

Dean Stojanovski
Assistant Development Manager
Billbergia
Suite 101, 25 Angas St
Meadowbank, NSW, 2114
E: dean.stojanovski@billbergia.com.au

Advice Letter Response to DPE Water Letter OUT22/1472

26 – 42 Eden Street, Arncliffe NSW

Ref: A101022.0395.LTR1.v1f

Date: 14 April 2022

Dear Mr. Stojanovski,

1 Introduction

ADE Consulting Group Pty Ltd (ADE) was engaged by Billbergia to provide information regarding groundwater management in response to a letter (reference OUT22/1472, dated 28 February 2022) from the Department of Planning and Environment – Water (DPE Water).

This letter report is to be submitted to the Department of Planning and Environment – Water (DPE Water) in support of a State Significant Development Application (SSDA-11429726) for the development of land at 26-42 Eden Street Arncliffe NSW (the site) for the purposes of a mixed- use precinct with open space, retail and residential uses, comprising social and market housing as part of the NSW Land and Housing Corporation (LAHCs) “Communities Plus” program.

The specific comments ADE has been requested to provide further information on, are presented in Attachment A of DPE Water’s letter and include:

1. *Groundwater Take and Licensing*
 - 1.1. *The proponent should:*
 - a. *Provide a consolidated site water balance which includes estimated volumes of groundwater inflows (both during construction and operation).*
 - b. *Demonstrate the ability to source water entitlement for the predicted groundwater take (if an exemption is not applicable).*
2. *Groundwater Impact Assessment and Management*
 - 2.1. *The proponent should assess the impact of development as per the requirements of the NSW Aquifer Interference Policy*
 - 2.2. *(Post-Approval) The proponent should submit a dewatering management plan.*

This letter report has been prepared in reference to the following reports prepared for the site:

- Ethos Urban Pty Ltd, ‘Environmental Impact Statement SSD-11429726’, dated 19 July 2021 (Ethos, 2021)
- ADE Consulting Group Pty Ltd, ‘Geotechnical Investigation Report - STC-2148-18709 v2’, dated 22 December 2020 (ADE 2020)
- ADE Consulting Group Pty Ltd, ‘Detailed Site Investigation - STC-2151-18730 v2’, dated 1 July 2021 (ADE 2021a)
- ADE Consulting Group Pty Ltd, letter re: 26-42 Eden Street, Arncliffe NSW. Reference A101021.0210.Ltr1.v1f, dated 15 September 2021 (ADE 2021b)

2 Background

2.1 Proposed Development

The project (SSD-11429736) involves the demolition of all existing structures within the site and construction of four residential tower blocks of 17 to 21 stories with associated retail and underground parking on a lot of area 13,440 m². The basement parking extends to five levels including upper ground and lower ground. The approximate depth of the excavation will be 19 m below ground level (refer to Attachment A for development plans).

2.2 Relevant Legislation and Guidelines

2.2.1 Water Management Act 2000

The Water Management Act 2000 (WM Act) is intended to ensure that water resources are conserved and properly managed for sustainable use benefitting both present and future generations. It is also intended to provide formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses as well as to provide for protection of catchment conditions.

The groundwater source in the site area is regulated by the Greater Metropolitan Region Water Sharing Plan (WSP) (2011) and located within the Sydney Basin Central Groundwater Source. According to the WSP, there is 4,029.5 ML/year of entitlement (2022-2023) within this groundwater source, and 193 water access license holders (WAL).

2.2.2 NSW Aquifer Interference Policy

The NSW Aquifer Interference Policy (Department of Trade and Investment (DTI) 2012) was finalised in September 2012 and clarifies the water licencing and approval requirements for aquifer interference activities in NSW. This policy outlines the water licencing requirements under the Water Act 1912 and WM Act.

A water access licence is required whether water is taken for consumptive use or whether it is taken incidentally by the aquifer interference activity (such as groundwater filling a void) even where that water is not being used consumptively as part of the activity's operation. Sufficient access licences must be held to account for all water taken from a groundwater or surface water source as a result of an aquifer interference activity, both for the life of the and after the activity has ceased. This take of water continues until an aquifer system reaches equilibrium and must be licensed.

The NSW Aquifer Interference Policy requires that potential impacts on groundwater sources, including their users and groundwater dependant ecosystems (GDE), be assessed against the minimal impact considerations outlined in the policy. The minimal impact considerations include a requirement that any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres of the activity. If the predicted impacts are less than the minimal impact considerations for less productive fractured rock groundwater sources, then the potential groundwater impacts of the project are acceptable.

Based on the above, ADE considers that the proposed development will involve aquifer interference and as such consideration of the environmental effects is required.

2.2.3 Water Management (General) Regulation 2018

The Water Management (General) Regulation (2018) is managed under the WM Act. The Regulation specified procedural and technical matters related to the administration of the Act, and specified exemptions from license and approval requirements under the Act. Clause 21(1) and Clause 7 of Schedule 4 of the Regulation offer water access license exemptions for aquifer interference activities.

“this exemption applies to any person lawfully engaged in a range of aquifer interference activities carried out in accordance with an authorised project in relation to the taking of up to 3 megalitres (ML) of groundwater from a groundwater source by one or more of those activities in a water year”

As defined in Clause 7(5), item C of Schedule 4, an authorised project may be defined as excavation required for the construction of a building, road or infrastructure.

ADE considers that the proposed development meets the criteria of this exemption, due to the low anticipated groundwater take produced because of dewatering the basement excavation.

3 Site Setting

3.1 Description

The site is located at 26-42 Eden Street, Arncliffe NSW 2205 and comprises an area of 1.361 ha. The site is situated within the LGA of Bayside Council and is currently zoned B4- Mixed Use. The site is legally defined as Deposited Plan (DP) 447649 (Lot 1), DP 23701 (Lots 1,2,3,7,8,9,10,11 and 12), DP 1094906 (Lot 3) and DP 1228031 (Lot 25 and 26). The location of the site is defined in *Attachment A – Development Plans*.

3.2 Landforms and Topography

The site is located mid-slope of a ridgeline which slopes down away to the north, with an approximate change in level of 11 metres across the site, at a height of approximately 24 m Australian Height Datum. In relation to other underground infrastructure located close by, the site is located between the M5 and M8 tunnels. The tunnel alignments are significantly deeper than the proposed excavation, with the M8 tunnel at Arncliffe being located at approximately -25 metres mAHd, while the maximum depth of the excavation of expected to be 19 m depth (approximately 6 m AHd).

3.3 Geology

The 1:100,000 Sydney Geological Map indicates that the geology of the site situated within Triassic Hawkesbury Sandstone of the Wianamatta Group. Hawkesbury Sandstone is described as “medium to coarse grained quartz sandstone, very minor shale and laminate lenses”, while the alluvium is described as “silty to peaty quartz sand, silt and clay”.

During the geotechnical investigation (ADE, 2020), subsurface ground conditions agreed with expected ground conditions and comprised a laterally variable thickness of fill underlain by residual slightly gravelly silty clay (to a depth of approximately 2.5mbgl,) underlain by Sandstone bedrock which was classified as weathered becoming medium and high strength with depth, to a maximum depth of investigation of 25.80 mbgl.

3.4 Hydrogeology and Hydrology

On a local scale, topography controls the groundwater flow near the ground surface in alluvial and shallow aquifers. In these systems, groundwater flow is likely to be localised and limited in extent, with occurrence of perched aquifers controlled by the presence of fine-grained materials. In general, these systems are responsive to rainfall and streamflow (SCA, 2012).

The site lies within the Bonnie Doon Creek catchment, which is a minor tributary of Cooks River (Appendix T, Ethos 2021). The site is located within the upstream portion of the lower catchment (defined as downstream of Illawarra railway), and is heavily urbanised with residential, commercial and industrial developments.

The site is located within the Sydney Basin Central Groundwater Source, to the west of the Botany Sands Aquifer, and as such the development is not considered a high risk to groundwater. Across the geological Sydney Basin, it is generally accepted that groundwater flow is predominantly in the horizontal direction given the enhanced flow along bedding plane joints in sandstone formations (Ward and Kelly, 2013) The hydraulic conductivity of the Hawkesbury Sandstone is related to the rock defect characteristics, which are influenced by the depth and in-situ stress conditions as well as the presence of regional structural features. Tammetta and Hewitt (2004) reported a maximum hydraulic conductivity values of the Hawkesbury Sandstone matrix of 0.5 m/d (5×10^{-6} m/s) with an average value of 0.0019 m/d (2×10^{-8} m/s) (Commonwealth of Australia 2022).

As part of the geotechnical investigation by ADE (2021a), four groundwater monitoring wells were installed across the site (*refer to Attachment B - Figures*). All groundwater wells were dry upon completion. Subsequent groundwater monitoring on 1 December 2020 by ADE, recorded groundwater depths ranging between 2.2mbgl (BH108) and 5.1mbgl (BH102), indicating the presence of groundwater in weathered sandstone horizons which flows through joints and bedding planes. Based on the groundwater monitoring data collected and the site information, groundwater was observed to flow in a north-north-easterly direction with an approximate hydraulic gradient of 0.03. A copy of borelogs from the Geotechnical Investigation (ADE, 2020) are included in *Attachment C* for reference.

3.5 Groundwater Users

Based on information provided by the Bureau of Meteorology Groundwater Dependent Ecosystems Atlas (BOM,2022), no GDE were recorded within a 500 m radius of the site.

There are three groundwater bores within a 500 m radius of the site (WaterNSW, 2022a). These include two private monitoring bores located approximately 50 m to the east of the site (GW114744 and GW023194) and a shallow private domestic bore (GW023194) located approximately 475 m to the southeast of the site, which is considered to be hydraulically upgradient of the site. No additional water supply works were recorded within 500 m of the site. Groundwater use/abstraction has a typical radius of influence of less than 500 m and on this basis, the site would not result in any impacts to a water supply work.

3.6 Groundwater Quality

With regards to groundwater quality, the DSI (ADE, 2021) concluded that due to the lack of potential on site and adjacent off-site contamination sources, the potential for groundwater contamination was low and no additional assessment was warranted.

3.7 Geotechnical Considerations

The geotechnical report (ADE, 2020) considered that the bulk excavation for the development will encounter the shallow soil profile and extend into the underlying high to very high strength sandstone bedrock with the expectation of providing a smooth cut rock face with zero lateral deflection at bulk excavation level and minimal at a horizontal distance of 12 m (twice the excavation depth) from the perimeter of the excavation.

Geotechnical investigation by ADE (2020) identified pad footings in Class II sandstone bedrock may be designed using a maximum allowable bearing pressure (ABP) of 6,000 kPa and that given the low amount of anticipated lateral displacement, the proposed drained basement design is considered appropriate.

Initial flows into the excavation may be locally high but would be expected to decrease considerably with time as the bedding seams/joints are drained. ADE recommend that monitoring of seepage be implemented during the excavation works to confirm the capacity of the drainage system. Seepage, if any, during excavation is expected to be satisfactorily controlled by conventional sump pumping systems. The expected low permeability of the bedrock profile suggests groundwater inflows into the excavation are unlikely to have an adverse impact on the proposed development or on the neighbouring sites.

The geotechnical report by ADE recommends that groundwater inflow into the bulk excavation is to be monitored by site personnel and the results (location, source, volume, etc) be reported to the hydraulic and geotechnical engineers so that unexpected conditions can be addressed in a timely manner. Drainage is to be provided behind all basement retaining walls, around the perimeter of the basement and below the basement slab. The completed excavation should be inspected by the hydraulic engineer to confirm that adequate drainage has been allowed. Drainage should be connected to the sump- and-pump system and discharging into the stormwater system. Any permanent groundwater control system should take into account any possible soluble substances in the groundwater which may dictate whether or not groundwater can be pumped into the stormwater system. The design of drainage and pump systems is to take the above issues into account along with careful ongoing inspections and maintenance programs.

4 Conclusions

4.1 Groundwater Take and Licensing

Groundwater flow into the excavation is expected to be relatively low based on lateral intragranular flow through weathered seams in the sandstone bedrock. Given the low volumes anticipated, ADE expects that the project would be eligible for the 3ML exemption under the water management (general) regulation 2018 based on the following:

The radial extent of the cone of depression based on dewatering of the excavation is estimated to be between 8 and 127 m based on the following assumptions:

- Length of excavation: 152 m (based on architectural drawings)
- Width of excavation = 90 m (based on architectural drawings)
- Depth of excavation (drawdown depth): 19m
- Saturated thickness of unconfined aquifer: (assumed to be full thickness) 25 m
- Hydraulic conductivity of aquifer (k): (based on average literature value for mean k of Hawkesbury Sandstone) 5×10^{-6} m/s to 2×10^{-8} m/s

Using Marinelli calculations, the upper bound solution for groundwater inflow (Q1) is calculated as follows:

$$h_0 = \sqrt{hp^2} + \frac{W}{Kh_1} \left[ro^2 \ln\left(\frac{ro^2}{rp^2}\right) - \frac{(ro^2 - rp^2)}{2} \right]$$

$$Q_1 = \pi W (ro^2 - rp^2)$$

Based on the assumptions for the maximum radius of depression and highest hydraulic conductivity value, the groundwater flow is estimated to be **2.2 m³/day (0.8 ML/year)**.

Prior to commencement of development, a Dewatering Management Plan is to be produced confirming the applicability of the exemption. ADE notes that should entitlement be required to account for water take that exceeds 3ML, this is to be resolved via trading with existing water entitlements held in the Sydney Basin Central Groundwater Source.

During development, groundwater inflow into the bulk excavation is to be monitored and reported to the hydraulic and geotechnical engineers and is expected to be managed via a sump and pump system.

4.2 Groundwater Impact Assessment and Management

The impact of the project has been assessed against the requirements of the NSW Aquifer Interference Policy.

Based on a review of existing environmental investigations and publicly available information, ADE considers the impact of extraction as a result of dewatering for the basement excavation to be low.

Intrusive investigation by ADE encountered laterally variable thickness of fill underlain by residual cohesive native soils over Sandstone bedrock, considered to be representative of Hawkesbury Sandstone. Low within the Hawkesbury Sandstone unit typically comprises lateral flow via weathered joints and bedding planes and typical hydraulic conductivity values are low.

Environmental investigation of soils beneath the site did not identify significant concentrations of contaminants which have the potential to impact groundwater quality beneath the site. On that basis, further investigation of groundwater was not considered necessary. No sensitive users of groundwater were identified within the vicinity of the site. The nearest extraction bore was recorded as approximate 475 m hydraulically upgradient of the site and is unlikely to be impacted by the development. In addition, no GDE were recorded within a 500 m radius of the site.

Post-approval, a dewatering management plan will be produced including estimates of likely volumes produced as a result of dewatering and provide a reference for the management of groundwater during construction and operation of the development.

If you have any questions, please do not hesitate to contact the undersigned.

For and on behalf of
ADE Consulting Group Pty Ltd
 ABN 14 617 358 808

Prepared by:



Elin Griffiths BSc (Hons) MSc
 Senior Environmental Consultant/ Hydrogeologist

Reviewed by:

Andrew Mitchell
 Senior Principal

4.3 References

- ADE Consulting Group Pty Ltd, 'Geotechnical Investigation Report - STC-2148-18709 v2', dated 22 December 2020 (ADE 2020)
- ADE Consulting Group Pty Ltd, 'Detailed Site Investigation - STC-2151-18730 v2', dated 1 July 2021 (ADE 2021a)
- ADE Consulting Group Pty Ltd, letter re: 26-42 Eden Street, Arncliffe NSW. Reference A101021.0210.Ltr1.v1f, dated 15 September 2021 (ADE 2021b)
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- McKibbin D & Smith PC 2000, Sandstone Hydrogeology of the Sydney Region, 15th Australian Geological Convention: Sandstone City – Sydney's Dimension Stone and other Sandstone Geomaterials, Monograph No. 5, G.H. McNally & B.J. Franklin (eds), EEHSG Geological Society of Australia.

Limitations and Disclaimer

This report has been prepared for the exclusive use of the client and is limited to the scope of the work agreed in the terms and conditions of contract (including assumptions, limitations and qualifications, circumstances, and constraints). ADE has relied upon the accuracy of information and data provided to it by the client and others.

ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia. No other warranty, expressed or implied, is made or intended. No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendixes and attachments. The report is an integral document and must be read in its entirety.

To the fullest extent permitted by law, ADE does not accept or assume responsibility to any third party (other than the client) for the investigative work, the report or the opinions given.

The scope of work conducted, and report herein may not meet the specific needs (of which ADE is not aware) of third parties. ADE cannot be held liable for third party reliance on this document. Any third party who relies upon this report does so at its own risk.

The subsurface environment can present substantial uncertainty due to its complex heterogeneity. The conclusions presented in this report are based on limited investigation of conditions at specific sampling locations chosen to be as representative as possible under the given circumstances. However, it is possible that this investigation may not have encountered all areas of contamination at the site due to the limited sampling and testing program undertaken.

The material subject to classification pertains only to the site and subject area outlined within the report and must be consistent with the waste description reported. If there are any unexpected finds that are not consistent with this classification, ADE must be notified immediately.

ADE does not verify the accuracy or completeness of, or adopt as its own, the information or data supplied by others and excludes all liability with respect to such information and data. To the extent that conditions differ from assumptions set out in the report, and to the extent that information provided to ADE is inaccurate or incomplete or has changed since it was provided to ADE, the opinions expressed in this report may not be valid and should be reviewed.

ADE's professional opinions are based upon its professional judgement, experience, training, and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited its investigation to the scope agreed upon with its client.

This Limitation and Disclaimer must accompany every copy of this report.

