WOOD & GRIEVE ENGINEERS

MEMO

TO: THE DATA EXCHANGE NETWORK LIMITED

FROM: Jonathan Durnell

PROJECT: Geotechnical Investigation - 5 Parkview Drive, Sydney Olympic Park

PROJECT NUMBER: 40727 DATE:29 November 2018

SUBJECT: Preliminary Geotechnical Summary

This memorandum is intended to provide a preliminary summary of the ground conditions encountered at 5 Parkview Drive, Sydney Olympic Park prior to the release of the Geotechnical Investigation Report. It is understood that the site will be redeveloped as a Data Centre. As such, ancillary plant (cooling tower units and backup power generators) are proposed to be situated around the exterior of the existing structure.

A ground investigation comprising of three (3) boreholes were progressed to depths of up to 8 m below ground level, to inform the foundation design and bearing capacity. The borehole investigation was carried out on 14/11/18 to 16/11/18.

The ground conditions encountered were observed to be broadly consistent with the published geological conditions of Wianamatta Group, Ashfield Shale indicated on the Department of Mineral Resources, Sydney 9130 Geological Sheet.

No estuarine deposits were encountered and as such, Acid Sulphate Soils are not considered to affect the site.

Based on the published information and the ground conditions encountered in the exploratory boreholes progressed, the site is considered to be suitable for the proposed ancillary plant to be supported on pad foundations or piles. Table 1 provides a summary of the expected ground conditions:

Table 1 - Preliminary Site Specific Ground Model

Unit	Geology	Depth to top of strata (mbgl)	Thickness (m)
1	Fill	0.00	0.20 -0.70
2	Residual Soil	0.20 -0.70	0.90 – 1.60
3	Weathered Shale Class V	0.70 – 2.00	0.50 – 1.30
4	Shale Class IV or better	2.0 - 2.5	Not proven

Please do not hesitate to contact us if you have any queries regarding the above.

Yours Sincerely

To us, it's more than just work

Sydney@wge.com.au www.wge.com.au
Wood & Grieve Engineers Limited ACN 137 999 609 trading as Wood & Grieve Engineers ABN 97 137 999 609
Albany • Brisbane • Busselton • Melbourne • Perth • Sydney

WOOD & GRIEVE ENGINEERS

MEMO

Jonathan Durnell CEng MICE CGeol FGS RoGEP
Geotechnical Project Engineer
Wood & Grieve Engineers
D: (02) 8484 7114 | T: (02) 8484 7000 | M: 0414 127 445
E: Jonathan.Durnell@wge.com.au

Enc - Draft Borehole Logs

Limitations

This report has been prepared for The Data Exchange Network Limited (the client) in accordance with our proposal and brief, and it is not intended for parties other than the Client. No responsibility or liability to any third party will be accepted. Data or opinions contained within the report may not be used in other contexts or for any other purposes without Wood & Grieve Engineers prior review and written agreement.

The opinions and recommendations in this report are based on observations and data collected at specific locations, only a finite amount of information has been collected to meet specific financial and technical requirements of our proposal and brief. This report does not purport to completely describe all the site characteristics and properties. Interpretation has been based on observations made during the site walkover. This report applies only to the site investigated.

Subsurface conditions are inherently variable and can change significantly over short distances. The conditions have been and continue to be created and changed by natural processes and anthropogenic activity. For example, fill can be placed over time, ground water levels can change, floods can deposit material and materials can move down slope. Because a report is based on conditions that existed at a time of investigation, decisions should not be made using the advice of a report that may have been affected by the passage of time.

Professional scientific and engineering judgement has been exercised by Wood & Grieve Engineers' qualified staff based on the information available for review to provide an opinion on the overall site conditions. Actual conditions may vary from those inferred in this report. No professional, no matter how qualified, can reveal the exact ground conditions or foresee their behaviour. Ground conditions have been created by complex natural and anthropogenic processes, and may continue to change. For instance, boundaries between strata may be gradational, or contacts be more abrupt, unknown faults or palaeochannels may be present but obscured and groundwater levels can fluctuate over time.

