Services
17772
13
BH9
14
BH9
EN9 1500

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 12, 2010
Logged: JH

BOREHOLE NO.: BH 10

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to coarse sand, pebble and rubble FILL	SM	VERY LOOSE	M
	B		SAND: dark brown, fine grained sand, trace of fines	SP	LOOSE	M
		1.0	SAND: light grey with brown, fine grained sand	SP	LOOSE	M
		2.0	CLAYEY SILTY SAND: brown, fine to medium grained sand	SM	STIFF	M
		3.0	SILTY CLAY: brown/orange brown, medium plasticity, trace of fine sand	CL	VERY STIFF	M
		4.0	SILTY CLAY: light grey with red brown, medium to high plasticity, scattered ironstone gravel	CL-CH	HARD	M
		5.0	SHALE: light grey and brown, completely to highly weathered, bands of ironstone and clay		EXTREMELY LOW STRENGTH	
			AUGER REFUSAL AT 5.9 M			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 19, 2010
Logged: JH

BOREHOLE NO.: BH 11

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to coarse grained sand, trace of fine gravel and rubble FILL	SM	VERY LOOSE	M
		1.0	SAND: yellow brown, fine grained	SP	LOOSE TO MEDIUM DENSE	M
		2.0	SILTY CLAY: brown/red brown, medium plasticity, scattered pebbles	CL	STIFF VERY STIFF	M
		3.0	SILTY CLAY: red brown with grey medium to high plasticity, trace of ironstone gravel	CL-CH	VERY STIFF TO HARD	M
		4.0	SILTY CLAY: light grey with red brown, medium to high plasticity	CL-CH	HARD	M
			SHALE: grey high to moderately weathered		EXTREMELY LOW STRENGTH	
		5.0	AUGER REFUSAL AT 4.6 M			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 19, 2010
Logged: JH

BOREHOLE NO.: BH 12

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to medium grained sand TOPSOIL/FILL	SM		M
	B		SAND: yellow brown, fine grained, some fines	SP	MEDIUM DENSE	M
		1.0				
			SILTY CLAY: red brown with grey, medium to high plasticity, trace of fine sand	CL-CH	VERY STIFF	M
		2.0				
			SILTY CLAY: light grey with RED brown, medium to high plasticity	CL-CH	VERY STIFF	M
		3.0				
		4.0				
			SHALE: grey brown, completely to highly weathered		EXTREMELY LOW STRENGTH	
WT			SHALE: grey, moderately weathered		EXTREMELY LOW STRENGTH	
		5.0				
			AUGER REFUSAL AT 5.5 M STANDPIPE PIEZOMETER INSTALLED			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Hydro Power
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date: July 15, 2010
Logged: JH

BOREHOLE NO.: BH 13

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to medium grained sand, scattered pebble and bricks	SM	LOOSE	M
			FILL			
			SAND: light grey, fine grained, trace of fines	SP	MEDIUM DENSE	M
		1.0				
			SANDY CLAY: light grey and orange brown, fine grained sand	SC-CL	FIRM	VM
		2.0				
			SILTY CLAY: red brown, medium to high plasticity	CL-CH	VERY STIFF	M
					HARD	
		3.0	SILTY CLAY: light grey with red brown, medium to high plasticity	CL-CH	HARD	M
		4.0				
			SHALE: light grey, completely to highly weathered		EXTREMELY LOW STRENGTH	
			SHALE: greyish brown, moderately weathered		EXTREMELY LOW STRENGTH	
		5.0				
			AUGER REFUSAL AT 5.6 M			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: Teratest
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 15, 2010JH
Logged:

BOREHOLE NO.: BH 14

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S6 @ 0.3 m		GRAVELLY SAND: black, fine to coarse grained sand, fine gravel, rubbish and ash	SM	MEDIUM DENSE	M
	S7 @ 0.7 m		FILL			
		1.0	SAND: black/grey, fine grained, some fines	SP	MEDIUM DENSE	M
	S8 @ 1.7 m		CLAYEY SAND: brown with orange brown, fine grained sand, low plasticity	SM-SC	MEDIUM DENSE	M
		2.0				
	S9 @ 2.6 m		SILTY CLAY: mottled light grey and yellow brown, medium to high plasticity	CL-CH	VERY STIFF	M
		3.0				
			SHALE: grey (completely to highly weathered)		EXTREMELY LOW STRENGTH	
		4.0				
	S10 @ 4.6 m					
			AUGER REFUSAL AT 4.7 M			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 14, 2010
Logged: JH

BOREHOLE NO.: BH 15

Sheet 1 of 2

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to coarse sand, scattered pebble, brick and concrete FILL	SM	LOOSE	M
		1.0	CLAYEY SAND: orange brown, fine to medium grained sand, low plasticity	SM-SC	LOOSE	M-VM
			SANDY CLAY: orange brown, fine to medium grained sand, low plasticity	SC-CL	FIRM	M-VM
		2.0	SILTY CLAY: light grey, high plasticity	CH	STIFF	M
		3.0			VERY STIFF	
			SILTY CLAY: light grey with red brown, medium to high plasticity RESIDUAL	CL-CH	HARD	M
		4.0	SHALE: light grey and brown, completely weathered		EXTREMELY LOW STRENGTH	
		5.0	SHALE: greyish brown, highly to moderately weathered			

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW	Project No.: 17772/8146B	**BOREHOLE NO.: BH 15**
Project: Eveleigh Street, Redfern	Date : July 14, 2010	Sheet 2 of 2
Location: Refer to Drawing No. 10/0811	Logged: JH	

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SHALE: greyish brown, high to moderately weathered		EXTREMELY LOW STRENGTH	
			AUGER REFUSAL AT 6.5 M			
		7.0				
		8.0				
		9.0				
		10.0				
		11.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 14, 2010
Logged: JH

BOREHOLE NO.: BH 16

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
	S1 @ 0.2 m		SILTY SAND: dark brown, fine grained, scattered pebbles FILL	SM	STIFF	M
	S2 @ 0.6 m	1.0	SAND: light brown, fine grained, trace of fines	SP	MEDIUM DENSE	M
	S3 @ 1.9 m	2.0	SILTY CLAY: yellow brown with red and grey, medium to high plasticity	CL-CH	VERY STIFF	M
	S4 @ 2.6 m	3.0	SILTY CLAY: mottled light grey and red brown, high plasticity	CH	HARD	M
	S5 @ 3.9 m		SHALE: red brown with grey, completely weathered		EXTREMELY LOW STRENGTH	
		4.0	AUGER REFUSAL AT 3.9 M			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 14, 2010
Logged: JH