ATTACHMENT A



Amendments		
Issue	Description	Date

Amendments		
Issue	Description	Date

Consultant
Consultant
Company
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Company
Consultant
Company

Client
BillBergia
Client Details



Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458
architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title
Eden Street Arnccliffe

Drawing Title
SITE PLAN

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PRELIMINARY

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Verified	Designer	Approved	Approver
Drawing Created (date)	Drawing Created (by)	Checker	
			20/10/2020
Scale	Project No	Drawing No	Issue

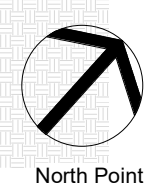
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1 BASEMENT 3-4
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Amendments			Amendments		
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Consultant
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Client
BillBergia
 Client Details



Project Title
Eden Street Arncliffe
 Drawing Title
Basement Level 3

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1 BASEMENT 2
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Client
BillBergia
Client Details



GROUP GSA
Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 60 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458
architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title
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Drawing Title
Basement Level 2

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PRELIMINARY

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1 BASEMENT 1
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DA - PARKING SCHEDULE	
Level	Carpark
BASEMENT 3	310
BASEMENT 2	302
BASEMENT 1	254
LOWER GROUND LEVEL	84
TOTAL	950

RDCP 2011 SECTION 7.7 ARNCLIFFE AND BANKSIA & SEPP AFFORDABLE RENTAL HOUSING 2009 (BUILDING C)		TOTAL : 941 CAR SPACES REQ. (WITH 800 m² SUPERMARKET)					
PARKING REQ	TOWER C	A	B	C	D	TOTAL	
STUDIO & 1 BED	1 SPACE	43	25	44	103	215	
2 BED	1 SPACE	65	114	32	28	239	
3 BED	2 SPACES	142	86	8	84	320	
		250	225	84	215	774	
VISITOR	1 PER 10 DWELLINGS	18	19	-	18	55	
BICYCLE	1 PER 10 DWELLINGS						
MOTORCYCLE	1 PER 15 DWELLINGS			73	48		
SHOPS/ RETAIL	1 PER 40m² GFA						
BICYCLE	1 PER 200m²						
MOTORCYCLE	1 PER 20 CAR SPACES			19	5		
CHILDCARE	1 PER 20 CHILDREN			20			
	1 PER 2 STAFF						
	1 PER RESIDENTIAL COMPONENT						

SITE AREA
13,440 m²
DEEP SOIL REQ
7% OF THE SITE AREA = 941 m²

CURRENT RETAIL GFA (800 m² supermarket)
3649 sqm / 40 = 92 spaces (incl 2 DDA)
19
5

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
	ISSUED FOR PRE DA	29/10/2020			

Consultant
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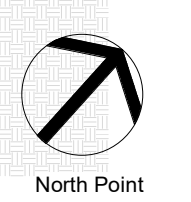
Client
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Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 60 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458
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nom architect M. Sheldon 3990

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Basement Level 1
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PRELIMINARY				
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Amendments		
Issue	Description	Date
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Amendments		
Issue	Description	Date

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Client
BillBergia
Client Details



GROUP GSA
Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 60 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458
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Lower Ground Level

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PRELIMINARY				
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Amendments		
Issue	Description	Date
1	ISSUED FOR CONSULTANTS ISSUED FOR PRE DA	22/10/2020 29/10/2020

Amendments		
Issue	Description	Date

Consultant
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GROUP GSA
Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458

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Upper Ground Level

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PRELIMINARY				
Plotted and checked by JK SMAR				
Verified	PDS	Approved	PDS	
Drawing Created (date)		Drawing Created (by)		JK SMAR
22/10/2020				
Scale	Project No	Drawing No	Issue	
1 : 250	180319	DA 2001	1	

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EDEN STREET



1 LEVEL 1-2
1:250

NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

Consultant
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Client
Billbergia
Client Details



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Level 7, 60 William St East Sydney NSW
Australia 2011
www.groupgsa.com

T +612 9361 4144 F +612 9332 3458
architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title
Eden Street Arncliffe

Drawing Title

Level 1-2

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PRELIMINARY

Plotted and checked by		Author	
Verified	Designer	Approved	Approver
Drawing Created (date)		Drawing Created (by) Checker	

22/10/2020

Scale Project No Drawing No Issue

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NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
-	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

Consultant
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Consultant Company ^{tails}

Client

BillBergia
Client Details



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Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com

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Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com
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Project Title

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Drawing Title

Level 3-5

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Verified	Designer	Approved	Approver
Drawing Created (date)		Drawing Created (by)	Checker
			22/10/2020
Scale	Project No	Drawing No	Issue
1 : 250	180319	DA 2004	1

EDEN STREET



NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

Consultant
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Client
BillBergia
Client Details



Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 50 William St East Sydney NSW
Australia 2011
www.groupgsa.com
T +612 9361 4144 F +612 9332 3458
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Project Title
Eden Street Arncliffe
Drawing Title
Level 6-7

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Verified	Designer	Approved	Approver	
Drawing Created (date)		Drawing Created (by)		Checker
22/10/2020				
Scale	Project No	Drawing No	Issue	
1 : 250	180319	DA 2007	1	

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NOTE: APARTMENT PLANS WIF

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
-	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

Consultant
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Client

BillBergia
Client Details



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Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com

T +612 9361 4144 F +612 9332 3458
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Project Title
Eden Street Arncliffe

Drawing Title

Level 8-14

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Scale	Project No	Drawing No	Issue
1 : 250	180319	DA 2009	1

EDEN STREET



NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

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Client
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Group GSA Pty Ltd ABN 76 002 113 779
Level 7, 60 William St East Sydney NSW
Australia 2011
www.groupgsa.com
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Project Title
Eden Street Arncliffe
Drawing Title
Level 15-17

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Scale	Project No	Drawing No	Issue
1 : 250	180319	DA 2016	1

EDEN STREET



NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
	ISSUED FOR PRE DA	29/10/2020			

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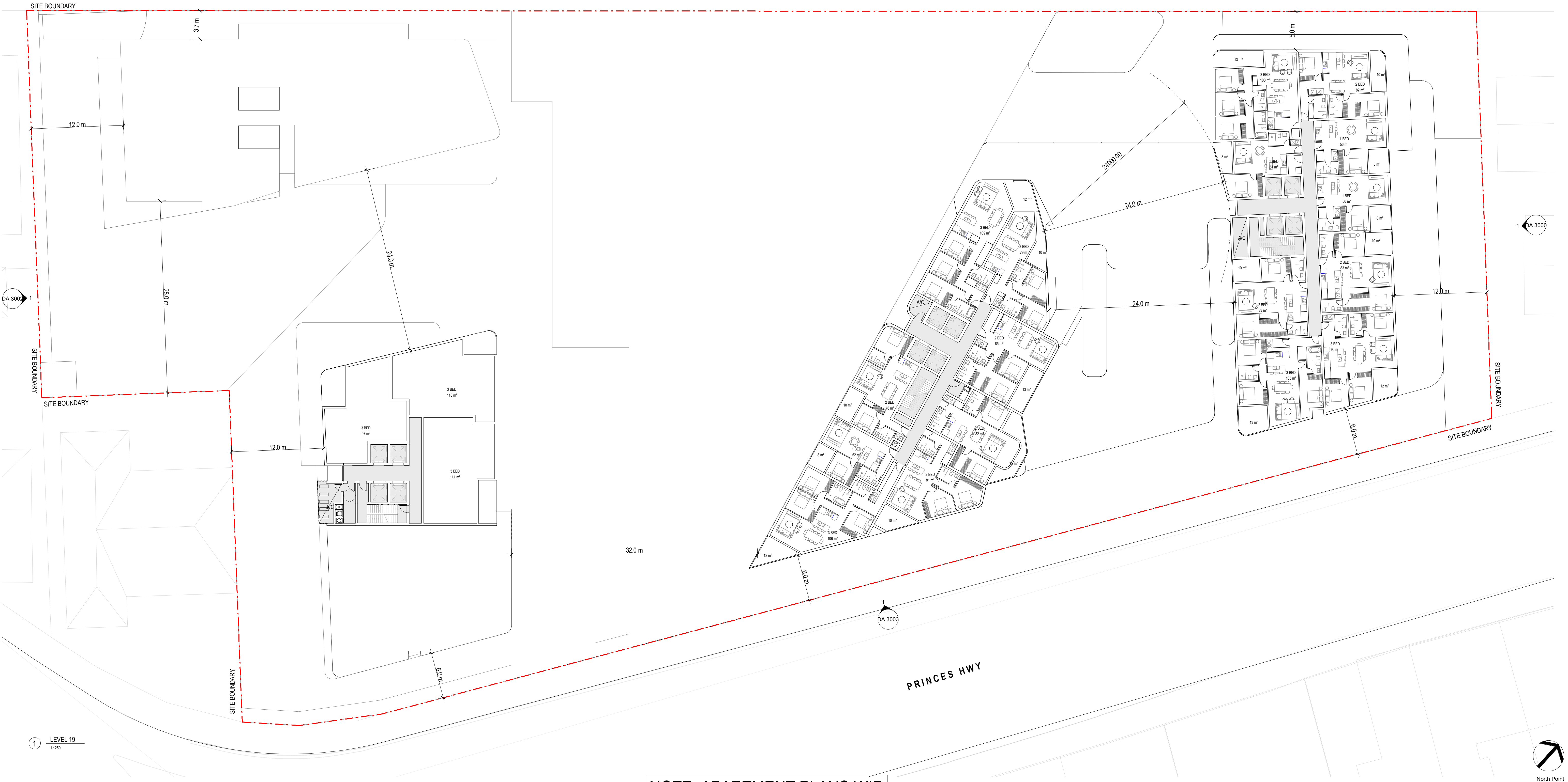
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Australia 2011
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Project Title
Eden Street Arncliffe
Drawing Title
Level 18

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1 : 250	180319	DA 2019	1	

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NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
	ISSUED FOR PRE DA	29/10/2020			

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Client
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Level 7, 50 William St East Sydney NSW
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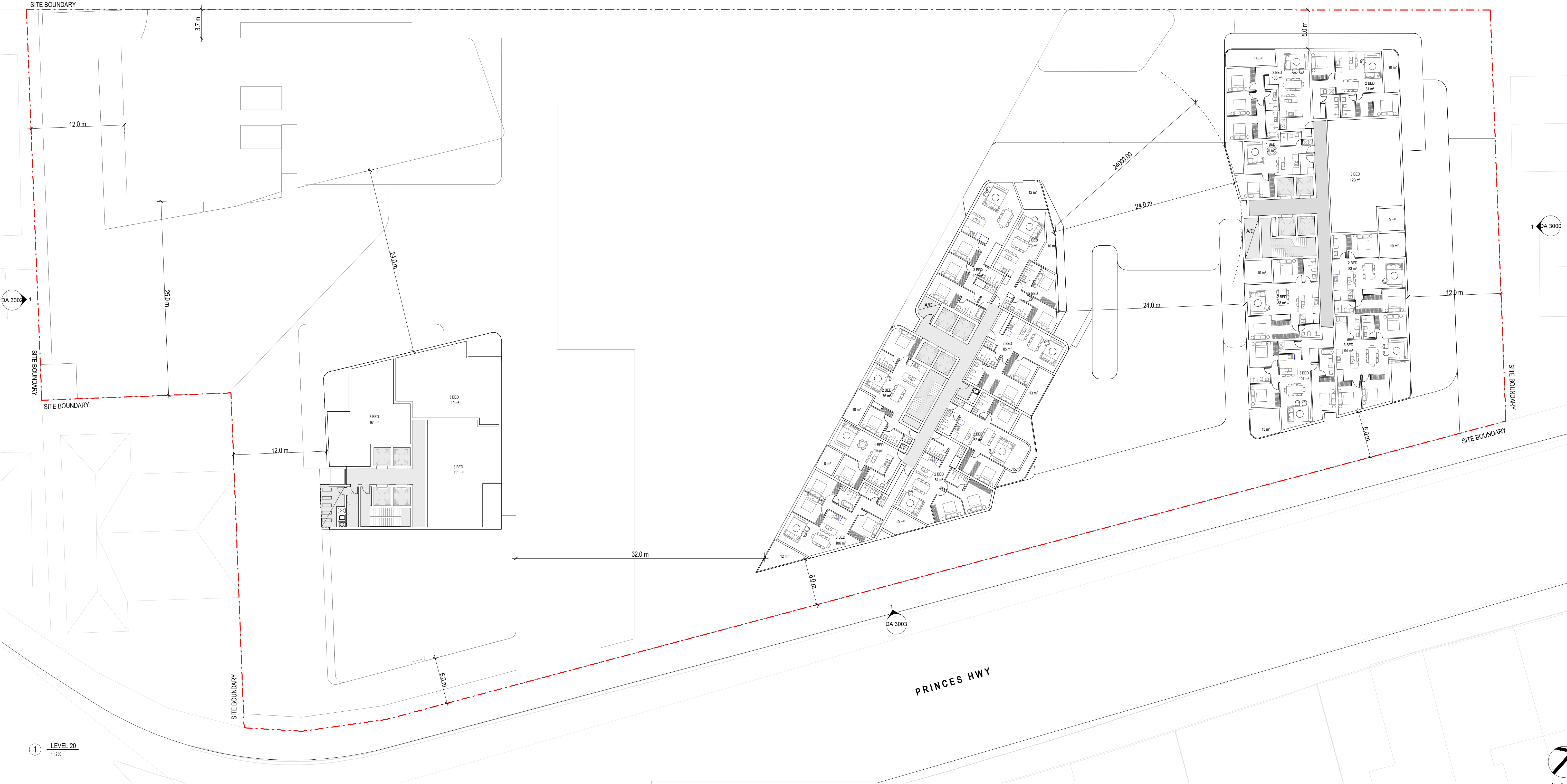
Project Title
Eden Street Arnccliffe
Drawing Title
Level 19

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Verified	Designer	Approved	Approver	
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Scale	Project No	Drawing No	Issue	
1 : 250	180319	DA 2020	1	

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NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
-	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

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Consultant Company ^{ails}

Client

BillBergia
Client Details



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Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com

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Level 7, 80 William St East Sydney NSW
Australia 2011
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Project Title
Eden Street Arncliffe

Drawing Title

Level 20

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			22/10/2020
Scale	Project No	Drawing No	Issued
1 : 250	180319	DA 2021	

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DA 3000

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North Point

NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
-	ISSUED FOR CONSULTANTS	22/10/2020			
1	ISSUED FOR PRE DA	29/10/2020			

Consultant
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Consultant Company ^{jails}

Client

BillBergia
Client Details



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Level 7, 80 William St East Sydney NSW
Australia 2011
www.groupgsa.com

T +612 9361 4144 F +612 9332 3458
architecture interior design urban design landscape
nom architect M. Sheldon 3990

Project Title
Eden Street Arncliffe

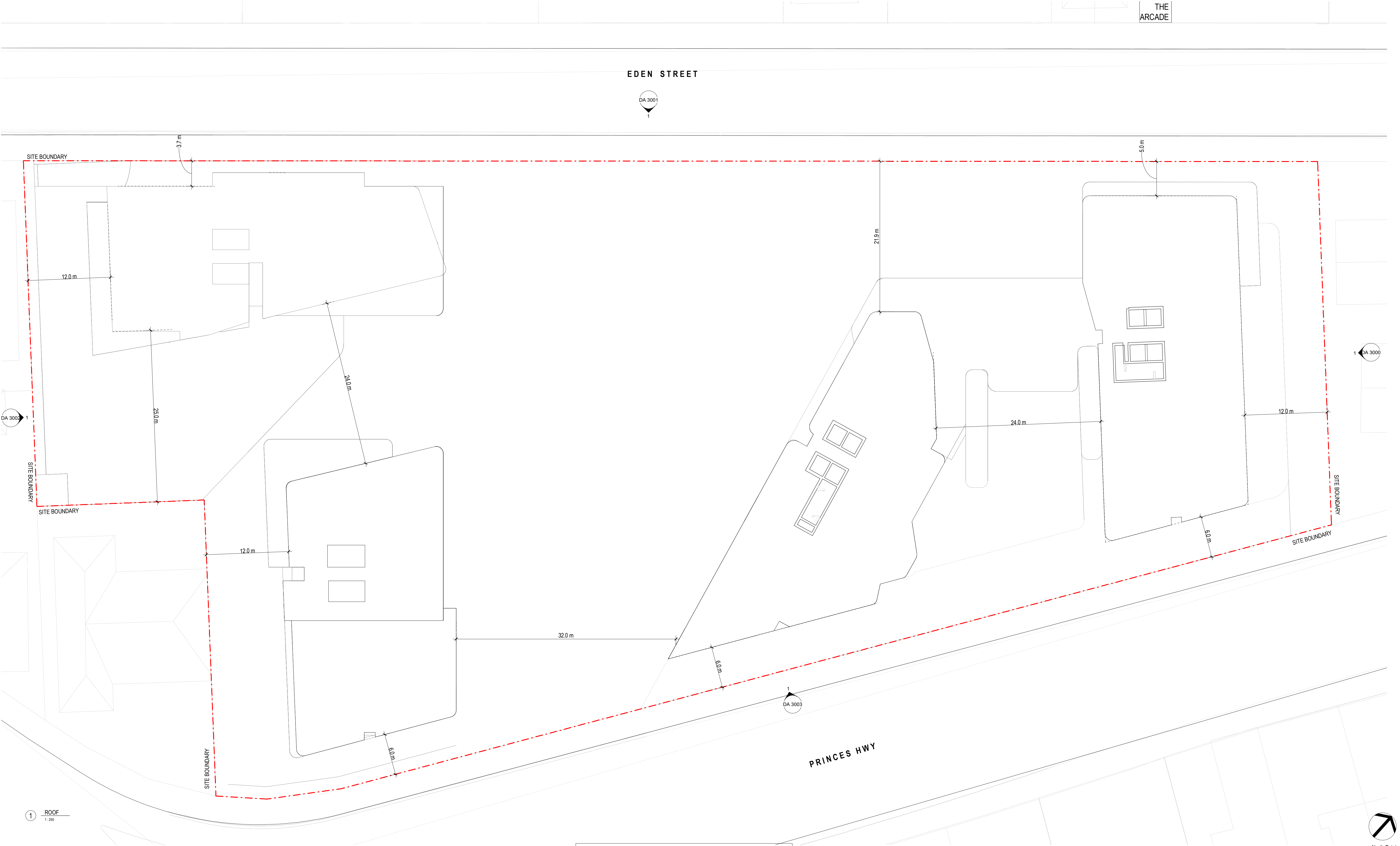
Drawing Title

Level 21

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Verified	Designer	Approved	Approver
Drawing Created (date)		Drawing Created (by)	Checker
			22/10/2020
Scale	Project No	Drawing No	Issue
1 : 250	180319	DA 2022	1



NOTE: APARTMENT PLANS WIP

Amendments			Amendments		
Issue	Description	Date	Issue	Description	Date
1	ISSUED FOR CONSULTANTS	22/10/2020			
	ISSUED FOR PRE DA	29/10/2020			

