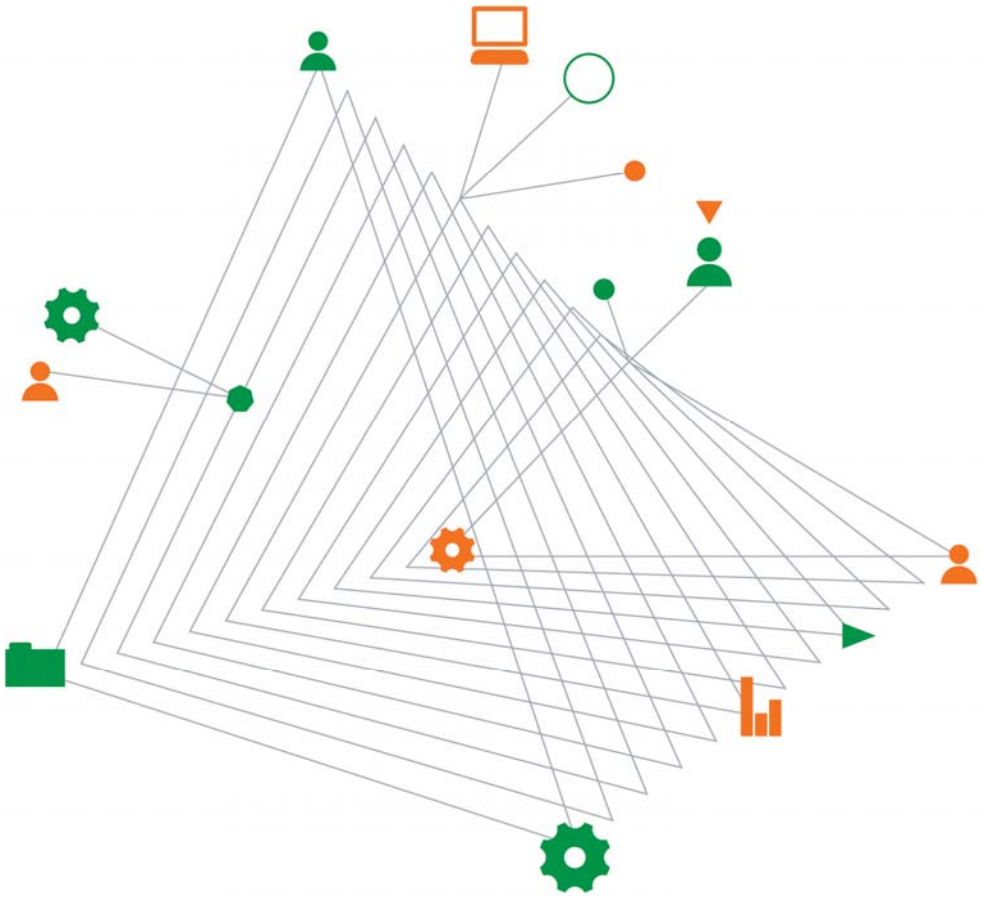
Bouygues Construction Australia Pty Ltd

Dooleys Lidcombe Catholic Club Redevelopment

Geotechnical Investigation Report

11 July 2016



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Dooleys Lidcombe Catholic Club Redevelopment

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Document authorisation

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For and on behalf of Coffey

Robert Turner
Principal Geotechnical Engineer

Quality information

Revision history

Revision	Description	Date	Author	Reviewer	Signatory
Rev 3	Amendments arising from reduced basement excavation	8/7/2016	CL	RT	RT
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Table of contents

Tables

Figures

Appendices

1. Introduction

This report presents the results of a geotechnical investigation for the proposed redevelopment at Dooleys Lidcombe Catholic Club on Church Street, Lidcombe. The geotechnical investigation was commissioned by George Pontifix of Bouygues Construction Australia Pty Ltd.

The purpose of the investigation was to gather information to support structural design and construction planning for the development, as per our proposal GEOTLCOV25554AA-AA, dated 26 October 2015.

This report presents the findings of the geotechnical investigation and provides;

- General geological and description of the site and material encountered.
- Advice on foundation systems.
- Bearing capacity recommendation for design and recommended founding levels.
- Assessment of settlement under the structure and road access ways.
- Assessment of the reactiveness of clays.
- Advice on soil characteristics for design of excavation shoring systems and retaining walls.
- Advice on ease of excavation and rippability of rock.
- Advice on grades for batters (temporary and permanent) and requirements for shoring and excavation.
- Advice on acceptability of excavated material to be used as fill.
- Advice on compaction requirements and compaction procedures for fill l and any other ground improvement methods that may be cost effective.
- Advice on ground anchor design.

2. Site and Proposed Development

The area of site is approximately 9,500 m^2 and is bounded in the south by Church Street, in the west by Olympic Drive and in the east by the existing Dooleys Lidcombe Catholic Club. The site extends to the north and encompasses the row of houses on the north side of Board Street. These houses and the section of Board Street they are on will be demolished as part of the development. The remainder of the development will replace the 230 bay car park on the corner of Olympic Drive and Church Street. Figure 1 outlines the area of the proposed development.

The proposed redevelopment comprises a 2 level club facility, a 12 level, 260 room hotel and a 2 level basement with floor level at RL10.5m. Current ground levels vary from about RL12 m to RL 15m. Insert 1 shows an indicative representation of the proposed development. The most significant structures near site are a four level residential dwelling on the corner of Ann Street and Olympic Drive (directly to the north of the structure) and the existing structures of the Dooleys Lidcombe Catholic Club.

Insert 1: Club and hotel indicative representation

The existing Dooleys Lidcombe Catholic Club is adjacent to the eastern edge of site. The existing club consists of an above ground multilevel car park, a restaurant and gaming area, a church building and a two level underground car park. We were supplied with two geotechnical investigation reports for these areas (Douglas Partners Project 37623 and 72664).

3. Method of investigation

3.1. Subsurface investigation

At the time of the field investigation, the proposed development included five basement levels. The investigation carried out was planned to address that scope of development. The field investigation consisted of eight cored boreholes completed to depths between 16.4 m and 20.0 m below ground level (BGL). Borehole locations were recorded in the field by hand-held GPS and are marked on Figure 1. The boreholes were drilled with drill rigs supplied by Terratest Drilling Pty Ltd. Drilling was undertaken from 19 to 26 November 2015.

Solid flight augers were used to drill through the asphalt (where present), surficial soils and extremely weathered bedrock. Standard Penetration Tests (SPTs) were undertaken during auger drilling at 1.5m intervals to assess in-situ strength and obtain soil samples. The rock was cored using NMLC or

HQ diamond core drilling techniques (noted on borehole logs). Additional samples were taken for chemical testing as part of testing reported in GEOTLCOV25554AA-AB.

A Coffey geotechnical engineer was present during fieldwork to identify drilling locations, record test results, log the encountered ground conditions and box the rock core. The borehole logs and rock core photographs are attached as Appendix A, together with Coffey soil and rock description and explanation sheets.

Following completion of fieldwork, selected soil samples, and the rock cores were sent to our core storage area and point load tested. The Point Load Index Strength test results are included on the attached borehole logs.

Dynamic Cone Penetrometer (DCP) Testing was undertaken on 14 December 2015. Three DCP tests were completed adjacent to BH6, BH7 and BH8 to depths between 300 mm and 1700 mm.

3.2. Laboratory Testing

Table 1 presents a summary of completed geotechnical laboratory testing.

Table 1: Summary of geotechnical laboratory testing

Sample Location	Material	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)
BH05, 1.0-1.2 m	Silty CLAY	8.0	29	16
BH03, 2.5-2.95 m	Siltstone	19.3	59	37
BH06, 1.5–1.95 m	CLAY	11.1	30	13
BH08, 1.0-1.45 m	CLAY	21.9	59	36

Laboratory test result certificates are contained in Appendix B.

3.3. Groundwater Monitoring

Standpipes were installed in BH01, BH03 and BH05 to the following depths:

- BH01 – 14.9 m BGL with 11.9 m screen
- BH03 – 8 m BGL with 5 m screen
- BH05 – 8 m BGL with 5.5 m screen

Details of the well installation are included in Appendix A with the borehole logs.

4. Subsurface conditions

4.1. Local geology

The Sydney 1:100,000 Geological Series Sheet indicates the Ashfield Shale is typically black to dark grey shale and laminite. The Ashfield Shale is the lowermost unit of the Wianamatta Group, and is underlain by the Mittagong Formation and the Hawkesbury Sandstone. The bedrock is overlain by natural residual soils as well as any fill from previous site use.

4.2. Summary of encountered subsurface conditions

4.2.1. Soil conditions

Three distinct soil units were present on site, Fill, Residual Soil and extremely weathered rock material of soil strength

The fill material is brown gravelly sand and gravelly clayey sand. The sand is fine to medium grained. The gravel is fine to medium sized and sub-angular to angular. The depth of fill encountered in the boreholes ranged from 0.18 m to 0.7 m.

Residual soils were pale grey and red brown clay and silty clay of high plasticity and of stiff to very stiff consistency and up to 2.7 m thick.

Extremely weathered siltstone and interbedded sandstone and siltstone were found at the site. They were pale grey and brown, extremely weathered and of very low rock strength.

4.2.2. Rock Conditions

Two rock types are present on site: laminate and interbedded sandstone and siltstone. The laminate was unweathered in all borehole locations, with the interbedded sandstone showing a range of weathering.

The interbedded sandstone and siltstone comprises between 30% and 60% sandstone and 40% and 70% siltstone, distinctly bedded at 0 to 10º. The sandstone is fine to medium grained and pale grey. The siltstone is dark grey. When weathered, a distinct brown staining is present.

The laminate is typically 70% siltstone and 30% sandstone. The sandstone is fine to medium grained and pale grey. The siltstone is dark grey. The laminations are at 0 to 5º. Laminite is distinguished from the interbedded siltstone and sandstone by the significantly thinner laminae (typically 5 to10 mm) in comparison to thicker beds (50 mm and greater) in the interbedded sandstone and siltstone.

4.3. Groundwater conditions

The standpipes installed in BH01, BH03 and BH05 were read on 1 December, 2015. Rising head permeability tests were undertaken in BH01 and BH03. Groundwater measurements are presented in Table 2 as depth below ground level (BGL) and m/day for hydraulic conductivity.

Table 2: Groundwater Monitoring Data

BH ID	1 December, 2015 (m BGL)	Hydraulic Conductivity (m/day)
BH01	4.81	0.047
BH03	4.31	0.059
BH05	5.95	-

5. Site geotechnical model

Figures 2 and 3 present the inferred geotechnical model. This model was based on the results of the borehole drilling. Table 3 summarises the geotechnical units, and presents a description of the units, and an assessment of the rock classification in accordance with Pells, Mostyn and Walker (1998).

Table 3: Geotechnical Units

Unit	Geological Unit	Material Description	Rock Mass Classification[1]	Unit Thickness (m)
1	Fill	Fill: Gravelly sand and clayey gravelly sand	NA	0.18 to 0.70
2	Residual Soil	Clay and silty clay	NA	1.38 to 2.7
3	Extremely Weathered Siltstone and Sandstone	Interbedded siltstone and sandstone, very low strength	Class V Shale	0.6 to 2.2
4a	Highly Weathered to Slightly Weathered Siltstone and Sandstone	Interbedded sandstone, siltstone: low to high strength.	Class III Shale	1.0 to 4.5
4b[2]	Fresh Siltstone and Sandstone	Interbedded sandstone and siltstone: medium to high strength.	Class II Shale	0 to 5.2
5	Fresh Laminite	Sandstone and siltstone: medium to high strength, fine sandstone laminae, typically 5-10mm	Class II Shale	7.75 to 13.8

[1] Rock classified as shale using the classification system by Pells, Mostyn and Walker(1998) “Foundations on Sandstone and Shale in the Sydney Region” Aust. Geomech. Jnl, Dec 1998.
[2] Units 4b is not present in all boreholes.

Rock classification is based on the worst condition encountered within the unit. All units may contain zones of rock with greater strength and possessing fewer defects than the indicated rock mass classification.

6. Recommendations

6.1. Foundations Recommendations

The proposed lower basement floor level is shown on the supplied architectural plan as RL 10.5 m, which would typically require excavation to about RL 10 m. The interpreted geotechnical sections in Figures 2 and 3 indicate that excavation to RL 10 m would generally penetrate to either Units 3 or 4a.

Units 2 and 3 are not recommended as a foundation for this structure. In proposed basement areas, footings could found on Unit 4a, 4b or 5, using piled or pad footings. In areas where no basement is proposed, footings should be piled to Unit 4b or Unit 5. To reduce the risk of differential settlements over the building, it may be preferable to founding all footings on Units 4b or 5 (i.e. same rock class).

Table 4 presents serviceability and Limit State geotechnical design parameters for footing design.

Table 4: Geotechnical Foundation Design Parameters for Shale

Unit	Serviceability End Bearing Pressure (MPa)	Ultimate End Bearing Capacity (MPa)	Ultimate Shaft Adhesion (kPa)	Young's Modulus (MPa)
4a (Class III Shale)	1 [B]	6 [B]	350 [A]	200
4b and 5 (Class II Shale)	3.5 [C]	30 [C]	600 [A]	700

A. *For piles, shaft adhesion should only be assumed where piles have a minimum socket of at least 1 pile diameter and a clean socket of roughness category R2 or better is required. Values may have to be reduced if wall smear or polish is present.*

B. *Assumes that at least 40% of footings are proved by core drilling or spoon testing.*

C. *Assumes that the ground condition for each footing is proved by core drilling or spoon testing.*

For the use of geotechnical design parameters for Unit 4a or better, geotechnical proving of foundation conditions for individual footings will be required. Such proving would require geotechnical inspections during construction to check rock mass quality.

As noted in Section 5, there may be areas of the site where better rock is encountered at proposed founding level than indicated by the generalised geotechnical model. Higher design parameters may be feasible subject to further geotechnical assessment.

For pad footings either a working stress or limit state design method could be adopted. For piles a limit state design method should be used if the design is to comply with AS2 159-2009 "Piling – Design and installation".

Footings designed using the serviceability end bearing pressures given above should result in settlements of less than 1% of the least footing dimension. Coffey can provide detailed analysis and refinement of the foundation system to support detailed design if required.

In accordance with AS2159-2009, the geotechnical strength reduction factor, Φg, is dependent on assignment of an Average Risk Rating (ARR) which takes into account various geotechnical uncertainties, redundancy of the foundation system, construction supervision, and the quantity and type of pile testing. The assessment of Φg therefore depends on the structural design of the foundation system as well as the design and construction method, and testing (if any) to be employed by the designer and piling contractor. To assist you with preliminary design we suggest Φg of 0.6 be adopted for footings on shale. Coffey should review the final selection of Φg for detailed design.

If foundations are to resist uplift, the ultimate shaft adhesion should be reduced by applying a factor of 0.7. Uplift piles should also be checked for an inverted cone pullout mechanism.

6.2. Soil and Rock Excavation Conditions

A summary of the excavatability of the encountered soil and rock is contained in Table 5, and is suggested as a guide only. Excavation contractors should inspect the rock core, engineering logs and core photographs to make their own judgement as to likely productivity and specific plant.

The generalised geotechnical model suggests that most of the excavation to RL 10m would be through Units 1, 2 and 3, with some Unit 4a. Nevertheless, the ground conditions were sufficiently variable that some Unit 4b or Unit 5 could be encountered.

Table 5: Guidelines for Excavation

Material	Likely Minimum Plant Requirements
Unit 1, Unit 2	Bulldozer blade, excavator bucket.
Unit 3, Unit 4a	Bulldozer with ripper, excavator bucket. Higher strength zones may require a rock breaker.
Unit 4b, Unit 5	Cat D10 or equivalent. Higher strength bands may require a rock breaker.

The use of hydraulic impact hammers for bulk excavation, trimming the sides of excavations, and detailed excavation, will cause vibrations that could affect vibration sensitive structures and services. Assessment of the potential impacts of excavation induced vibrations should be considered as part of detailed design and excavation planning. Additional discussion of the vibration monitoring requirements is contained in Section 6.3.6.

6.3. Excavation Support

6.3.1. General Excavation Support Requirements

Permanent excavation support is typically controlled by site constraints, tolerable ground movements and requirements to restrain soil and poor quality rock. Table 6 contains a preliminary assessment of support options for the geotechnical units.

Table 6: Preliminary support options

Material	Support Options
Unit 1, Unit 2 and Unit 3	• Unsupported excavation at suitable batter slopes. • Retaining walls. • Soil nails with mesh and shotcrete (minimum 75 mm thick), with adequate drainage for the Class V shale.
Unit 3	• Retaining walls. • Pattern rock bolting in low strength shale and in fractured zones within the better quality rock. • Mesh support by doweling and shotcrete (minimum 75 thick) or fibre reinforced shotcrete, with adequate drainage.
Unit 4a	• Mesh support by doweling and shotcrete (minimum 75 thick) or fibre reinforced shotcrete, with adequate drainage. • Isolated bolting of potential unstable rock wedges.

Because the excavation is not expected to substantially penetrate Units 4a or 5, it may be prudent to adopt a full depth shoring system for the excavation.

Final assessment of shoring options will be dictated by excavation requirements with respect to tolerable ground movements and the condition of rock revealed during the excavation.

6.3.2. Unsupported cut and fill batters

The following batters are recommended for the design of unsupported exposed cuts and fills up to 3 m in height and above the groundwater table. Temporary batters should not be in place for longer than three months.

Table 7– Recommended unsupported maximum batters

Material	Temporary Batter	Permanent Batter
Engineered Fill [1] (excluding high plasticity)	1(H):1(V)	1.5(H):1(V)
Cuts in Unit 2 / Unit 3 [1]	1.5(H):1(V)	2(H):1(V)
Cuts in Units 4a, 4b or 5 [2]	Vertical	Vertical

Notes:

1. *Protection against erosion may be required.*
2. *Localised or pattern rock bolting will be required to stabilise rock wedges or blocks formed by unfavourably oriented defects. Significant weaker bands in the shale may require shotcrete protection against degradation.*

These recommended maximum batters are based on there being no structures or surcharge located at or near the crest of the cuts. Steeper slopes in the fill, soil and weathered rock materials would require engineer designed retaining structures. Site specific advice is required for unsupported cuts greater than 3 m in height.

Coffey should inspect the excavated faces during and at the completion of construction to assess the need for localised doweling or rock bolting to control adversely oriented defects or to identify localised layers or zones of weaker rock that may require shotcrete protection. Where such areas are identified, permanent support could comprise 24 mm (min) diameter pre-tensioned, post-grouted rock bolts with double corrosion protection or glass-fibre reinforced plastic bolts. Rock bolt lengths will depend on actual site conditions and all rock bolts are to be installed in accordance with the manufacturer's recommendations.

6.3.3. Retaining Walls for Soil and Class V Rock

Where excavations cannot be battered, soil and more weathered shale could be supported using shoring walls such as conventional soldier pile wall.

Other alternatives include top-down construction, internal propping or temporary anchors. Temporary anchor installation would require the permission of adjacent property owners where anchors cross boundaries or easements.

It is recommended that a detailed analysis be undertaken, including assessment of surcharge loads, to develop a suitable retention support system. As a guide, Table 8 below presents typical design parameters for retaining wall design.

Table 8: Parameters for retaining wall design

Material	Bulk unit Weight γ (kN/m3)	'Active' Earth Pressure Coefficient, K_a	'At Rest' Earth Pressure Coefficient, K_0	'Passive' Earth Pressure Coefficient, K_p	C' (kPa)	ϕ' (degrees)
Unit 2	20	0.4	0.5	2.5	5	25
Unit 3[1]	22	0.4	0.5	2.5	10	25
Unit 3[2]	23	0.33	0.5	3	25	30

[1] Values assume potential failure along clay cover joints from 50-70º
[2] Rock mass failure

Active earth pressure coefficients should be adopted where wall movements of about 1% of the wall height can be tolerated. At rest pressure coefficients should be adopted where less movement can be tolerated. However, it should be understood that a well-constructed wall will still undergo movements of the order of 0.1% to 0.3% of the wall height where at rest pressures are adopted. Coffey can aid in detailed analysis of retaining wall movements should this be required.

Retaining walls should be designed for hydrostatic pressures unless permanent and effective drainage can be provided. Applicable surcharge loads should be added to earth pressures.

6.3.4. Rock Anchors

Temporary anchors should be inclined downwards to anchor in the better quality shale.

Preliminary design of anchors may be based on a working bond stress value of:

- 350 kPa in Unit 4a
- 550 kPa in Unit 4b and 5

The actual design load capacity of anchors should be based on a performance specification, verified by proof-testing. This is particular important when anchors are constructed within the highly weathered material, where the actual ground condition encountered by the anchor may be variable.

6.3.5. Excavation Induced ground movements

The proposed excavation will cause some ground movements. Many factors can influence the size of these movements, from ground conditions to design and construction quality. Documented data has shown that for well-designed and constructed shoring, vertical and lateral movements can be about 0.1% to 0.3% of the retained thickness of stiff clay soils. If this aspect is critical, we can assess (possibly by numerical analysis) likely ground movements during design of the shoring system.

If your site has sensitive structures or services nearby, a relatively stiff shoring with bracing and/or tie-back anchors designed to resist pressures higher than active earth pressures may be required. Such cases should be specifically addressed by Coffey during detailed design when adjacent footing layouts and loadings are known.

In rock excavation, lateral movement occurs due to relief of *in situ* locked-in horizontal stresses and must be considered as part of design. There are relatively high natural horizontal stresses within Sydney rock, the magnitude of which varies with rock quality. From our past experience of deep

basements in Sydney, typical lateral movements range from 0.5 mm to 2 mm per metre depth of excavation, depending on rock quality and presence of bedding seams.

Lateral ground movements due to stress relief have been measured at distances of up to 1.5 to 2 times the basement depth from the edge of excavations. These typically show that movements can be up to 30% of the displacement around the excavation perimeter at a distance approximately equal to the excavation depth. Stress relief ground movements are unlikely to be significant at distances greater than twice the excavation depth. However, these approximations will be affected by local geological structures and should only be used as a rough guide.

Coffey can assess the potentially damaging effects of stress redistribution on nearby structures and their foundations as part of the detailed design process. Usually the risk of potential damage is not readily quantifiable and induced movements are not possible to avoid. We recommend a condition survey of all adjacent structures is completed before excavation begins and ground movements monitored during excavation.

6.3.6. Protection of adjacent structures

For the protection of adjoining structures the type of structure, location, layout, and depth should be determined at the commencement of excavation design works. This information could then be used in conjunction with available information on site ground conditions and the results of any subsequent investigations for geotechnical assessments to determine whether the excavations may affect existing structures. Depending on the complexity of the geotechnical problem, analytical methods would range from a simple empirical assessment, through to 3-dimensional finite element analyses and consultation with the project structural engineers will be required to assess possible load influences, resulting ground movements/stresses, and additional support requirements.