BOREHOLE NO.: BH 17

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to medium grained sand, pieces of crushed brick FILL	SM	LOOSE	M
		1.0	SAND: brown, fine to coarse grained, some fines	SP	LOOSE TO MEDIUM DENSE	M
		2.0	SAND: light brown, fine grained sand	SP	MEDIUM DENSE	M
			SILTY CLAYEY SAND: brown, fine grained sand, low plasticity	SC	FIRM	M-VM
			SILTY CLAY: red brown, medium to high plasticity, trace of fine to coarse sand	CL-CH	STIFF	M
		3.0	SILTY CLAY: red brown and light grey, medium to high plasticity, scattered ironstone gravel	CL-CH	VERY STIFF	M
		4.0	SHALE: light grey completely to highly weathered bands of ironstone and grey clay		EXTREMELY LOW STRENGTH	
		5.0	SHALE: grey highly to moderately weathered, AUGER REFUSAL AT 6.0 M		EXTREMELY LOW STRENGTH	

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 14, 2010
Logged: JH

BOREHOLE NO.: BH 18

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SILTY SAND: dark brown, fine to coarse grained sandstone, pebble and bricks FILL	SM	LOOSE	M
		1.0	SAND: light brown, fine grained, traces of fines	SP	MEDIUM DENSE	M
			CLAYEY SAND: brown/yellow brown, fine to medium grained sand, low plasticity	SC	STIFF	M
			SILTY CLAY: red brown with grey, medium to high plasticity	CL-CH	STIFF TO VERY STIFF	M
		2.0	SILTY CLAY; mottled light grey and red brown, high plasticity	CL-CH	VERY STIFF	M
			SILTY CLAY; light grey, completely weathered bands of red brown ironstone RESIDUAL	CL-CH	HARD	M
		3.0	SHALE: red brown and grey, completely to highly weathered		EXTREMELY LOW STRENGTH	
		4.0	AUGER REFUSAL AT 4.3 M			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date : July 14, 2010
Logged: JH

BOREHOLE NO.: BH 19

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			GRAVELLY SAND: brown and red brown, fine to coarse sand, fine grained brick	SM	LOOSE TO MEDIUM DENSE	M
			FILL			
		1.0				
			SILTY CLAY: medium brown with light grey, medium plasticity	CL	STIFF	M-VM
		2.0				
			Bands of ironstone gravel		HARD	
			SHALE: light grey, with red brown, completely weathered bands of ironstone gravel		EXTREMELY LOW STRENGTH	
		3.0				
		4.0				
			SHALE: grey with red brown, moderately weathered			
			AUGER REFUSAL AT 4.8			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd

GEOTECHNICAL LOG - NON CORE BOREHOLE

Client: DeiCorp NSW
Project: Eveleigh Street, Redfern
Location: Refer to Drawing No. 10/0811

Project No.: 17772/8146B
Date: July 14, 2010
Logged: JH

BOREHOLE NO.: BH 20

Sheet 1 of 1

WATER TABLE	SAMPLES	DEPTH (m)	DESCRIPTION OF DRILLED PRODUCT (Soil type, colour, grain size, plasticity, minor components, observations)	SYMBOL	CONSISTENCY (cohesive soils) or RELATIVE DENSITY (sands and gravels)	MOISTURE
			SANDY SILTY CLAY: dark brown, fine to coarse sand, some gravel FILL	CL	VERY LOOSE	M
			GRAVELLY SILTY SAND: fine to coarse grained sand, some fines, fine gravel FILL	SM	MEDIUM DENSE	M
		1.0	SILTY CLAY: orange brown with grey medium plasticity, trace of fine sand	CL	FIRM	M
			SILTY CLAY: light grey with red brown, medium to high plasticity	CL-CH	FIRM	M
		2.0	SHALE: light grey/grey with red brown, completely weathered bands of ironstone	CL-CH	STIFF	M
			silty clay with red brown medium to high plasticity RESIDUAL			
			SHALE: light grey and brown, highly weathered		EXTREMELY LOW STRENGTH	
		3.0				
			SHALE: grey, moderately weathered		EXTREMELY LOW STRENGTH	
		4.0	AUGER REFUSAL AT 3.9 M			
		5.0				

NOTES: D - disturbed sample U - undisturbed tube sample B - bulk sample
WT - level of water table or free water N - Standard Penetration Test (SPT)

See explanation sheets for meaning of all descriptive terms and symbols

Contractor: STS
Equipment: Christie
Hole Diameter (mm): 100
Angle from Vertical (°) 0

SMEC Testing Services Pty Ltd
14/1 Cowpasture Place, Wetherill Park NSW 2164
Phone: (02)9756 2166 Fax: (02)9756 1137 Email: smectesting@pacific.net.au

Dynamic Cone Penetrometer Test Report

Project: EVELEIGH STREET, REDFERN
Client: DEICORP NSW
Address: 140-152 New Canterbury Road, Petersham
Test Method: AS 1289.6.3.2

Project No.: 17772/8146B
Report No.: 10/0811
Report Date: July 15, 2010

Site No.	P9	P10	P11	P12					
Location	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811					
Starting Level	Surface Level	Surface Level	Surface Level	Surface Level					
Depth (m)	Penetration Resistance (blows / 150mm)				Depth (m)	Penetration Resistance (blows / 150mm)			
0.00 - 0.15		2	4	2	3.00 - 3.15				
0.15 - 0.30		2	7	4	3.15 - 3.30				
0.30 - 0.45		3	9	4	3.30 - 3.45				
0.45 - 0.60		4	5	3	3.45 - 3.60				
0.60 - 0.75		4	5	4	3.60 - 3.75				
0.75 - 0.90		3	4	6	3.75 - 3.90				
0.90 - 1.05		1	5	8	3.90 - 4.05				
1.05 - 1.20		1	5	9	4.05 - 4.20				
1.20 - 1.35		1	7	11	4.20 - 4.35				
1.35 - 1.50		3	5	9	4.35 - 4.50				
1.50 - 1.65		7	6	5	4.50 - 4.65				
1.65 - 1.80		7	7	8	4.65 - 4.80				
1.80 - 1.95		5	10	10	4.80 - 4.95				
1.95 - 2.10		4	13	15	4.95 - 5.10				
2.10 - 2.25		7	20	20	5.10 - 5.25				
2.25 - 2.40		12	27	20R	5.25 - 5.40				
2.40 - 2.55		20	D		5.40 - 5.55				
2.55 - 2.70		27			5.55 - 5.70				
2.70 - 2.85		D			5.70 - 5.85				
2.85 - 3.00					5.85 - 6.00				

Remarks: * = Pre-drilled hole prior to testing

Approved Signatory..