Consultant		Client	
Consultant	BillBergia	Client	BillBergia
Company	Client Details		
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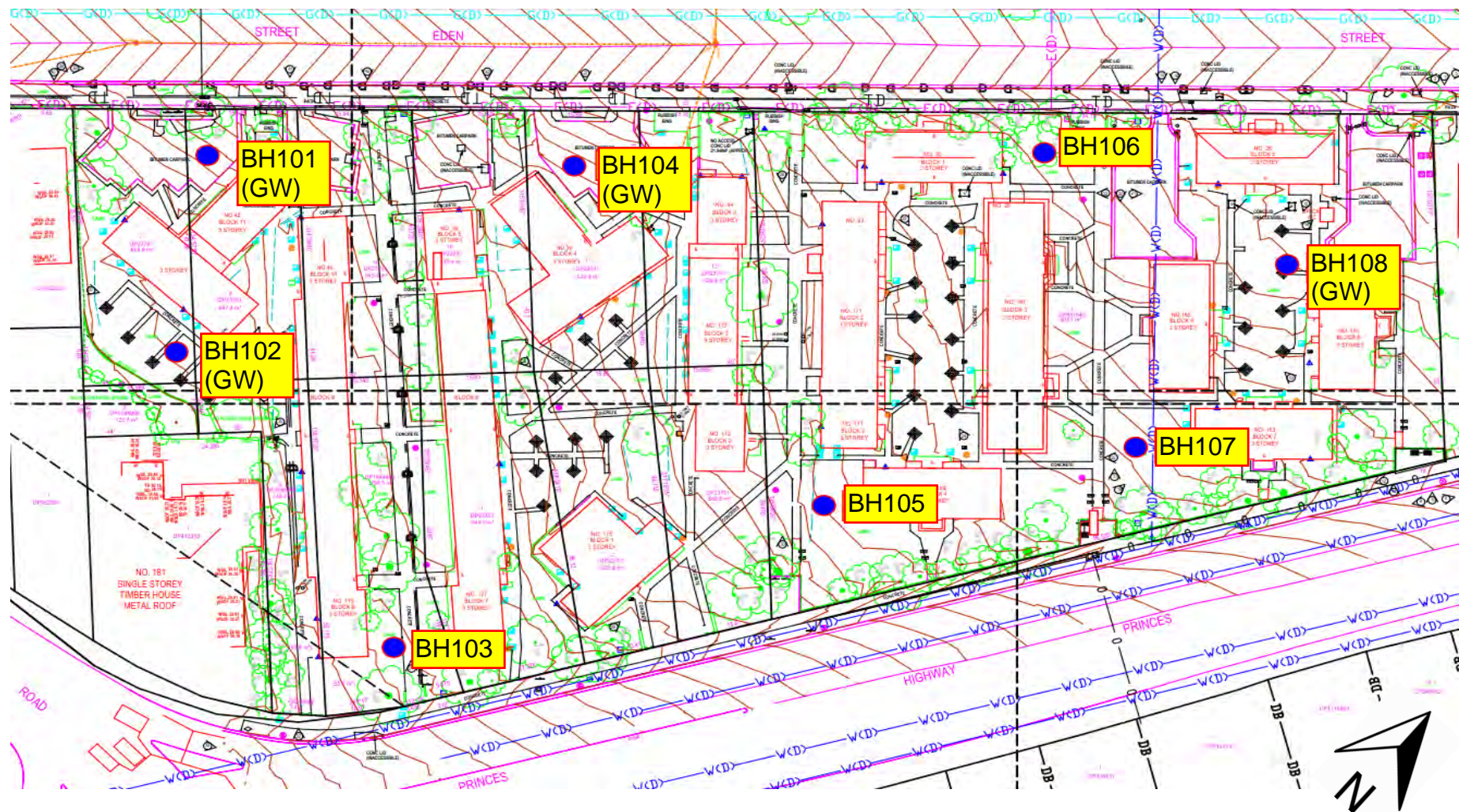
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Project Title	
Eden Street Arncliffe	
Drawing Title	
ROOF PLAN	
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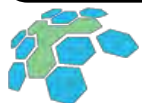
PRELIMINARY				
Plotted and checked by		Author		
Verified	Designer	Approved	Approver	
Drawing Created (date)		Drawing Created (by)		Checker
				22/10/2020
Scale	Project No	Drawing No	Issue	
1 : 250	180319	DA 2023	1	

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ATTACHMENT B



TITLE:	Borehole Location Plan	JOB #:	STC-2148-18709	PREPARED:	OV
PROJECT:	Arncliffe Site - Geotechnical Investigation	VERSION:	1	CHECKED:	JP
CLIENT:	Billbergia Pty Ltd	PAGE:	1 of 1	DATE:	21.12.2020



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

UNIT 6/7 MILLENNIUM COURT, SILVERWATER NSW, 2128
TEL: (02) 8541 7214 EMAIL: info@ade.group

ATTACHMENT C

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 3

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED : 27/11/2020 DATE COMPLETED : 27/11/2020

DATE LOGGED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING					MATERIAL									
PROGRESS	DRILLING & CASING	WATER	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE	CONDITION	CONSISTENCY	RELATIVE DENSITY	STRUCTURE & Other Observations
ADIT			Not Encountered	1.00m SPT 2,3,3 N=6 1.45m	19.0				FILL: Silty SAND, fine to medium grained, dark brown, trace of tree rootlets	M				FILL
									FILL: Silty SAND, fine to medium grained, orange and brown, with clay bands					
					1.0				Sandy CLAY, medium to high plasticity, grey and brown, fine to medium grained sand	F - St	w PL	St - VSt		RESIDUAL SOIL
					18.0			CI-CH						
					2.0									

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 3

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES					
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
DRILLING & CASING	WATER												
			19.0										
			18.0										
			2.0			2.13m START CORING AT 2.13m							
↑ NMLC	Not Encountered	1 Is(50) d=0 a=0 MPa	17.0			SANDSTONE, fine to medium grained, orange and pale grey, extremely weathered, very low estimated strength, iron indurated	XW				2.17: Ewz, 0-5°, 70mm		
							HW				2.35: Be, 20°, Pl, Ro, Is		
				3.0		2.90m 3.00m CORE LOSS 0.10m							
							HW				3.07: Be, 0-5°, Ir, Ro, Is		
				1 Is(50) d=0.1 a=0.06 MPa	4.0							84	3.90: Cs, 0°, Pl, Ro, Is 3.98: Ewz, 0°, 100 mm 4.02: Ewz, 0-5°, 40mm 4.07: Be, 0-5°, Pl, Ro, Is 4.12: Ewz, 30mm 4.17: Be, 0-10°, Pl, Ro, Is
				1 Is(50) d=0.36 a=0.15 MPa	15.0			MW					
				1 Is(50) d=0.91 a=1.11 MPa	14.0			SW					5.24: Ewz, 0-5°, 10mm, sandy clay 5.38: Jt, 50°, Pl, Ro, Healed 5.40: Cs, 0°, 5 mm 5.51: Be, 0°, Pl, Ro, Co
		1 Is(50) d=0.72 a=0.73 MPa	13.0								6.30: Ewz, 10°, 5 mm		
		1 Is(50) d=0.75 a=1.36 MPa	12.0								6.60: Cs, 10°, 5 mm		

See Explanatory Notes for details of abbreviations & basis of descriptions.



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CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 108

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 3

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328873.0, N: 6243204.5 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 19.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	L			
NMLC	Not Encountered	1 Is(50) d=0.93 a=1.72 MPa	11.0		<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><d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Hole Terminated at 16.00 m

Target depth

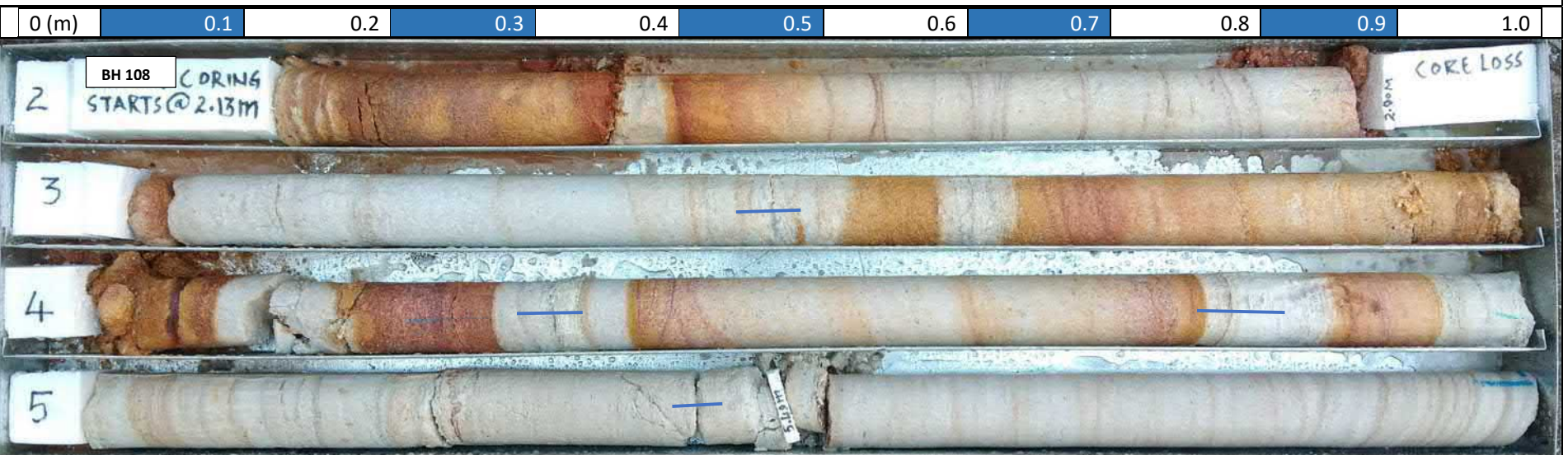
See Explanatory Notes for details of abbreviations & basis of descriptions.




ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 2.13 m – 6.00m
Core Photo : No. 1



 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	2.13 m – 6.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.00 m – 10.00 m
 Core Photo : No. 2

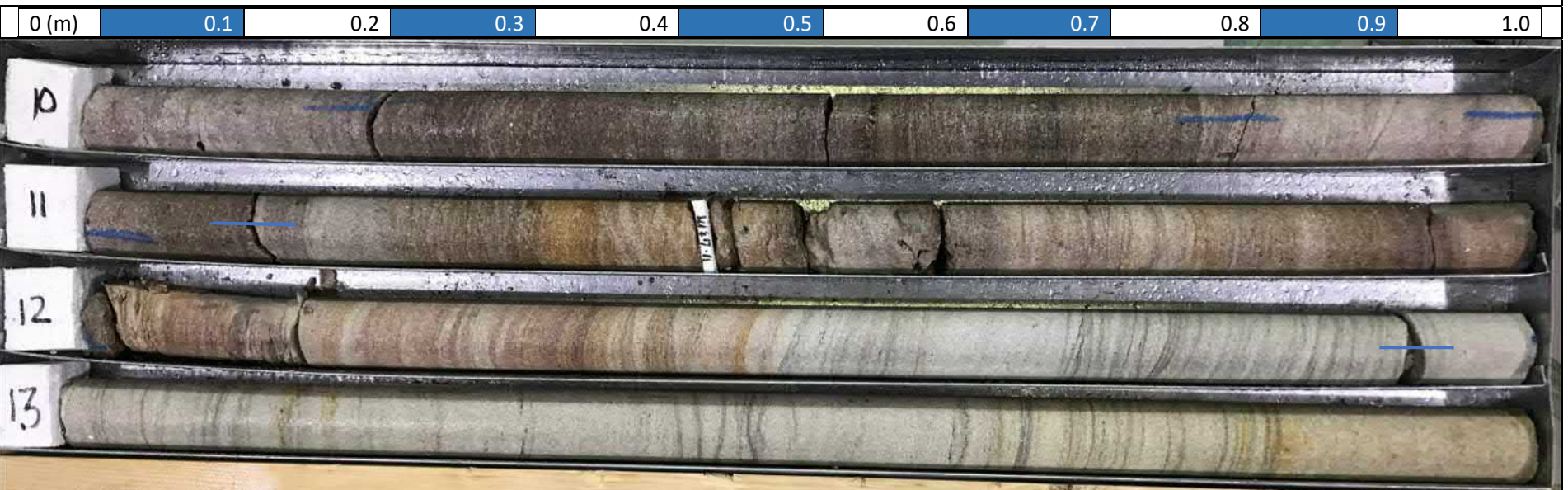
0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
-------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----




	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.00 m – 10.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

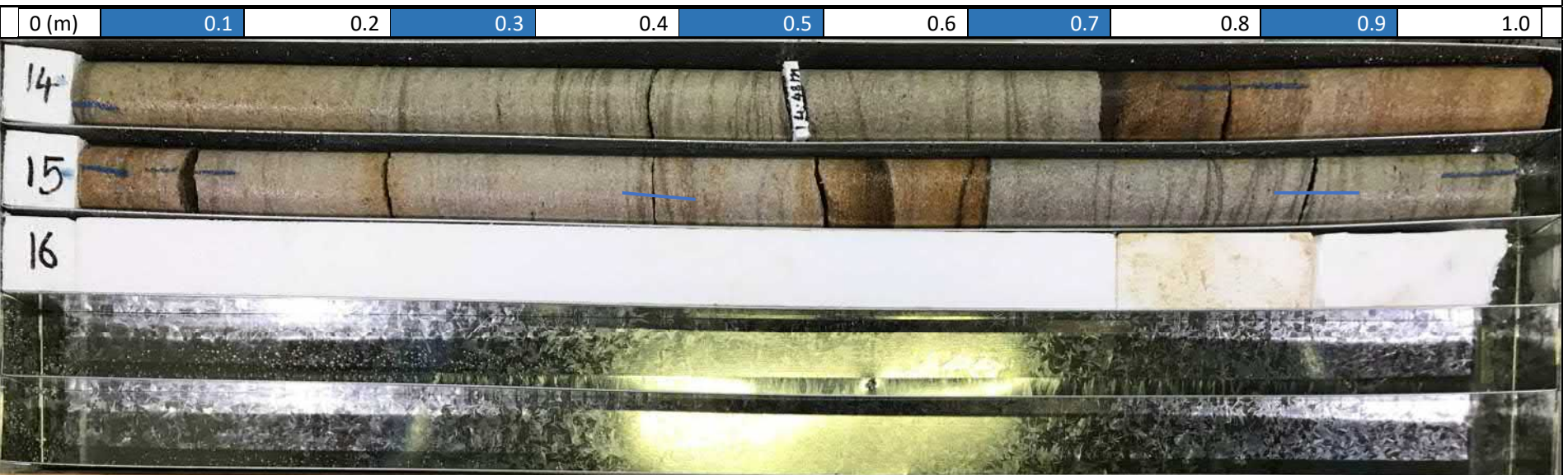
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 10.00 m – 14.00 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.00 m – 14.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 14.00 m – 16.00 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 108
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	14.00 m – 16.00m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES												
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral						NATURAL FRACTURE (mm)				RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL 0.1 L 0.3 M 1 H 3 VH 10 EH	20 40 100 300 1000										
				25.0	1.0														
						1.76m START CORING AT 1.76m													
				24.0	2.0	SANDSTONE, fine to coarse grained, red and brown, yellow and pale grey, extremely weathered, extremely low to soil strength	XW								0	2.00: Ewz			
						2.40m 2.45m CORE LOSS 0.05m CORE LOSS	MW								0	2.65: Ewz			
				23.0	3.0	SANDSTONE, fine to medium grained, pale grey, and pale orange, extremely weathered, extremely low to soil strength, with grey laminations, indistinctly cross bedded at 0-20°, closely to moderately spaced	SW												
			1			Is(50) a=0.4 MPa													
				22.0	4.0	4.20m-5.20m: Trace coarse grained sandstone bands									95				
			1			Is(50) a=1.18 MPa													
				21.0	5.0											4.98: Cs, 0-5°, 20mm 5.02: Be, 0-10°, Ir, Ro, IS 5.08: Be, 10-20°, Pl, Ro, IS			
																5.58: Cs, 10°, 2mm, clay			
			1			Is(50) a=0.96 MPa	SW - FR												
				20.0	6.0														
			1			Is(50) a=0.68 MPa													
				19.0	7.0	7.30-7.52m: shale lens									92	7.41: shale lense, Ew to Hw weathered			
			1			Is(50) a=0.75 MPa													

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 101

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES							
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other				
DRILLING & CASING	WATER														
<div>NMLC</div>															
		1 Is(50) a=1.05 MPa	17.0	9.0		SANDSTONE, fine to medium grained, pale grey, and pale orange, extremely weathered, extremely low to soil strength, with grey laminations, indistinctly cross bedded at 0-20°, closely to moderately spaced (<i>continued</i>)	SW • FR			92	8.22: Cs, 0-5°, 130mm, sandy clay				
		1 Is(50) a=1.16 MPa		16.0	0.0							98	10.60: Cs, 0-5°, 20mm, sandy clay		
		1 Is(50) a=1.7 MPa	15.0	1.0						97	12.26: Fz, 5-10°, 60mm				
		1 Is(50) a=1.66 MPa		14.0	2.0							12.88: Be, 0-5°, Ir, Ro, IS			
		1 Is(50) a=0.67 MPa	13.0	3.0									96	14.32: Cs, 0-5°, 20mm 14.53: Ewz, 0-5°, 30mm 14.88: Cs, 0-5°, 20mm	
		1 Is(50) a=0.58 MPa		12.0	4.0										
		1 Is(50) a=0.58 MPa	11.0	5.0											
		1 Is(50) a=1.04 MPa													

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

HOLE NO : BH 101

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328748.7, N: 6243121.6 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 24/11/2020 DATE COMPLETED : 24/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES			
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
<div><div>NMLC</div><div></div></div> <div><div>1</div><div>Is(50) a=1.11 MPa</div><div>9.0</div><div>7.0</div></div> <div><div>1</div><div>Is(50) a=1.27 MPa</div><div>8.0</div><div>8.0</div></div> <div><div>1</div><div>Is(50) a=1.21 MPa</div><div>7.0</div><div>9.0</div></div> <div><div>1</div><div>Is(50) a=1.27 MPa</div><div>6.0</div><div>20.0</div></div> <div><div>1</div><div>Is(50) a=2.19 MPa</div><div>5.0</div><div>21.0</div></div> <div><div>21.00m</div><div>Hole Terminated at 21.00 m Target depth</div></div> <div><div>4.0</div><div>22.0</div></div> <div><div>3.0</div><div>23.0</div></div> <div><div>SW</div><div>FR</div></div> <div><div>VL</div><div>L</div><div>M</div><div>H</div><div>VH</div><div>EH</div></div> <div><div>20</div><div>40</div><div>100</div><div>300</div><div>1000</div></div> <div><div>98</div><div>98</div></div> <div><div>16.83: Cc, 0-5°, 10mm</div><div>18.30: Jt, 70°, Pl, Ro, Cl</div><div>19.60: Cs, 5-10°, 10mm, sandy clay</div><div>20.28: Ewz, 0-5°, 20mm, sandy clay</div><div>20.48: Be, 0°, Pl, Sm, Is</div><div>21.00: E.C.R</div></div>											

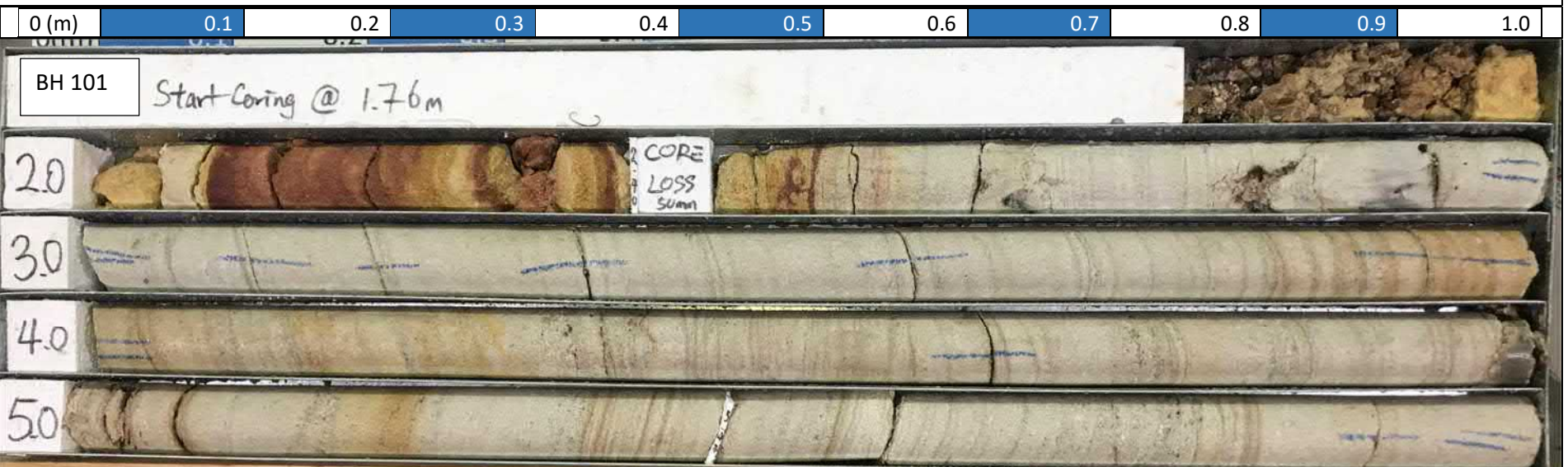
See Explanatory Notes for details of abbreviations & basis of descriptions.