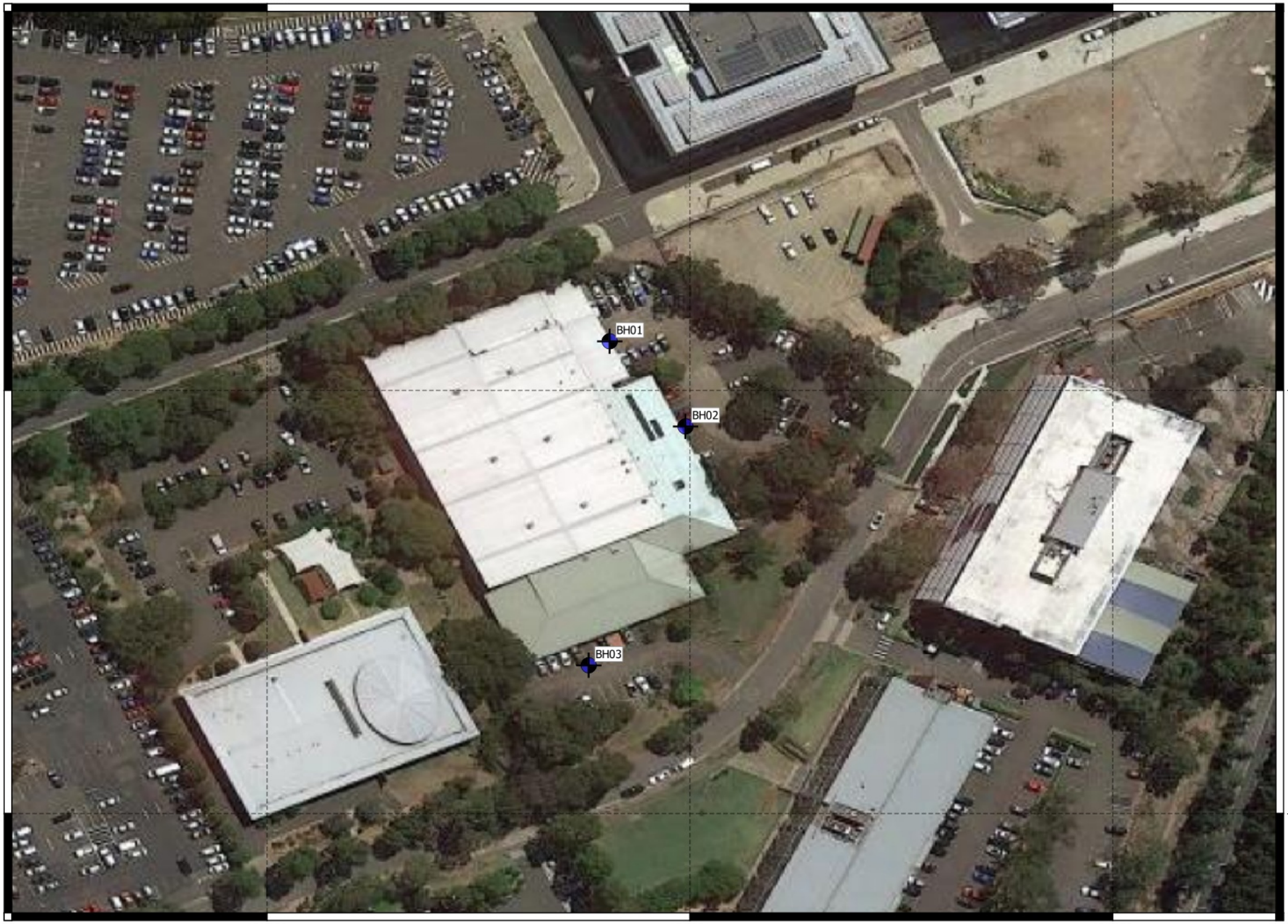
It is strongly recommended that any plans and specifications prepared by others and relating to the content of this report, or amendments to the original plans or specifications, are reviewed by Wood & Grieve Engineers to verify that the intent of our recommendations is properly reflected in the design. During construction or maintenance works Wood & Grieve Engineers request the opportunity to review our interpretations if the exposed site conditions are significantly different from those inferred in this report.