Technician: JH

Laurie Ihnativ - Manager

SMEC Testing Services Pty Ltd
14/1 Cowpasture Place, Wetherill Park NSW 2164
Phone: (02)9756 2166 Fax: (02)9756 1137 Email: smectesting@pacific.net.au

Dynamic Cone Penetrometer Test Report

Project: EVELEIGH STREET, REDFERN
Client: DEICORP NSW
Address: 140-152 New Canterbury Road, Petersham
Test Method: AS 1289.6.3.2

Project No.: 17772/8146B
Report No.: 10/0811
Report Date: July 15, 2010

Site No.	P13	P14	P15	P16			P14		
Location	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811			Refer to Drawing No. 10/0811		
Starting Level	Surface Level	Surface Level	Surface Level	Surface Level					
Depth (m)	Penetration Resistance (blows / 150mm)				Depth (m)	Penetration Resistance (blows / 150mm)			
0.00 - 0.15	2	3	2	4	3.00 - 3.15		12		
0.15 - 0.30	3	6	4	8	3.15 - 3.30		16		
0.30 - 0.45	9	10	2	14	3.30 - 3.45		16		
0.45 - 0.60	13	10	1	17	3.45 - 3.60		21		
0.60 - 0.75	7	7	2	8	3.60 - 3.75		27		
0.75 - 0.90	7	5	1	9	3.75 - 3.90		D		
0.90 - 1.05	5	5	1	7	3.90 - 4.05				
1.05 - 1.20	3	4	1	4	4.05 - 4.20				
1.20 - 1.35	3	3	3	3	4.20 - 4.35				
1.35 - 1.50	3	7	4	6	4.35 - 4.50				
1.50 - 1.65	4	4	7	5	4.50 - 4.65				
1.65 - 1.80	5	4	10	8	4.65 - 4.80				
1.80 - 1.95	9	4	13	20	4.80 - 4.95				
1.95 - 2.10	11	4	20	25	4.95 - 5.10				
2.10 - 2.25	16	4	16/R	D	5.10 - 5.25				
2.25 - 2.40	20	6			5.25 - 5.40				
2.40 - 2.55	24	8			5.40 - 5.55				
2.55 - 2.70	D	12			5.55 - 5.70				
2.70 - 2.85		11			5.70 - 5.85				
2.85 - 3.00		13			5.85 - 6.00				

Remarks: * = Pre-drilled hole prior to testing

Approved Signatory..

Technician: JH

Laurie Ihnativ - Manager

SMEC Testing Services Pty Ltd
14/1 Cowpasture Place, Wetherill Park NSW 2164
Phone: (02)9756 2166 Fax: (02)9756 1137 Email: smectesting@pacific.net.au

Dynamic Cone Penetrometer Test Report

Project: EVELEIGH STREET, REDFERN
Client: DEICORP NSW
Address: 140-152 New Canterbury Road, Petersham
Test Method: AS 1289.6.3.2

Project No.: 17772/8146B
Report No.: 10/0811
Report Date: July 15, 2010

Site No.	P17	P18	P19	P20		P17			
Location	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811	Refer to Drawing No. 10/0811		Refer to Drawing No. 10/0811			
Starting Level	Surface Level	Surface Level	Surface Level	Surface Level					
Depth (m)	Penetration Resistance (blows / 150mm)				Depth (m)	Penetration Resistance (blows / 150mm)			
0.00 - 0.15	2	1	1	0.5	3.00 - 3.15	D			
0.15 - 0.30	4	3	1	0.5	3.15 - 3.30				
0.30 - 0.45	5	5	5	8	3.30 - 3.45				
0.45 - 0.60	8	9	6	16	3.45 - 3.60				
0.60 - 0.75	10	6	2	6	3.60 - 3.75				
0.75 - 0.90	5	8	6	4	3.75 - 3.90				
0.90 - 1.05	5	7	8	4	3.90 - 4.05				
1.05 - 1.20	6	7	20	4	4.05 - 4.20				
1.20 - 1.35	6	7	9	5	4.20 - 4.35				
1.35 - 1.50	6	9	7	5	4.35 - 4.50				
1.50 - 1.65	6	9	9	5	4.50 - 4.65				
1.65 - 1.80	6	10	5	7	4.65 - 4.80				
1.80 - 1.95	4	12	6	10	4.80 - 4.95				
1.95 - 2.10	4	13	8	17	4.95 - 5.10				
2.10 - 2.25	4	15	8	20	5.10 - 5.25				
2.25 - 2.40	7	17/R	9	24	5.25 - 5.40				
2.40 - 2.55	9		22	D	5.40 - 5.55				
2.55 - 2.70	9		D		5.55 - 5.70				
2.70 - 2.85	14				5.70 - 5.85				
2.85 - 3.00	23				5.85 - 6.00				

Remarks: * = Pre-drilled hole prior to testing

Approved Signatory..

Technician: JH

Laurie Ihnativ - Manager

E1. CLASSIFICATION OF SOILS

E1.1 Soil Classification and the Unified System

An assessment of the site conditions usually includes an appraisal of the data available by combining values of engineering properties obtained by the site investigation with descriptions, from visual observation of the materials present on site.

The system used by SMEC in the identification of soil is the Unified Soil Classification system (USC) which was developed by the US Army Corps of Engineers during World War II and has since gained international acceptance and has been adopted in its metricated form by the Standards Association of Australia.

The Australian Site Investigation Code (AS1726-1981, Appendix D) recommends that the description of a soil includes the USC group symbols which are an integral component of the system.