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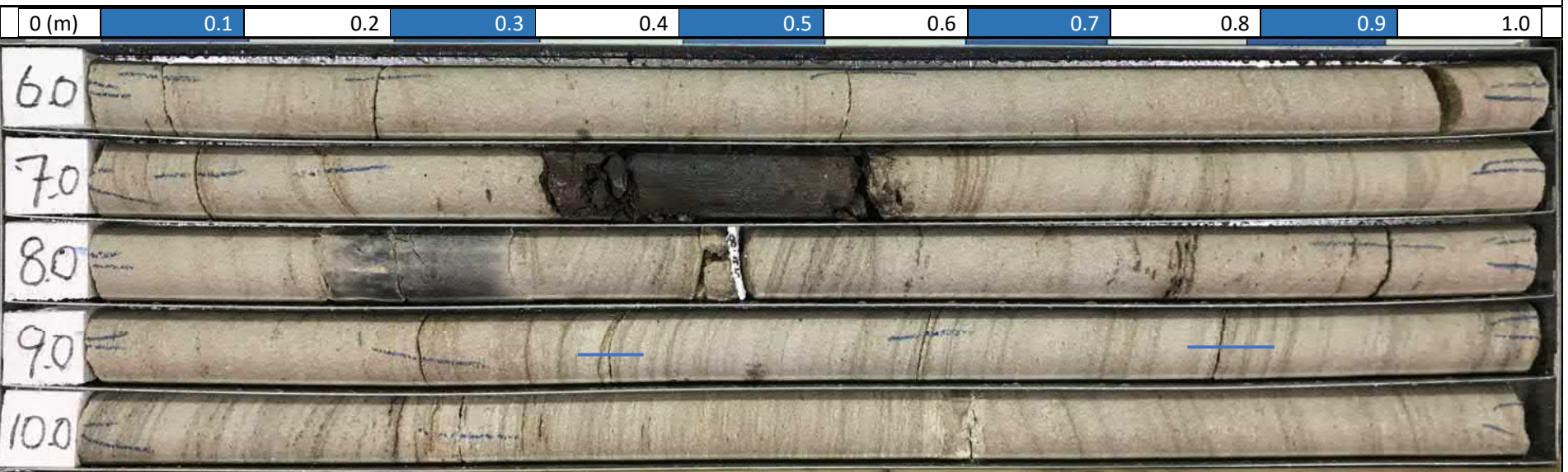
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.76 m – 6.0 m
 Core Photo : No. 1




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.76 m – 6.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

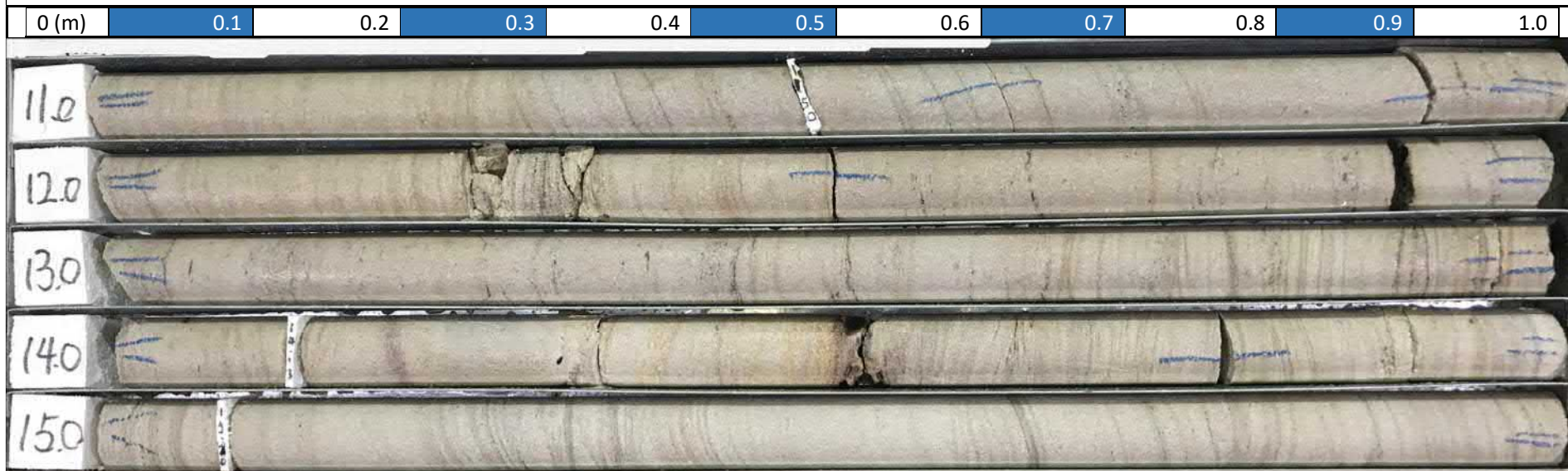
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.0 m – 11.0 m
 Core Photo : No. 2




 ADE CONSULTING GROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.0 m – 11.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

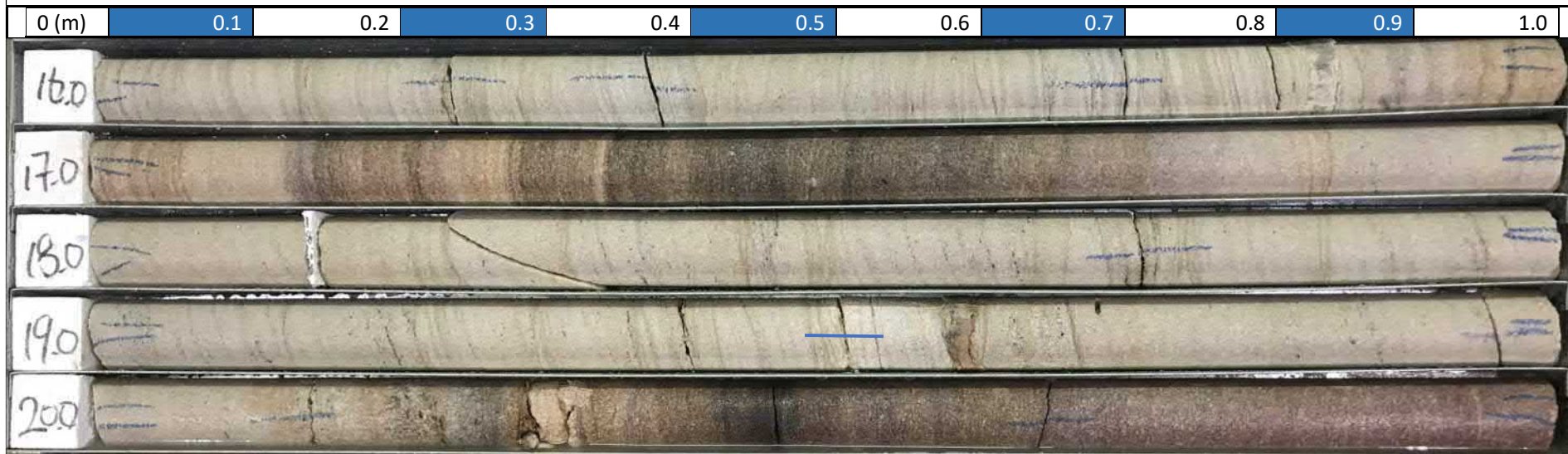
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 11.0 m – 16.0 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.0 m – 16.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.0 m – 21.0 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 101
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.0 m – 21.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

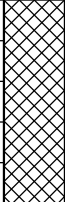
EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED : 23/11/2020 DATE COMPLETED : 23/11/2020 DATE LOGGED : 23/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING				MATERIAL												
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
DRILLING & CASING	WATER											5	10	15	20	
↑ ADIT ↓				27.0				FILL: Silty SAND, fine to medium grained sand, brown, fine to medium gravel, trace of tree rootlets and organic material	M							FILL
				26.0	1.0		1.00m					Continued as Cored Drill Hole				
				25.0	2.0											
				24.0	3.0											
				23.0	4.0											
				22.0	5.0											
				21.0	6.0											
				20.0	7.0											

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES									
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral						NATURAL FRACTURE (mm)		RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							L 0.1	M 0.3	H 1	VH 3	EH 10	20	40	100		
			27.0														
						1.00m START CORING AT 1.00m											
↑		1 Is(50) a=0.15 MPa	26.0	1.0		SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20°	SW							92	1.37: Ewz, 0-5°, 10mm, sandy caly		
		1 Is(50) a=0.17 MPa	25.0	2.0											2.70: Be, 0-5°, Pl, Ro, Is		
		1 Is(50) a=0.32 MPa	24.0	3.0											2.95: Cs, 0-5°, 30mm, sandy clay		
															3.44: Ewz, 0-5°, 50mm, sandy clay		
															3.72: Cs, 5°, 10mm, sandy clay, Is		
															3.84: EWz, 0-5°, 80mm, Sandy Clay		
				23.0		4.0	3.89m										
							4.00m CORE LOSS 0.11m										
							SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20°								4.29: Be, 10-30°, Pl, Ro, Is		
			1 Is(50) a=0.54 MPa	22.0		5.0			FR						97	5.68: Ewz, 0-5°, 10mm, Sandy Clay	
		1 Is(50) a=0.69 MPa	21.0	6.0										5.93: Cs, 0-5°, 20mm, sandy clay			
		1 Is(50) a=1.1 MPa	20.0	7.0										6.66: Ewz, 5-30°, 20-40mm, sandy clay			
		1 Is(50) a=1.34 MPa											100				

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES						
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
DRILLING & CASING	WATER							VL	L				M	H
			19.0			SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20° (continued)	FR							
		1 Is(50) a=1.38 MPa											100	
			18.0	9.0										9.17: Jt, 80-90°, Pl, Ro, Ve
		1 Is(50) a=1.78 MPa												9.76: Jt, 60-70°, Pl, Ro, Ve
			17.0	0.0									90	9.96: Be, 0-10°, Pl, Ro, Is
		1 UCS 8.33 MPa												10.22: Be, 10-20°, Pl, Ro, Co, sandy clay
														10.41: Be, 15-20°, Pl, Ro, Is
		1 Is(50) a=2.02 MPa	16.0	1.0										
			15.0	2.0										11.84: Cs, 5-20°, 30mm, sandy Clay
		1 Is(50) a=2.02 MPa											98	
			14.0	3.0										
		1 Is(50) a=2.3 MPa												
		1 Is(50) a=1.35 MPa	13.0	4.0										
			12.0	5.0							96	14.97: Ewz, 5-20°, 50mm, sandy clay		
		1 Is(50) a=1.07 MPa										15.60: Ewz, 0-5°, 10mm, Sandy Clay		

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 102

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328776.2, N: 6243092.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 27.03 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES					
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL 0.1 L 0.3 M 1 H 3 VH 10 EH				
NMLC		1 Is(50) a=1.13 MPa	11.0			SANDSTONE, fine to medium grained, pale grey to orange, with indistinct laminations at 0-20° (continued)	FR			96	16.43: Cs, 0-5°, 30mm, Sandy Clay 16.91: Ewz, 0-5°, 10mm, Sandy Clay 17.3: Be, 10°, Pl, Ro, Is 	

See Explanatory Notes for details of abbreviations & basis of descriptions.



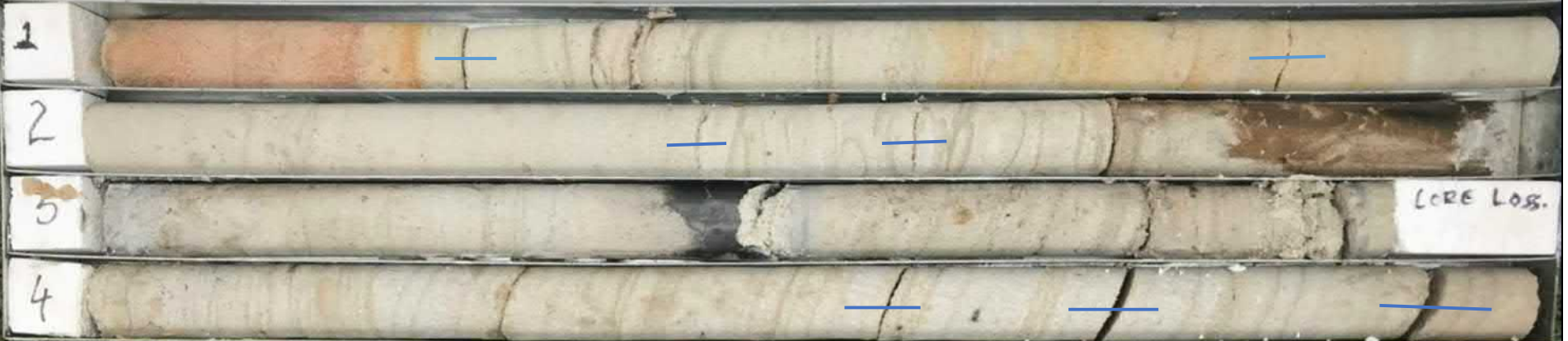
ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION


ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 1.00 m – 5.00 m
Core Photo : No. 1

0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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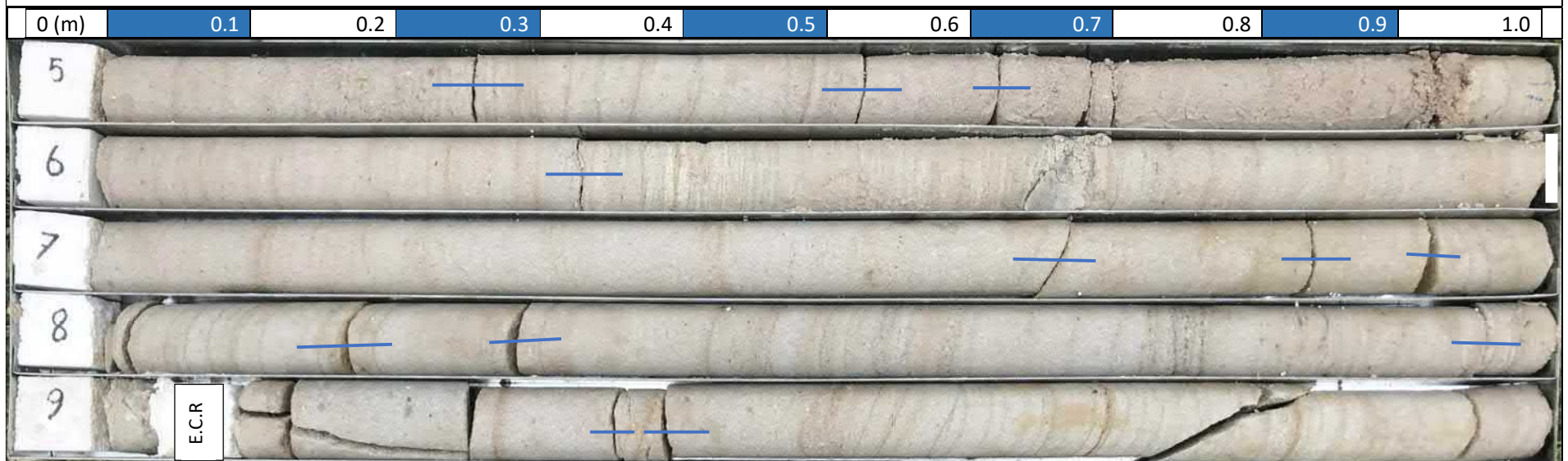
STC-2148-18709 Start Coring BH102 @ 1.00m




 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.0 m – 5.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

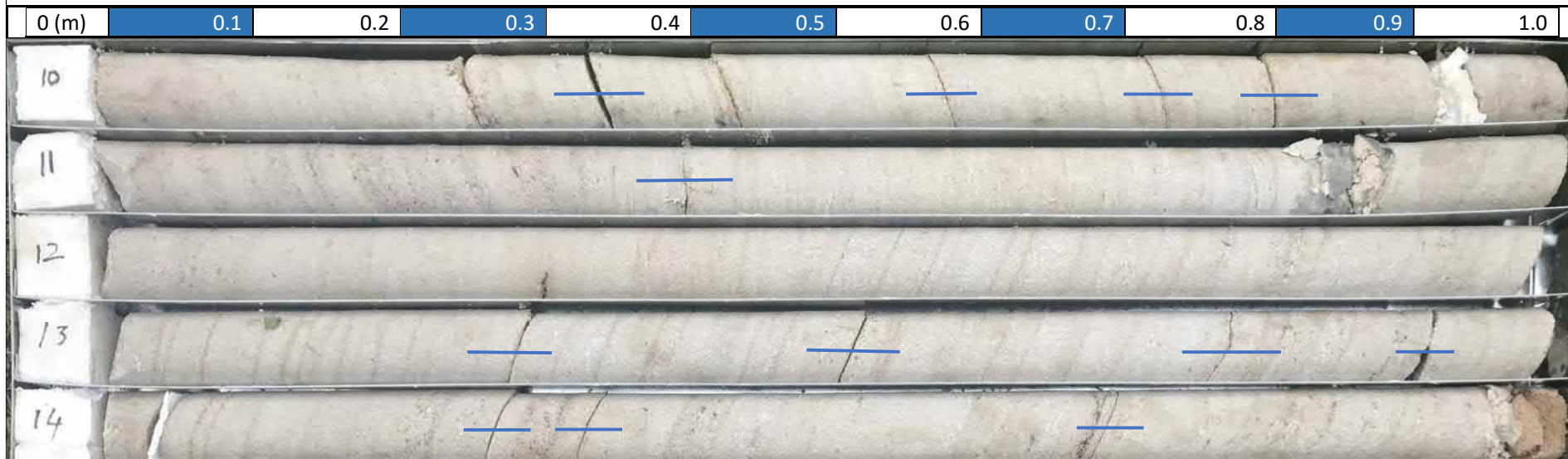
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 5.00 m – 10.0 m
 Core Photo : No. 2