Sydney@wge.com.au **www.wge.com.au**
Wood & Grieve Engineers Limited ACN 137 999 609 trading as Wood & Grieve Engineers ABN 97 137 999 609
Albany • Brisbane • Busselton • Melbourne • Perth • Sydney

151.073 151.074 151.075

-33.845

-33.846



N

Legend

Borehole

151.073 151.074 151.075

MACQUARIE GEOTECH
3 Watt Drive, Bathurst NSW 2795
P: 02 6332 2011 F: 02 6334 4213 E: macgeo@macgeo.com.au

Client: Wood & Grieve Engineers

Project: Sydney Olympic Park

Location: 5 Parkview Drive, NSW

Drawn: D.ODonnell | Checked: J.Boyle | 21-11-2018

0 10 20 30 40 50 60

Metres - Scale 1:500

Vertical to Horizontal Scale 1 : 1
Co-ordinate Reference System - EPSG: 4326 WGS: 84

JOB NO B18558

Macquarie Geotechnical Ltd
Geotechnical Investigation Locality Map

Drawing Number: B18558-rev0

MACQUARIE GEOTECH

Borehole No.
BH01
Page 1 of 1

Engineering Log - Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	14/11/2018
Project Name:	5 Parkview Drive	Completed:	14/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	D. O'Donnell
Hole Position:	56H 321793.0 m E 6253419.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	115 mm	Bearing:		Datum:		Operator:	T. T

Drilling Information										Soil Description			Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency Relative Density	Pocket Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T			Not Observed	D 0.40-0.70 m ES 0.50 m ES 1.00 m SPT 1.00-1.10 m 30/100mm N=R D 1.50-2.00 m D 2.00-2.50 m SPT 2.50-2.58 m 30/80mm N=R D 3.00-3.50 m D 3.50-4.00 m SPT 4.00-4.05 m 30/50mm N=R D 4.50-5.50 m SPT 5.50-5.73 m 24,30/80mm N=R D 6.00-7.00 m SPT 7.00-7.25 m 24,30/100mm N=R D 7.50-8.00 m			1 2 3 4 5 6 7		CONCRETE: grey, matrix supported, clasts up to 50mm GRAVELLY CLAY: medium plasticity, brown, fine and coarse, sub-angular to angular concrete and mudstone gravel, trace fine to coarse grained sand GC CLAYEY GRAVEL: fine to coarse gravel, sub-angular to angular, brown, grey, low plasticity clay CL CLAY: low plasticity, brown, with fine to coarse, sub-angular to angular gravel From 3.5 to 4.0m: Brown, pale brown. Locally recovered as gravelly clay From 5.0 to 6.0m: Dark grey, trace fine to coarse sand CI Extremely/Highly weathered MUDSTONE recovered as CLAY, low plasticity, brown, with fine to coarse, fine to coarse sub-angular to angular gravel From 7.0 to 7.5m: Trace fine, sub-angular to angular gravel Hole Terminated at 8.00m Target depth	M (<PL) D M (<PL)	St VD H		FILL EXTREMELY WEATHERED MATERIAL HEAVILY WEATHERED MATERIAL EXTREMELY WEATHERED MATERIAL HEAVILY WEATHERED MATERIAL

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Plastic Limit
< PL
= PL
< PL

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

MACQUARIE GEOTECH

Borehole No.
BH02
Page 1 of 2

Engineering Log - Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	15/11/2018
Project Name:	5 Parkview Drive	Completed:	15/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	H. Tran
Hole Position:	56H 321815.0 m E 6253354.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	115mm	Bearing:		Datum:		Operator:	T. T

Drilling Information									Soil Description			Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency Relative Density / Pocket Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T			Not Observed	D 0.15-0.30 m D 0.30-0.60 m ES 0.70 m SPT 1.00-1.45 m 7,10,15 N=25 D 1.50-2.00 m D 2.00-2.50 m ES 2.00 m			0 1 2 3 4 5 6 7			ASPHALT: grey, agg up to 50mm	D	D	ROAD SURFACE
										CLAYEY GRAVEL: medium and coarse gravel, sub-angular to angular, grey-brown, medium plasticity clay			FILL
									CI	SILTY CLAY: medium plasticity, orange-brown, with fine to coarse grained sand, with fine to coarse, sub-angular to angular gravel			RESIDUAL SOIL
										SILTY CLAY: medium plasticity, orange-brown, with fine to coarse, sub-angular to angular gravel		VSt	
											M (<PL)		
									CI	GRAVELLY CLAY: medium plasticity, orange-brown, fine to coarse, sub-angular to angular gravel, trace fine to coarse grained sand			EXTREMELY WEATHERED MATERIAL
										From 2.0 to 2.5m: Locally a clayey gravel		H	
										Continued on cored borehole sheet			