The soil description should contain the following information in order:

Soil composition

- SOIL NAME and USC classification symbol (IN BLOCK LETTERS)
- plasticity or particle characteristics
- colour
- secondary and minor constituents (name estimated proportion, plasticity or particle characteristics, colour

Soil condition

- moisture condition
- consistency or density index

Soil structure

- structure (zoning, defects, cementing)

Soil origin

interpretation based on observation eg FILL, TOPSOIL, RESIDUAL, ALLUVIUM.

E1.2 Soil Composition

(a) Soil Name and Classification Symbol

The USC system is summarized in Figure E1.2.1. The primary division separates soil types on the basis of particle size into:

- Coarse grained soils - more than 50% of the material less than 60 mm is larger than 0.06 mm (60 μm).
- Fine grained soils - more than 50% of the material less than 60 mm is smaller than 0.06 mm (60 μm).

Initial classification is by particle size as shown in Table E1.2.1. Further classification of fine grained soils is based on plasticity.

TABLE E1.2.1 - CLASSIFICATION BY PARTICLE SIZE

NAME	SUB-DIVISION	SIZE
Clay (1)		< 2 μm
Silt (2)		2 μm to 60 μm
Sand	Fine Medium Coarse	60 μm to 200 μm 200 μm to 600 μm 600 μm to 2 mm
Gravel (3)	Fine Medium Coarse	2 mm to 6 mm 6 mm to 20 mm 20 mm to 60 mm
Cobbles (3)		60 mm to 200 mm
Boulders (3)		> 200 mm

Where a soil contains an appropriate amount of secondary material, the name includes each of the secondary components (greater than 12%) in increasing order of significance, eg sandy silty clay.

Minor components of a soil are included in the description by means of the terms "some" and "trace" as defined in Table E1.2.2.

TABLE E1.2.2 - MINOR SOIL COMPONENTS

TERM	DESCRIPTION	APPROXIMATE PROPORTION (%)
Trace	presence just detectable, little or no influence on soil properties	0-5
Some	presence easily detectable, little influence on soil properties	5-12

The USC group symbols should be included with each soil description as shown in Table E1.2.3

TABLE E1.2.3 - SOIL GROUP SYMBOLS

SOIL TYPE	PREFIX
Gravel	G
Sand	S
Silt	M
Clay	C
Organic	O
Peat	Pt

The group symbols are combined with qualifiers which indicate grading, plasticity or secondary components as shown on Table E1.2.4

TABLE E1.2.4 - SOIL GROUP QUALIFIERS

SUBGROUP	SUFFIX
Well graded	W
Poorly Graded	P
Silty	M
Clayey	C
Liquid Limit <50% - low to medium plasticity	L
Liquid Limit >50% - low to medium plasticity	H

(b) Grading

"Well graded" Good representation of all particle sizes from the largest to the smallest.

"Poorly graded" One or more intermediate sizes poorly represented

"Gap graded" One or more intermediate sizes absent

"Uniformly graded" Essentially single size material.

(c) Particle shape and texture

The shape and surface texture of the coarse grained particles should be described.

Angularity may be expressed as "rounded", "sub-rounded", "sub-angular" or "angular".

Particle **form** can be "equidimensional", "flat" or elongate".

Surface texture can be "glassy", "smooth", "rough", pitted" or striated".

(d) Colour

The colour of the soil should be described in the moist condition using simple terms such as:

Black White Grey Red
Brown Orange Yellow Green
Blue

These may be modified as necessary by "light" or "dark". Borderline colours may be described as a combination of two colours, eg. red-brown.

For soils that contain more than one colour terms such as:

- Speckled Very small (<10 mm dia) patches
- Mottled Irregular
- Blotched Large irregular (>75 mm dia)
- Streaked Randomly oriented streaks

(e) Minor Components

Secondary and minor components should be individually described in a similar manner to the dominant component.

E1.3 Soil Condition

(a) Moisture

Soil moisture condition is described as "dry", "moist" or "wet".

The moisture categories are defined as:
Dry (D) - Little or no moisture evident. Soils are running.
Moist (M) - Darkened in colour with cool feel. Granular soil particles tend to adhere. No free water evident upon remoulding of cohesive soils.

In addition the moisture content of cohesive soils can be estimated in relation to their liquid or plastic limit.

(b) Consistency

Estimates of the consistency of a clay or silt soil may be made from manual examination, hand penetrometer test, SPT results or from laboratory tests to determine undrained shear or unconfined compressive strengths. The classification of consistency is defined in Table E1.3.1.

TABLE E1.3.1 - CONSISTENCY OF FINE-GRAINED SOILS

TERM	UNCONFINED STRENGTH (kPa)	FIELD IDENTIFICATION
Very Soft	<25	Easily penetrated by fist. Sample exudes between fingers when squeezed in the fist.
Soft	25 – 50	Easily moulded in fingers. Easily penetrated 50 mm by thumb.
Firm	50 – 100	Can be moulded by strong pressure in the fingers. Penetrated only with great effort.
Stiff	100 – 200	Cannot be moulded in fingers. Indented by thumb but penetrated only with great effort.
Very Stiff	200 – 400	Very tough. Difficult to cut with knife. Readily indented with thumb nail.
Hard	>400	Brittle, can just be scratched with thumb nail. Tends to break into fragments.

Unconfined compressive strength as derived by a hand penetrometer can be taken as approximately double the undrained shear strength ($q_u = 2\ c_u$).

(c) Density Index

The insitu density index of granular soils can be assessed from the results of SPT or cone penetrometer tests. Density index should not be estimated visually.

TABLE E1.3.2 - DENSITY OF GRANULAR SOILS

TERM	SPT N VALUE	STATIC CONE VALUE q_c (MPa)	DENSITY INDEX (%)
Very Loose	0 – 3	0 - 2	0 - 15
Loose	3 – 8	2 - 5	15 - 35
Medium Dense	8 – 25	5 - 15	35 - 65
Dense	25 – 42	15 - 20	65 - 85
Very Dense	>42	>20	>85

E1.4 Soil Structure

(a) Zoning

A sample may consist of several zones differing in colour, grain size or other properties. Terms to classify these zones are:

Layer - continuous across exposure or sample
Lens - discontinuous with lenticular shape
Pocket - irregular inclusion
Each zone should be described, their distinguishing features, and the nature of the interzone boundaries.