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	5.0 m – 10.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

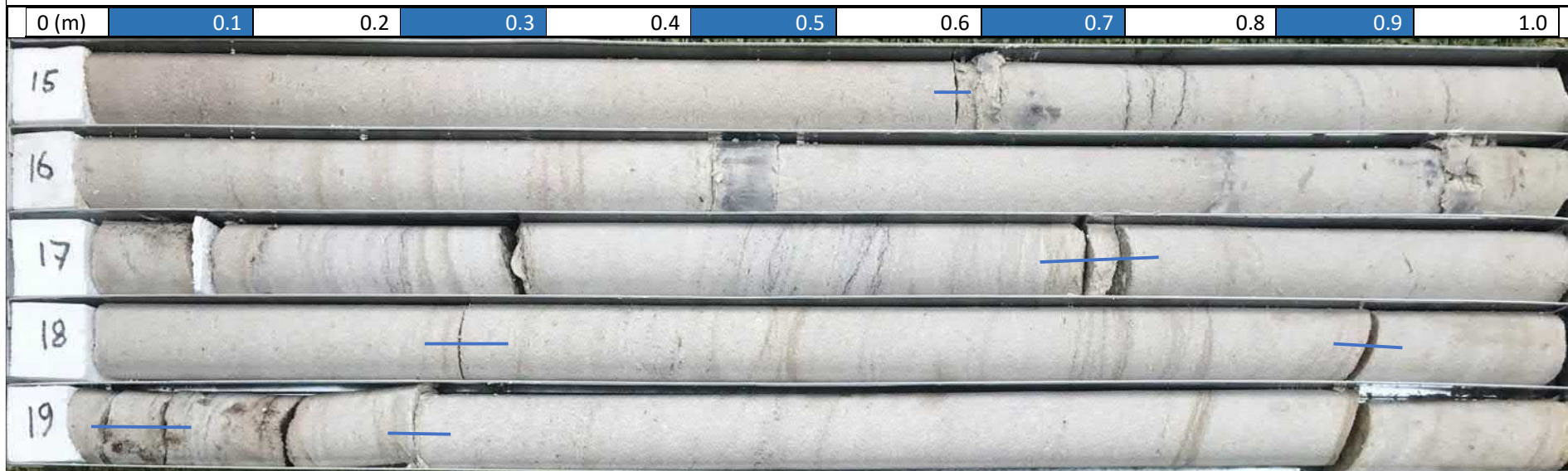
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 10.0 m – 15.0 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.0 m – 15.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

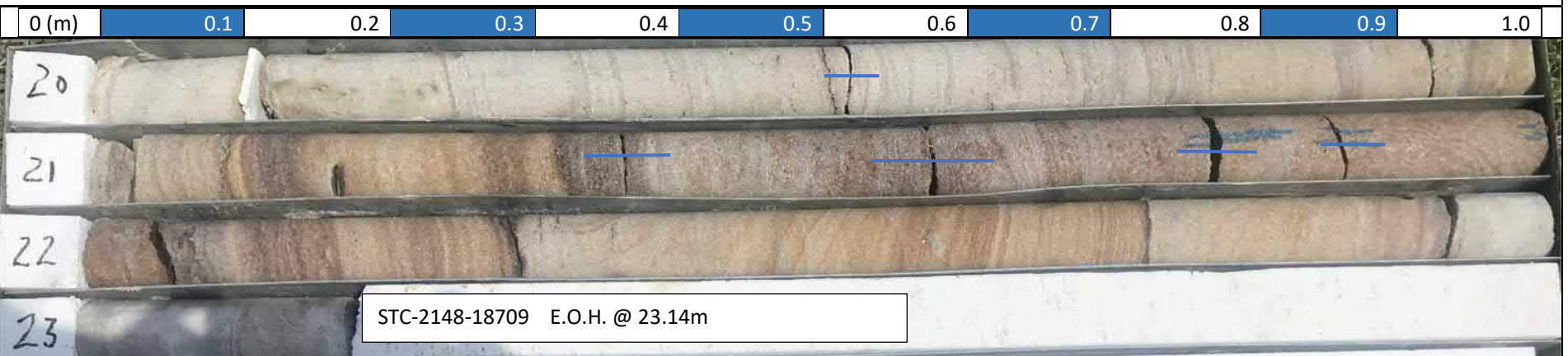
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 15.0 m – 20.0m
Core Photo : No. 4




	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	15.0 m – 20.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 20.0 m – 23.14 m
Core Photo : No. 5



 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 102
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	20.0 m – 23.14 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	24.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 5

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED : 23/11/2020 DATE COMPLETED : 23/11/2020

DATE LOGGED : 23/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING						MATERIAL											
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations	
DRILLING & CASING	WATER											5	10	15	20		
<div>AD/T</div>		Not Encountered	0.50m B-1	26.0	1.0		CL-CI	0.10m Top Soil FILL: Silty SAND , fine grained, dark brown, trace of tree rootlets	D						FILL		
	1.00m 1.00m SPT 23,R,R N=R		1.04m Sandy CLAY , low to medium high plasticity, pale grey and brown, fine to medium grained sand, with fine to medium grained sandstone gravel					w < PL								H	RESIDUAL SOIL
	1.45m		1.58m														
			Continued as Cored Drill Hole														
				25.0													
					2.0												
					24.0												
					3.0												
					23.0												
					4.0												
					22.0												
					5.0												
					21.0												
					6.0												
					20.0												
					7.0												
					19.0												

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 5

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES						
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
DRILLING & CASING	WATER							● Axial ○ Diametral	EH					
			26.0	1.0				VL 0.1 L 0.3 M 1 H 3 VH 10 EH	20 40 100 300 1000					
						1.58m START CORING AT 1.58m								
↑ NMLC		Not Encountered	1 Is(50) a=0.2 MPa	25.0	2.0	SANDSTONE , fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands	MW - SW			95	2.09: Be, 20°, Pl, Ro, Is			
	1 Is(50) a=0.39 MPa		24.0	3.0										
	1 Is(50) a=0.46 MPa		23.0	4.0										3.72: Jt, 70°, Pl, Ro, Ve 3.85: Jt, 45°, Pl, Ro, Cl
	1 Is(50) a=0.36 MPa		22.0	5.0										4.45: Be, 0°, Pl, Ro, Is
	1 Is(50) a=0.36 MPa		21.0	6.0										5.64: Sz, 160mm
	1 Is(50) a=0.79 MPa		20.0	7.0										7.14: Cs, 0-5°, 20mm, clay
	1 Is(50) a=0.94 MPa	19.0				7.82-8.16m: purple band				94				
											98			

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 5

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	HL			
		1 Is(50) a=1 MPa	18.0	9.0		SANDSTONE, fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands (continued)	MW • SW				98	9.00: Cs, 0-5°, 10mm, sandy clay
		1 Is(50) a=1.66 MPa	17.0	10.0		10.35-10.75m: carbonaceous speckles						10.20: Be, 0-10°, Pl, Ro, Co
		1 Is(50) a=1.1 MPa	16.0	11.0								10.78: Be, 0-5°, Pl, Ro, Co, sandy clay
		1 Is(50) a=1.24 MPa	15.0	12.0							97	12.30: Cs, 0-20°, 50mm, sandy clay
												12.55: Be, 15-20°, Pl, Ro, Co
		1 Is(50) a=1.41 MPa	14.0	13.0								12.78: Be, 0°, Pl, Ro, Co, sandy clay
												13.19: Ewz, 0°-20°, 2-10mm, sandy clay
		1 Is(50) a=1.37 MPa	13.0	14.0							98	15.48: Cs, 0-10°, 20mm, clay
		1 Is(50) a=1.28 MPa	12.0	15.0								
		1 Is(50) a=1.29 MPa	11.0									

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 5

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020 DATE COMPLETED : 23/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES			
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L 0.1 M 0.3 H 1 VH 3 EH 10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
<div><div><div>NMLC</div><div>Not Encountered</div></div><div><div>1</div><div>Is(50) a=1.26 MPa</div></div><div><div>1</div><div>Is(50) a=1.04 MPa</div></div><div><div>1</div><div>Is(50) a=0.42 MPa</div></div><div><div>1</div><div>Is(50) a=0.53 MPa</div></div><div><div>1</div><div>Is(50) a=0.65 MPa</div></div><div><div>1</div><div>Is(50) a=1.83 MPa</div></div><div><div>1</div><div>Is(50) a=2.27 MPa</div></div><div><div>1</div><div>Is(50) a=1.63 MPa</div></div></div> <div><div><div><div>SANDSTONE, fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands (<i>continued</i>)</div><div>16.58-17.20m: becoming purple and brown</div></div><div><div>21.20-23.28m: becoming purple and brown</div></div></div><div><div>MW</div><div>• SW</div></div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div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See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 103

FILE / JOB NO : STC-2148-18709

SHEET : 5 OF 5

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328821.5, N: 6243084.4 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 26.85 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 23/11/2020

DATE COMPLETED : 23/11/2020

LOGGED BY : NH

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	HL			
NMLC ↓	Not Encountered	1 Is(50) a=1.8 MPa	2.0	25.0	25.80m	SANDSTONE, fine to medium grained, pale grey with light brown and yellow laminations, cross-bedded at 0-20°, with discontinuous iron bands (continued)	MW • SW			100	25.80: E.C.R	
		1 Is(50) a=1.79 MPa	1.0	26.0								
				27.0		Hole Terminated at 25.80 m Target depth						
				28.0								
				29.0								
				30.0								
				31.0								
				32.0								
				33.0								
				34.0								
				35.0								
				36.0								
				37.0								
				38.0								
				39.0								
				40.0								
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				42.0								
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				91.0								
				92.0								
				93.0								
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				95.0								
				96.0								
				97.0								
				98.0								
				99.0								
				100.0								

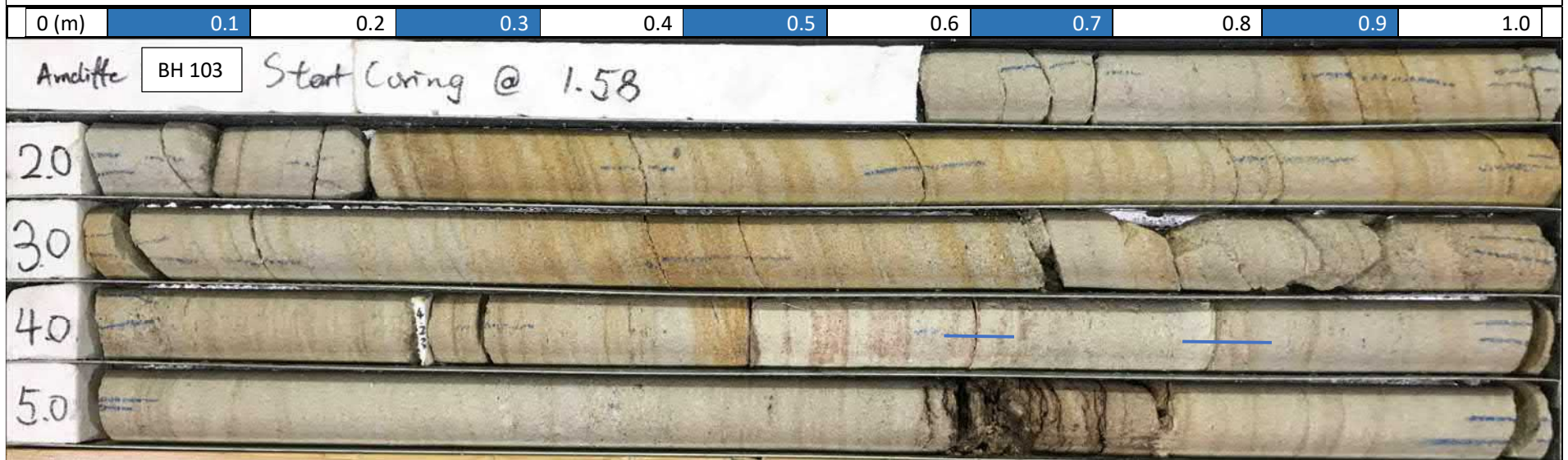
See Explanatory Notes for details of abbreviations & basis of descriptions.




ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

ADE Consulting Group

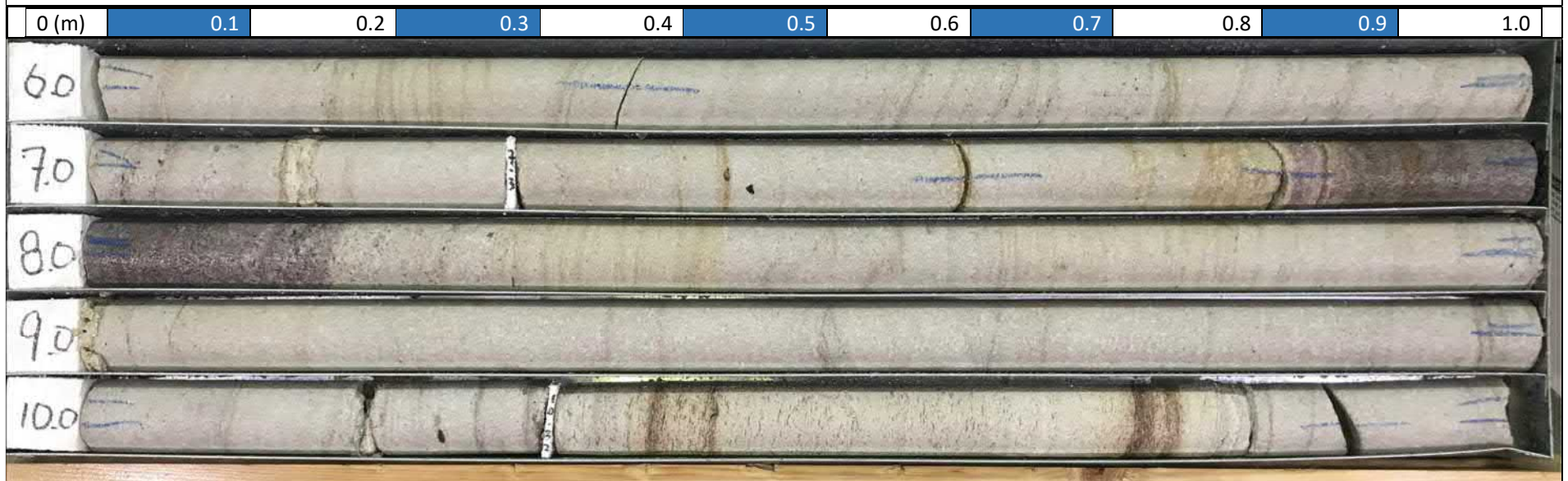
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 1.58 m – 6.00 m
Core Photo : No. 1




 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.58 m – 6.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

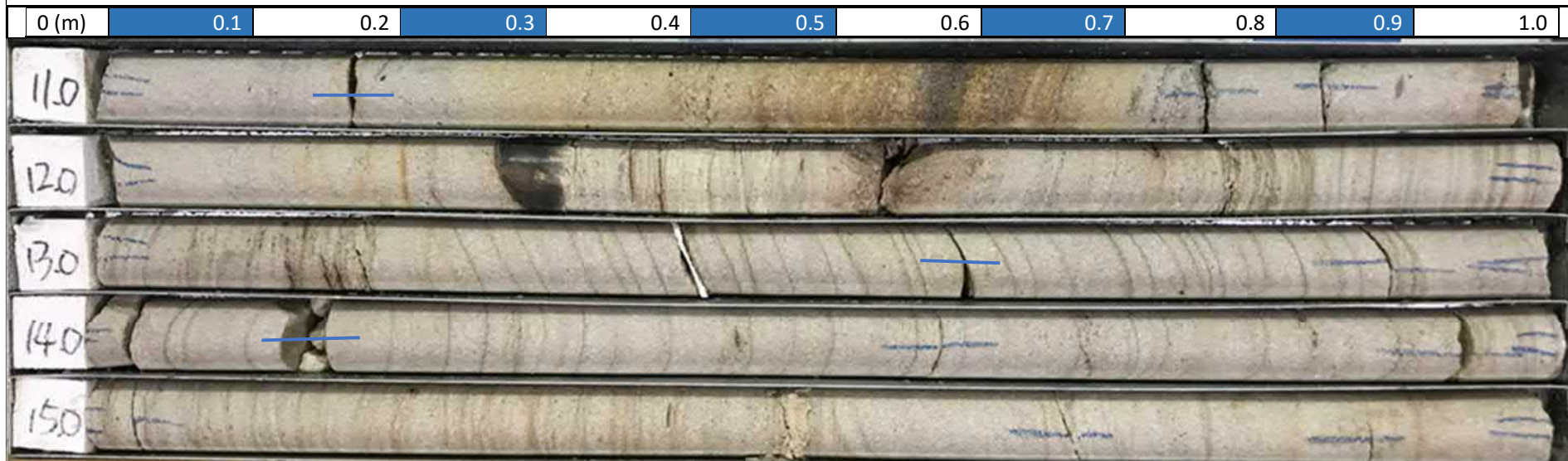
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.0 m – 11.0 m
 Core Photo : No. 2




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.0 m – 11.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