The use of excavation plant such as impact hammers will generate vibrations that may affect any surrounding sensitive structures and buried services. Measures to mitigate the risks associated with vibration such as the use of rock saws or rock grinders should be considered. The vibration limits in Table 9 below are commonly recommended to reduce the risk of vibration damage to sensitive receptors.

Table 9: Ground Vibration Limits for Various Types of Structures

Type of Structure	Peak Particle Velocity (mm/s)
Historic buildings or monuments	2
Residential or low rise buildings in good condition	10
Reinforced concrete commercial and industrial buildings in good condition	25

It is recommended that a limit is selected considering the structure of concern. It should be noted that limits set by the relevant authorities may override these recommendations.

Dilapidation surveys should be carried out on neighbouring structures or sensitive services prior to commencing excavation as a baseline record of their condition. Excavation trials with vibration monitoring should also be carried out to assess appropriate distances for various excavation plant to be used to limit generated vibrations, and need for ongoing vibration monitoring during site works to confirm that the limits are not exceeded.

6.4. Earthworks

6.4.1. Use of excavated material as engineering fill

Unit 1 material (the existing gravelly sand fill) can be reused as engineering fill.

Unit 2 materials (residual soil) are typically highly plastic, and highly reactive when used as engineering fill. This does not preclude it use as engineering fill, however careful moisture control and consideration for the potential for shrink/swell ground movements is required. Over compaction of this material should be avoided as this will increase shrink/swell movements.

Contamination of Unit 1 and 2 materials is discussed in GEOTLCOV25554AA-AB, and may affect their reuse as engineered fill.

6.4.2. Compaction requirements and procedures

Where filling is required to form the foundation for floor slabs or pavements, ground should be prepared by stripping topsoil and unsuitable materials, and benching the ground surface so that fill can be placed in near horizontal layers.

Each bench should be proof rolled with 4 passes of smooth single-drum, non-vibratory roller of minimum weight 12 tonnes. An experienced earthworks practitioner should observe the proof rolling to detect soft, wet or heaving zones. Where these zones are encountered the affected area should be improved by appropriate methods, such as:

- Excavation of the affected soil and replacement with Engineered Fill;
- Tyning and moisture conditioning of the *in situ* material and compaction to achieve the criteria given below for Engineered Fill.

Fill supporting structures or pavements should be compacted to at least 98% Standard Maximum Dry Density (SMDD). Engineered Fill should be spread in layers not exceeding 250 mm loose thickness and moisture conditioned to Standard Optimum Moisture Content (SOMC) ±2% then compacted without delay with appropriate compaction plant.

Fill within 0.3 m depth of floor slab/pavement subgrade level should be compacted to at least 100% SMDD.

Preparation for, and construction of Engineered Fill should be carried out under Level 1 Geotechnical Inspection and Testing as defined in Section 8.2 of *AS 3798 – 2007 Guidelines on earthworks for commercial and residential developments.*

6.4.3. CBR for preliminary design

Information on site CBR was taken from DCP testing completed by Coffey within this investigation and from information gathered by Douglas Partners in their previous investigations.

Results of DCP testing indicate in-situ CBR ranging from 4% to 20% or more. These results can be misleading as they represent the CBR at the in-situ moisture content, rather than at the optimum moisture content which is typically used for laboratory testing. A laboratory CBR test completed by Douglas Partners measured a CBR of 3.5% to 4.0% at an optimum moisture content of 28.3% and a standard maximum dry density of 1.58 m/t^3.

Based on these results a preliminary design subgrade CBR of 3% is recommended. This assumes the subgrade is properly prepared as per Section 6.4.2.

6.5. Groundwater

A separate groundwater report (GEOTLCOV25554AA-AK, dated 24 June 2016) was issued and provides comments and recommendations for a two level basement structure.

7. Limitations of this report

Subsurface conditions can be complex and may vary over relatively short distances – and over time. The inferred geotechnical model and recommendations in this report are based on limited subsurface investigations at discrete locations. The engineering logs describe subsurface conditions only at the investigation locations.

Further investigations may be required to support detailed design if there are scope limitations or changes to the nature of the project. We can assist with detailed design and/or to review designs, and verify that the conditions exposed are consistent with design assumptions during construction.

The attached document entitled “Important information about your Coffey report” forms an integral part of this report and presents additional information about its uses and limitations.

Important information about your Coffey Report

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

Your report is based on project specific criteria

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

Subsurface conditions can change

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

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

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

Your report is prepared for specific purposes and persons

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

Interpretation by other design professionals

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

Data should not be separated from the report*

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

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples.

These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

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

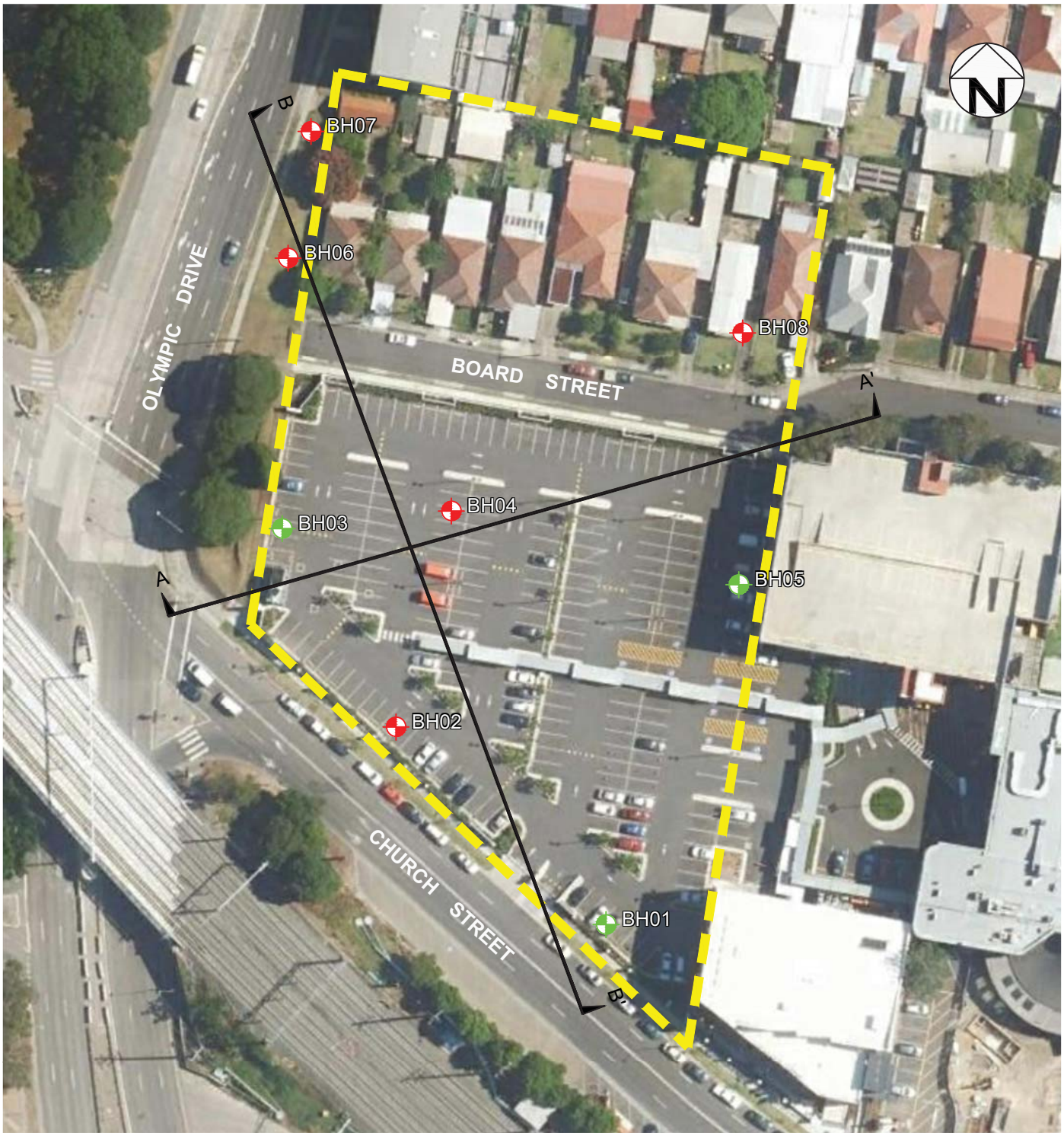
Rely on Coffey for additional assistance

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

Responsibility

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

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



LEGEND

- BOREHOLE LOCATION
- BOREHOLE LOCATION WITH PIEZOMETER
- APPROXIMATE SITE BOUNDARY, HOTEL & CLUB DEVELOPMENT
- SECTION LINE

10 0 10 30 50

Scale (metres) 1:1000

AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.2
AERIAL IMAGE ©: 2015 AEROMETREX

drawn	RH / AW
approved	RH
date	16 / 12 / 15
scale	AS SHOWN
original size	A4

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client: BOUYGUES CONSTRUCTION AUSTRALIA

project: DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT
LIDCOMBE, SYDNEY, NSW

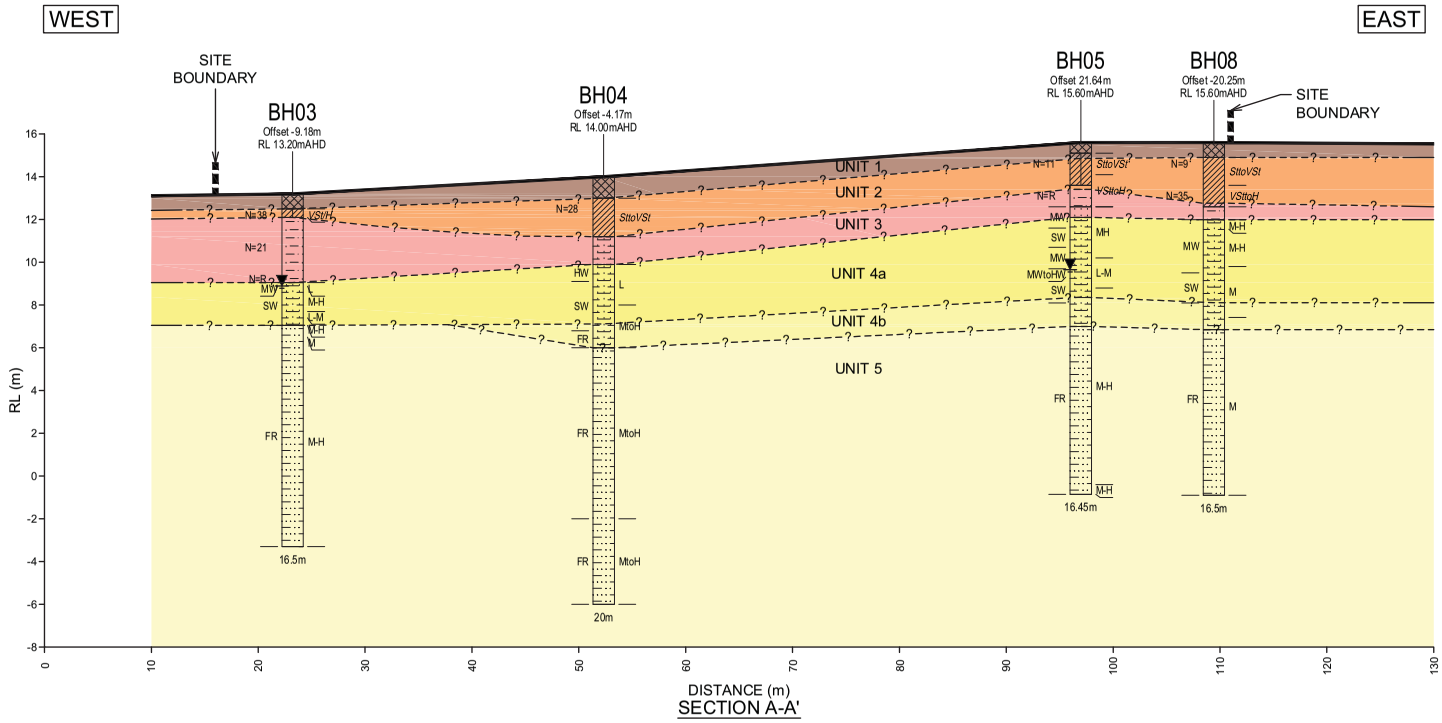
title: BOREHOLE LOCATION PLAN

project no: GEOTLCOV25554AA-AC | figure no: FIGURE 1 | rev: A

PLOT DATE: 16/12/2015 9:35:51 AM DWG FILE: F:\GEOTECHNICS\1 PROJECTS\GEOTLCOV25\GEOTLCOV25554AA DOOLEYS LIDCOMBE CLUB & HOTEL DEVELOPMENT\CAD\GEOTLCOV25554AA-AC.DWG

NOTES:

1. BOREHOLE ELEVATIONS ARE ESTIMATED FROM SUPPLIED TOPOGRAPHICAL SURVEY.
2. ALL MATERIAL BOUNDARIES ARE INTERPRETED FROM INVESTIGATION LOCATIONS, ACTUAL CONDITIONS MAY VARY FROM INTERPRETED SECTIONS.
3. BOREHOLE LOCATIONS ARE OFFSET FROM SECTION LINES.



SECTION A-A'

LEGEND

- FILL
- SILTY CLAY
- SILTSTONE
- INTERBEDDED SILTSTONE & SANDSTONE
- INTERLAMINATED SILTSTONE & SANDSTONE
- CLAY
- ASPHALT
- SANDSTONE
- EXISTING GROUND SURFACE
- INFERRED GEOLOGICAL BOUNDARY
- WATER LEVEL
- N*=17 STANDARD PENETRATION TEST RESULT

UNIT LEGEND

- UNIT 1 - FILL
- UNIT 2 - RESIDUAL SOIL
- UNIT 3 - EXTREMELY WEATHERED BEDROCK
- UNIT 4a - WEATHERED INTERBEDDED SILTSTONE/SANDSTONE
- UNIT 4b - FRESH INTERBEDDED SILTSTONE/SANDSTONE
- UNIT 5 - FRESH LAMINITE

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RH	RH	16/12/15

Horizontal Scale (metres) 1:500

Vertical Scale (metres) 1:250

drawn	RH / AW
approved	RH
date	16 / 12 / 15
scale	AS SHOWN
original size	A3

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client: BOUYGUES CONSTRUCTION AUSTRALIA

project: DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT LIDCOMBE, SYDNEY, NSW

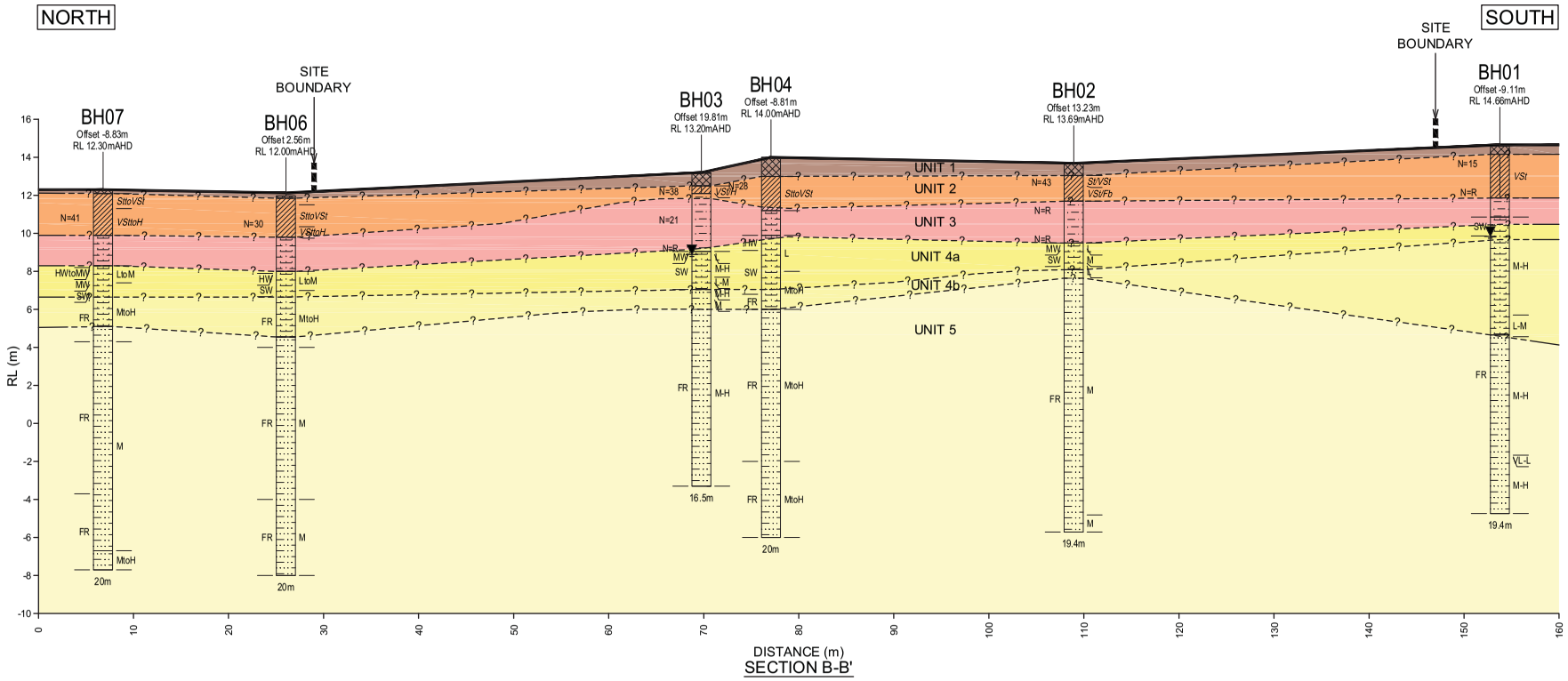
title: SECTION A-A'

project no: GEOTLCOV25554AA-AC | figure no: FIGURE 2 | rev: A

PLOT DATE: 16/12/2015 9:44:35 AM DWG FILE: F:\GEOTECHNICS\1 PROJECTS\GEOTLCOV\25\GEOTLCOV25554AA DOOLEYS LIDCOMBE CLUB & HOTEL DEVELOPMENT\CAD\GEOTLCOV25554AA-AC.DWG

NOTES:

1. BOREHOLE ELEVATIONS ARE ESTIMATED FROM SUPPLIED TOPOGRAPHICAL SURVEY.
2. ALL MATERIAL BOUNDARIES ARE INTERPRETED FROM INVESTIGATION LOCATIONS, ACTUAL CONDITIONS MAY VARY FROM INTERPRETED SECTIONS.
3. BOREHOLE LOCATIONS ARE OFFSET FROM SECTION LINES.



SECTION B-B'

LEGEND

- FILL
- SILTY CLAY
- SILTSTONE
- INTERBEDDED SILTSTONE & SANDSTONE
- INTERLAMINATED SILTSTONE & SANDSTONE
- CLAY
- ASPHALT
- SANDSTONE
- EXISTING GROUND SURFACE
- INFERRED GEOLOGICAL BOUNDARY
- WATER LEVEL
- N*=17 STANDARD PENETRATION TEST RESULT

UNIT LEGEND

- UNIT 1 - FILL
- UNIT 2 - RESIDUAL SOIL
- UNIT 3 - EXTREMELY WEATHERED BEDROCK
- UNIT 4a - WEATHERED INTERBEDDED SILTSTONE/SANDSTONE
- UNIT 4b - FRESH INTERBEDDED SILTSTONE/SANDSTONE
- UNIT 5 - FRESH LAMINITE

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	RH	RH	16/12/15

Horizontal Scale (metres) 1:500

Vertical Scale (metres) 1:250

drawn	RH / AW
approved	RH
date	16 / 12 / 15
scale	AS SHOWN
original size	A3

coffey

client: BOUYGUES CONSTRUCTION AUSTRALIA

project: DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT LIDCOMBE, SYDNEY, NSW

title: SECTION B-B'

project no: GEOTLCOV25554AA-AC | figure no: FIGURE 3 | rev: A

Appendix A - Borehole logs, core photographs and explanation sheets

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Engineering Log - Borehole

Borehole ID.	**BH01**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**23 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E					**FILL: ASPHALT**: 40mm thickness.	D				**ASPHALT**
			E	14				**FILL: Gravelly Clayey SAND**: fine to medium grained, brown, fine to medium sub-angular to angular gravel.					**FILL** PID(0.05-0.2m) =3.7ppm, no odours or staining observed
			E SPT 5, 7, 8 N*=15	13	1.0		CH	**Silty CLAY**: high plasticity, red brown mottled pale grey.	<Wp	VSt			**RESIDUAL SOIL** PID(0.5-0.6m) =4.6ppm
					2.0			1.3 m: becoming with some sandstone/ silstone, brown					
			SPT 19, 14, 25/130mm HB N*=R	12	3.0			**SILTSTONE**: brown and grey, extremely to highly weathered, estimated very low to low strength.					**WEATHERED BEDROCK**
				11									
					4.0			Borehole BH01 continued as cored hole					
				10	5.0								
				9	6.0								
				8	7.0								
				7									

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:57

method
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
HA hand auger

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud
C casing
N nil

penetration
1 2 3 no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

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Engineering Log - Cored Borehole

		Borehole ID.	**BH01**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**23 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		14	1.0								
		13	2.0								
		12	3.0								
		11			start coring at 3.80m						
NMLC	Not Observabl01/12/15 07:30	10	4.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (40%) and sandstone (60%), sandstone is fine grained, pale grey, siltstone is dark grey.	SW		a=2.88 d=1.82	100%		PT, 0 - 5°, IR, RO, Fe SN
		9	5.0			FR		a=1.50 d=1.48	98%		PT, 5 - 15°, CU, RO, CN
		8	6.0					a=1.42 d=1.24			
		7	7.0					a=1.58 d=1.05	99%		PT, 5 - 15°, IR, RO, CN

Defects are: PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH01**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**23 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	6	9.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (40%) and sandstone (60%), sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=2.91 d=1.11			
		5	10.0		**LAMINITE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=1.06 d=0.94	99%		PT, 0 - 5°, UN, RO, CN PT, 0°, IR, RO, CN
		4	11.0					a=1.15 d=0.90			
		3	12.0					a=2.31 d=1.11	99%		PT, 0 - 5°, IR, RO, CN
		2	13.0					a=1.92 d=0.89			PT, 0 - 5°, UN, RO, CN
		1	14.0					a=0.62 d=0.56			
		0	15.0		14.66 to 14.82 m: fine grained sandstone band			a=0.96 d=0.57	92%		JT, 55 - 65°, IR, RO, CN JT, 70 - 80°, UN, RO, CN PT, 0 - 5°, IR, RO, CN JT, 0 - 90°, IR, RO, CN
		-1						a=0.75 d=0.53			PT, 0°, PL, RO, Silty clay VN

Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH01**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**23 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	-2	17.0		**LAMINITE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=5.66 d=2.67	92%		CS, 0°, Silty clay, 120 mm PT, 0 - 5°, IR, RO, CN multiple defects, Jts at 65-80°
		-3	18.0					a=0.98 d=0.74	96%		Defects are: PT, 0 - 10°, PL, RO, CN, unless otherwise described
		-4	19.0					a=2.00 d=0.78			
		-5	20.0		Borehole BH01 terminated at 19.40 m Target depth			a=0.76 d=0.72			
		-6	21.0								
		-7	22.0								
		-8	23.0								
		-9									

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

Piezometer Installation Log

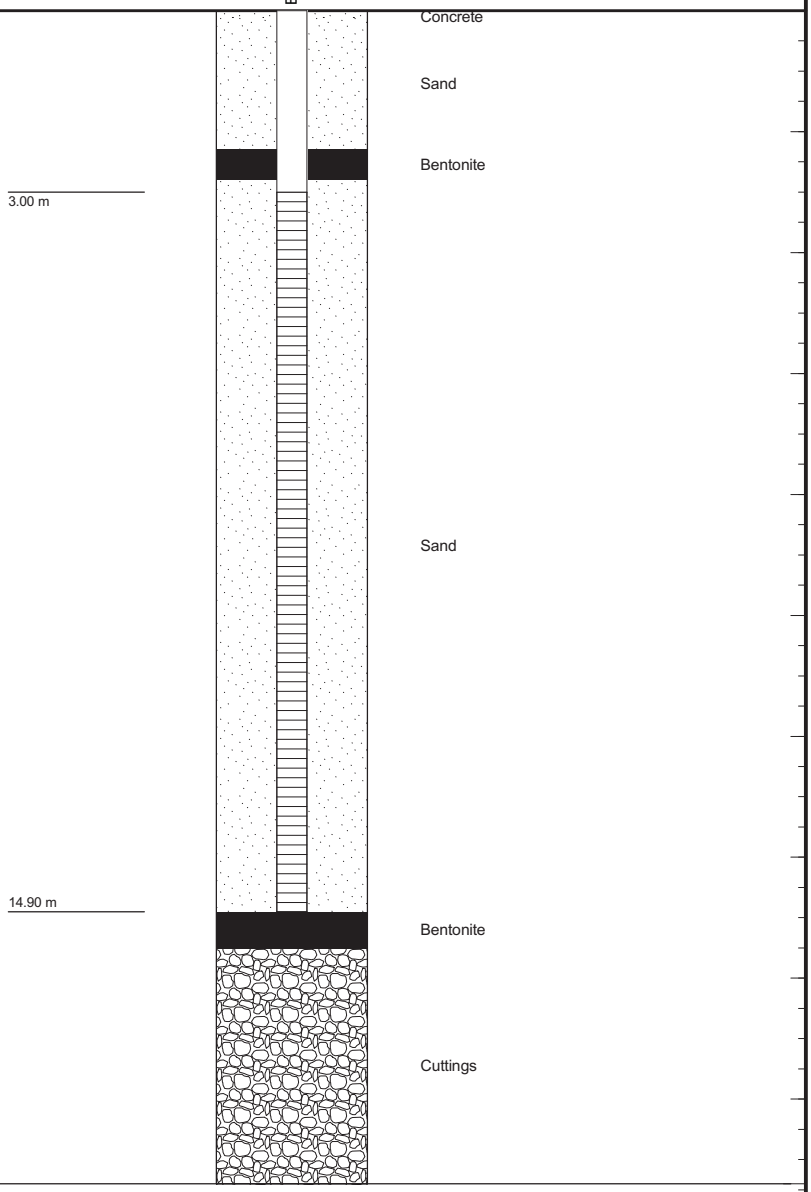
Hole ID.	**BH01**
sheet:	1 of 1
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**23 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 309956; N: 6270732 (Datum Not Specified) surface elevation: 14.66 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

method & support	water	RL (m)	depth (m)	graphic log	material name
AD/T, CASING	Not Observable	12			FILL: ASPHALT FILL: Gravelly Clayey SAND Silty CLAY
					SILTSTONE
	01/12/15 07:30		4		INTERBEDDED SILTSTONE AND SANDSTONE
		8			
			8		
		4			LAMINITE
NMLC			12		
		0			
			16		
		-4			
					Borehole BH01 terminated at 19.40 m Target depth



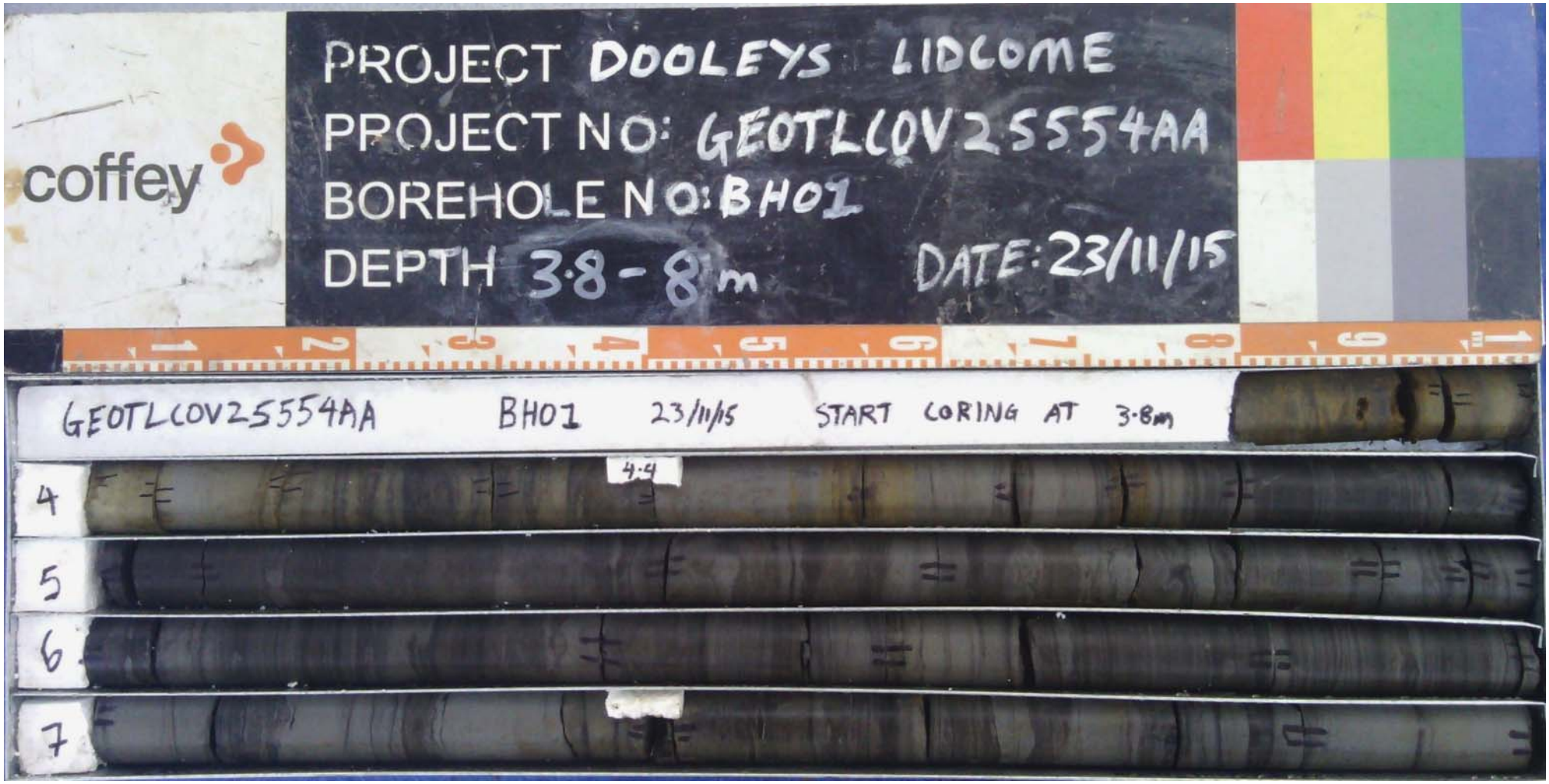
method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH01	standpipe		14.90 m -0.24 m AHD		

CDF_0_9_04BB.GLB Log COF PIEZOMETER INSTALLATION LOG GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47



PointID : BH01 Depth Range: 3.80 - 8.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH01

project no: GEOTLCOV25554AA | fig no: **PHOTO 1** | rev:

PointID : BH01 Depth Range: 8.00 - 13.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

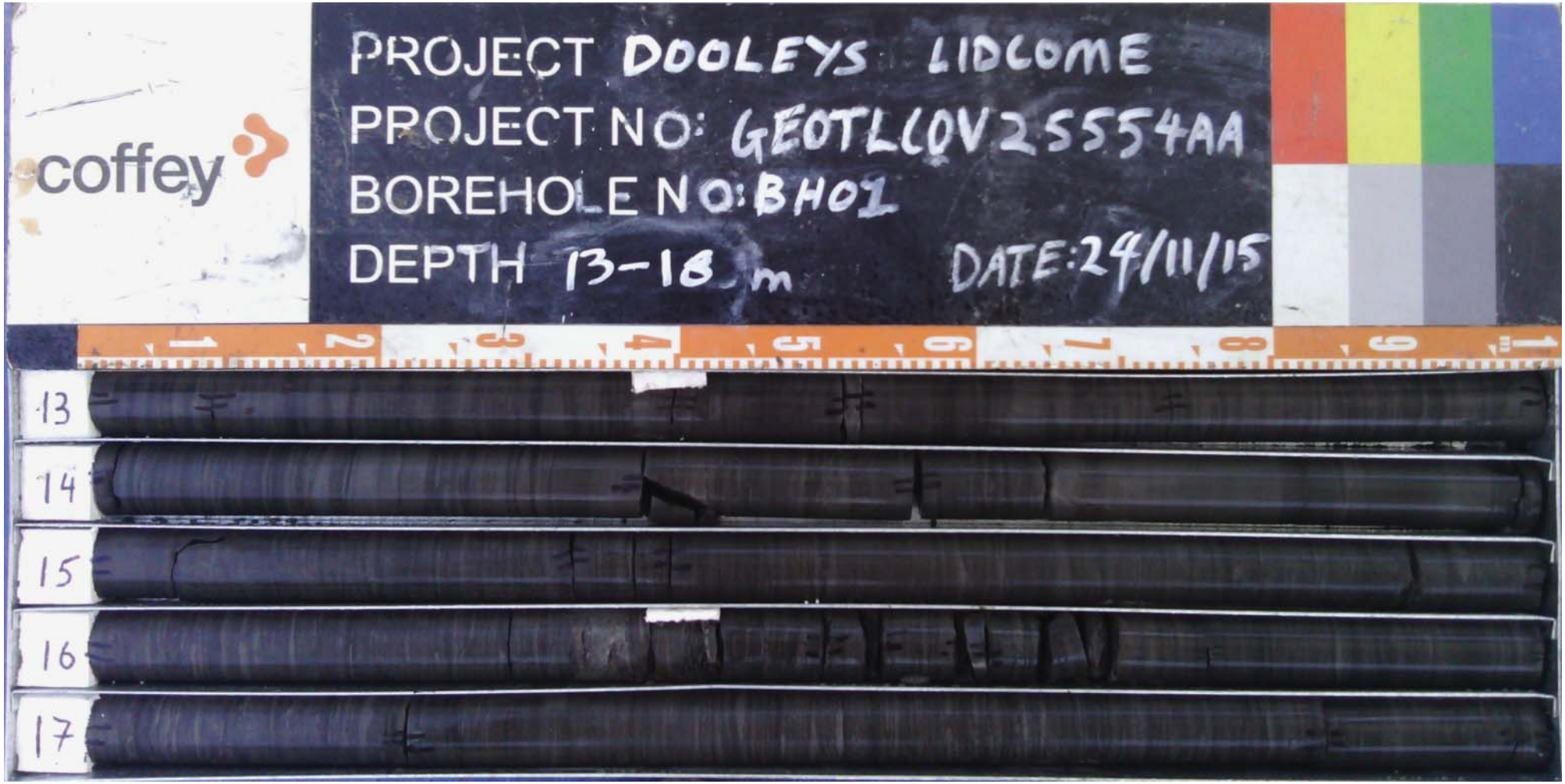
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH01

project no: GEOTLCOV25554AA | fig no: **PHOTO 2** | rev:



PointID : BH01 Depth Range: 13.00 - 18.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

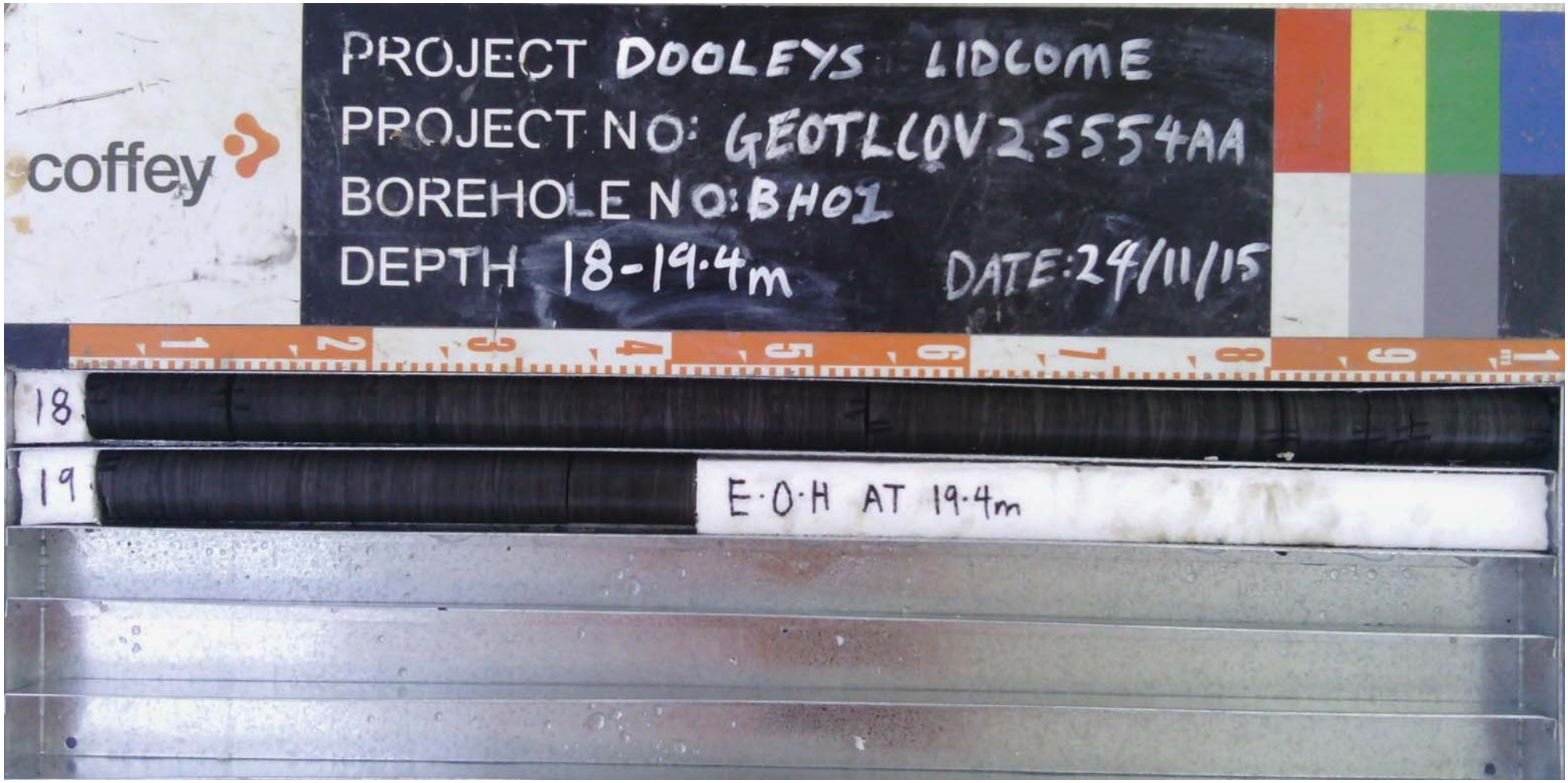
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH01

project no: GEOTLCOV25554AA | fig no: **PHOTO 3** | rev:



PointID : BH01 Depth Range: 18.00 - 19.40 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH01

project no: GEOTLCOV25554AA | fig no: **PHOTO 4** | rev:

coffey

Engineering Log - Borehole

Borehole ID.	**BH02**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**20 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**23 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
AD/T, CASING		Not Observable		13				**FILL: ASPHALT**: 20mm thickness.	D				**ASPHALT**
								FILL: Sandy Clayey GRAVEL: fine to medium grained, sub-rounded to angular, brown, sand is fine to medium grained.					**FILL** no odours or staining observed
					1.0		CH	**CLAY**: high plasticity, brown mottled red brown.	<Wp	St / VSt			**RESIDUAL SOIL**
			SPT 14, 20, 23 N*=43	12				1.2 m: with some extremely weathered silstone, brown		VSt / Fb			
					2.0			**SILTSTONE**: brown grey, extremely to highly weathered, estimated very low strength..					**WEATHERED BEDROCK**
			SPT 24/110mm HB N*=R	11	3.0								
				10									
			SPT 15/90mm HB N*=R		4.0			Borehole BH02 continued as cored hole					
				9	5.0								
				8	6.0								
				7	7.0								
				6									

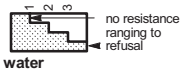
CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:57

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix, e.g. AD/T
- B blank bit
- T TC bit
- V V bit

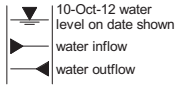
support
- M mud
- C casing
- N nil

penetration



no resistance ranging to refusal

water



10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH02**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**20 Nov 2015**
date completed:	**23 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		13	1.0		start coring at 4.20m						
		12	2.0								
		11	3.0								
		10	4.0								
NMLC	Not Observable	9	5.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. 4.2 to 4.25 m: sandstone, fine to medium grained, pale grey	MW SW		a=1.09 d=0.91	89%		JT, 70°, partially annealed PT, 5°, IR, RO, CN PT, 0°, IR, RO, Fe SN JT, 85 - 90°, IR, RO, Clay VN
		8	6.0		5.28 to 5.46 m: interbedded siltstone and sandstone band **LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. 6.3 to 6.4 m: grey fine grained sandstone band	FR		a=0.96 d=0.56 a=0.64 d=0.18	77%		JT, 30 - 45°, IR, RO, CN JT, 50 - 90°, CU, RO, CN
		7	7.0								
		6						a=0.60 d=0.77	77%		multiple partings

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH02**
		sheet:	3 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**20 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**23 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	5	9.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.80 d=0.40			JT, 45°, IR, RO, CN
		4	10.0					a=0.98 d=0.55	77%		PT, 0 - 5°, UN, RO, CN JT, 40 - 60°, IR, RO, CN SM, 5 - 10°, Silty clay, 10 mm JT, 85 - 90°, PL, RO, CN
		3	11.0					a=0.63 d=0.69			PT, 5 - 10°, UN, RO, CN JT, 0°, PL, RO, CN CS, 0°, 10 mm
		2	12.0					a=0.46 d=0.35	98%		
		1	13.0					a=0.54 d=0.69			
		0	14.0					a=0.58 d=0.52			JT, 70 - 90°, IR, RO, CN
		-1	15.0					a=2.99 d=0.99	97%		
		-2						a=0.90 d=0.53			

Defects are:PT, 0 - 10°, PL - IR, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH02**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**20 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**23 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318949; N: 6251435 (Datum Not Specified) surface elevation: 13.69 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	-3	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.53 d=0.44	97%		
		-4	18.0					a=0.37 d=0.27	90%		CS, 0 - 5°, 10 mm
		-5	19.0					a=0.66 d=0.56			multiple defects CS, 0 - 10°, IR, 30 mm JT, 35 - 50°, CU, RO, CN SM, 0 - 5°, CU, 50 mm CS, 90 mm Defects are:PT, 0 - 10°, PL - IR, RO, CN, unless otherwise described
		-6	20.0		Borehole BH02 terminated at 19.40 m Target depth						
		-7	21.0								
		-8	22.0								
		-9	23.0								
		-10									

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

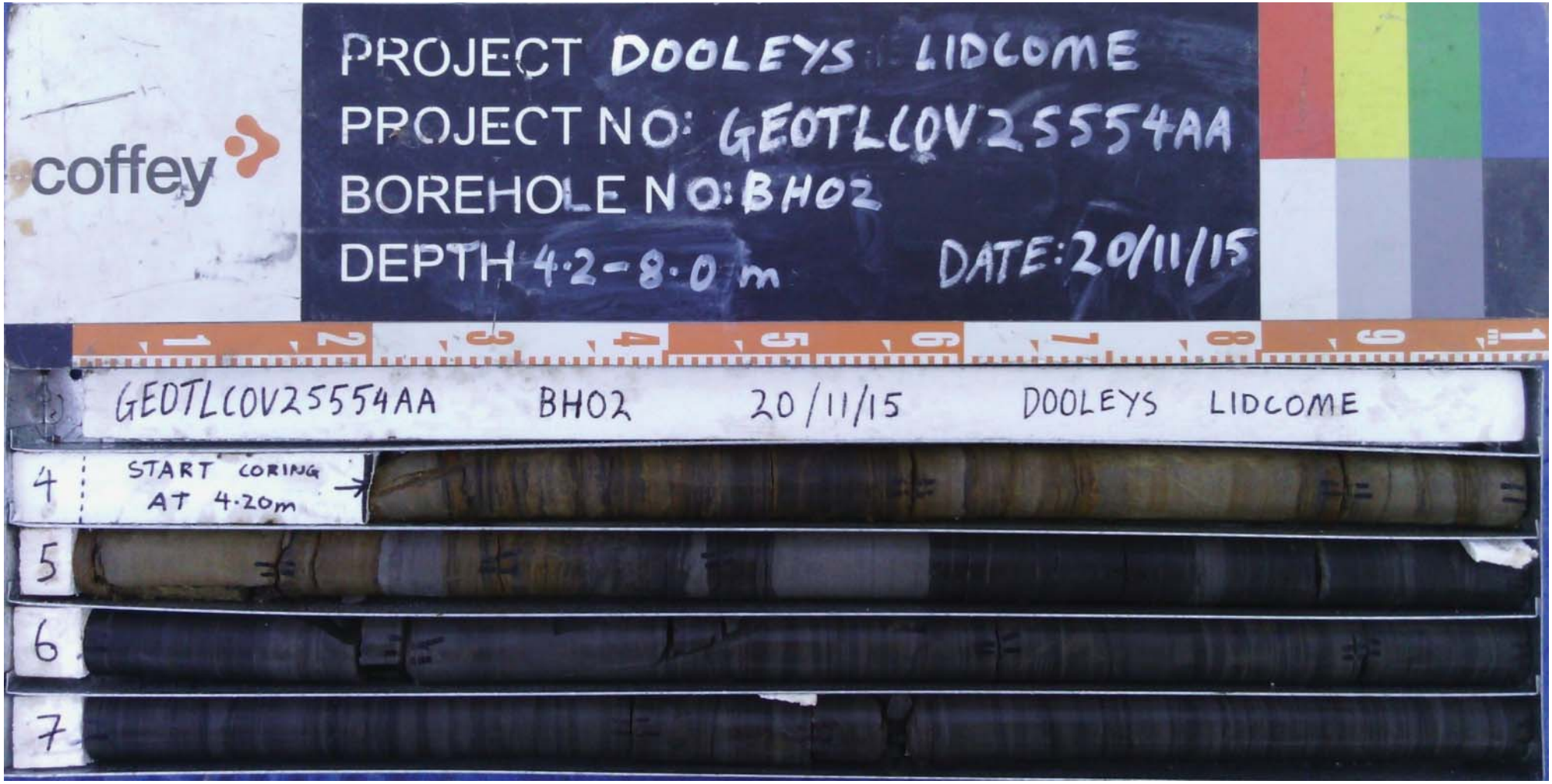
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating