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

MACQUARIE GEOTECH

Cored Borehole No.
BH02
Page 2 of 2

Engineering Log - Cored Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	15/11/2018
Project Name:	5 Parkview Drive	Completed:	15/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	H. Tran
Hole Position:	56H 321815.0 m E 6253354.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Barrel Type and Length:	3 m	Bearing:		Datum:		Operator:	T. T

Drilling Information | ***Rock Substance*** | ***Rock Mass Defects***

Method	Support	Water	TCR (%)	SCR (%)	RQD (%)	RL (m)	Depth (m)	Graphic Log	Material Description rock type: grain characteristics, colour, structure, minor components	Weathering	Strength Is(50) ● - Axial ○ - Diametral EL VL L M H VH EH	Defect Spacing (mm) 30 100 300 1000 3000	Defect Description thickness, type, inclination, planarity, roughness, coating/infilling Particular	General
							1							
							2		Continued from non-cored borehole sheet					
NMLC	C	Not Observed	72		0		3		No Core					
									MUDSTONE: fine grained, crystalline, massive, dark grey, yellow-brown, laminated	HW			FZ, Clay VNR	
							4						JT, 0°, Clay VNR, UN, S JT, 0°, Clay VNR, UN, S JT, 0°, Clay VNR, UN, S JT, 15°, Clay VNR, UN, S FZ, Clay VNR JT, 0 - 5°, CN, PR, S JT, 0°, CN, UN, S JT, 90°, Fe SN, UN, RF JT, 10°, Clay VNR, UN, RF JT, 0°, CN, PR, RF JT, 5°, Silt VNR, UN, S JT, 0 - 5°, Silt VNR, UN, S JT, 80°, Fe SN, ST, S JT, 5°, Silt VNR, UN, S JT, 5°, Fe SN, UN, S JT, 15°, Clay VNR, UN, S FZ, Clay VNR FZ, Clay VNR	
									4.50-5.50m: With siltstone laminations.					
			100		19		5			MW				
							6		6.00-7.00m: Grey and dark grey.				JT, 0°, CN, PR, S	
										SW			JT, 0°, CN, PR, S JT, 0 - 5°, CN, PR, S	
							7		Hole Terminated at 7.00 m Target depth					

Method
AS - Auger Screwing
WB - Washbore
HQ3 - HQ3 Core Barrel
NQ3 - NQ3 Core Barrel

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Weathering
FR - Fresh
SW - Slightly Weathered
MW - Moderately Weathered
HW - Highly Weathered
XW - Extremely Weathered
RS - Residual Soil

Strength
(indirect tensile strength)
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

MACQUARIE GEOTECH

Borehole No.
BH03
Page 1 of 2

Engineering Log - Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	16/11/2018
Project Name:	5 Parkview Drive	Completed:	16/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	A. Drösemeyer
Hole Position:	56H 321789.0 m E 6253562.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	115 mm	Bearing:		Datum:		Operator:	T. T

Drilling Information									Soil Description			Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description Fraction, Colour, Structure, Bedding, Plasticity, Sensitivity, Additional	Moisture Condition	Consistency Relative Density / Pocket Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T			Not Observed	D 0.10-0.20 m ES 0.30 m D 0.50-1.00 m ES 0.80 m SPT 1.00-1.45 m 4,10,16 N=26 D 1.50-2.00 m D 2.00-2.50 m			0 1 2			ASPHALT: grey, agg up to 40mm			ROAD SURFACE
										CLAYEY GRAVEL: fine to coarse gravel, sub-angular to angular, dark grey, low plasticity clay, with fine to coarse grained sand	D	VD	FILL
									Cl	SILTY CLAY: medium plasticity, orange-brown, with fine to coarse, sub-angular gravel			RESIDUAL SOIL
										From 1.50 to 2.00m: With fine, sub-angular to angular gravel.	M (<PL)	VSt	
									Cl	GRAVELLY CLAY: medium plasticity, pale grey, fine to coarse, sub-angular gravel		H	EXTREMELY WEATHERED MATERIAL
							3 4 5 6 7			Continued on cored borehole sheet			

Method
AS - Auger Screwing
RR - Rock Roller
WB - Washbore

Penetration
No resistance ranging to refusal

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very Soft
S - Soft
F - Firm
VSt - Very Stiff
H - Hard
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Classification Symbols and Soil Descriptions
Based on Unified Soil Classification System