(b) Defects

Defects which are present in the sample can include:

- fissures
- roots (containing organic matter)
- tubes (hollow)
- casts (infilled)

Defects should be described giving details of dimensions and frequency. Fissure orientation, planarity, surface condition and infilling should be noted. If there is a tendency to break into blocks, block dimensions should be recorded

E1.5 Soil Origin

Information which may be interpretative but which may contribute to the usefulness of the material description should be included. The most common interpreted feature is the origin of the soil. The assessment of the probable origin is based on the soil material description, soil structure and its relationship to other soil and rock materials.

Common terms used are:

"Residual Soil" - Material which appears to have been derived by weathering from the underlying rock. There is no evidence of transport.

"Colluvium" - Material which appears to have been transported from its original location. The method of movement is usually the combination of gravity and erosion.

"Landslide Debris" - An extreme form of colluvium where the soil has been transported by mass movement. The material is obviously distributed and contains distinct defects related to the slope failure.

"Alluvium" - Material which has been transported essentially by water. Usually associated with former stream activity.

"Fill" - Material which has been transported and placed by man. This can range from natural soils which have been placed in a controlled manner in engineering construction to dumped waste material. A description of the constituents should include an assessment of the method of placement.

E1.6 Fine Grained Soils

The physical properties of fine grained soils are dominated by silts and clays.

The definition of clay and silt soils is governed by their Atterberg Limits. Clay soils are characterised by the properties of cohesion and plasticity with cohesion defines as the ability to deform without rupture. Silts exhibit cohesion but have low plasticity or are non-plastic.

The field characteristics of clay soils include:

- dry lumps have appreciable dry strength and cannot be powdered
- volume changes occur with moisture content variation
- feels smooth when moist with a greasy appearance when cut.

The field characteristics of silt soils include:

- dry lumps have negligible dry strength and can be powdered easily
- dilatancy - an increase in volume due to shearing - is indicted by the presence of a shiny film of water after a hand sample is shaken. The water disappears upon remoulding. Very fine grained sands may also exhibit dilatancy.
- low plasticity index
- feels gritty to the teeth

E1.7 Organic Soils

Organic soils are distinguished from other soils by their appreciable content of vegetable matter, usually derived from plant remains.

The soil usually has a distinctive smell and low bulk density.

The USC system uses the symbol Pt for partly decomposed organic material. The O symbol is combined with suffixes "O" or "H" depending on plasticity.

Where roots or root fibres are present their frequency and the depth to which they are encountered should be recorded. The presence of roots or root fibres does not necessarily mean the material is an "organic material" by classification.

Coal and lignite should be described as such and not simply as organic matter.

E2 CLASSIFICATION OF ROCKS

E2.1 Uniform Rock Description

The aim of a rock description for engineering purposes is to give an indication of the expected engineering properties of the material.

In a similar manner to soil materials, the assessment of site conditions where rock is encountered has to be based on the use of a descriptive method which is uniform and repeatable. Description has to:

- provide a clear identification of the rock substance and its engineering properties, and
- include details of the features which affect the engineering properties of the rock mass.

There is no internationally accepted system for rock description but SMEC Testing Services Pty Ltd has adopted a method which incorporates terminology defined by common usage in the engineering geological profession. Most feature definitions are as recommended by the International Society of Rock Mechanics and by the Standards Association of Australia.

For uniform presentation the different features are described in order:

Rock Substance

- NAME (in block letters)
- Mineralogy
- Grain Size
- Colour
- Fabric
- Strength
- Weathering/Alteration

Rock Mass

- Defect type
- Defect orientation
- Defect features
- Defect spacing

E2.2 Rock Substance

(a) Rock name

Each rock type has a specific name which is based on:

- mineralogy
- grain size
- fabric
- origin

The only method of determining the precise rock name is by thin section petrography.

Field identification of rocks for engineering purposes should be based on the use of common, easily understood, simple, geological names. In many cases knowledge of the precise name is of little consequence in the assessment of site conditions. If required the "field name" can be qualified by reference to a petrographic report. Reference to local geological reports often provides information on the rock types which may be expected.

(b) Mineralogy

The rock description should include the identification of the prominent minerals. This identification is usually restricted to the more common minerals in medium and coarse grained rocks.

(c) Grain Size

Rock material descriptions should include general grouping of the size of the predominant mineral grains as defined in Table E2.2.1. The maximum size, or size range, of the larger mineral grains or rock fragments should be recorded.

TABLE E2.2.1. - GRAIN SIZE GROUPS

TERM	GRAIN SIZE (mm)
Very Coarse	>60
Coarse	2 - 60
Medium	0.06 - 2
Fine	0.002 - 0.06
Very Fine	<0.002
Glassy	

(d) Colour

The colour of the rock should be described in the moist condition using simple terms such as:

Black	White	Grey	Red
Brown	Orange	Yellow	Green
Blue			

These may be modified as necessary by "light" or "dark". Borderline colours may be described by a combination of two colours, eg: grey-blue.

(e) Fabric

The fabric of a rock includes all the features of texture and structure, though the term refers specifically to the arrangement of the constituent grains or crystals in a rock. The fabric can provide an indication of the mode of formation of the rock:

- in sedimentary rocks bedding indicates depositional conditions,
- in igneous rocks the texture indicates the rate of cooling, and
- in metamorphic rocks the foliation indicates the stress conditions

Descriptions of fabric should include structure orientation, either with reference to North and horizontal, or to a plane normal to the core axis.

Tables E2.2.2, E2.2.3 and E2.2.4 list common textural features of sedimentary, igneous and metamorphic rocks with the subdivision of stratification spacing in Table E2.2.5.