PointID : BH02 Depth Range: 4.20 - 8.00 m

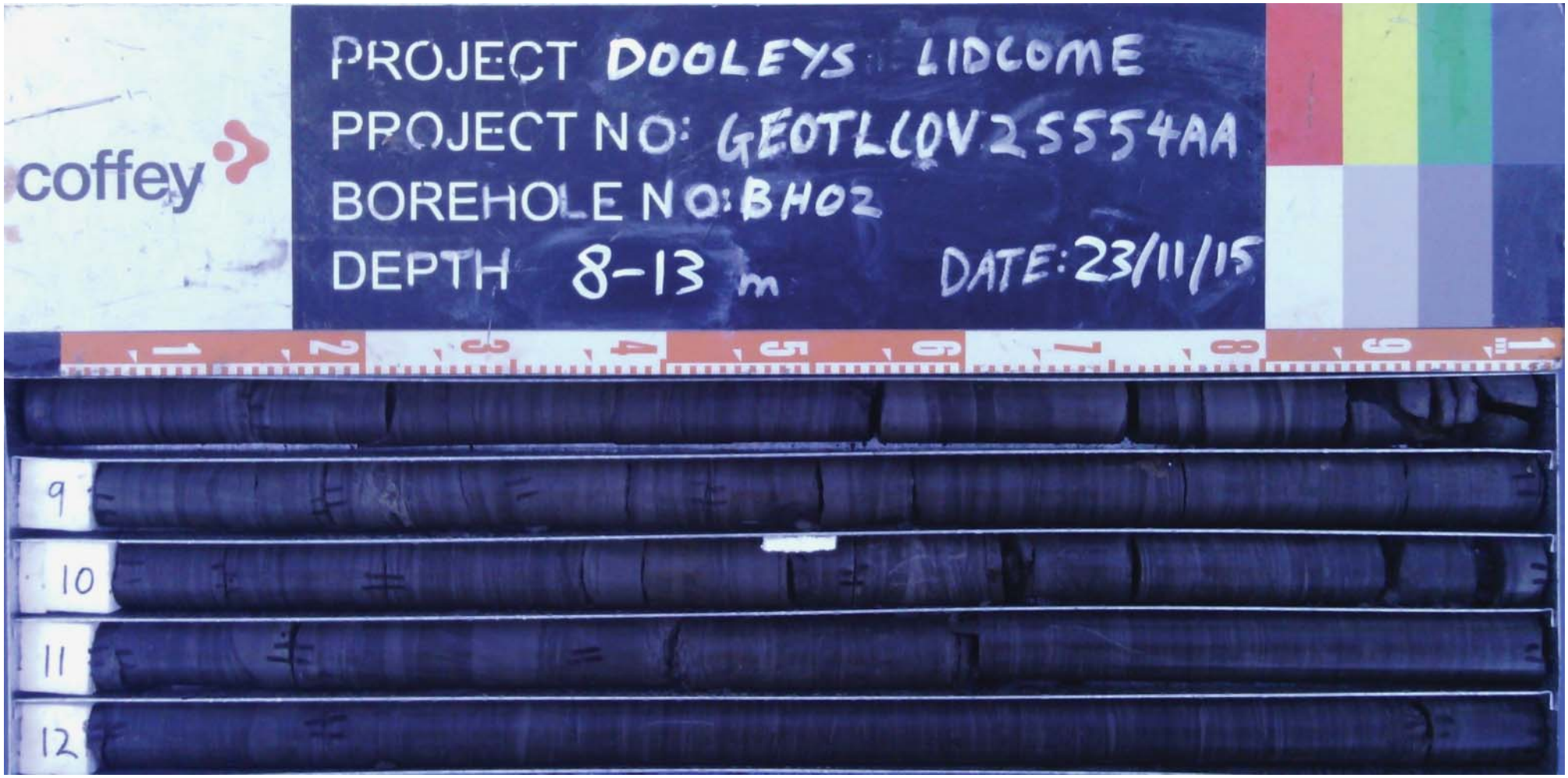
drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH02

project no: GEOTLCOV25554AA | fig no: **PHOTO 5** | rev:



PointID : BH02 Depth Range: 8.00 - 13.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

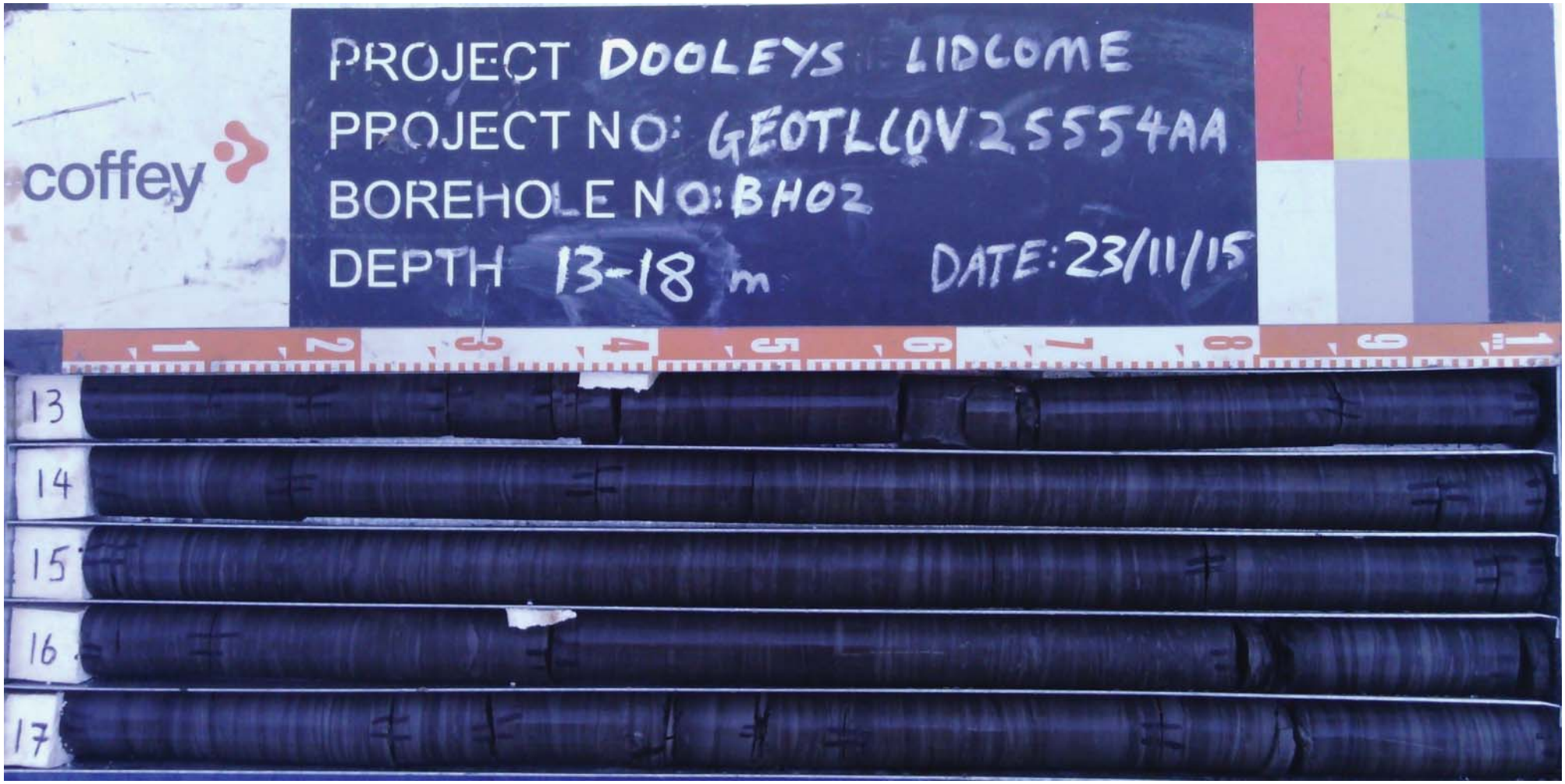
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH02

project no: GEOTLCOV25554AA | fig no: **PHOTO 6** | rev:



PointID : BH02 Depth Range: 13.00 - 18.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

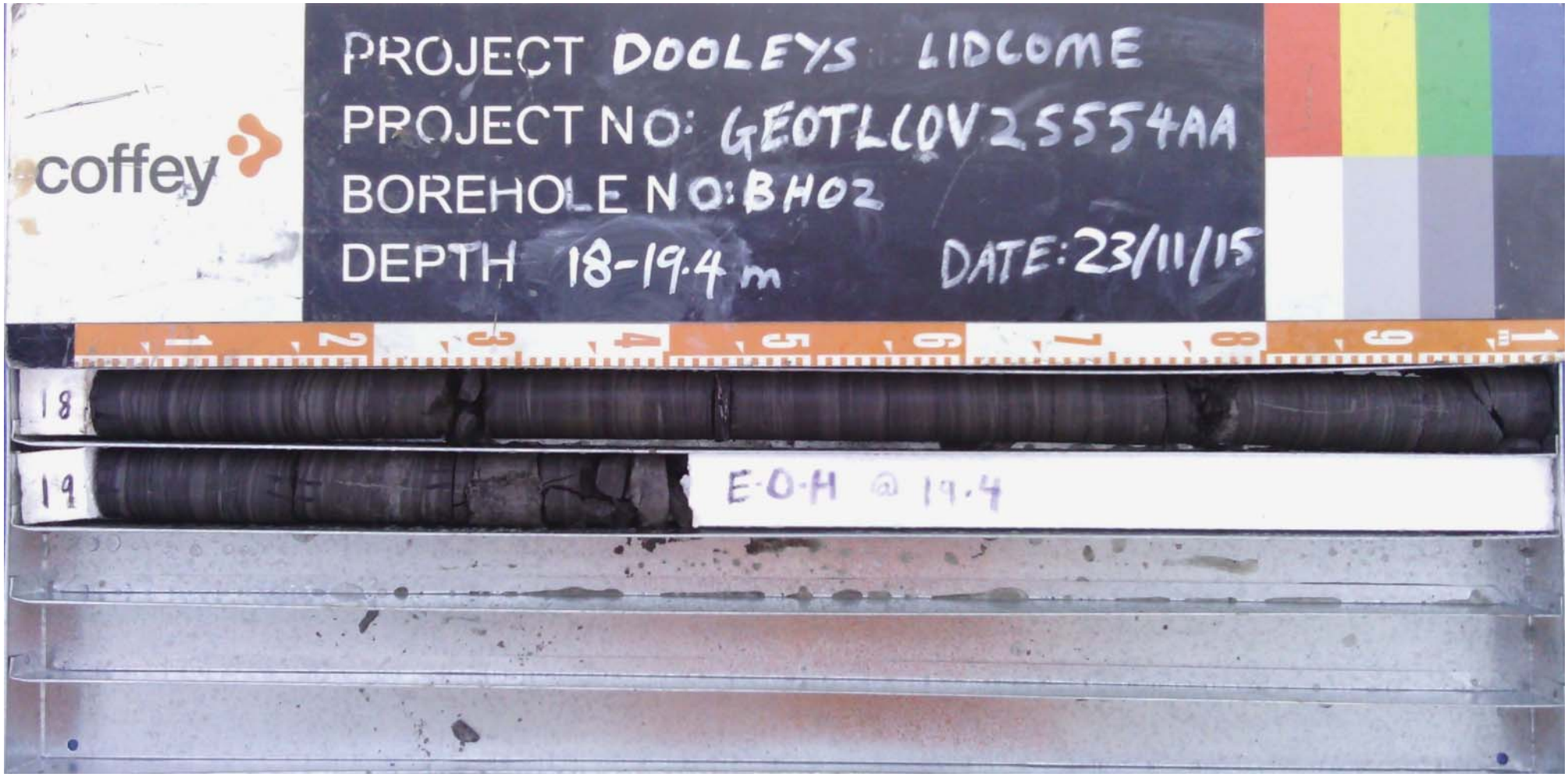
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH02

project no: GEOTLCOV25554AA | fig no: **PHOTO 7** | rev:



PointID : BH02 Depth Range: 18.00 - 19.40 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH02

project no: GEOTLCOV25554AA | fig no: **PHOTO 8** | rev:

coffey

Engineering Log - Borehole

		Borehole ID.	**BH03**
		sheet:	1 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/100 mm) 2 4 6 8 10	structure and additional observations
AD/T			E	13				**FILL: ASPHALT**: 30mm thickness.					**ASPHALT**
								FILL: Gravelly SAND: fine to medium grained, fine to medium sub-angular to angular gravel.					**FILL** PID(0.05-0.2m) = 0.0ppm, no odours or staining observed PID(0.5-0.6m) =0.0ppm
HA			E										
			E				CH	**Silty CLAY**: high plasticity, brown mottled red brown and pale grey.	<Wp	VSt / H			**RESIDUAL SOIL**
			SPT 5, 12, 26 N*=38	12	1.0			1 to 1.3 m: remoulds to silty clay					
								SILTSTONE: brown and pale grey, extremely weathered, estimated very low strength.					**WEATHERED BEDROCK**
AD/T CASING		Not Observable		11	2.0								
			SPT 20, 8, 13 N*=21	10	3.0								
			SPT 25 HB N*=R	9	4.0			Borehole BH03 continued as cored hole					
				8	5.0								
				7	6.0								
				6	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH03**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		13									
			1.0								
		12									
			2.0								
		11									
			3.0								
		10									
			4.0		start coring at 4.15m						
NMLC	01/12/15 07:25 Not Observable	9			**INTERBEDDED SILTSTONE AND SANDSTONE**: fine grained, pale grey to dark grey, siltstone (70%) and sandstone (30%), distinctly bedded at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.	HW MW		a=1.03 d=0.33	97%		SM, 5°, IR, Clay filled, 20 mm PT, 0 - 5°, IR, RO, CN
			5.0								JT, 70 - 85°, IR, RO, CN
		8						a=1.11 d=0.37			
			6.0			SW					CS, 0 - 15°, RO, Fe SN
		7			**LAMINITE**: fine grained, pale grey, siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.	FR		a=0.73 d=0.40	96%		
			7.0								
		6						a=0.91 d=0.57	100%		multiple partings

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH03**
		sheet:	3 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular	general
NMLC	Not Observable	5	9.0		**LAMINITE**: fine grained, pale grey, siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=1.47 d=0.56			SM, 0 - 10°, Clay filled, 20 mm	Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described
											SM, 0°, Clay filled, 20 mm	
		4									JT, 10°, UN, SO, Pyrite VN	
			10.0					a=0.72 d=0.46	100%			
		3						a=0.79 d=0.48				
			11.0									
		2						a=0.72 d=0.46			CS, 0°, PL	
			12.0						100%			
		1						a=0.46 d=0.52				
			13.0									
		0						a=0.69 d=0.56				
			14.0								PT, 0°, PL, RO, Clay VN	
		-1									PT, 0°, PL, RO, Clay VN	
								a=1.26 d=0.47	97%			
			15.0									
		-2						a=0.52 d=0.25				
											JT, 75°, UN, SO, CN	
											JT, 75°, UN, SO, CN	

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
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- barrel withdrawn

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- PT parting
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- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
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- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH03**
sheet:	4 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**19 Nov 2015**
date completed:	**19 Nov 2015**
logged by:	**TO**
checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 X = axial; O = diametral VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular ... general
NMLC		-3				FR	O X	a=0.87 d=0.36	97%		
					Borehole BH03 terminated at 16.50 m Target depth						
		-4	17.0								
		-5	18.0								
		-6	19.0								
		-7	20.0								
		-8	21.0								
		-9	22.0								
		-10	23.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

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- HW highly weathered
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- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
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- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Piezometer Installation Log

		Hole ID.	**BH03**
		sheet:	1 of 1
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**19 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**19 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318929; N: 6251470 (Datum Not Specified) surface elevation: 13.20 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

method & support	water	RL (m)	depth (m)	graphic log	material name
AD/T, HA		12			FILL: ASPHALT
					FILL: Gravelly SAND
					Silty CLAY
AD/T, CASING	Not Observable				SILTSTONE
	01/12/15 07:25	8	4		INTERBEDDED SILTSTONE AND SANDSTONE
NMLC		4			LAMINITE
		0	8		
			12		
		-4	16		Borehole BH03 terminated at 16.50 m Target depth

bore construction license:
drilling company:
driller:
driller's permit no.:

BH03

Concrete
Sand
Bentonite
3.00 m
Sand
8.00 m
Bentonite
Cuttings

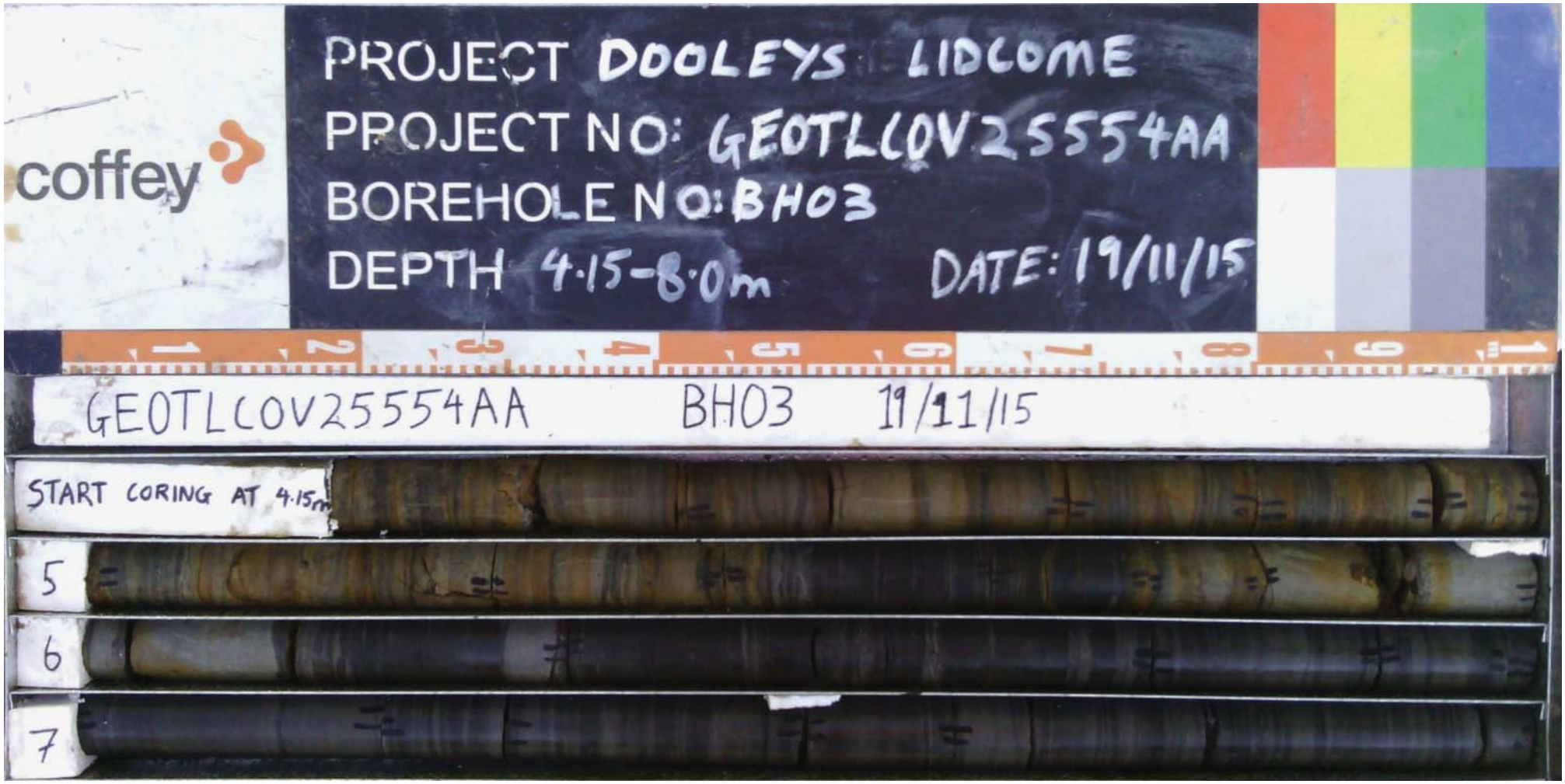
method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH03	standpipe		8.00 m 5.20 m AHD		

CDF_0_9_04BB.GLB Log COF PIEZOMETER INSTALLATION LOG GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47



PointID : BH03 Depth Range: 4.15 - 8.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