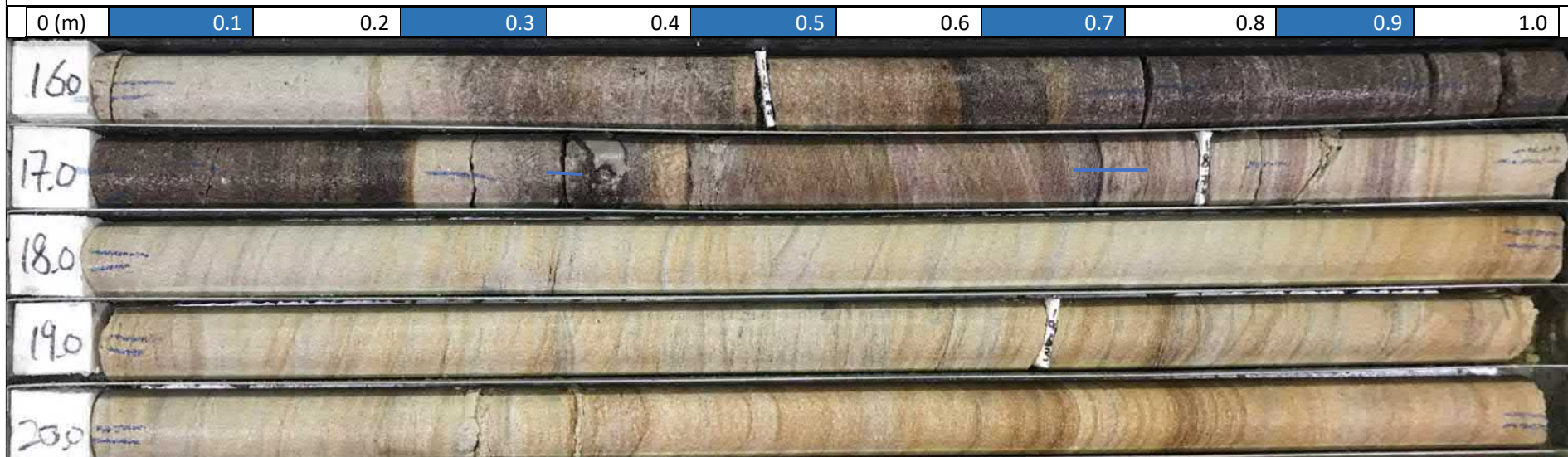
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 11.0 m – 16.0 m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.0 m – 16.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

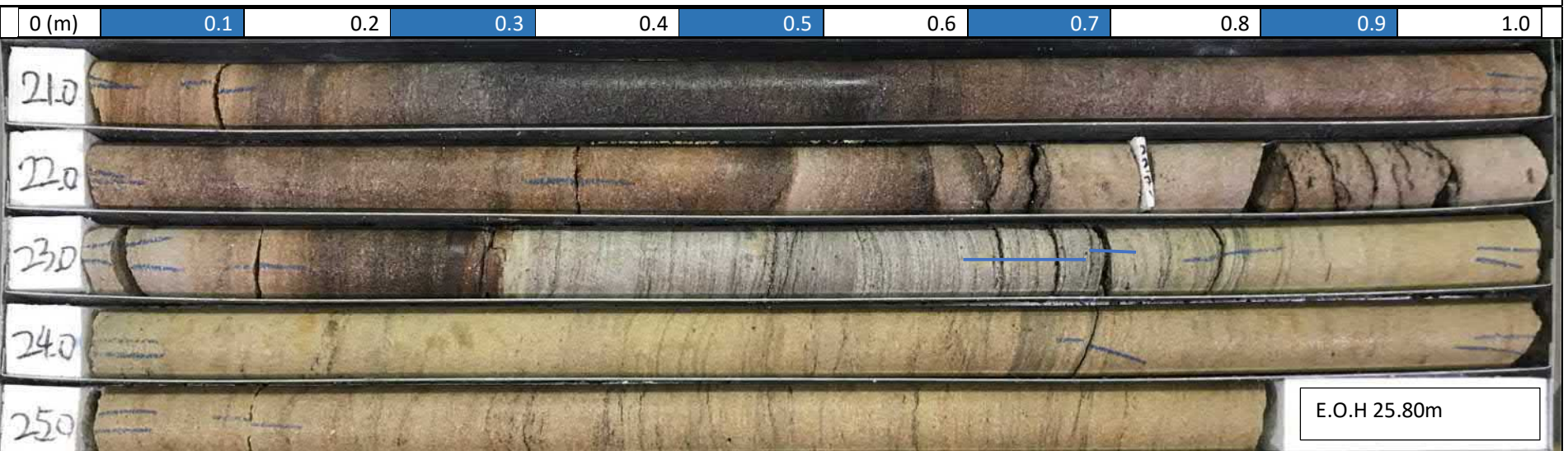
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.0 m – 21.0m
Core Photo : No. 4




	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.0 m – 21.0 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 21.0 m – 25.82 m
Core Photo : No. 5



 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 103
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	21.0 m – 25.82 m
	Title:	Core Photographs	Photograph By:	NH
	Location:	31 Eden St. Arncliffe, NSW	Date:	23.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL


DRILLER : CN

DATE STARTED : 28/11/2020 DATE COMPLETED : 28/11/2020

DATE LOGGED : 28/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING						MATERIAL										
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
DRILLING & CASING	WATER											5	10	15	20	
AD/T		Not Encountered	1.00m SPT 2,3,2 N=5 1.45m	23.0		CI-CH	FILL: Silty SAND , fine to medium grained, dark brown, with fine to medium sandstone gravel, with organic material @0.5m: becoming red-brown	M							FILL	
	22.0			Sandy CLAY , medium to high plasticity, red and brown, fine to coarse grained sand, with fine to medium angular to subangular gravel										RESIDUAL SOIL PP: 90, 180 kPa		
	21.0						M	F - St								
					2.50m			Continued as Cored Drill Hole								
					3.0											
					20.0											
					4.0											
					19.0											
					5.0											
					18.0											
					6.0											
					17.0											
					7.0											
					16.0											

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 28/11/2020 DATE COMPLETED : 28/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES										
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)					NATURAL FRACTURE (mm)				RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	VL-0.1	L	0.3	M	H	VH	VH-3	EH		
			23.0															
				1.0														
			22.0															
				2.0														
			21.0															
						2.50m START CORING AT 2.50m												
		1 Is(50) d=0.06 a=0.06 MPa		3.0		SANDSTONE, fine to medium grained, brown, extremely weathered, very low estimated strength, iron indurated	XW										0	2.70: Ewz, 400mm 3.00: Ewz, 15mm
		1 Is(50) d=0.09 a=0.05 MPa		20.0		SANDSTONE, fine to medium grained, brown and pale grey, and red, indistinctly cross-bedded at 0-20°, iron indurated	HW											3.83: Be, 0-5°, Pl, Ro, Co, sandy clay
				4.0														
			19.0															
						4.50m											98	
		1 Is(50) d=0.15 a=0.13 MPa		5.0		SANDSTONE, fine to medium grained, pale grey, with grey laminations, indistinctly cross-bedded at 0-10°	MW											5.73: Jt, 60°, Pl, Ro, Ve 5.95: Be, 30°, Pl, Ro, Ve 6.05: Be, 0-5°, Pl, Ro, Co, clayey sand 6.28: Be, 0-10°, Pl, Ro, Co, clayey sand
		1 Is(50) d=0.08 a=0.07 MPa		18.0														
				6.0														
			17.0			6.28-6.80m: becoming orange and grey												
		1 Is(50) d=0.34 a=0.2 MPa		7.0														6.98: Ewz, 30mm, sandy clayey 7.20: 2x Be, 0-5°, St, Ro, Is , spaced at 30 mm
		1 Is(50) d=0.19 a=0.14 MPa		16.0			SW											

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 28/11/2020 DATE COMPLETED : 28/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING					MATERIAL					FRACTURES									
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH					NATURAL FRACTURE (mm)		RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other			
DRILLING & CASING	WATER							20	40	100	300	1000							
NMLC		Not Encountered		15.0		SANDSTONE, fine to medium grained, pale grey, with grey laminations, indistinctly cross-bedded at 0-10° (continued)	SW								96	8.15: Be, 5°, Pl, Sm, Is			
			1	Is(50) d=1.06 a=2.19 MPa	9.0													9.05: Cs, 5°. 10 mm	
			1	Is(50) d=1.21 a=1.61 MPa	14.0														
			1	Is(50) d=1.85 a=1.03 MPa	10.0												100		
			1	Is(50) d=1.85 a=1.03 MPa	13.0													10.60: Be, 0-5°, Pl, Ro, Is	
					11.0														11.10: Be, 5°, Pl, Sm, Is
			1	Is(50) d=0.5 a=0.54 MPa	12.0														11.73: Be, 0-5°, Pl, Ro, Is
			1	Is(50) d=0.72 a=0.47 MPa	12.0														
					11.0														12.38: Ewz, 30mm
					13.0														12.89: Be, 0-5°, Pl, Ro, Co
		1	Is(50) d=1.32 a=1.06 MPa	10.0											98				
				14.0															
		1	Is(50) d=1.68 a=1.81 MPa	9.0															
				15.0															
		1	Is(50) d=1.36 a=1.04 MPa	8.0											100				

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 104

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328872.6, N: 6243171.3 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.30 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 28/11/2020 DATE COMPLETED : 28/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES					
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)		RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	L	M	H		
NMLC ↓	Not Encountered	MPa	7.0	17.0	17.87m	SANDSTONE, fine to medium grained, pale grey, with grey laminations, indistinctly cross-bedded at 0-10° (continued) 16.28-17.40: becoming orange, red-brown	FR	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div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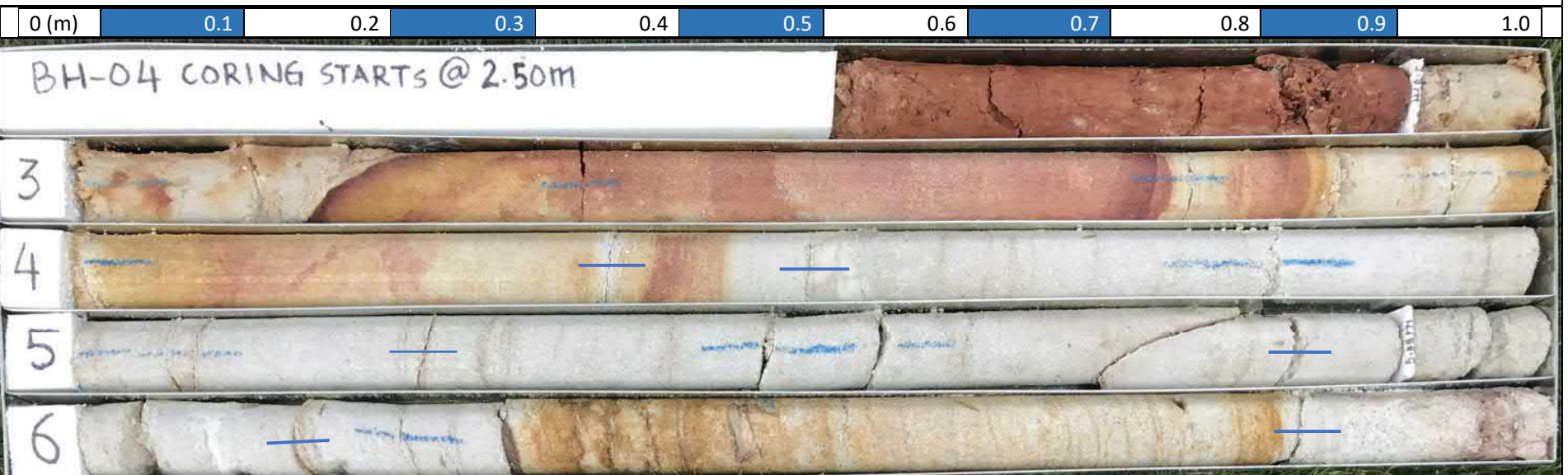
See Explanatory Notes for details of abbreviations & basis of descriptions.




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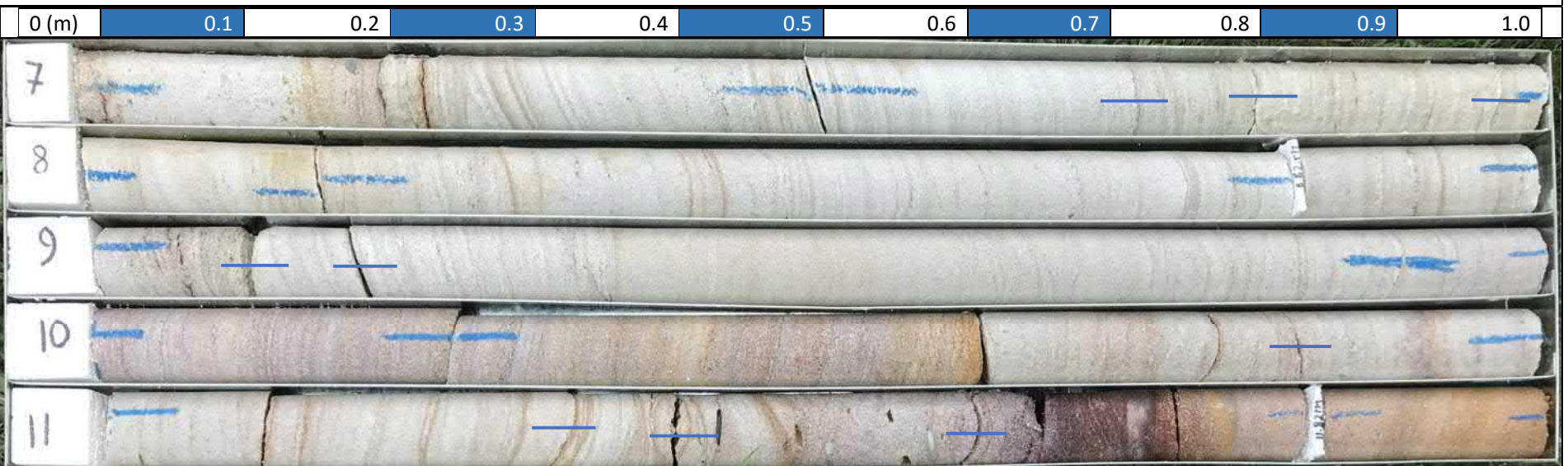
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 2.50 m – 7.0 m
 Core Photo : No. 1




 ADE CONSULTING GROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	2.50 m – 7.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

ADE Consulting Group

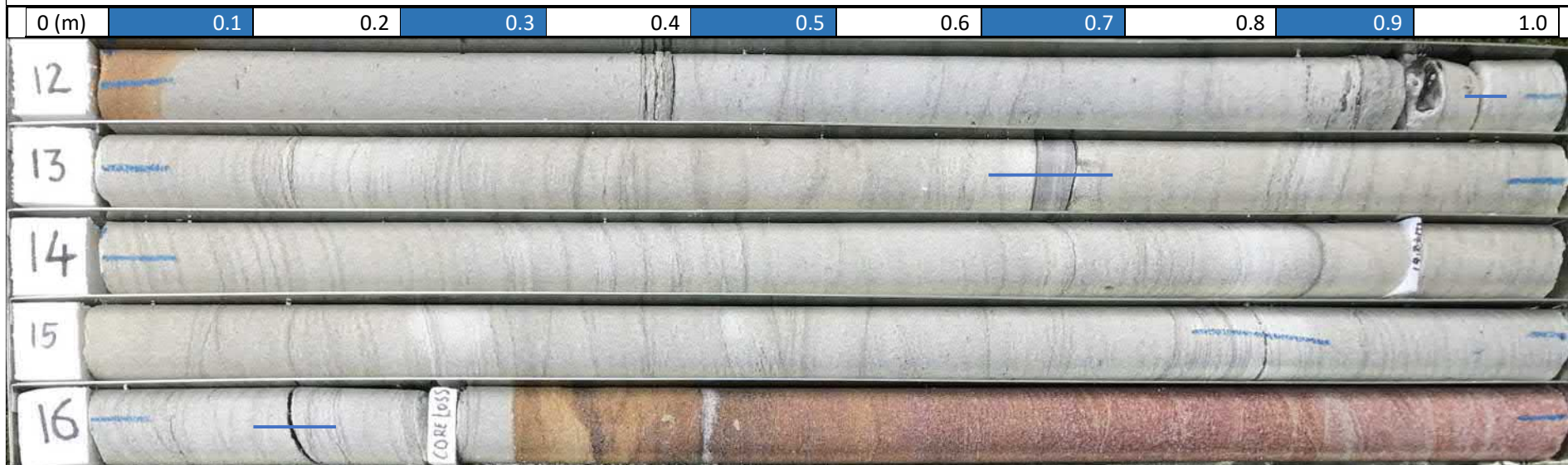
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 7.0 m – 12.0 m
 Core Photo : No. 2




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	7.0 m – 12.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

ADE Consulting Group

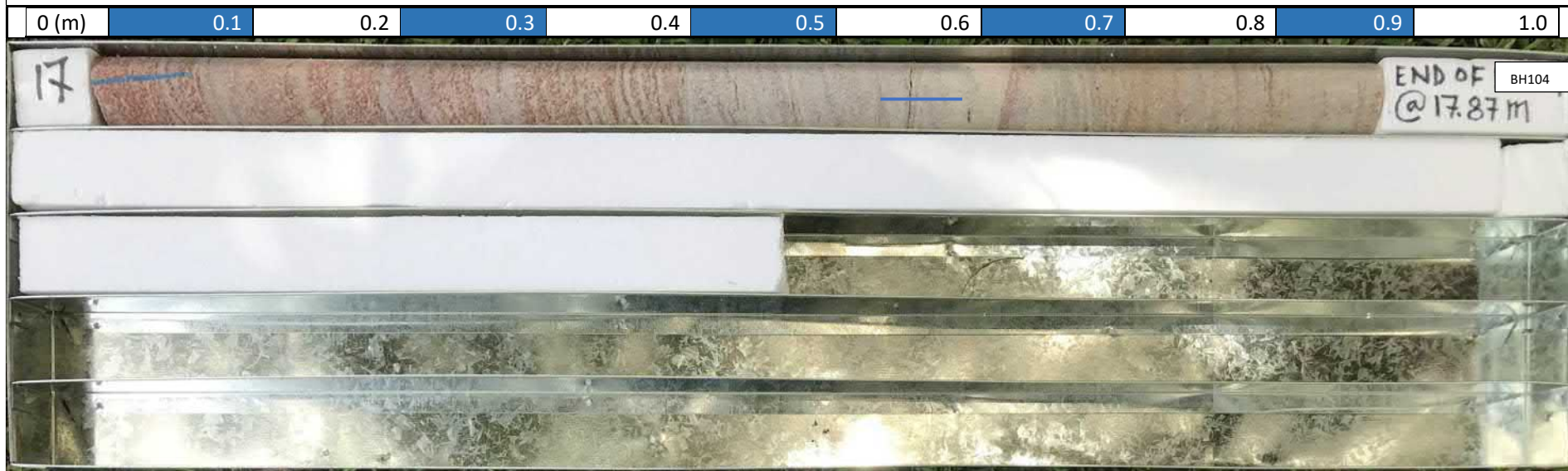
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 12.0 m – 17.0 m
 Core Photo : No. 3




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	12.0 m – 17.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

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Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 17.0 m – 17.87 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH104
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	17.0 m – 17.87 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	28.11.2020

HOLE NO : BH 105

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED : 26/11/2020 DATE COMPLETED : 26/11/2020

DATE LOGGED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

[illegible]

See Explanatory Notes for details of abbreviations & basis of descriptions.