TABLE E2.2.2 - COMMON STRUCTURES IN IGNEOUS ROCKS

STRATIFICATION (Planar)	STRATIFICATION (Irregular)
Bedding	Washout
Cross Bedding	Slump Structure
Graded Bedding	Shale Breccia
Lamination	
Cross Lamination	

TABLE E2.2.3 - COMMON STRUCTURES IN IGNEOUS ROCKS

	FINE GRAINED ROCKS	COARSE GRAINED ROCKS
Uniform Grain Size	Massive	Massive
	Flow Banded	Granitic
	Vesicular	Pegmatitic
Different Grain Size	Porphyritic	Porphyritic

TABLE E.2.2.4 - COMMON STRUCTURES IN METAMORPHIC ROCKS

FINE GRAINED ROCKS	COARSE GRAINED ROCKS
Slatey Cleavage	Granoblastic
Spotted	Porphyroblastic
Hornsfelsic	Lincated
Foliated	Gneissic
Mylonitic	Mylonitic

TABLE E2.2.5 - STRATIFICATION SPACING

TERM	SEPARATION (mm)
Very Thickly Bedded	>2000
Thickly Bedded	600 - 2000
Medium Bedded	200 - 600
Thinly Bedded	60 - 200
Very Thinly Bedded	20 - 60
Laminated	6 - 20
Thinly Laminated	<6

(f) Strength

Substance strength is one of the most important engineering features of a rock and every description should include at least an estimate of the rock strength class of the material. This estimate can be calibrated by test results, either by Point Loan Strength Index or by Unconfined Compressive Strength.

The rock strength class in As 1726-1981 is defined by Point Loan Strength Index $I_s(50)$. The relationship between Point Loan and Unconfined Strength is commonly assumed to be about 20, but can range from 4 (in some carbonate rocks) to 40 (in some igneous rocks). It is necessary to confirm the relationship for each rock type and project. classification should be based on material at field moisture content, as some rocks give a significantly higher strength when tested dry.

Table E2.2.6 defines the rock strength classes, with indicative field tests listed in Table E2.2.7 which assist in classification when testing equipment is not available.

TABLE E2.2.6 - CLASSIFICATION OF ROCK STRENGTH

SYMBOL	TERM	POINT LOAD STRENGTH (MPa)	APPROX Qu (MPa)
EL	extremely low	<0.03	<1
VL	very low	0.03 - 0.1	1 - 3
L	low	0.1 - 0.3	3 - 10
M	medium	0.3 - 1	10 - 30
H	high	1 - 3	30 - 70
VH	very high	3 - 10	70 - 200
EH	extremely high	>10	>200

TABLE E2.2.7 - FIELD TESTS FOR ROCK STRENGTH CLASSIFICATION

STRENGTH CLASS	FIELD TEST
Extremely Low	Indented by thumb nail with difficulty
Very Low	Scratched by thumb nail
Low	Easily broken by hand or pared with a knife
Medium	Broken by hand or scraped with a knife
High	Broken in hand by firm hammer blows
Very High	Broken against solid object with several hammer blow
Extremely High	Difficult to break against solid object with several hammer blows

(g) Weathering/Alteration

In addition to the description of rock substance as examined, an assessment is required of the extent to which the original rock material has been affected by subsequent events. The usual processes are:

- Weathering - Decomposition due to the effect of surface or near surface activities
- Alteration - Chemical modification by the action of materials originating from within the mantle below.

The classification of weathering/alteration presented in Table E2.2.8 is based on the extent/degree to which the original rock substance has been affected. This classification has little engineering significance, as the properties of the rock as examined may bear no relationship to the properties of the fresh rock.

TABLE E2.2.8 - CLASSIFICATION OR ROCK WEATHERING/ALTERATION

TERMS	DEFINITION
Fresh (Fr)	Rock substance unaffected.
Fresh Stained (FR St)	Rock substance unaffected. Staining of defect surfaces.
Slightly (SW)	Partial staining or discolouration of rock substance.
Moderately (MW)	Staining or discolouration extends throughout the whole rock substance.
Highly (HW)	Rock substance partly decomposed.
Completely (CW)	Rock substance entirely decomposed.

E2.3 Rock Mass

The engineering properties of rock mass reflect the effect which the presence of defects has on the properties of the rock substance. Description of the rock mass properties consists of supplementing the description covered by Section E2.2 with data on the defects which are present.

(a) Defect type

The different defect types are described in Table E2.3.1.

(b) Defect orientation

Descriptions of defects should include orientation, either of individual fractures or of groups of fractures. Orientation should be with reference to North and horizontal, or to a plane normal to the core axis.

TABLE E2.3.1 - ROCK DEFECT TYPES

TYPE	SYMBOL	DESCRIPTION
Parting	Pt	A defect parallel or subparallel to a layered arrangement of mineral grains or micro-fractures which has caused planar anistrophy in the rock substance.
Joint	Jt	A defect across which the rock substance has little tensile strength and is not related to textural or structural features with the rock substance.
Sheared Zone	SZ	A zone with roughly parallel planar boundaries or rock substance containing closely spaced, often slickensided, joints.
Crushed Zone	CZ	A zone with roughly parallel planar boundaries of rock substance composed of disoriented, usually angular, fragments of rock.
Seam	Sm	A zone with roughly parallel boundaries infilled by soil or decomposed rock.

(c) Defect features

The character of a defect is described by its continuity, planarity, surface roughness, width, and infilling.

Continuity In outcrop the extent of a joint, bedding plane or similar defect both along and across the strike can be measured. In core, continuity measurement is restricted to defects nearly parallel to the core axis.

Planarity Described as "Planar", "Irregular", "Curved" or "Undulose".

Roughness Described as "Rough", "Smooth", "Polished" or "Slickensided".

Width Measured in millimetres normal to the plane of nthe defect

Infilling Described as "Clean", "Stained", "Veneer" (<1 mm) or "Infill" (>1 mm). The coating or infilling material should be identified.

(d) Defect spacing

The spacing of defects, particularly where they occur in parallel groups or sets, provides an indication of the rock block sizes which:

- have to be supported in the face or roof of an excavation
- will be produced by the excavation operation.

It is preferable to provide measured data but discontinuity spacing is grouped as shown in Table E2.3.2.