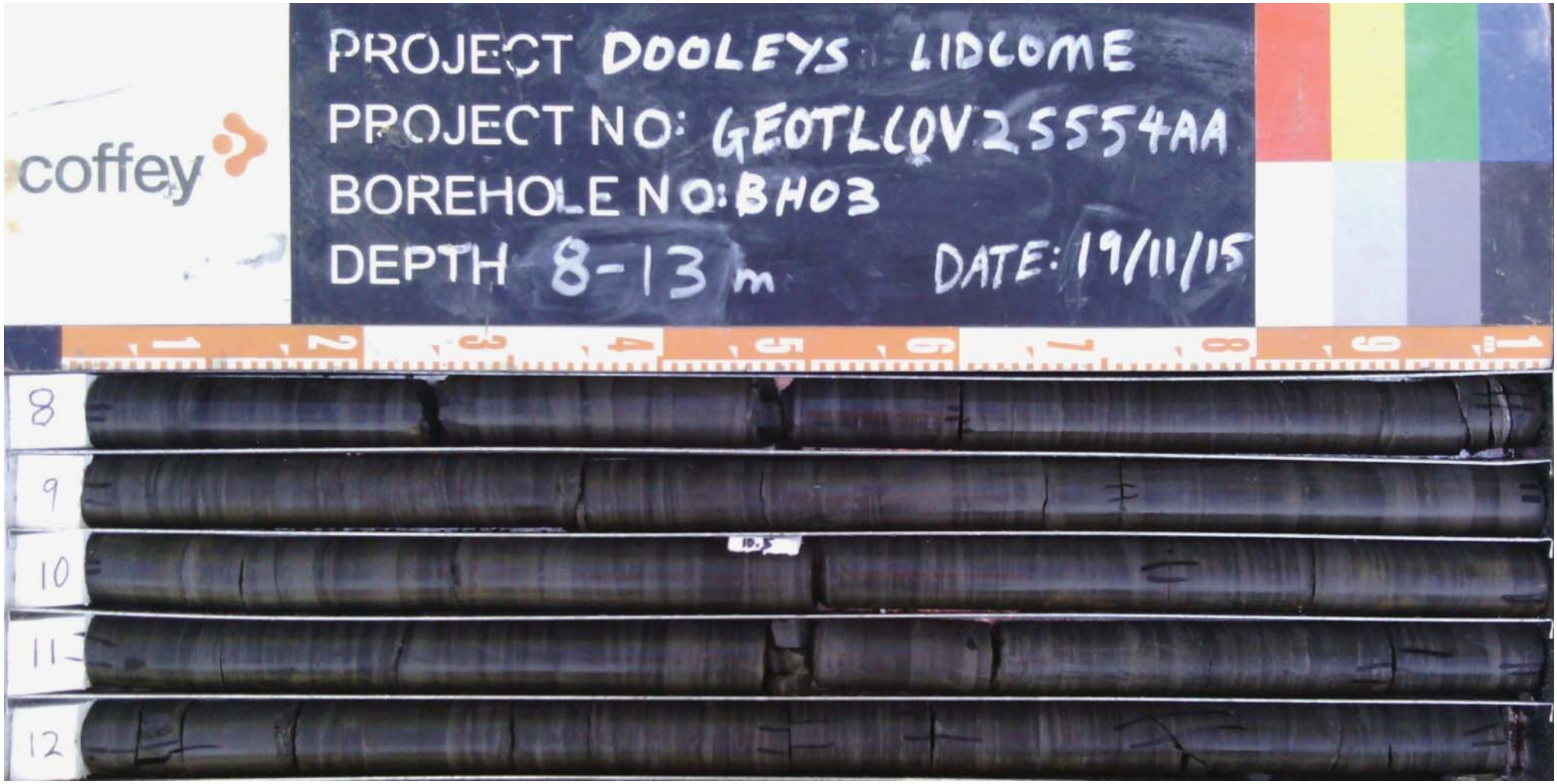
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH03

project no: GEOTLCOV25554AA | fig no: **PHOTO 9** | rev:



PointID : BH03 Depth Range: 8.00 - 13.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH03

project no: GEOTLCOV25554AA | fig no: **PHOTO 10** | rev:

PointID : BH03 Depth Range: 13.00 - 16.50 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH03

project no: GEOTLCOV25554AA | fig no: **PHOTO 11** | rev:

coffey

Engineering Log - Borehole

Borehole ID.	**BH04**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Truck mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E E	14				**FILL: ASPHALT** **FILL: Gravelly SAND**: fine to medium grained, brown, gravel is fine to medium grained, sub-rounded. becoming dark brown, gravel is , medium to coarse grained, sub-rounded to sub-angular	D to M <Wp				**ASPHALT** **FILL** PID(0.2m) = 0.0ppm, no odours or staining observed PID(0.4m) = 5.2ppm
				13	1.0		CH	**CLAY**: high plasticity, brown mottled pale grey.		VSt to H			**RESIDUAL SOIL**
			E SPT 2, 7, 21 N*=28	12	2.0			becoming pale grey					PID(1.5m) = 2.3ppm
				11	3.0			**INTERBEDDED SANDSTONE AND SILTSTONE**: pale grey to dark grey, extremely weathered, very low strength.					**WEATHERED BEDROCK**
				10	4.0			Borehole BH04 continued as cored hole					
				9	5.0								
				8	6.0								
				7	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

Engineering Log - Cored Borehole

Borehole ID.	**BH04**		
sheet:	2 of 4		
project no.	**GEOTLCOV25554AA**		
client:	**Bouygues Construction Australia**	date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		14									
		13	1.0								
		12	2.0								
		11	3.0								
		10	4.0		start coring at 4.10m						
HQ	Not Observable	9	5.0		**INTERLAMINATED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly bedded at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining on the joints and partings	HW SW FR		a=0.57 d=0.09 a=0.98 d=0.40 a=5.71 d=3.99 a=0.67 d=0.58	71% 91%		JT, 0°, ST, RO, Fe SN SM, CL Clay, 8 mm PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN JT, 5°, ST, RO, CN PT, 0°, UN, RO, Fe SN PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, Fe SN CS, SN, 10 mm PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, CN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN PT, 0°, PL, SO, Pyrite VN SM, CL Clay, 5 mm JT, 80°, UN, RO, Fe SN JT, 5°, UN, RO, CN JT, 80°, ST, RO, CN JT, 90°, IR, RO, CN Defects are:PT, 0°, PL, SO, Fe SN, unless otherwise described
		8	6.0								
		7	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH04**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	0 5 4 3 2 1 0 -1	9.0 10.0 11.0 12.0 13.0 14.0 15.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.	FR		a=0.89 d=0.14 a=0.66 d=0.33 a=0.51 d=0.30 a=0.55 d=0.12 a=0.63 d=0.40 a=0.54 d=0.32 a=2.57 d=0.60 a=0.95 d=0.47	91% 98% 94% 92% 98%		PT, 0°, PL, SO, Pyrite VN JT, 80 - 85°, PL, SO, CN JT, 40°, UN, RO, CN JT, 80 - 85°, UN, RO, CN Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
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- HA hand auger

water
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- water inflow
- complete drilling fluid loss
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core run & RQD
- barrel withdrawn

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*W replaced with A for alteration

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- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH04**
sheet:	4 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**AH**

position: E: 318954; N: 6251461 (Datum Not Specified) surface elevation: 14.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	-3	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=2.34 d=0.71	98%		
		-4	18.0					a=0.69 d=0.35			
		-5	19.0					a=0.84 d=0.43	92%		JT, 90°, IR, RO, CN JT, 80°, UN, RO, CN
		-6	20.0		Borehole BH04 terminated at 20.00 m Target depth			a=1.23 d=0.38			JT, 70°, UN, RO, CN JT, 80°, UN, RO, CN
		-7	21.0								
		-8	22.0								
		-9	23.0								

Defects are: PT, 0 - 10°, PL, SO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
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- AD auger drilling
- CB claw or blade bit
- W washbore
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- HA hand auger

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- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

PointID : BH04 Depth Range: 4.00 - 8.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH04

project no: GEOTLCOV25554AA | fig no: **PHOTO 12** | rev:

PointID : BH04 Depth Range: 8.00 - 12.00 m

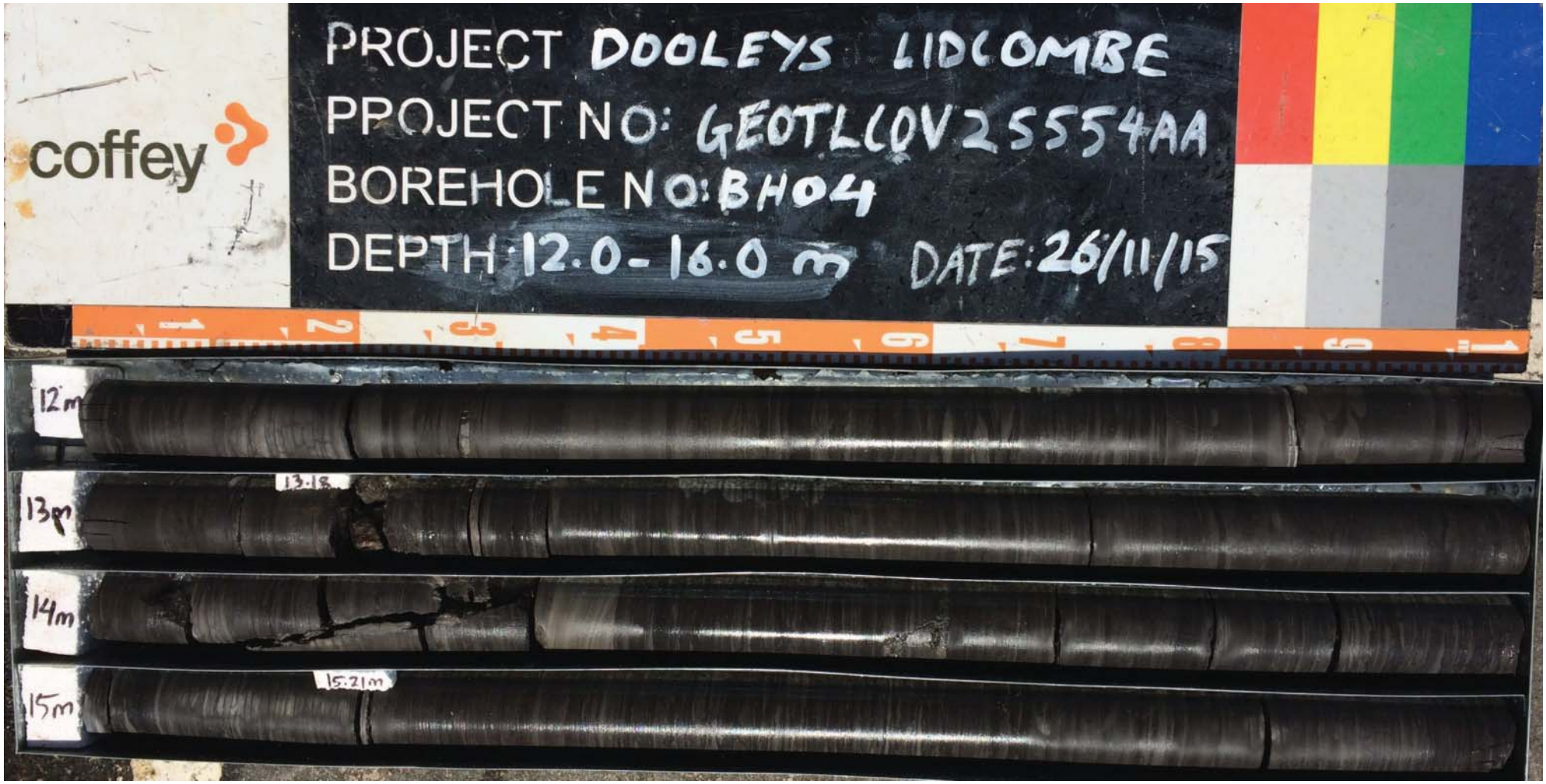
drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH04

project no: GEOTLCOV25554AA | fig no: **PHOTO 13** | rev:



PointID : BH04 Depth Range: 12.00 - 16.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

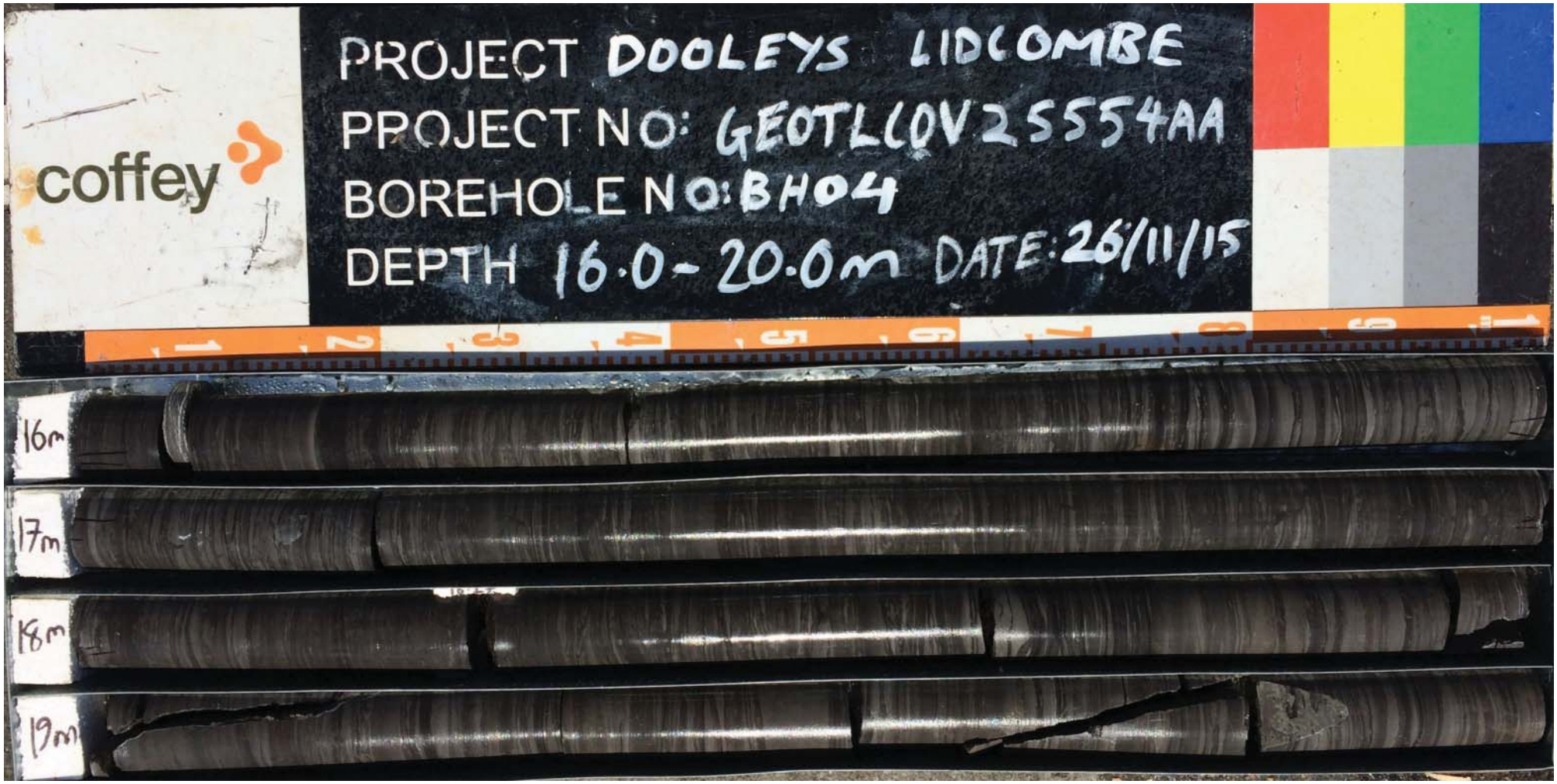
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH04

project no: GEOTLCOV25554AA | fig no: **PHOTO 14** | rev:



PointID : BH04 Depth Range: 16.00 - 20.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia		
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141		
title:	**CORE PHOTOGRAPH** **BH04**		
project no: GEOTLCOV25554AA		fig no: **PHOTO 15**	rev:

coffey

Engineering Log - Borehole

Borehole ID.	**BH05**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
AD/T CASING	1 2 3	Not Observable	E	15	0.0			**FILL: ASPHALT**	D to M				**ASPHALT**
								FILL: Gravelly SAND: fine to medium grained, gravel is fine to medium grained, sub angular to angular.					**FILL**
			E SPT 5, 5, 6 N*=11 E	14	1.0		CH	**Silty CLAY**: high plasticity, pale grey mottled red brown.	<Wp	St to VSt VSt to H	100 200 300 400	2 4 6 8 10	**RESIDUAL SOIL**
			SPT 10, 20/100mm HB N*=R	13	2.0			**SILTSTONE**: brown, extremely weathered, very low strength. becoming brown-grey, extremely to highly weathered, estimated very low to low strength					**WEATHERED BEDROCK**
				12	3.0			Borehole BH05 continued as cored hole					
				11	4.0								
				10	5.0								
				9	6.0								
				8	7.0								

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH05**
		sheet:	2 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		15									
			1.0								
		14									
			2.0								
		13									
			3.0		start coring at 3.00m						
NMLC	Not Observable	12			**SANDSTONE**: fine to medium grained, pale grey to orange brown, indistinctly laminated.	MW		a=2.27 d=0.48	99%		SM, 0°, PL, CL Clay, 20 mm PT, 5°, CU, RO, CN PT, 0 - 5°, UN, RO, CN
			4.0		**INTERBEDDED SANDSTONE AND SILTSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.	SW		a=0.32 d=0.21			SM, 0 - 5°, IR, Clay
		11									
			5.0			MW		a=2.36 d=0.54			PT, 0 - 5°, IR, RO, Fe SN
	01/12/15 07:35	10							91%		CS, 0°, 30 mm SZ, Fe SN, 30 mm JT, 90°, PL, RO, Fe SN PT, 0 - 15°, IR, RO, Fe SN
			6.0			MW to HW					
		9				SW		a=1.06 d=0.26			
			7.0								
		8				FR		a=1.58 d=0.43			JT, 80 - 90°, IR, RO, Pyrite SN
									92%		JT, 60 - 85°, IR, RO, CN

Defects are:PT, 0 - 10°, PL, RO, Fe SN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH05**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**25 Nov 2015**
date completed:	**25 Nov 2015**
logged by:	**TO**
checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description (ROCK TYPE: grain characterisics, colour, structure, minor components)	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	7	9.0		**INTERBEDDED SANDSTONE AND SILTSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=1.70 d=0.56			PT, 0°, RO, CN, 30 mm, multiple partings
		6	10.0		**LAMINITE**: siltstone (60%) and sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=1.02 d=0.64	92%		PT, 0°, RO, CN, 30 mm, multiple partings PT, 0 - 5°, IR, RO, CN
		5	11.0					a=0.70 d=0.73			PT, 0 - 5°, IR, RO, CN
		4	12.0					a=0.96 d=0.67			
		3	13.0		sandstone band, fine grained, grey			a=0.90 d=0.89	98%		
		2	14.0					a=1.42 d=1.03			
		1	15.0					a=0.77 d=0.58	97%		PT, IR, multiple partings
		0						a=0.81 d=0.67			

Defects are:PT, 0 - 10°, PL, RO, Fe SN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH05**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular general
NMLC					**LAMINITE**: siltstone (60%) and sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR	O X	a=1.08 d=0.49	97%		
		-1	17.0		Borehole BH05 terminated at 16.45 m Target depth						
		-2	18.0								
		-3	19.0								
		-4	20.0								
		-5	21.0								
		-6	22.0								
		-7	23.0								
		-8									

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

Piezometer Installation Log

		Hole ID.	**BH05**
		sheet:	1 of 1
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318977; N: 6251499 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

equipment type: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance** | **piezometer construction details**

method & support	water	RL (m)	depth (m)	graphic log	material name
AD/T, CASING	Not Observable				FILL: ASPHALT
					FILL: Gravelly SAND
					Silty CLAY
					SILTSTONE
					SANDSTONE
NMLC	01/12/15 07:35	12	4		INTERBEDDED SANDSTONE AND SILTSTONE
		8	8		
		4	12		LAMINITE
		0	16		
		-4			Borehole BH05 terminated at 16.45 m Target depth

bore construction license:
drilling company:
driller:
driller's permit no.:

BH05

Cuttings
Bentonite
2.50 m
Sand
8.00 m
Bentonite
Cuttings

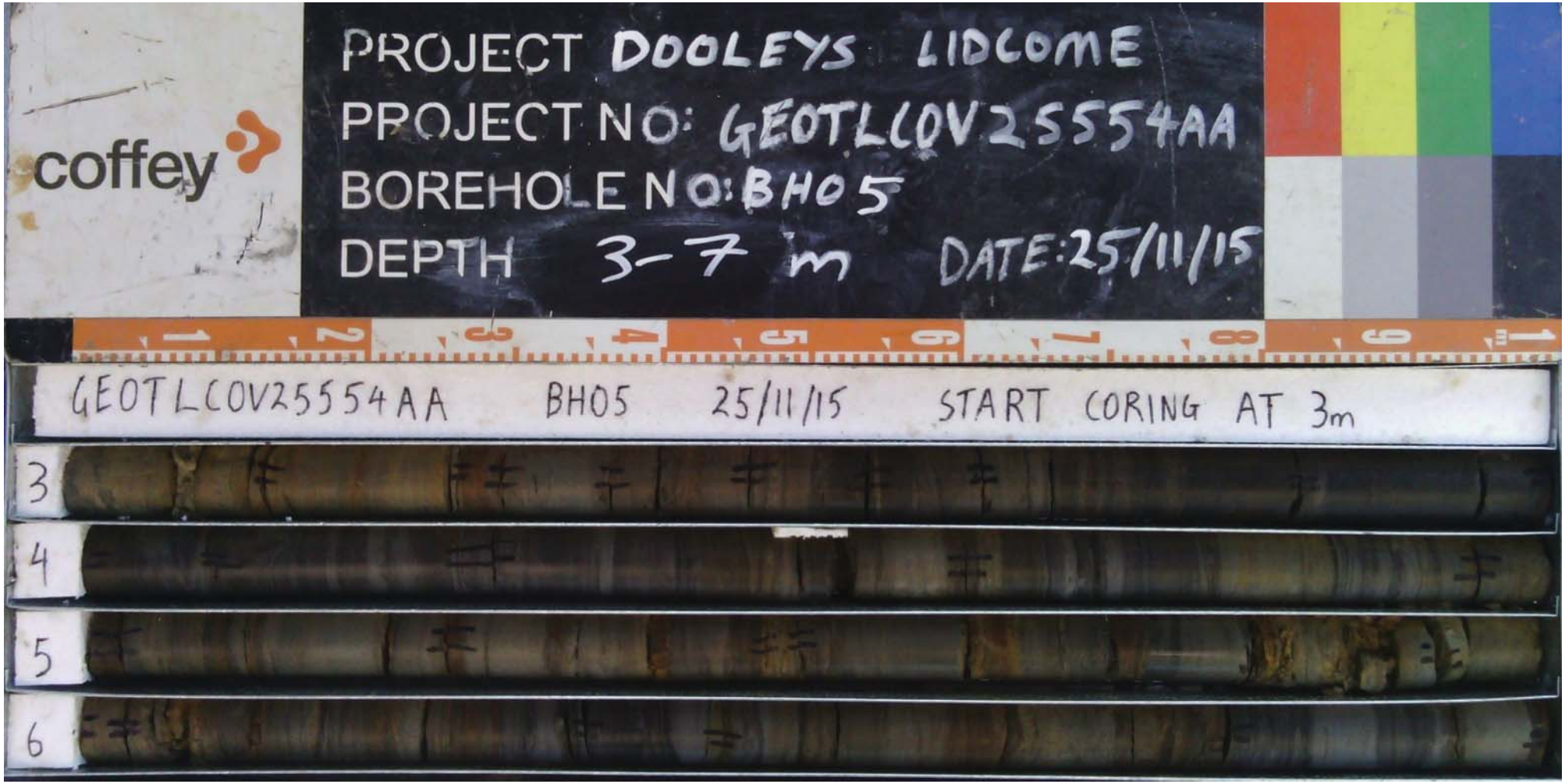
method & support
see engineering log for details

water
- 10-Oct-12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

ID	type	stick up & RL	tip depth & RL	install. date	water level
BH05	standpipe piezo.		8.00 m 7.60 m AHD		