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SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020

DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES										
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)					NATURAL FRACTURE (mm)		RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other		
DRILLING & CASING	WATER							VL	L	M	H	VH	EH	20			40	100
			22.0	1.0		1.16m START CORING AT 1.16m												
↑ NMLC		Not Encountered	Is(50) a=0.34 MPa			SANDSTONE, fine to medium grained, orange, pale grey and red, with occasional clay bands	HW											
								MW										

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES								
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other				
DRILLING & CASING	WATER														
NMLC															
Not Encountered															
1 Is(50) a=0.82 MPa			14.0	9.0	SANDSTONE, fine to medium grained, orange, pale grey and red, with occasional clay bands (<i>continued</i>)	SW			98	8.22: Jt, 10°, Pl, Ro, Co, clayey sand					
										8.75: Ewz, 0-5°, 20mm, clayey sand					
										9.20: Ewz, 0-5°, 10mm, clayey sand					
1 Is(50) a=2.24 MPa			13.0	0.0											
1 Is(50) a=0.12 MPa			12.0	1.0											10.56: Ewz, 0-5°, 20mm, sandy clay
															10.85: Be, 0-5°, Pl, Ro, Is
															11.04: Be, 5°, Pl, Sm, Is
1 Is(50) a=0.16 MPa			11.0	2.0											11.98: Be, 0-10°, Pl, Ro, Ve
															12.25: Be, 0-5°, Pl, Sm, Is
1 Is(50) a=0.89 MPa			10.0	3.0											13.00: Be, 5°, Pl, Sm, Is
1 Is(50) a=0.91 MPa			9.0	4.0											14.08: Ewz, 5°, 5 mm
1 Is(50) a=1.06 MPa			8.0	5.0											
1 Is(50) a=1.14 MPa															

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 105

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328846.9, N: 6243141.2 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 23.00 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral VL -0.1 L -0.3 M -1 H -3 VH -10 EH	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><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See Explanatory Notes for details of abbreviations & basis of descriptions.




ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 1.16 m – 5.0 m
Core Photo : No. 1

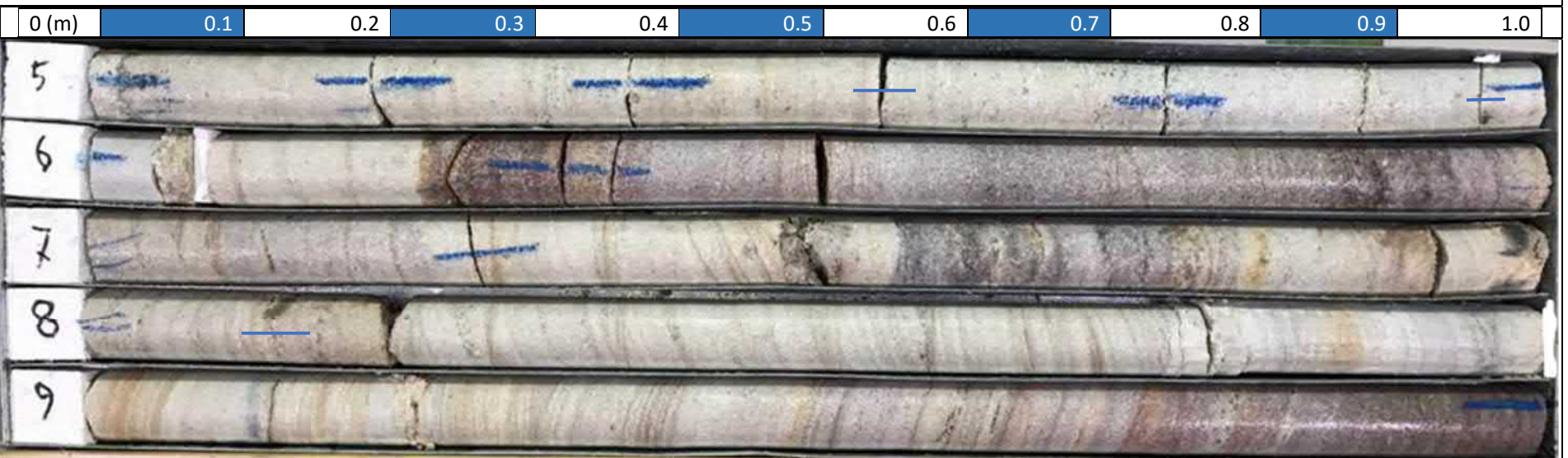
0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.16 m – 5.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

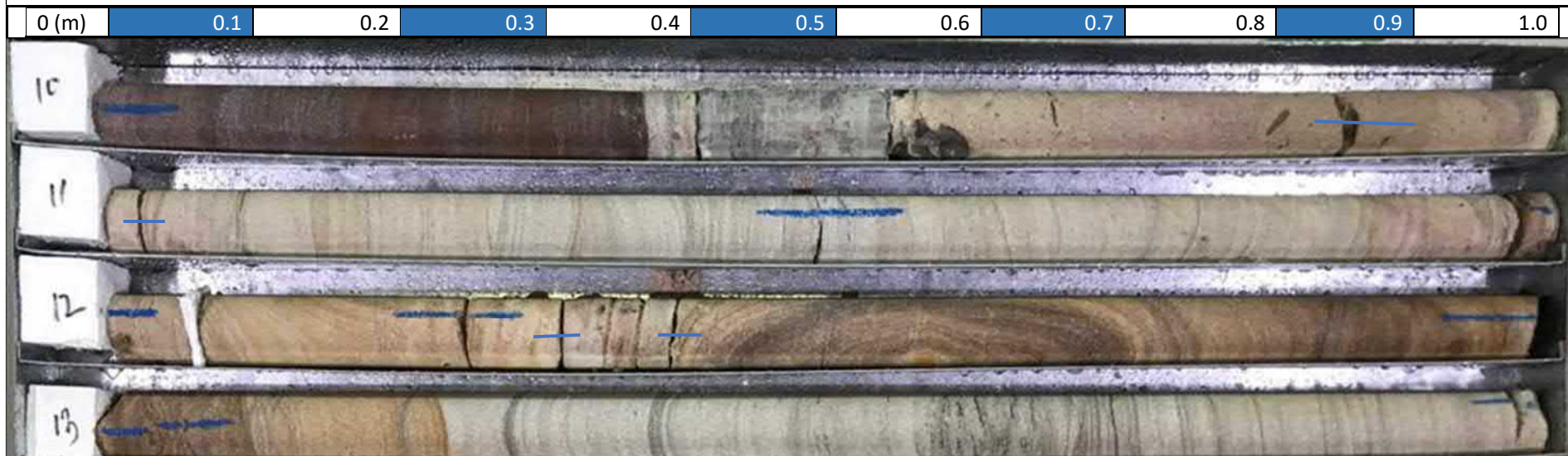
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 5.0 m – 10.0 m
 Core Photo : No. 2




 ADE CONSULTING GROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	5.0 m – 10.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

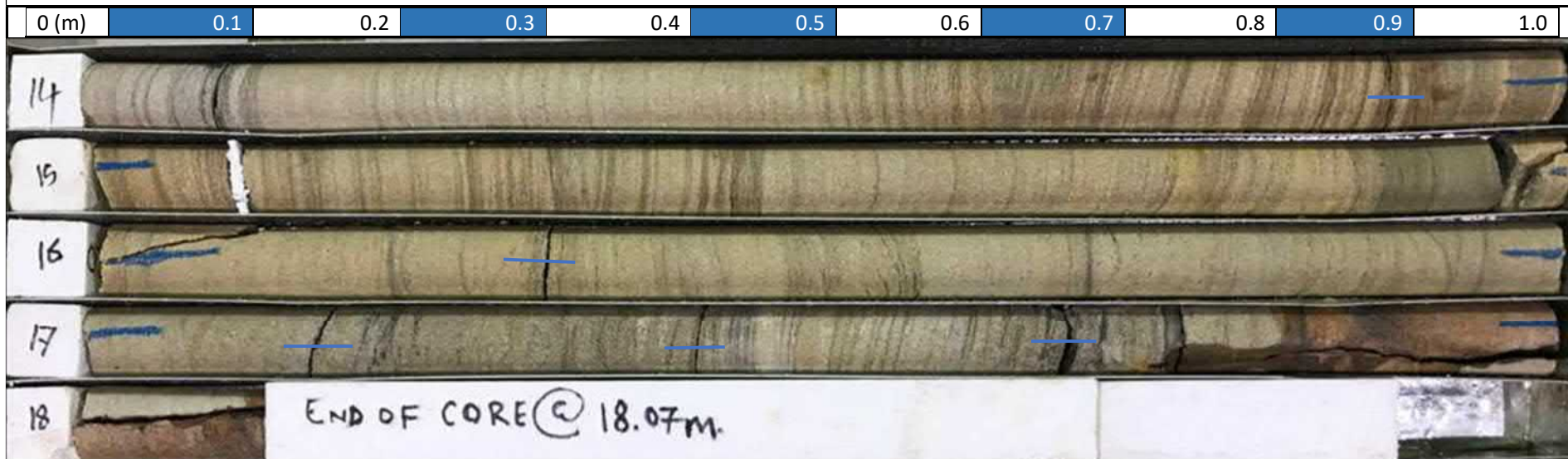
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 10.0 m – 14.0 m
 Core Photo : No. 3




 ADECONSULTINGGROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	10.0 m – 14.0 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 14.0 m – 18.07 m
Core Photo : No. 4



 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 105
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	14.0 m – 18.07 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	26.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL


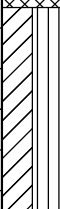
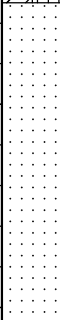
DRILLER : CN

DATE STARTED : 27/11/2020 DATE COMPLETED : 27/11/2020

DATE LOGGED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING						MATERIAL										
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
DRILLING & CASING	WATER											5	10	15	20	
<div>ADIT</div>		Not Encountered		20.0			FILL: Silty SAND , fine to medium grained, dark brown, trave of sandstone gravel and tree rootlets	M							FILL	
			1.00m SPT 1,2,2 N=4	19.0		CI-CH	Sandy CLAY , medium to high plasticity, grey and brown, fine to medium grained sand	w PL	F						RESIDUAL SOIL	
			1.45m				SANDSTONE , fine to medium grained, pale grey and red-orange, extremely weathered, very low estimated strength								BEDROCK	
			2.50m SPT 3,6,16 N=22	18.0		2.00m: becoming grey	H									
			2.95m	3.0			3.08m	Continued as Cored Drill Hole								
				17.0												
				4.0												
				16.0												
				5.0												
				15.0												
				6.0												
				14.0												
				7.0												
				13.0												

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL 0.1 L 0.3 M 1 H 3 VH 10 EH				
			20.0									
			1.0									
			19.0									
			2.0									
			18.0									
			3.0			3.08m START CORING AT 3.08m						
<div></div>												
NMLC		Not Encountered	17.0			SANDSTONE, fine to medium grained, pale grey, orange and brown, with grey and brown laminations, indistinctly cross-bedded at 0-10°, iron indurated	HW					3.16: Ewz, 0-5°, 20mm
			1	Is(50) d=0.3 a=0.17 MPa		4.0						3.40: EWz, 0-5°, 5mm
			1	Is(50) d=0.04 a=0.1 MPa		16.0	4.45-4.52m: becoming red				90	3.75: Be, 0-40°, Ir, Ro, Co, clayey sand
						5.0						4.14: Ewz, 0-5°, 30mm, clayey sand
						15.0		MW				4.26: Be, 0-5°, Ir, Ro, Co, sandy clay
						6.0						4.75: Ewz, 0-5°, 100mm
						5.07: Ewz, 0-5°, 20mm						
			1	Is(50) d=0.75 a=1.14 MPa		6.0						5.48: Cs, 0°, 5 mm
			1	Is(50) d=1.9 a=1.87 MPa		14.0	6.30-7.40m: with coarse grained sandstone bands				98	5.62: Be, 0-10°, Pl, Ro, Co, sandy clay
						7.0						
			13.0									7.34: Ewz, 0-5°, 40mm, sandy clay
		1	Is(50) d=0.56 a=0.77 MPa									

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral VL 0.1 L 0.3 M 1 H 3 VH 10 EH	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other	
DRILLING & CASING	WATER											
NMLC				Not Encountered				MW				
				1	MPa Is(50) d=0.56 a=0.63 MPa	12.0					98	
				1	Is(50) d=0.84 a=1.91 MPa						100	9.60: Be , 0°, Pl, Sm, Is
				1	Is(50) d=1.31 a=1.18 MPa		10.00-12.25m: becoming pale orange and brown					
				1	Is(50) d=0.36 a=0.41 MPa		11.10-11.15m: Shale lens					11.11: shale lens, 40mm
				1	Is(50) d=0.36 a=0.41 MPa							11.82: Be, 0-5°, Ir, Ro, Ve
				1	Is(50) d=1.03 a=0.97 MPa		12.25m	SW				
				1	Is(50) d=1.54 a=1.32 MPa		SANDSTONE, fine to medium grained, grey with dark grey laminations, cross-bedded at 0-10°	FR			100	
				1	Is(50) d=0.86 a=2.31 MPa							14.68: Be, 0-5°, Pl, Ro, Ve
				1	Is(50) d=0.86 a=2.31 MPa		14.90-15.90m: iron induration, becoming orange and brown				100	
				1	Is(50) d=0.86 a=2.31 MPa							15.85: Be, 0-5°, Ir, Ro, Is

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 106

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328833.1, N: 6243198.6 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 20.25 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 27/11/2020 DATE COMPLETED : 27/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● - Axial ○ - Diametral	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
NMLC ↓	Not Encountered	1 Is(50) d=1.36 a=1.59 MPa	4.0		SANDSTONE, fine to medium grained, grey with dark grey laminations, cross-bedded at 0-10° (continued)	SW • FR			100	16.72: shale lens, 30mm	
		1 Is(50) d=1.74 a=2.15 MPa	7.0								16.72-16.76m: carbonaceous speckles
			3.0		17.37m					17.37: E.C.R	
						Hole Terminated at 17.37 m Target depth					
			8.0								
			2.0								
			19.0								
			1.0								
			20.0								
			0.0								
			21.0								
			-1.0								
			22.0								
			-2.0								
			23.0								
			-3.0								

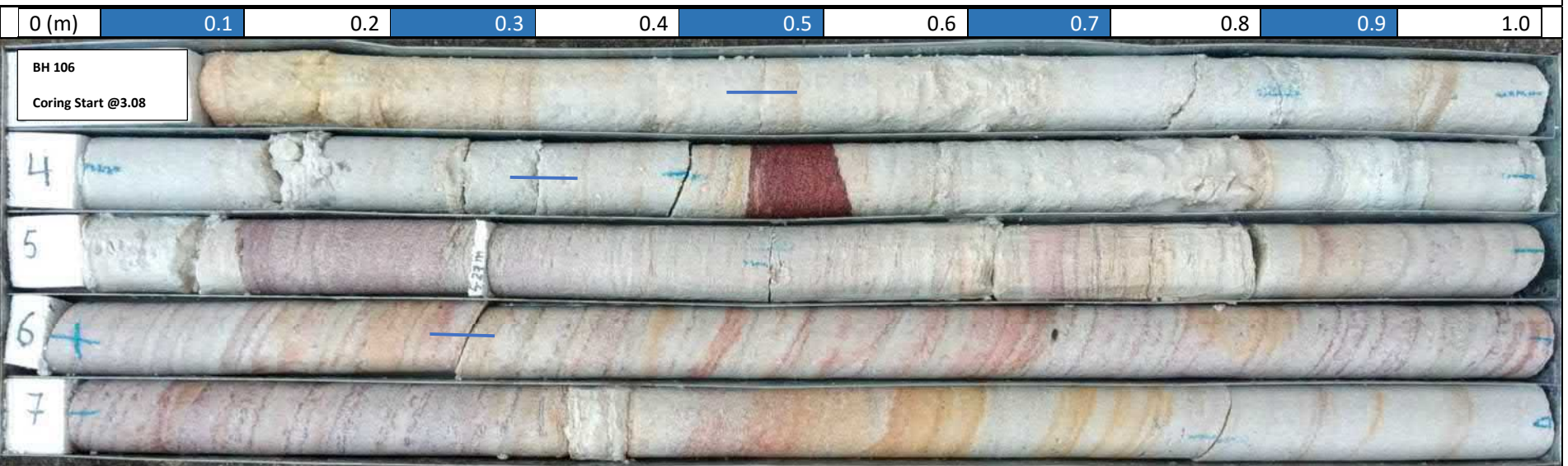
See Explanatory Notes for details of abbreviations & basis of descriptions.