TABLE E2.3.2 - DISCONTINUITY SPACING

DESCRIPTION	SPACING (mm)
Extremely Widely Spaced	>6000
Very Widely Spaced	2000 - 6000
Widely Spaced	600 - 2000
Medium Spaced	200 - 600
Closely Spaced	60 - 200
Very Closely Spaced	20 - 60
Extremely Closely Spaced	<20

SMEC Testing Services

APPENDIX B

POINT LOAD & CBR TEST RESULTS

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Point Load Strength Index Report

Project: Eveleigh Street, Redfern — Project No.: 17772/8146B
Client: DeiCorp NSW — Report No.: 10/0828
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049 — Report Date: 21/07/2010
Test Method: AS4133.4.1 — Page: 1 of 7

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 13/07/2010
Borehole No. 1

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
10.92	D	0.427	SH	BE	M
10.92	A	0.602	SH	BE	M
11.30	A	0.825	SH	BE	M
11.83	A	0.798	SH	BE	M
12.43	D	0.438	SH	BE	M
12.43	A	0.800	SH	BE	M
13.17	A	1.125	SH	BE	M
14.05	D	0.512	SH	BE	M
14.05	A	1.002	SH	BE	M
14.95	A	1.441	SH	BE	M
15.18	D	0.632	SH	BE	M
15.18	A	1.857	SH	BE	M
16.46	D	0.652	SH	BE	M
16.46	A	1.544	SH	BE	M
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Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 13/07/2010
Borehole No. 1

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
17.45	D	1.416	SH	BE	M
17.45	A	1.694	SH	BE	M
18.25	D	1.396	SH	BE	M
18.25	A	2.839	SH	BE	M
19.67	D	1.036	SH	BE	M
19.67	A	1.212	SH	BE	M
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---	---	---	---	---	---
---	---	---	---	---	---
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STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
CR= CRYSTALLINE	C= CUBE		YS= CLAYSTONE
			IG= IGNEOUS

Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

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Point Load Strength Index Report

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Test Method: AS4133.4.1

Project No.: 17772/8146B
Report No.: 10/0828
Report Date: 21/07/2010

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 12/07/2010
Borehole No. 2

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
5.94	A	0.085	SH	BE	M
6.06	D	0.291	SH	BE	M
6.06	A	0.238	SH	BE	M
6.60	A	0.202	SH	BE	M
6.80	D	0.384	SH	BE	M
6.80	A	0.234	SH	BE	M
7.72	A	0.483	SH	BE	M
8.57	D	0.718	SH	BE	M
8.57	A	1.704	SH	BE	M
8.66	D	0.454	SH	BE	M
8.66	A	1.036	SH	BE	M
9.50	A	1.382	SH	BE	M
10.32	D	0.390	SH	BE	M
10.32	A	0.889	SH	BE	M
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Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 12/07/2010
Borehole No. 2

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
11.42	A	1.266	SH	BE	M
12.16	D	1.656	SH	BE	M
12.16	A	1.659	SH	BE	M
12.89	D	1.234	SH	BE	M
12.89	A	1.441	SH	BE	M
13.25	D	1.307	SH	BE	M
13.25	A	1.041	SH	BE	M
14.30	D	1.656	SH	BE	M
14.30	A	1.125	SH	BE	M
16.20	D	1.717	SH	BE	M
18.15	A	0.884	SH	BE	M
18.15	D	1.328	SH	BE	M
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---	---	---	---	---	---
---	---	---	---	---	---

STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
CR= CRYSTALLINE	C= CUBE		YS= CLAYSTONE
			IG= IGNEOUS

Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

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Point Load Strength Index Report

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Client: DeiCorp NSW — Report No.: 10/0828
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049 — Report Date: 21/07/2010
Test Method: AS4133.4.1 —

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 14/07/2010
Borehole No. 3

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
4.62	D	0.054	SH	BE	M
4.62	A	0.092	SH	BE	M
5.40	A	0.035	SH	BE	M
6.20	D	0.035	SH	BE	M
6.20	A	0.047	SH	BE	M
6.68	D	0.043	SH	BE	M
6.68	A	0.052	SH	BE	M
8.46	D	0.777	SH	BE	M
8.46	A	0.577	SH	BE	M
8.70	A	0.749	SH	BE	M
9.48	A	1.673	SH	BE	M
10.26	D	0.384	SH	BE	M
10.26	A	1.538	SH	BE	M
11.10	D	1.140	SH	BE	M
11.10	A	1.397	SH	BE	M

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 14/07/2010
Borehole No. 3

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
11.62	D	0.659	SH	BE	M
11.62	A	1.212	SH	BE	M
12.41	D	0.861	SH	BE	M
12.41	A	1.146	SH	BE	M
13.73	D	0.566	SH	BE	M
13.73	A	0.666	SH	BE	M
15.36	D	0.504	SH	BE	M
15.36	A	0.544	SH	BE	M
16.31	D	0.372	SH	BE	M
17.00	D	0.923	SH	BE	M
17.00	A	0.586	SH	BE	M
17.83	D	0.687	SS	BE	M
17.83	A	1.572	SS	BE	M
19.20	D	0.656	SS	BE	M
19.20	A	1.537	SS	BE	M

STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
CR= CRYSTALLINE	C= CUBE		YS= CLAYSTONE
			IG= IGNEOUS

Remarks:

Approved Signatory.....

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Client: DeiCorp NSW — Report No.: 10/0828
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049 — Report Date: 21/07/2010
Test Method: AS4133.4.1 — Page: 4 of 7

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 19/07/2010
Borehole No. 6

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
6.70	A	0.238	SH	BE	M
7.54	D	0.120	SH	BE	M
7.54	A	0.248	SH	BE	M
8.27	A	0.344	SH	BE	M
9.44	D	1.032	SH	BE	M
9.44	A	1.160	SH	BE	M
9.90	D	1.245	SH	BE	M
9.90	A	1.645	SH	BE	M
10.68	D	1.447	SH	BE	M
11.44	D	1.490	SH	BE	M
11.44	A	1.654	SH	BE	M
14.71	D	0.881	SH	BE	M
14.71	A	1.371	SH	BE	M
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Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 19/07/2010
Borehole No. 6

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
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STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
CR= CRYSTALLINE	C= CUBE		YS= CLAYSTONE
			IG= IGNEOUS

Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

SMEC Testing Services Pty Ltd
14/1 Cowpasture Place, Wetherill Park NSW 2164
Phone: (02)9756 2166 Fax: (02)9756 1137 Email: smectesting@pacific.net.au

Point Load Strength Index Report

Project: Eveleigh Street, Redfern
Client: DeiCorp NSW
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049
Test Method: AS4133.4.1