CDF_0_9_04BB.GLB Log COF PIEZOMETER INSTALLATION LOG GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:47



PointID : BH05 Depth Range: 3.00 - 7.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH05

project no: GEOTLCOV25554AA | fig no: **PHOTO 16** | rev:

PointID : BH05 Depth Range: 7.00 - 12.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

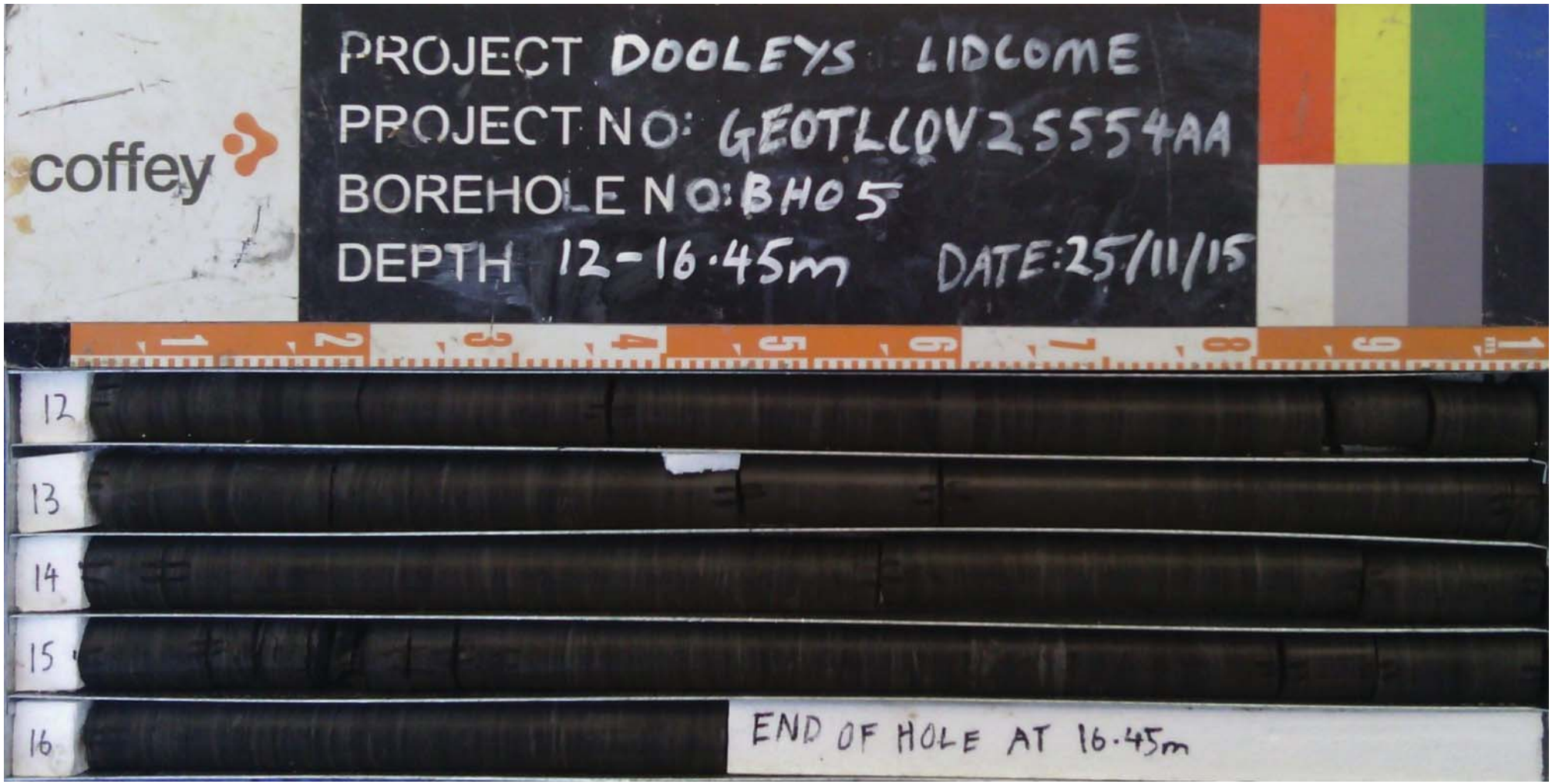
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH05

project no: GEOTLCOV25554AA | fig no: **PHOTO 17** | rev:



PointID : BH05 Depth Range: 12.00 - 16.45 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH05**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 18**	

coffey

Engineering Log - Borehole

Borehole ID.	**BH06**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Truck mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
AD/T CASING	1 2 3	Not Observable	E E E SPT 9, 30, HB N*=30	12 11 10 9 8 7 6 5	1.0 2.0 3.0 4.0 5.0 6.0 7.0		CH	**FILL: Gravelly SAND**: fine grained, dark brown, gravel is medium to coarse grained, with a trace of clay. **CLAY**: high plasticity, brown mottled grey.	D to M <Wp	St to VSt VSt to H	100 200 300 400	2 4 6 8 10	**FILL** **RESIDUAL SOIL** PID(0.2m) = 0.2ppm, no odours or staining observed PID(0.5m) = 0.4ppm PID(1.0m) = 0.5ppm
								INTERBEDDED SILTSTONE AND SANDSTONE: extremely weathered, very low strength. with fragments of siltstone and sandstone					**WEATHERED BEDROCK**
								Borehole BH06 continued as cored hole					

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH06**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**25 Nov 2015**
date completed:	**25 Nov 2015**
logged by:	**NM**
checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		12	0.0								
		11	1.0								
		10	2.0								
		9	3.0								
		8	4.0		start coring at 4.00m						
HQ	Not Observable	7	5.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining in the joints and partings	HW SW		a=0.47 d=0.11	76%		PT, 0°, UN, SO, Fe SN JT, 85 - 90°, UN, SO, Fe SN SM, Clay, 10 mm JT, 30°, UN, RO, Fe SN CS, Fe SN, 6 mm SM, CL Clay, 5 mm CS, Fe SN, 5 mm
		6	6.0		sandstone band	FR		a=0.59 d=0.20	86%		PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN JT, 20°, UN, SO, Pyrite VN PT, 0°, PL, SO, Pyrite VN PT, 0°, PL, SO, CN
		5	7.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=0.69 d=0.33 a=0.76 d=0.30	95%		Defects are;PT, 0°, PL, SO, Fe SN, unless otherwise described

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH06**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**25 Nov 2015**
date completed:	**25 Nov 2015**
logged by:	**NM**
checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	4			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.43 d=0.30	95%		
		3	9.0						100%		
								a=0.98 d=0.36			
		2	10.0						100%		
								a=0.91 d=0.32			
		1	11.0						97%		
								a=0.53 d=0.30			
		0	12.0								
								a=0.56 d=0.15			
		-1	13.0						98%		SM, Clay, 2 mm
								a=0.56 d=0.11			
		-2	14.0								
								a=1.07 d=0.40			
		-3	15.0								
								a=0.90 d=0.44	100%		

Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH06**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**25 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**25 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318931; N: 6251513 (Datum Not Specified) surface elevation: 12.00 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Truck mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	-5	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.79 d=0.40	100%		Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described
		-6	18.0					a=0.61 d=0.28			
		-7	19.0					a=1.23 d=0.31	97%		
		-8	20.0					a=0.94 d=0.35			SM, Clay, 5 mm
					Borehole BH06 terminated at 20.00 m Target depth						
		-9	21.0								
		-10	22.0								
		-11	23.0								

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method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

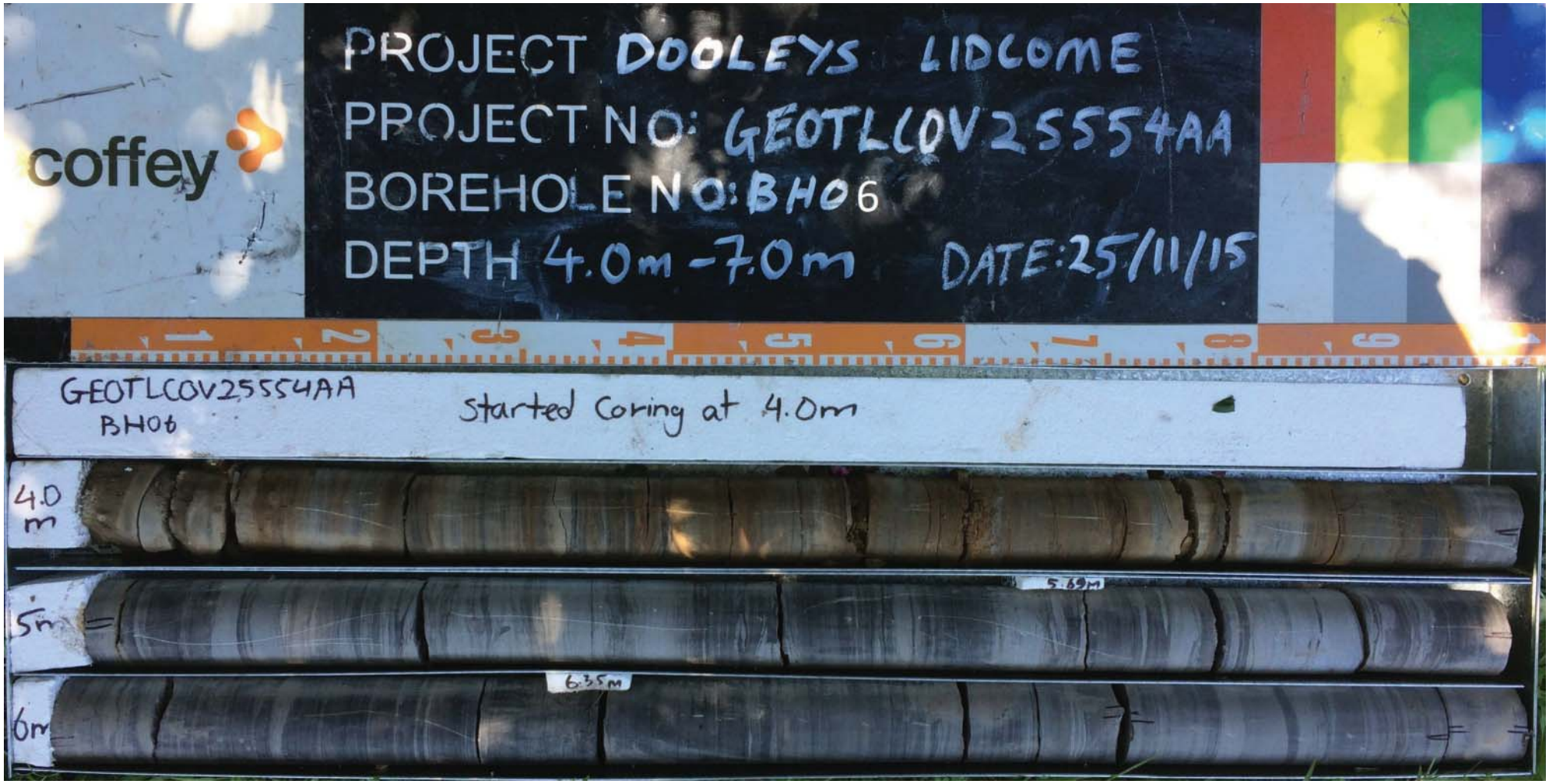
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating



PointID : BH06 Depth Range: 4.00 - 7.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

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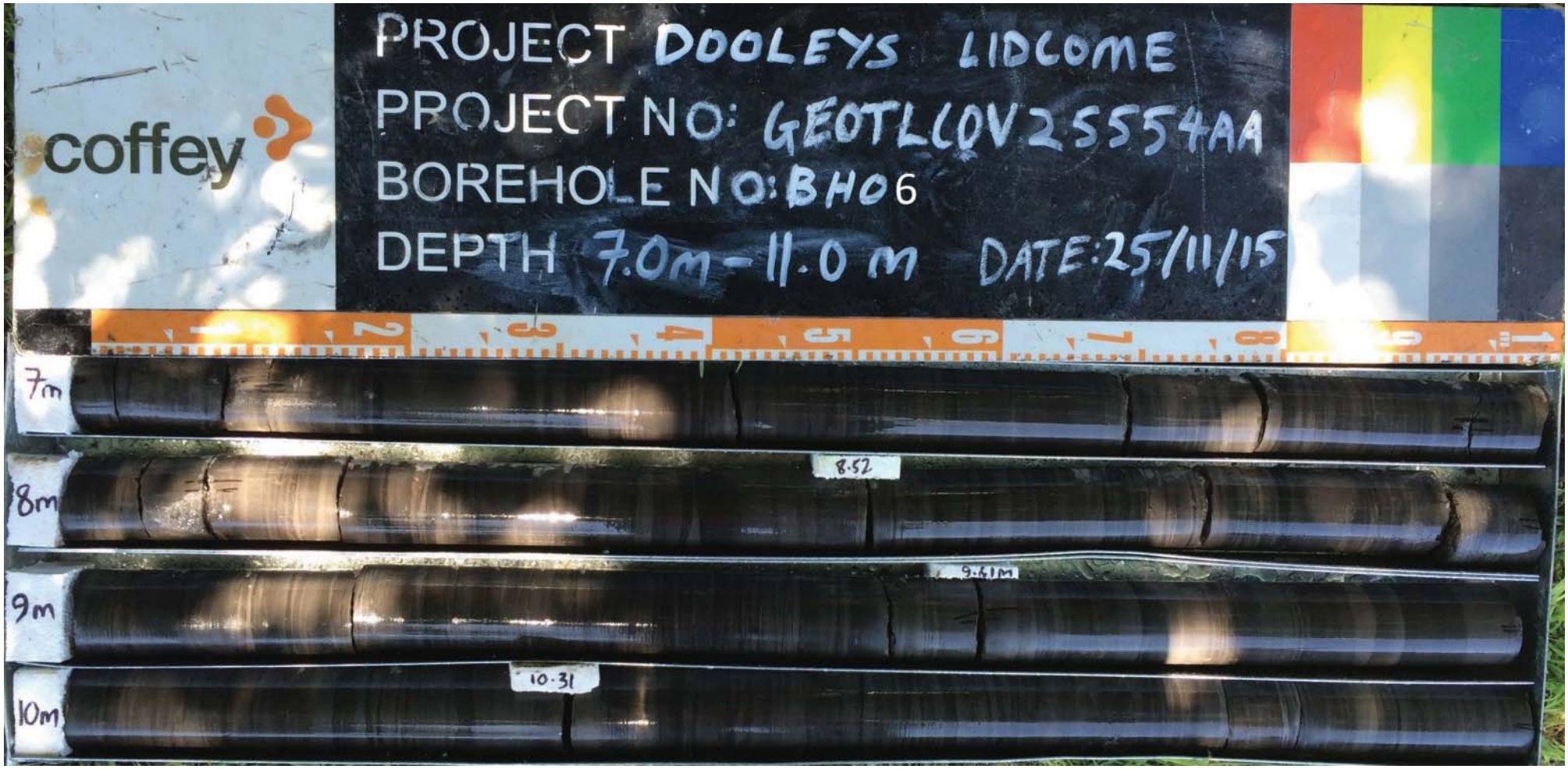
client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH06

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 19**	



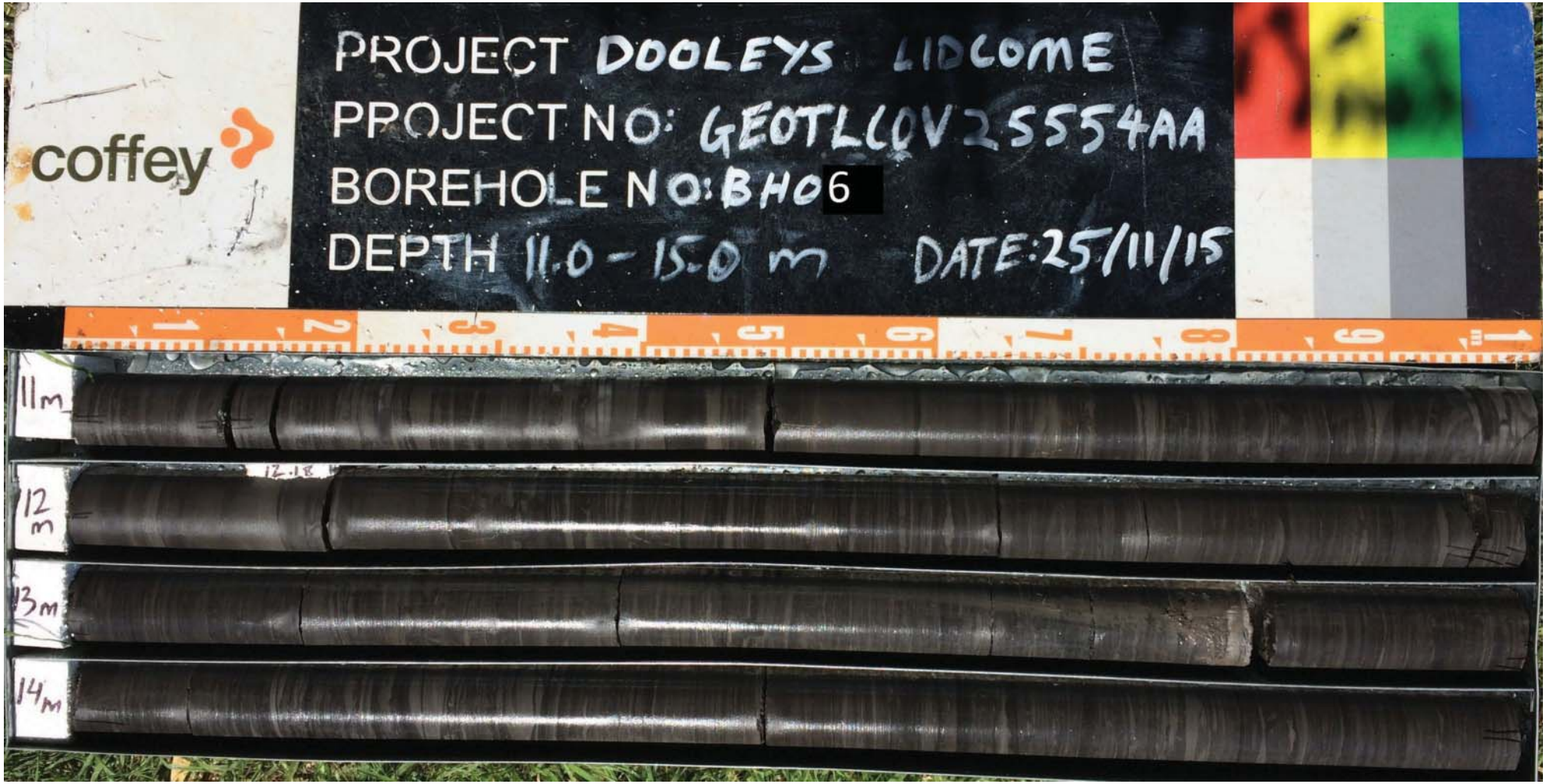
PointID : BH06 Depth Range: 7.00 - 11.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH06**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 20**	



PointID : BH06 Depth Range: 11.00 - 15.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH06**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 21**	

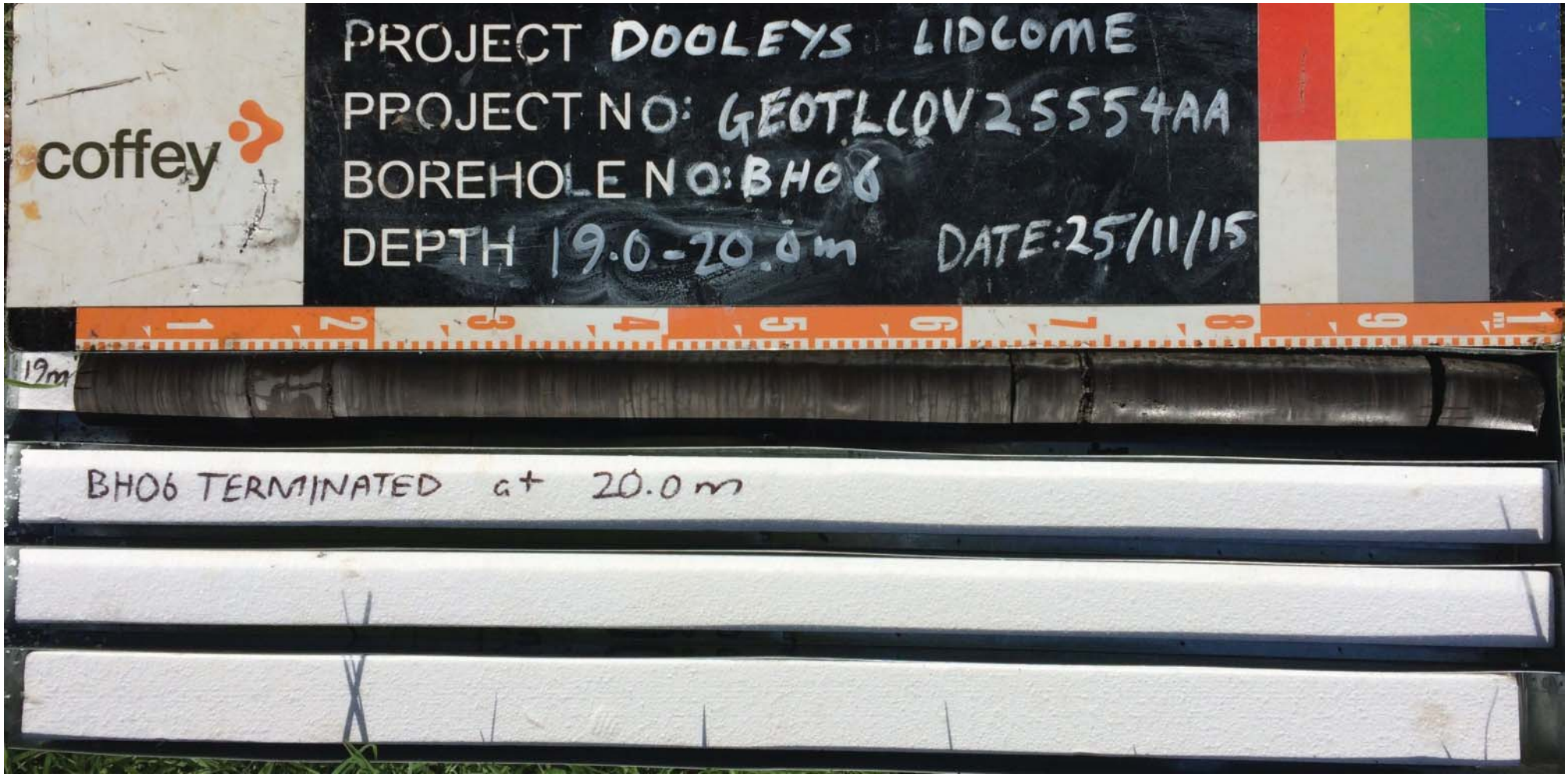
PointID : BH06 Depth Range: 15.00 - 19.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH06**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 22**	