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SOLUTIONS THROUGH INNOVATION

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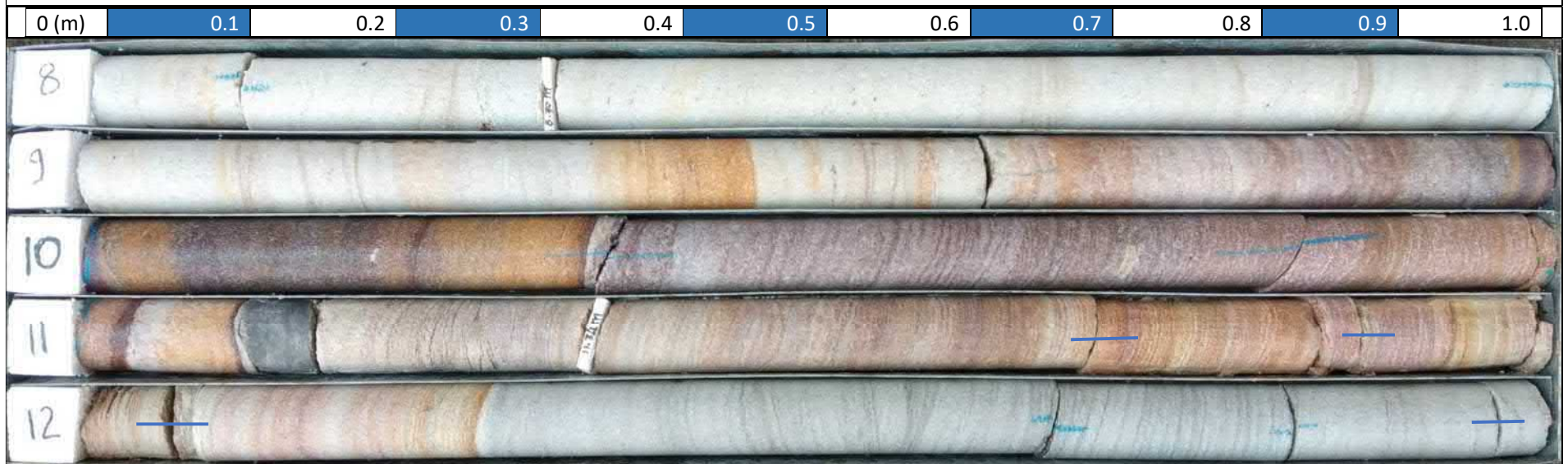
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 3.08 m – 8.00m
Core Photo : No. 1




 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	3.08 m – 8.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

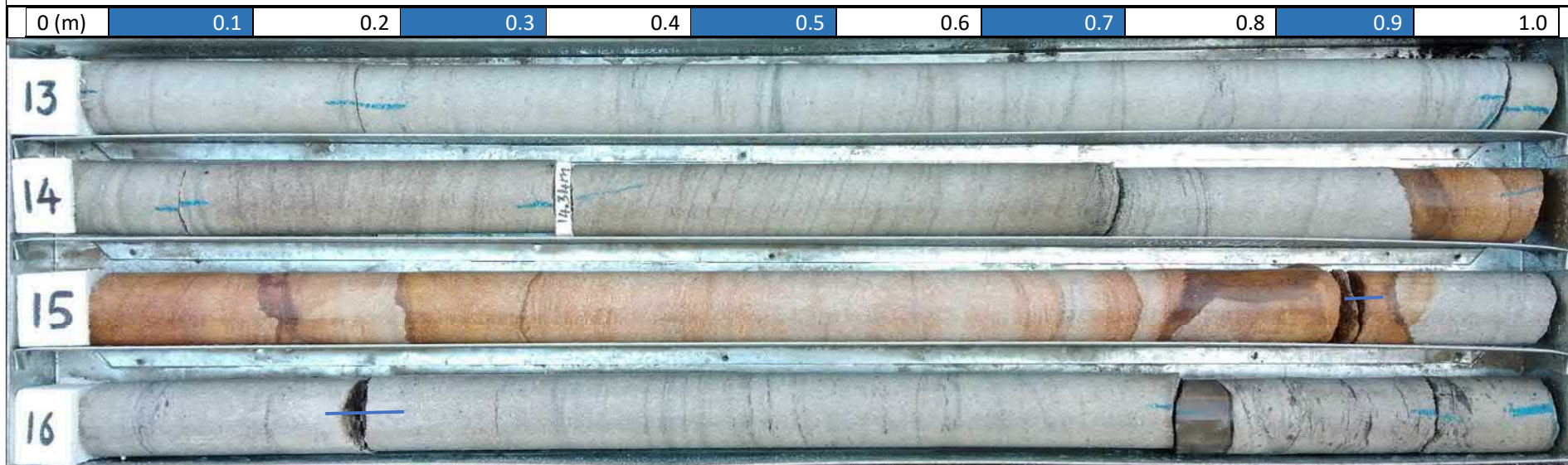
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 8.00 m – 13.00m
Core Photo : No. 2




 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	8.00 m – 13.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 13.00 m – 17.00m
Core Photo : No. 3




 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	13.00 m – 17.00m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 17.00 m – 17.37m
Core Photo : No. 4

0 (m)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
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 ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION	Client:	Billbergia Pty Ltd	Borehole No:	BH 106
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	17.00 m – 17.37 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107

FILE / JOB NO : STC-2148-18709

SHEET : 1 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

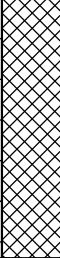
EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED : 26/11/2020 DATE COMPLETED : 26/11/2020 DATE LOGGED : 26/11/2020 LOGGED BY : DK CHECKED BY : JP

DRILLING						MATERIAL											
PROGRESS		GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE	CONDITION	CONSISTENCY	RELATIVE DENSITY	PENETROMETER TEST				STRUCTURE & Other Observations
DRILLING & CASING	WATER												5	10	15	20	
AD/T		Not Encountered	1.00m SPT 7,8,15/40mm N=R	21.0	1.0			FILL: Silty SAND, fine to medium grained, dark brown and orange, with sandstone gravel	M		H					FILL	
				20.0													Continued as Cored Drill Hole
				2.0													
				19.0													
				3.0													
				18.0													
				4.0													
				17.0													
				5.0													
				16.0													
				6.0													
				15.0													
				7.0													
				14.0													

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107

FILE / JOB NO : STC-2148-18709

SHEET : 2 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING			MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral L -0.1 M -0.3 H -1 VH -3 EH -10	NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER										
NMLC				21.0							
				1.0							
						1.28m START CORING AT 1.28m					
		1	Is(50) a=0.22 MPa	20.0		SANDSTONE, fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated	MW				1.52: Be, 20°, Pl, Ro, Is, clay
				2.0						96	2.07: Cs, 0-5°, 20mm, clayey sand 2.18: Cs, 0-5°, 30mm, clayey sand
		1	Is(50) a=0.25 MPa	19.0							2.47: Cs, 0-5°, 5mm 2.60: Cs, 10°, 5mm
				3.0			SW				3.01: Ewz, 0-5°, 10mm, clayey sand
				18.0							
		1	Is(50) a=0.2 MPa		4.0						
				17.0						98	4.59: Cs, 0-5°, 30mm, sandy clay
			5.0								
	1	Is(50) a=0.26 MPa	16.0								5.49: : 2x Be, 20°, Pl, Ro, Co, spaced at 20 mm 5.70: Be, 10°, Pl, Ro, Co 5.85: Be, 0-5°, Pl, Ro, Co, 2mm
			6.0								6.09: Ewz, 0-5°, 40mm 6.19: Cs, 4mm
			15.0								
	1	Is(50) a=0.49 MPa		7.0						96	6.75: Cs, 0-5°,10mm 6.95: Be, 0-5°, Pl, Ro, Co, Is
			14.0								7.68: be, 5°, Pl, Ro, ve

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107

FILE / JOB NO : STC-2148-18709

SHEET : 3 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56)

SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING				MATERIAL				FRACTURES				
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50)		NATURAL FRACTURE (mm)	RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	DL			
						SANDSTONE, fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated (continued)	SW			96	8.18: : Be, 0-5°, Pl, Ro, Is	
		1	Is(50) a=0.43 MPa	13.0							8.38: Ewz, 10mm	
				9.0							8.88: Jt, 20°, Pl, Ro, Co, Is	
				12.0							9.18: Be, 0-30°, Pl, Ro, Is	
											9.34: Be, 0°, Pl, Ro, Is	
		1	Is(50) a=3.31 MPa								9.82: Be, 0-5°, Pl, Ro, Is	
				0.0							9.94: Cs, 0-5°, 20mm, with calyey sand	
		1	Is(50) a=0.1 MPa	11.0							10.14: Ewz, 0-20°,30mm, sandy clay	
											10.20: Be, 0-5°, Pl, Ro, Is	
				1.0							10.60: Ewz, 0-5°, 20mm	
				10.0		10.72: Ewz, 5°, 5mm						
				2.0						95		
		1	Is(50) a=0.4 MPa									
				9.0								
		1	Is(50) a=0.82 MPa	3.0								
				8.0							100	13.29: Cs, 0°, 5 mm
		1	Is(50) a=1.07 MPa									
				4.0								
				7.0								
		1	Is(50) a=1.12 MPa									
				5.0								
				6.0							100	15.06: Be, 0-5°, Pl, Ro, Ve
		1										

See Explanatory Notes for details of abbreviations & basis of descriptions.



ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

CORED DRILL HOLE - GEOLOGICAL LOG

HOLE NO : BH 107

FILE / JOB NO : STC-2148-18709

SHEET : 4 OF 4

CLIENT : Billbergia Pty Ltd
LOCATION : 31 Eden St. Arncliffe

PROJECT : Arncliffe Site - Geotechnical Investigation

POSITION : E: 328866.3, N: 6243164.1 (MGA94 Zone 56) SURFACE ELEVATION (RL) : 21.35 (m AHD) ANGLE FROM HORIZONTAL : 90°

EXCAVATION METHOD : HANJIN D&B-8D

MOUNTING : Track

CONTRACTOR : ROCKWELL

DRILLER : CN

DATE STARTED: 26/11/2020 DATE COMPLETED : 26/11/2020

LOGGED BY : DK

CHECKED BY : JP

DRILLING					MATERIAL					FRACTURES						
PROGRESS		SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	DESCRIPTION ROCK TYPE : Colour, Grain size, Structure (texture, fabric, mineral composition, hardness alteration, cementation, etc as applicable)	Weathering	ESTIMATED STRENGTH Is(50) ● Axial ○ Diametral					NATURAL FRACTURE (mm)		RQD (%)	ADDITIONAL DATA (joints, partings, seams, zones, etc) Description, orientation, infilling or coating, shape, roughness, thickness, other
DRILLING & CASING	WATER							VL	L	M	H	EH	20	40		
NMLC	Not Encountered	1 Is(50) a=1.61 MPa	5.0			SANDSTONE, fine to medium grained, orange, red and grey, indistinctly cross-bedded at 0-10°, iron indurated (continued)	SW FR							100		
		1 Is(50) a=1.48 MPa	7.0													
			4.0			17.82m									17.82: E.C.R	
			8.0			Hole Terminated at 17.82 m Target depth										
			3.0													
			19.0													
			2.0													
			20.0													
			1.0													
			21.0													
			0.0													
			22.0													
			-1.0													
			23.0													
			-2.0													

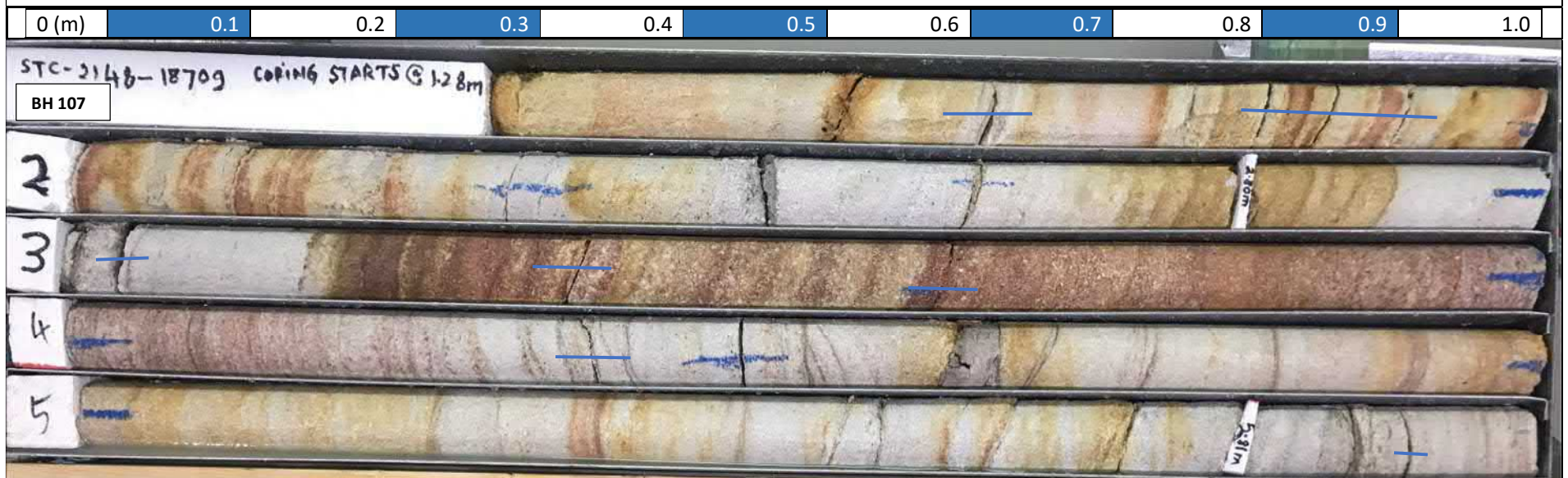
See Explanatory Notes for details of abbreviations & basis of descriptions.




ADE CONSULTING GROUP
SOLUTIONS THROUGH INNOVATION

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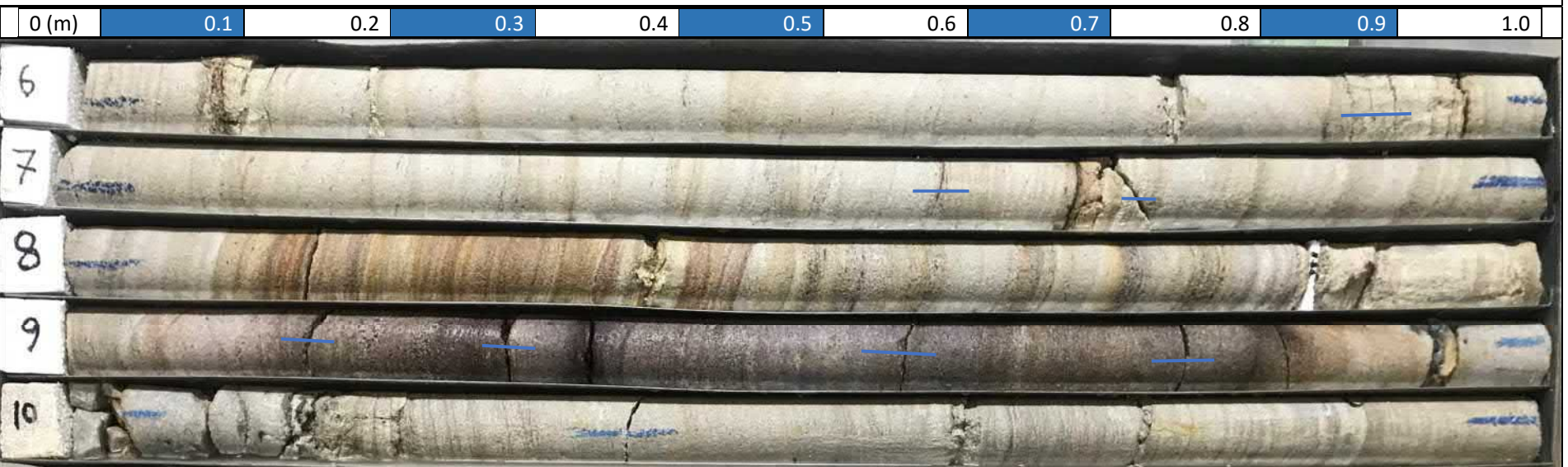
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 1.28 m – 6.00m
 Core Photo : No. 1




	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	1.28 m – 6.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

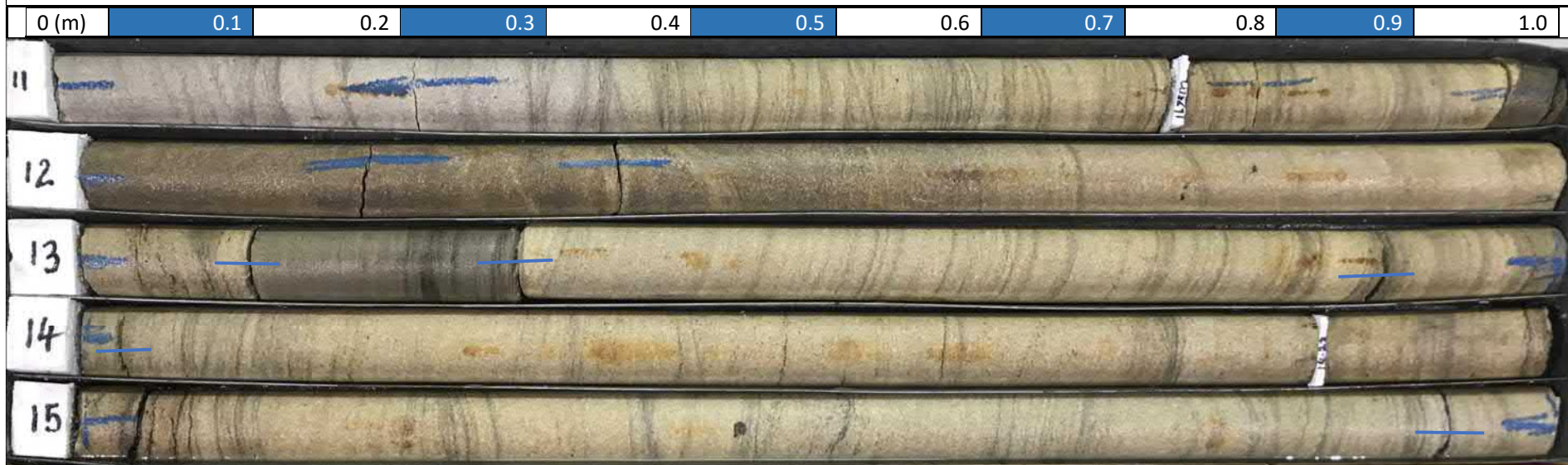
Project : Billbergia Pty Ltd
 Job No. : STC-2148-18709
 Borehole : Arncliffe Site - Geotechnical Investigation
 Depth : 6.00 m – 11.00m
 Core Photo : No. 2




 ADE CONSULTING GROUP <small>SOLUTIONS THROUGH INNOVATION</small>	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	6.00 m – 11.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

ADE Consulting Group

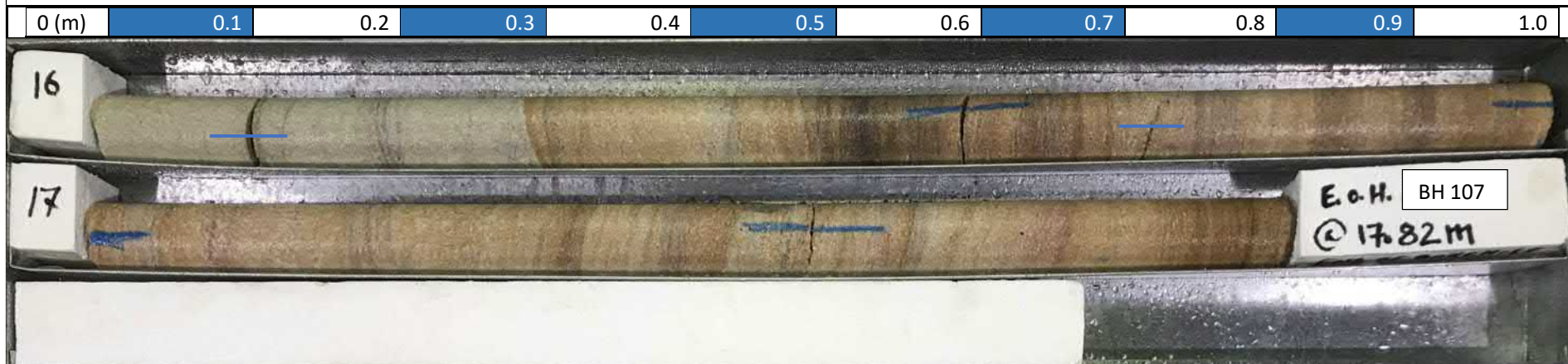
Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 11.00 m – 16.00m
Core Photo : No. 3




	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	11.00 m – 16.00 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020

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Project : Billbergia Pty Ltd
Job No. : STC-2148-18709
Borehole : Arncliffe Site - Geotechnical Investigation
Depth : 16.00 m – 17.82 m
Core Photo : No. 4



	Client:	Billbergia Pty Ltd	Borehole No:	BH 107
	Project:	Arncliffe Site - Geotechnical Investigation	Depth:	16.00 m – 17.82 m
	Title:	Core Photographs	Photograph By:	DK
	Location:	31 Eden St. Arncliffe, NSW	Date:	27.11.2020