Project No.: 17772/8146B
Report No.: 10/0828
Report Date: 21/07/2010

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 16/07/2010
Borehole No. 7

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
9.18	D	0.054	SH	BE	M
9.18	A	0.069	SH	BE	M
9.92	D	0.446	SH	BE	M
9.92	A	0.674	SH	BE	M
10.30	D	0.993	SH	BE	M
11.05	D	0.850	SH	BE	M
11.05	A	0.743	SH	BE	M
12.05	D	0.753	SH	BE	M
12.05	A	0.722	SH	BE	M
12.66	D	0.862	SH	BE	M
12.66	A	0.771	SH	BE	M
14.04	D	0.970	SH	BE	M
14.04	A	1.208	SH	BE	M
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Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 16/07/2010
Borehole No. 7

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
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STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
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LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
CR= CRYSTALLINE	C= CUBE		YS= CLAYSTONE
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Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

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Point Load Strength Index Report

Project: Eveleigh Street, Redfern
Client: DeiCorp NSW
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049
Test Method: AS4133.4.1

Project No.: 17772/8146B
Report No.: 10/0828
Report Date: 21/07/2010

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 15/07/2010
Borehole No. 8

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
6.20	D	0.910	SH	BE	M
6.20	A	0.175	SH	BE	M
6.37	D	0.303	SH	BE	M
6.37	A	0.140	SH	BE	M
9.34	D	0.433	SH	BE	M
9.52	D	0.818	SH	BE	M
9.52	A	0.587	SH	BE	M
10.32	D	0.543	SH	BE	M
10.32	A	0.655	SH	BE	M
11.23	D	0.512	SH	BE	M
11.23	A	0.559	SH	BE	M
12.08	D	0.861	SS	BE	M
12.08	A	1.751	SS	BE	M
14.10	D	1.338	SS	BE	M
14.10	A	1.119	SS	BE	M

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 15/07/2010
Borehole No. 8

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
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STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
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Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

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Point Load Strength Index Report

Project: Eveleigh Street, Redfern — Project No.: 17772/8146B
Client: DeiCorp NSW — Report No.: 10/0828
Address: Shop 5/140-152 New Canterbury Road, Petersham NSW 2049 — Report Date: 21/07/2010
Test Method: AS4133.4.1 — Page: 7 of 7

Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 20/07/2010
Borehole No. 9

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
10.24	A	0.990	SH	BE	M
11.04	D	1.055	SH	BE	M
11.04	A	0.997	SH	BE	M
11.65	A	0.668	SH	BE	M
11.95	D	0.628	SH	BE	M
11.95	A	1.322	SH	BE	M
12.56	D	1.319	SH	BE	M
12.56	A	0.931	SH	BE	M
13.11	D	0.555	SH	BE	M
13.11	A	0.933	SH	BE	M
14.55	D	0.733	SH	BE	M
14.55	A	0.987	SH	BE	M
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Sampling Proceedure: Geotechnical Investigation (Not covered under NATA Terms of Registration)
Date Samples Drilled / Taken: 20/07/2010
Borehole No. 9

Depth	Test Type	Is(50) (Mpa)	Rock Type	Rock Structure	Moisture
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STRUCTURE	TEST TYPE	MOISTURE CONDITION	ROCK TYPE
MA= MASSIVE	A= AXIAL	W= WET	SS= SANDSTONE
BE= BEDDED	D= DIMETRAL	M= MOIST	ST= SILTSTONE
LA= LAMINATED	I= IRREGULAR	D= DRY	SH= SHALE
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Remarks:

Approved Signatory.....

Technician: J.H.

James Hughes - QA Manager

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Phone: (02)9756 2166 Fax: (02)9756 1137 Email: smectesting@pacific.net.au

California Bearing Ratio Determination Report

Project: Eveleigh Street, Redfern — Project No.: 17772
Client: DeiCorp NSW Pty Ltd — Report No.: 10/0935
Address: 140-152 New Canterbury Road, Petersgam NSW 2049 — Report Date: 13/08/2010
Test Method: AS1289.2.1.1, 5.1.1, 6.1.1 — Page: 1 of 1
No. of Days Soaked: 4 — Compactive Effort: Standard
Target Compaction (%): 100
Client Request No.: N/A — Surcharge (Kg): 4.5
Sampling Proceedure: AS 1289.1.2.1 Clause 6.5.3 - Power Auger Drilling (Not covered under NATA Terms of Registration)

STS / Sample No.		8146B / 1	8146B / 2	8146B / 3	8146B / 4		
Sample Location		Borehole 2 Refer to Drawing No: 10/0811	Borehole 7 Refer to Drawing No: 10/0811	Borehole 10 Refer to Drawing No: 10/0811	Borehole 12 Refer to Drawing No: 10/0811		
Material Description		Silty Sand, brown, scattered pebbles	Sand, yellow-brown	Sand, dark brown	Sand, brown/yellow-brown, some fines		
Depth of Sample (m)		0.1 - 0.6	0.2 - 1.0	0.3 - 0.8	0.2 - 0.8		
Sample Date		12/07/2010	12/07/2010	12/07/2010	12/07/2010		
Oversize on Wet Basis (%)		1.9	Nil	0.3	0.2		
Field Moisture Content (%)		11.0	7.5	6.8	4.5		
Optimum Moisture Contest (%)		11.9	10.4	12.2	13.1		
Maximum Dry Density (t/m³)		1.92	1.83	1.72	1.66		
Dry Density (t/m³)	Before Soaking	1.91	1.82	1.72	1.66		
	After Soaking	1.91	1.82	1.72	1.66		
Relative Compaction (%)	Before Soaking	99.8	99.4	100.0	99.7		
	After Soaking	99.8	99.4	100.0	99.7		
Moisture Content (%)	Before Soaking	12.0	10.7	12.0	12.8		
	After Soaking	13.1	13.3	16.7	18.7		
Moisture Ratio Before Soaking (%)		101.2	103.1	98.3	97.5		
Moisture Content after test (%)	Top 30mm	13.2	14.8	16.3	18.0		
	Entire Depth	12.7	14.1	16.9	18.8		
Swell after Soaking (%)		0.0	0.0	0.0	0.0		
CBR Value (%)		**35**	**15**	**25**	**15**		
Penetration (mm)		**5.0**	**2.5**	**2.5**	**2.5**		

Remarks: +19mm material excluded from test

Approved Signatory.

Technician: MB, AK — Lincoln Coleman - Senior Geotechnician