PointID : BH06 Depth Range: 19.00 - 20.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH06

project no: GEOTLCOV25554AA | fig no: **PHOTO 23** | rev:

coffey

Engineering Log - Borehole

Borehole ID.	**BH07**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**24 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90° DCP id.:

drill model: DRILLTECH 550, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration 1 2 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa) 100 200 300 400	DCP (blows/ 100 mm) 2 4 6 8 10	structure and additional observations
AD/T CASING		Not Observable	E	12			CH	**FILL: Gravelly SAND**: fine to medium grained, dark brown, gravel is medium to coarse grained, with a trace of silt.	D to M				**FILL**
								CLAY: high plasticity, brown mottled grey.	<Wp	St to VSt			**RESIDUAL SOIL** PID(0.2m) = 0.0ppm, no odours or staining observed
			E	11	1.0					VSt to H			PID(1.0m) = 0.0ppm
			SPT 4, 11, 30 HB N*=41	10	2.0			becoming pale grey					PID(1.5m) = 0.0ppm
				9	3.0			**INTERBEDDED SILTSTONE AND SANDSTONE**: extremely weathered, very low strength.					**WEATHERED BEDROCK**
				8	4.0			Borehole BH07 continued as cored hole					
				7	5.0								
				6	6.0								
				5	7.0								

method
AD auger drilling*
AS auger screwing*
HA hand auger
W washbore
HA hand auger

* bit shown by suffix
e.g. AD/T
B blank bit
T TC bit
V V bit

support
M mud N nil
C casing

penetration
1 2 3 no resistance ranging to refusal

water
10-Oct-12 water level on date shown
water inflow
water outflow

samples & field tests
B bulk disturbed sample
D disturbed sample
E environmental sample
SS split spoon sample
U## undisturbed sample ##mm diameter
HP hand penetrometer (kPa)
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
VS vane shear; peak/remouded (kPa)
R refusal
HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
D dry
M moist
W wet
Wp plastic limit
Wl liquid limit

consistency / relative density
VS very soft
S soft
F firm
St stiff
VSt very stiff
H hard
Fb friable
VL very loose
L loose
MD medium dense
D dense
VD very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH07**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**24 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**NM**
checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		12									
			1.0								
		11									
			2.0								
		10									
			3.0								
		9									
			4.0		start coring at 4.00m						
HQ	Not Observable	8			**INTERBEDDED SILTSTONE AND SANDSTONE**: siltstone (50%) and sandstone (50%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. iron staining in the joints and partings	HW to MW MW		a=0.60 d=0.24			JT, 85 - 90°, UN, RO, Fe SN PT, 0°, UN, SO, Fe SN PT, 0°, UN, SO, Fe SN SM, Clay, 3 mm
			5.0			SW			81%		SM, CL Clay, 5 mm JT, 80°, PL, SO, Fe SN
		7									PT, 0°, PL, SO, Fe SN PT, 0°, PL, SO, Fe SN
					sandstone band, pale grey	FR		a=1.71 d=1.19			PT, 0°, PL, SO, Fe SN
		6	6.0					a=1.60 d=0.13			
					sandstone band, pale grey						JT, 45°, UN, SO, CN
			7.0						95%		
		5			**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=0.98 d=0.23			

Defects are:PT, 0°, PL, SO, Fe SN, unless otherwise described

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method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn
- RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH07**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**24 Nov 2015**
date completed:	**24 Nov 2015**
logged by:	**NM**
checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	4	9.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.58 d=0.33	95%		Defects are:PT, 0 - 10°, PL, SO, CN, unless otherwise described
		3						a=1.41 d=0.40			
			10.0								
		2						a=0.87 d=0.51	97%		
			11.0								
		1						a=1.47 d=0.56			
			12.0								
		0						a=0.67 d=0.21			
			13.0								
		-1						a=0.73 d=0.11	100%		
			14.0								SM, Clay, 10 mm
		-2						a=1.91 d=0.51			
			15.0								
		-3						a=0.86 d=0.19	100%		

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

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Engineering Log - Cored Borehole

		Borehole ID.	**BH07**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**24 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**24 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**NM**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 318935; N: 6251535 (Datum Not Specified) surface elevation: 12.30 m (AHD) angle from horizontal: 90°

drill model: DRILLTECH 550, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
HQ	Not Observable	-4	17.0		**LAMINITE**: siltstone (70%) and sandstone (30%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.97 d=0.30	100%		
		-5						a=1.00 d=0.59			
		-6	18.0					a=1.15 d=0.65			JT, 40°, IR, RO, CN JT, 70°, IR, SO, CN
		-7	19.0		**LAMINITE**: siltstone (30%) and sandstone (70%), distinctly laminated at 0-10°, sandstone is fine grained, pale grey, siltstone is dark grey.			a=1.83 d=0.30	95%		JT, 80°, IR, SO, CN
		-8	20.0		Borehole BH07 terminated at 20.00 m Target depth						
		-9	21.0								
		-10	22.0								
		-11	23.0								

Defects are: PT, 0 - 10°, PL, SO, CN, unless otherwise described

method & support
AS auger screwing
AD auger drilling
CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm)
NQ wireline core (47.6mm)
HQ wireline core (63.5mm)
PQ wireline core (85.0mm)
SPT standard penetration test
HA hand auger

water
10/10/12, water level on date shown
water inflow
complete drilling fluid loss
partial drilling fluid loss
25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
core recovered (graphic symbols indicate material)
no core recovered

core run & RQD
barrel withdrawn
RQD = Rock Quality Designation (%)

weathering & alteration*
RS residual soil
XW extremely weathered
HW highly weathered
DW distinctly weathered
MW moderately weathered
SW slightly weathered
FR fresh
*W replaced with A for alteration

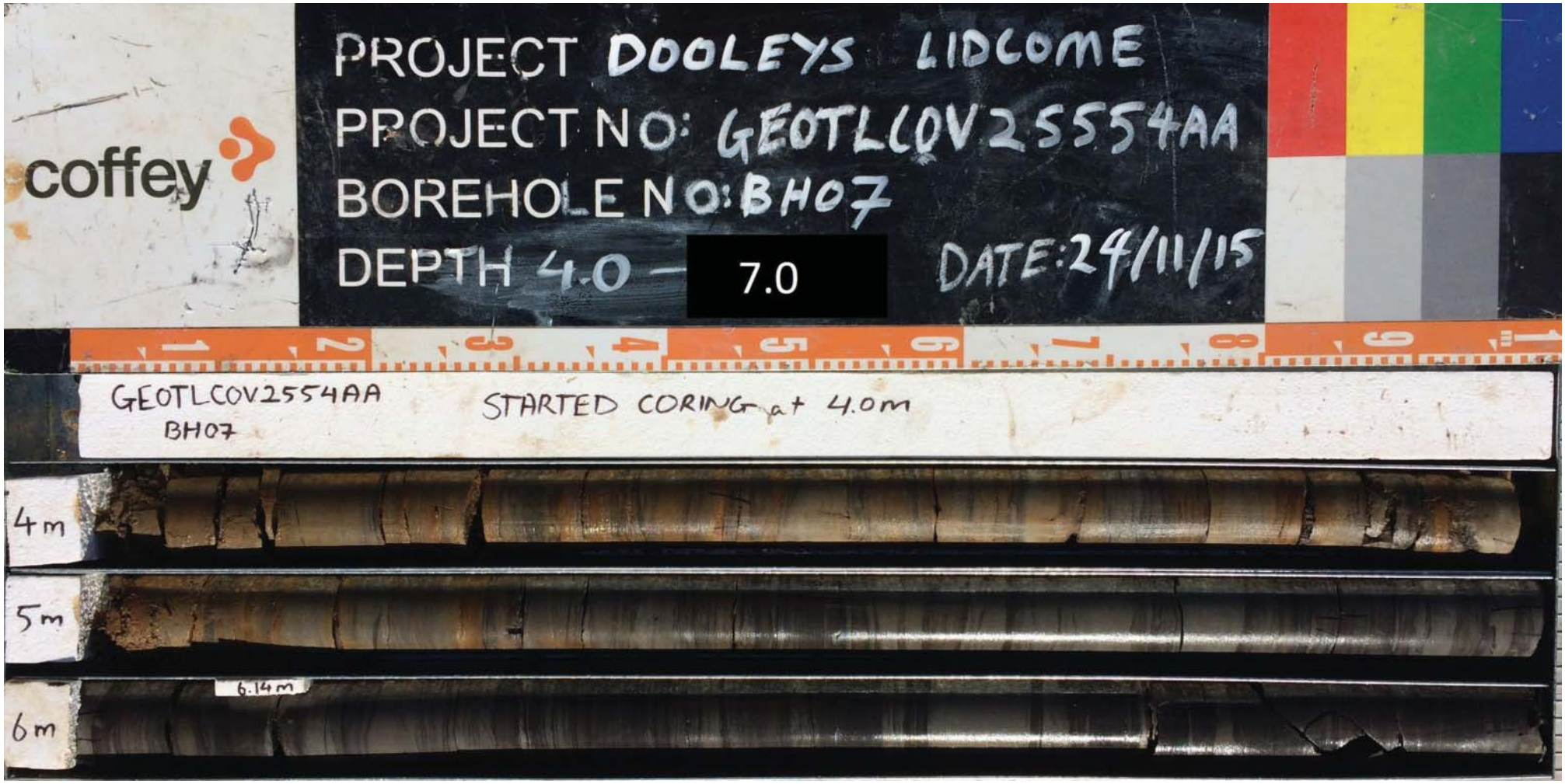
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
PT parting
JT joint
SZ shear zone
SS shear surface
CS crushed seam
SM seam
DB drilling break

roughness
SL slickensided
POL polished
SO smooth
RO rough
VR very rough

planarity
PL planar
CU curved
UN undulating
ST stepped
IR Irregular

coating
CN clean
SN stain
VN veneer
CO coating



PointID : BH07 Depth Range: 4.00 - 7.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

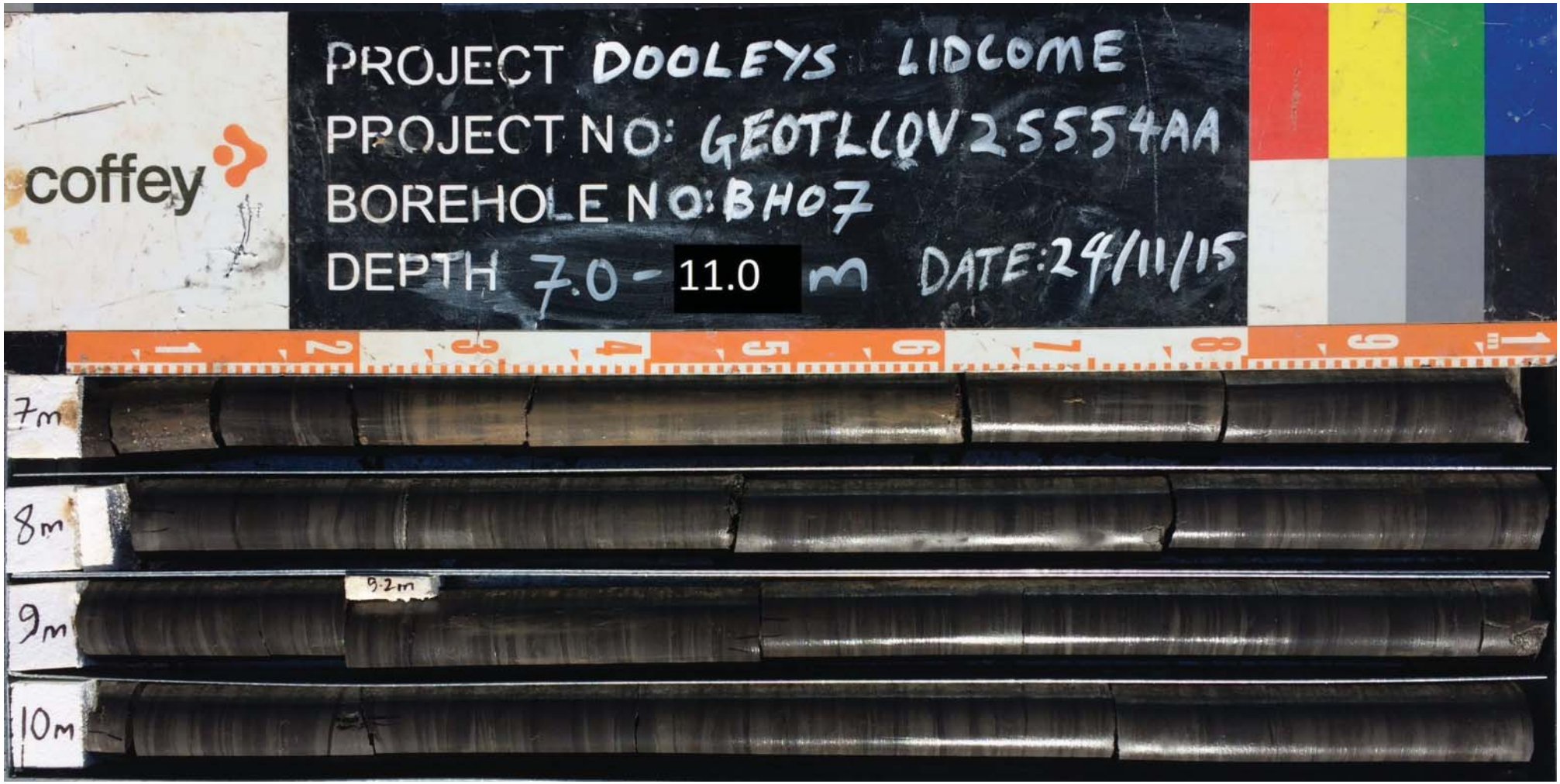
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH07

project no: GEOTLCOV25554AA | fig no: **PHOTO 24** | rev:



PointID : BH07 Depth Range: 7.00 - 11.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

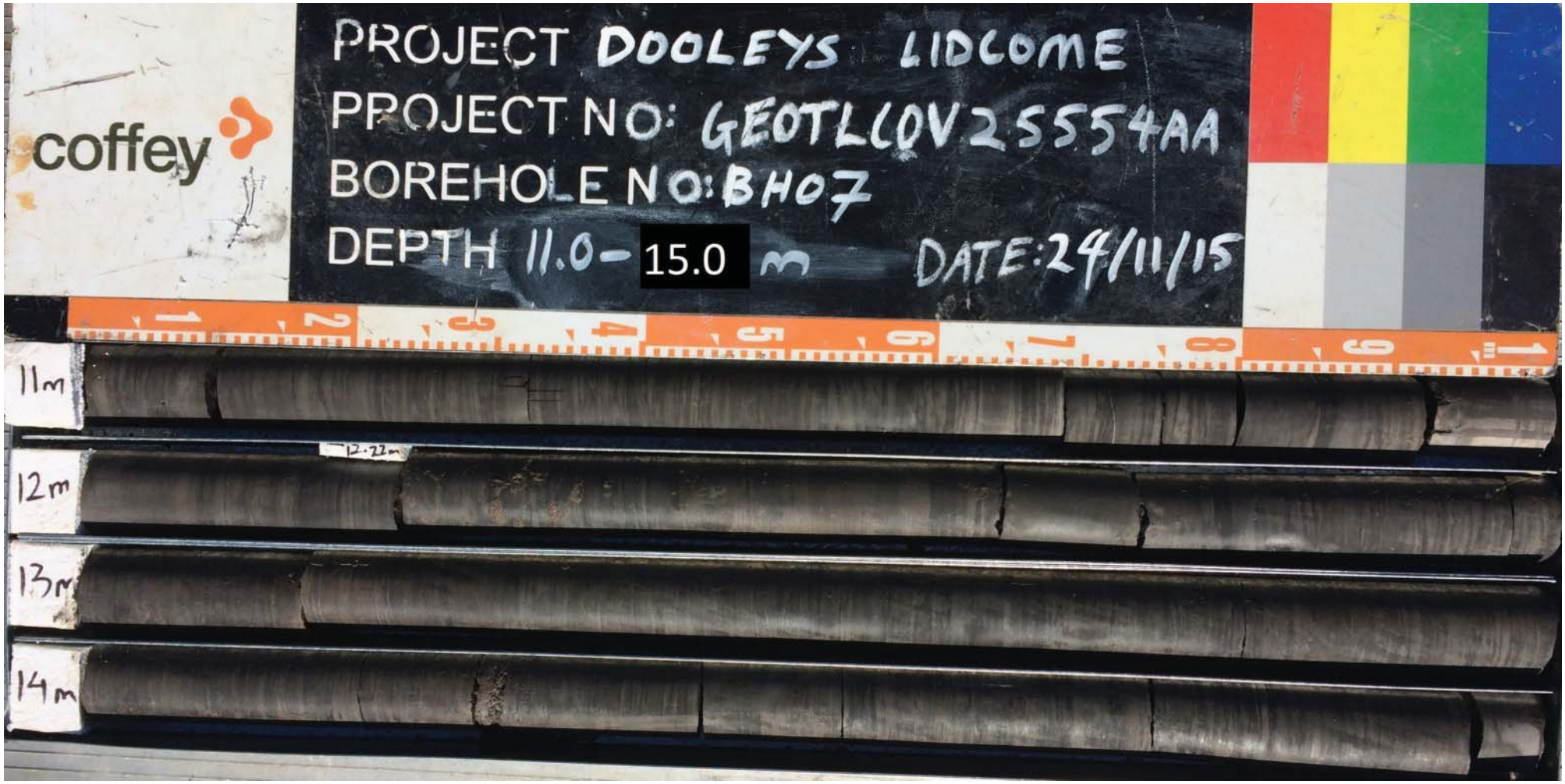
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH07

project no: GEOTLCOV25554AA | fig no: **PHOTO 25** | rev:



PointID : BH07 Depth Range: 11.00 - 15.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

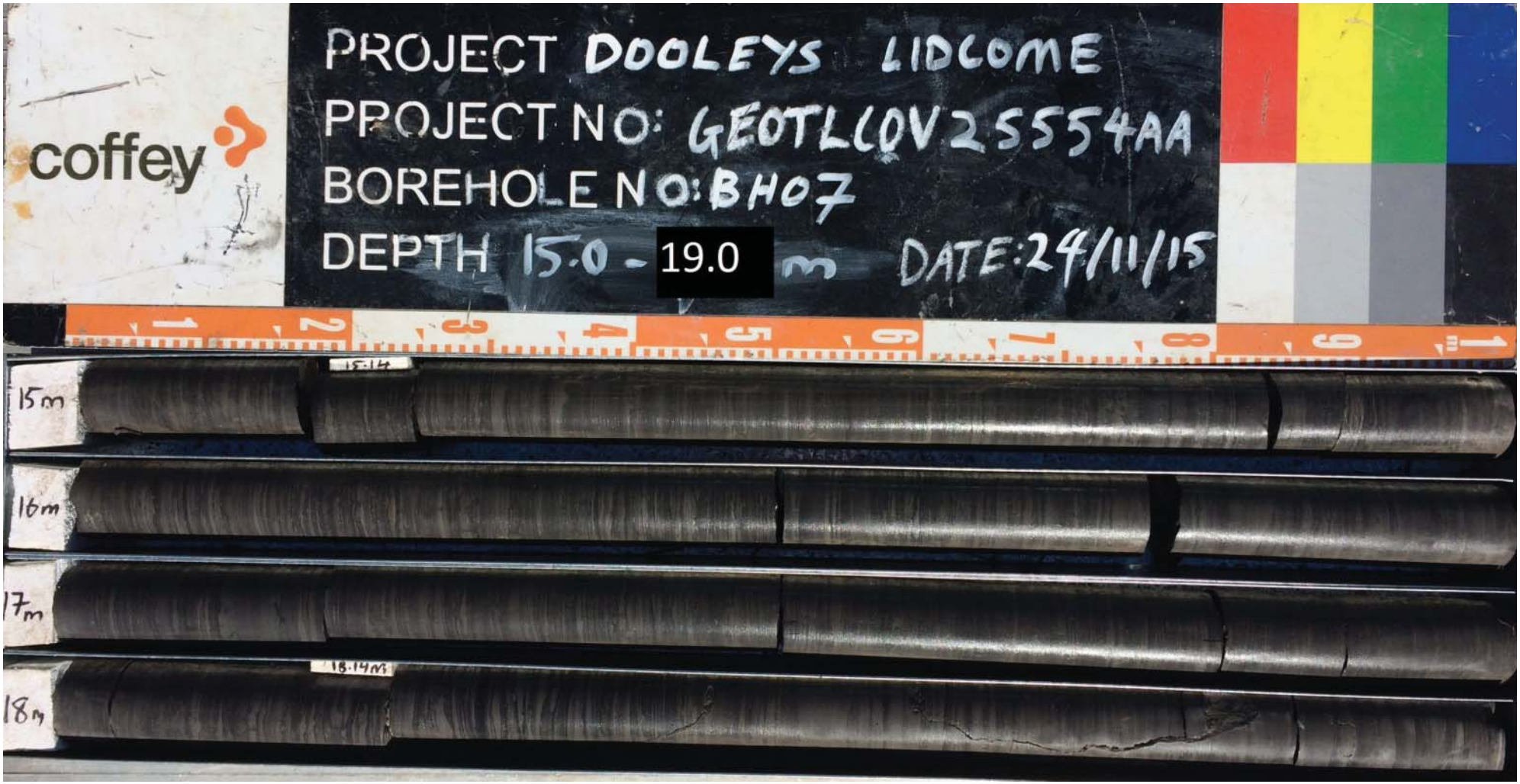
coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH07

project no: GEOTLCOV25554AA | fig no: **PHOTO 26** | rev:



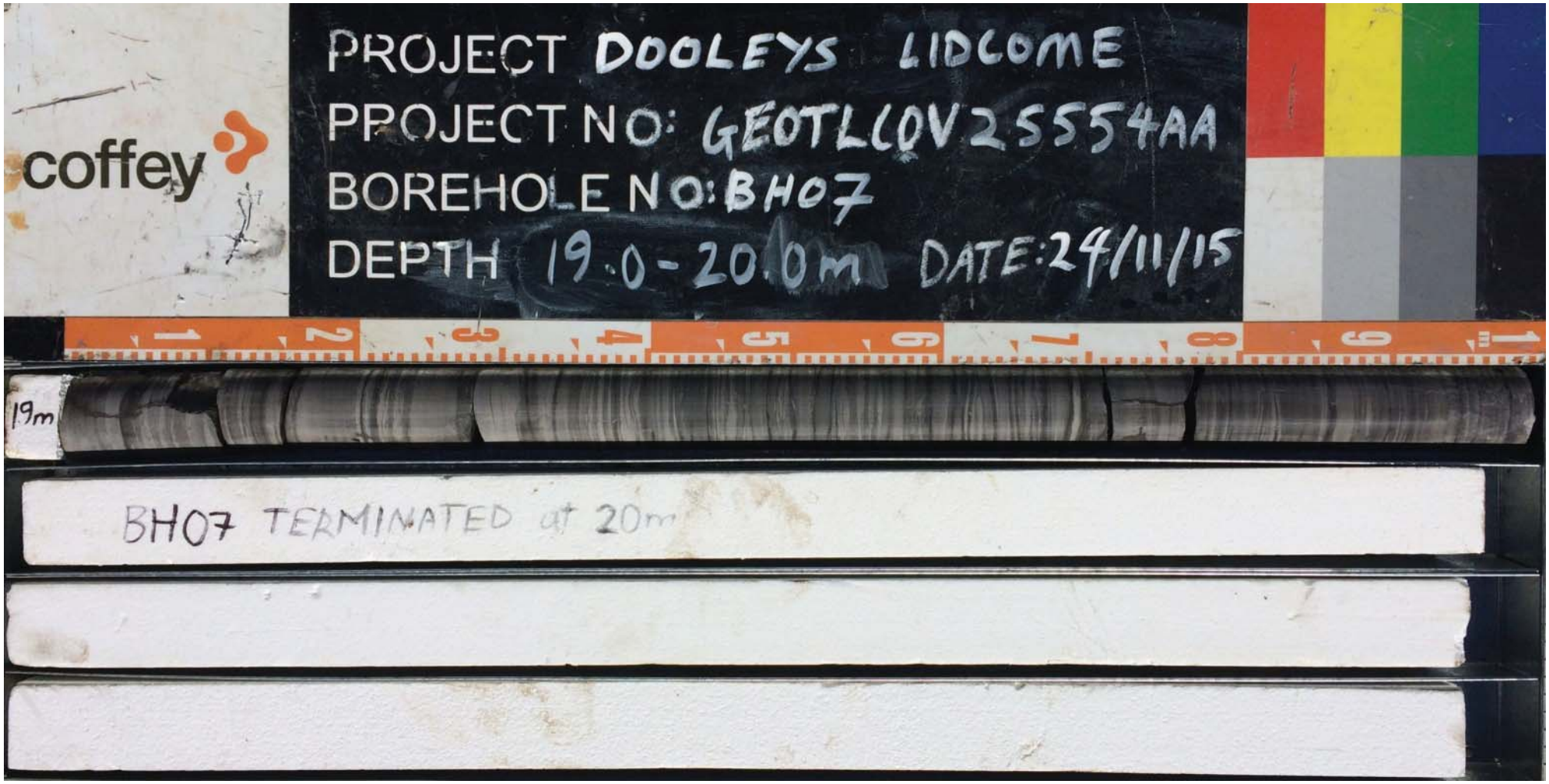
PointID : BH07 Depth Range: 15.00 - 19.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH07**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 27**	



PointID : BH07 Depth Range: 19.00 - 20.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client:	Bouygues Construction Australia
project:	Dooleys Lidcombe Club & Hotel Development 24-28 John St, Lidcombe NSW 2141
title:	**CORE PHOTOGRAPH** **BH07**

project no:	fig no:	rev:
GEOTLCOV25554AA	**PHOTO 28**	

coffey

Engineering Log - Borehole

Borehole ID.	**BH08**
sheet:	1 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**
date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**
logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**
checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90° DCP id.:

drill model: GEO205, Track mounted hole diameter : 100 mm

drilling information | **material substance**

method & support	penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description (SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components)	moisture condition	consistency / relative density	hand penetrometer (kPa)	DCP (blows/ 100 mm)	structure and additional observations
HA		Not Observable	E					**FILL: Gravelly CLAY**: fine to medium grained, high plasticity, brown to dark brown, smell of fertiliser.	~Wp				**FILL** PID(0.2m) = 4.5ppm, no odours or staining observed PID(0.05-0.7m) = 4.7ppm
			E	15									
			E				CH	**CLAY**: high plasticity, pale grey mottled red brown.	<Wp	St to VSt			**RESIDUAL SOIL** PID(1.0-1.1m) = 4.4ppm
AD/T			SPT 3, 4, 5 N*=9	14	1.0			with ironstone gravel					
CASING					2.0					VSt to H			
			SPT 6, 12, 23 N*=35	13									
					3.0			**SILTSTONE**: grey and brown, extremely weathered, estimated very low strength.					**BEDROCK**
				12				Borehole BH08 continued as cored hole					
					4.0								
				11									
					5.0								
				10									
					6.0								
				9									
					7.0								
				8									

CDF_0_9_04BB.GLB Log COF BOREHOLE: NON CORED + DCP GEOTLCOV25554AA.GPJ <<DrawingFile>> 15/12/2015 07:58

method
- AD auger drilling*
- AS auger screwing*
- HA hand auger
- W washbore
- HA hand auger

* bit shown by suffix
e.g. AD/T
- B blank bit
- T TC bit
- V V bit

support
- M mud
- C casing
- N nil

penetration
1 2 3 — no resistance ranging to refusal

water
- 10-Oct-12 water level on date shown
- water inflow
- water outflow

samples & field tests
- B bulk disturbed sample
- D disturbed sample
- E environmental sample
- SS split spoon sample
- U## undisturbed sample ##mm diameter
- HP hand penetrometer (kPa)
- N standard penetration test (SPT)
- N* SPT - sample recovered
- Nc SPT with solid cone
- VS vane shear; peak/remouded (kPa)
- R refusal
- HB hammer bouncing

classification symbol & soil description
based on Unified Classification System

moisture
- D dry
- M moist
- W wet
- Wp plastic limit
- Wl liquid limit

consistency / relative density

VS	very soft
S	soft
F	firm
St	stiff
VSt	very stiff
H	hard
Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense
VD	very dense

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH08**
sheet:	2 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**26 Nov 2015**
date completed:	**26 Nov 2015**
logged by:	**TO**
checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
		15									
			1.0								
		14									
			2.0								
		13									
			3.0								
		12			start coring at 3.61m						
NMLC	Not Observable		4.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly distinctly bedded at 0-10, sandstone is fine grained, pale grey, siltstone is dark grey.	MW		a=1.32 d=0.59	90%		CS, 0 - 10°, IR, 10 mm PT, 0 - 10°, IR, RO, Fe SN PT, 0 - 5°, CU, RO, CN PT, 5°, UN, RO, CN PT, 5°, IR, RO, CN
		11						a=0.79 d=0.10			
			5.0								JT, 80 - 90°, PL, RO, Fe SN CS, 0 - 5°, IR, RO, CN
		10									PT, 0°, IR, RO, Fe SN PT, 0 - 5°, IR, RO, CN
			6.0		becoming grey and dark grey			a=1.22 d=0.57	59%		CS, 0°, IR, RO, Fe SN, 35 mm CS, 0°, IR, RO, Fe SN, 10 mm
		9				SW		a=1.34 d=0.79			PT, 0°, IR, RO, Fe SN PT, 0°, IR, RO, Fe SN
			7.0								SM
											JT, 90°, IR, RO, Fe SN PT, 5°, IR, RO, Clay CO
		8				FR		a=2.56 d=0.34			PT, 0°, IR, RO, Fe SN PT, 0°, IR, RO, CN
									92%		

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

Borehole ID.	**BH08**
sheet:	3 of 4
project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**
principal:	**Dooleys Lidcombe Catholic Club**
project:	**Dooleys Lidcombe Club & Hotel Development**
location:	**24-28 John St, Lidcombe NSW 2141**
date started:	**26 Nov 2015**
date completed:	**26 Nov 2015**
logged by:	**TO**
checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information | **material substance** | **rock mass defects**

method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular / general
NMLC	Not Observable	7	9.0		**INTERBEDDED SILTSTONE AND SANDSTONE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly distinctly bedded at 0-10, sandstone is fine grained, pale grey, siltstone is dark grey. *(continued)*	FR		a=0.53 d=0.71			PT, 5°, IR, RO, CN JT, 85 - 90°, UN, RO, CN PT, 0 - 5°, IR, RO, CN PT, 10°, CU, RO, CN PT, 0°, IR, RO, CN
		6	10.0		**LAMINITE**: Siltstone (60%) dark grey and Sandstone (40%), distinctly laminated at 0-5°, sandstone is fine grained, pale grey, siltstone is dark grey. fine grained sandstone band, 150 mm, pale grey			a=0.78 d=0.33	92%		
		5	11.0					a=0.61 d=0.27			
		4	12.0					a=0.70 d=0.45	100%		
		3	13.0					a=1.32 d=0.33			
		2	14.0					a=0.64 d=0.43			
		1	15.0					a=0.60 d=0.28	94%		JT, 70°, IR, RO, CN PT, 0 - 5°, CU, RO, CN JT, 75 - 85°, IR, RO, CN
		0						a=0.67 d=0.54			

Defects are:PT, 0 - 10°, PL, RO, CN, unless otherwise described

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating

coffey

Engineering Log - Cored Borehole

		Borehole ID.	**BH08**
		sheet:	4 of 4
		project no.	**GEOTLCOV25554AA**
client:	**Bouygues Construction Australia**	date started:	**26 Nov 2015**
principal:	**Dooleys Lidcombe Catholic Club**	date completed:	**26 Nov 2015**
project:	**Dooleys Lidcombe Club & Hotel Development**	logged by:	**TO**
location:	**24-28 John St, Lidcombe NSW 2141**	checked by:	**MF**

position: E: 319010; N: 6251500 (Datum Not Specified) surface elevation: 15.60 m (AHD) angle from horizontal: 90°

drill model: GEO205, Track mounted drilling fluid: hole diameter : 100 mm

drilling information				material substance						rock mass defects		
method & support	water	RL (m)	depth (m)	graphic log	material description **ROCK TYPE**: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 (X = axial; O = diametral) VL L M H VH EH	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm) 30 100 300 1000 3000	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other) particular general
NMLC						FR		a=0.83 d=0.49	94%		
		-1			Borehole BH08 terminated at 16.50 m Target depth						
			17.0								
		-2									
			18.0								
		-3									
			19.0								
		-4									
			20.0								
		-5									
			21.0								
		-6									
			22.0								
		-7									
			23.0								
		-8									

CDF_0_9_04BB.GLB Log COF BOREHOLE: CORED GEOTLCOV25554AA.GPJ <<DrawingFile>> 11/12/2015 10:48

method & support
- AS auger screwing
- AD auger drilling
- CB claw or blade bit
- W washbore
- NMLC NMLC core (51.9 mm)
- NQ wireline core (47.6mm)
- HQ wireline core (63.5mm)
- PQ wireline core (85.0mm)
- SPT standard penetration test
- HA hand auger

water
- 10/10/12, water level on date shown
- water inflow
- complete drilling fluid loss
- partial drilling fluid loss
- 25uL water pressure test result (lugeons) for depth interval shown

graphic log / core recovery
- core recovered (graphic symbols indicate material)
- no core recovered

core run & RQD
- barrel withdrawn

RQD = Rock Quality Designation (%)

weathering & alteration*
- RS residual soil
- XW extremely weathered
- HW highly weathered
- DW distinctly weathered
- MW moderately weathered
- SW slightly weathered
- FR fresh

*W replaced with A for alteration

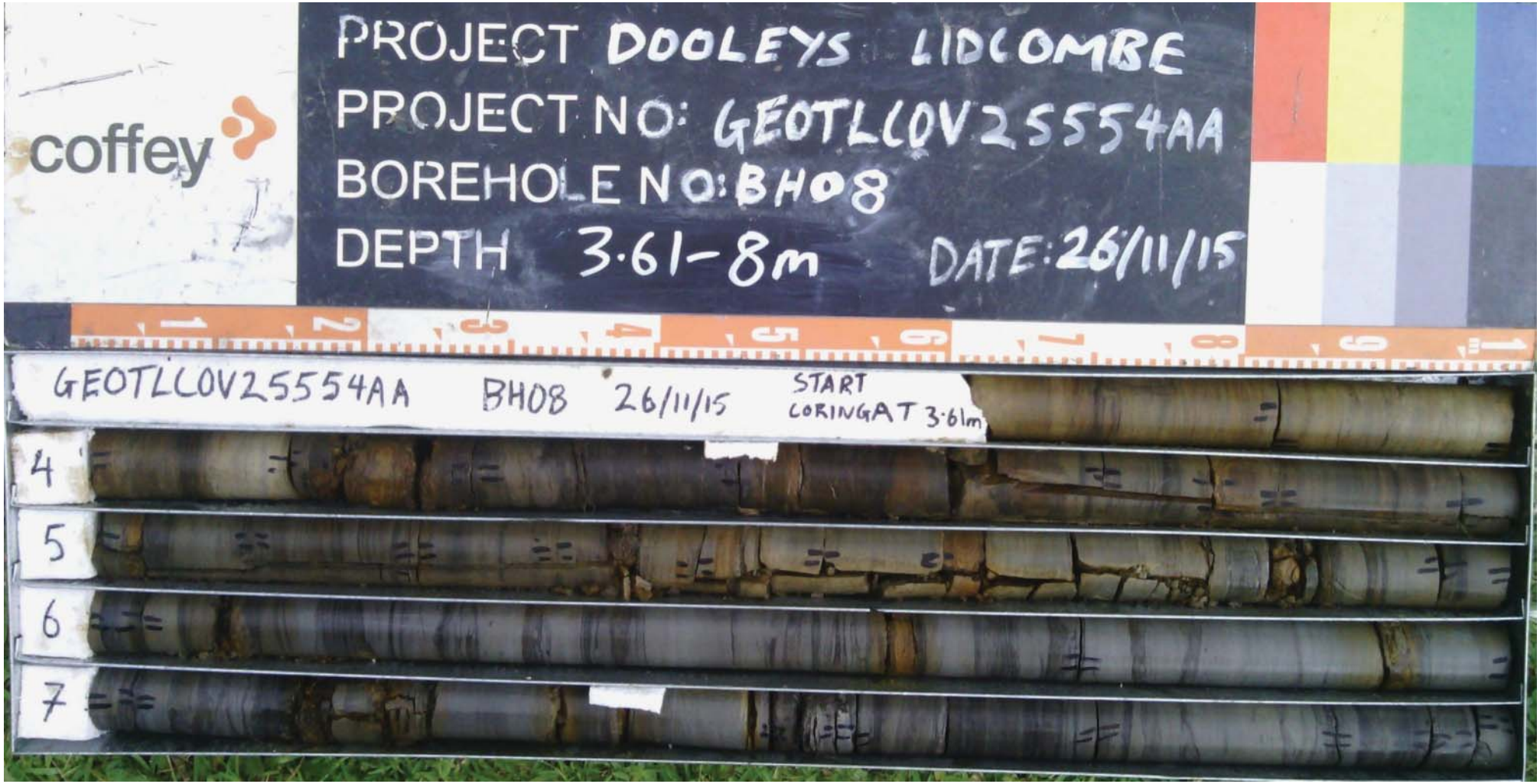
strength
- VL very low
- L low
- M medium
- H high
- VH very high
- EH extremely high

defect type
- PT parting
- JT joint
- SZ shear zone
- SS shear surface
- CS crushed seam
- SM seam
- DB drilling break

roughness
- SL slickensided
- POL polished
- SO smooth
- RO rough
- VR very rough

planarity
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR Irregular

coating
- CN clean
- SN stain
- VN veneer
- CO coating



PointID : BH08 Depth Range: 3.61 - 8.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH08

project no: GEOTLCOV25554AA | fig no: **PHOTO 29** | rev:

PointID : BH08 Depth Range: 8.00 - 13.00 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

coffey

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH08

project no: GEOTLCOV25554AA | fig no: **PHOTO 30** | rev:

PointID : BH08 Depth Range: 13.00 - 16.50 m

drawn	RH
approved	RH
date	11/12/2015
scale	N.T.S.
original size	A4

client: Bouygues Construction Australia

project: Dooleys Lidcombe Club & Hotel Development
24-28 John St, Lidcombe NSW 2141

title: **CORE PHOTOGRAPH**
BH08

project no: GEOTLCOV25554AA | fig no: **PHOTO 31** | rev:

Appendix B - Results of Laboratory Testing

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Concord West, Sydney Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
4 Rothwell Ave. (PO Box 329)
Concord West NSW 2138

Phone: +61 (2) 9736 3922
Fax: +61 (2) 9743 5860

Report No: CWES15S-06760-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Pty Ltd (Chatswood)
PO Box 5275
West Chatswood NSW 1515

Principal:
Project No.: INFOCWES00517AA
Project Name: GEOTLCOV25554AA - DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT
Lot No.: TRN:

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Approved Signatory: Lachlan Smith
(Senior Geotechnician)
NATA Accredited Laboratory Number:431
Date of Issue: 14/12/2015

Sample Details

Sample ID: CWES15S-06760
Client Sample: BH05
Date Sampled: 01/12/2015
Source: Ex. Site
Material:
Specification: No Specification
Sampling Method: Submitted by client
Project Location: Church St, Lidcombe
Sample Location: BH05
1.0-1.2m

Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	8.0	
Sample History	AS 1289.1.1	Air-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	N/A	
Mould Length (mm)		0	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.2	29	
Method		One Point	
Plastic Limit (%)	AS 1289.3.2.1	13	
Plasticity Index (%)	AS 1289.3.3.1	16	
Date Tested		14/12/2015	

Comments

N/A

Concord West, Sydney Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
4 Rothwell Ave. (PO Box 329)
Concord West NSW 2138

Phone: +61 (2) 9736 3922
Fax: +61 (2) 9743 5860

Report No: CWES15S-06763-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Pty Ltd (Chatswood)
PO Box 5275
West Chatswood NSW 1515

Principal:
Project No.: INFOCWES00517AA
Project Name: GEOTLCOV25554AA - DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT
Lot No.: TRN:

Accredited for compliance with ISO/IEC 17025.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Approved Signatory: Lachlan Smith
(Senior Geotechnician)
NATA Accredited Laboratory Number:431
Date of Issue: 14/12/2015

Sample Details

Sample ID: CWES15S-06763
Client Sample: BH08
Date Sampled: 01/12/2015
Source: Ex. Site
Material:
Specification: No Specification
Sampling Method: Submitted by client
Project Location: Church St, Lidcombe
Sample Location: BH08
1.0-1.45m

Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	21.9	
Sample History	AS 1289.1.1	Air-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	8.0	
Mould Length (mm)		125	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	59	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	23	
Plasticity Index (%)	AS 1289.3.3.1	36	

Comments

N/A

Concord West, Sydney Laboratory

Coffey Testing Pty Ltd
ABN 92 114 364 046
4 Rothwell Ave. (PO Box 329)
Concord West NSW 2138

Phone: +61 (2) 9736 3922
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Report No: CWES15S-06762-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Pty Ltd (Chatswood)
PO Box 5275
West Chatswood NSW 1515

Principal:
Project No.: INFOCWES00517AA
Project Name: GEOTLCOV25554AA - DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT
Lot No.: TRN:

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Approved Signatory: Lachlan Smith
(Senior Geotechnician)
NATA Accredited Laboratory Number:431
Date of Issue: 14/12/2015

Sample Details

Sample ID: CWES15S-06762
Client Sample: BH06
Date Sampled: 01/12/2015
Source: Ex. Site
Material:
Specification: No Specification
Sampling Method: Submitted by client
Project Location: Church St, Lidcombe
Sample Location: BH06
1.5-1.95m

Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	11.1	
Sample History	AS 1289.1.1	Air-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	5.5	
Mould Length (mm)		125	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	30	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	17	
Plasticity Index (%)	AS 1289.3.3.1	13	

Comments

N/A

Concord West, Sydney Laboratory

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Phone: +61 (2) 9736 3922
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Report No: CWES15S-06761-1
Issue No: 1

Material Test Report

Client: Coffey Geotechnics Pty Ltd (Chatswood)
PO Box 5275
West Chatswood NSW 1515

Principal:
Project No.: INFOCWES00517AA
Project Name: GEOTLCOV25554AA - DOOLEYS LIDCOMBE CLUB AND HOTEL DEVELOPMENT
Lot No.: TRN:

Accredited for compliance with ISO/IEC 17025.

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Approved Signatory: Lachlan Smith
(Senior Geotechnician)
NATA Accredited Laboratory Number:431
Date of Issue: 14/12/2015

Sample Details

Sample ID: CWES15S-06761
Client Sample: BH03
Date Sampled: 01/12/2015
Source: Ex. Site
Material:
Specification: No Specification
Sampling Method: Submitted by client
Project Location: Church St, Lidcombe
Sample Location: BH03
2.5-2.95m

Test Results

Description	Method	Result	Limits
Moisture Content (%)	AS 1289.2.1.1	19.3	
Sample History	AS 1289.1.1	Oven-dried	
Preparation	AS 1289.1.1	Dry Sieved	
Linear Shrinkage (%)	AS 1289.3.4.1	9.0	
Mould Length (mm)		125	
Crumbling		No	
Curling		No	
Cracking		No	
Liquid Limit (%)	AS 1289.3.1.1	59	
Method		Four Point	
Plastic Limit (%)	AS 1289.3.2.1	22	
Plasticity Index (%)	AS 1289.3.3.1	37	

Comments

N/A