Plastic Limit
< PL
= PL
< PL

MACQUARIE GEOTECH

Cored Borehole No.
BH03
Page 2 of 3

Engineering Log - Cored Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	16/11/2018
Project Name:	5 Parkview Drive	Completed:	16/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	A. Drösemeyer
Hole Position:	56H 321789.0 m E 6253562.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Barrel Type and Length:	3 m	Bearing:		Datum:		Operator:	T. T

Drilling Information								***Rock Substance***				***Rock Mass Defects***	
Method	Support	Water	TCR (%)	SCR (%)	RQD (%)	RL (m)	Depth (m)	Graphic Log	Material Description rock type: grain characteristics, colour, structure, minor components	Weathering	Strength Is(50) ● - Axial ○ - Diametral (EL VL L M H VH EH)	Defect Spacing (mm) (30 100 300 1000 3000)	Defect Description thickness, type, inclination, planarity, roughness, coating/infilling — Particular	General
							1							
							2		Continued from non-cored borehole sheet					
NMLC	C	Not Observed	67		0		3		No Core					
									CLAYEY GRAVEL: fine to coarse gravel, sub-angular to angular, pale grey-brown, low to medium plasticity clay					
			100		11		4		CARBONACEOUS MUDSTONE: fine grained, crystalline, massive, brown to black, laminated	XW			SM, 0°, Clay VNR, PR, S SM, 0°, Clay VNR, PR, S JT, 0 - 5°, Clay VNR, PR, S JT, 0°, CN, PR, S FZ, Clay VNR JT, 0°, Clay VNR, PR, S JT, 0°, Fe SN, PR, S JT, 5 - 10°, Clay VNR, PR, S JT, 0 - 5°, Clay VNR, PR, S JT, 80°, Clay VNR, PR, S JT, 0 - 5°, Clay VNR, PR, S JT, 0 - 5°, CN, PR, S JT, 10°, Clay VNR, PR, S JT, 0 - 5°, Fe SN, PR, S JT, 30°, Fe SN, ST, RF SM, 10°, Clay VNR, PR, S JT, 35 - 40°, Clay VNR, ST, S JT, 0 - 5°, Clay VNR, PR, RF JT, 5 - 10°, Clay VNR, ST, RF JT, 0 - 5°, Clay VNR, UN, S JT, 0 - 5°, Clay VNR, UN, S JT, 0 - 5°, Clay VNR, UN, RF JT, 0 - 5°, Clay VNR, UN, S JT, 5 - 10°, CN, UN, S JT, 0 - 5°, CN, UN, RF JT, 0 - 5°, Clay VNR, UN, RF JT, 60°, Clay VNR, UN, RF	
							5		5.50-7.00m: Locally dark brown and yellow brown	HW to MW				
							6			MW to SW				
							7		Hole Terminated at 6.77 m Target depth					

Method
AS - Auger Screwing
WB - Washbore
HQ3 - HQ3 Core Barrel
NQ3 - NQ3 Core Barrel

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Weathering
FR - Fresh
SW - Slightly Weathered
MW - Moderately Weathered
HW - Highly Weathered
XW - Extremely Weathered
RS - Residual Soil

Strength
(indirect tensile strength)
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

MACQUARIE GEOTECH

Cored Borehole No.
BH03
Page 3 of 3

Engineering Log - Cored Borehole

Project No.: B18558

Client:	Wood & Grieve Associates	Commenced:	16/11/2018
Project Name:	5 Parkview Drive	Completed:	16/11/2018
Hole Location:	Sydney Olympic Park	Logged By:	A. Drösemeyer
Hole Position:	56H 321789.0 m E 6253562.0 m N	Checked By:	J. Boyle

Drill Model and Mounting:	E50	Inclination:	-90°	RL Surface:	No survey		
Barrel Type and Length:	3 m	Bearing:		Datum:		Operator:	T. T

Drilling Information								***Rock Substance***				***Rock Mass Defects***		
Method	Support	Water	TCR (%)	SCR (%)	RQD (%)	RL (m)	Depth (m)	Graphic Log	Material Description rock type: grain characteristics, colour, structure, minor components	Weathering	Strength Is(50) ● - Axial ○ - Diametral EL VL L M H VH EH	Defect Spacing (mm) 30 100 300 1000 3000	Defect Description thickness, type, inclination, planarity, roughness, coating/infilling Particular	General
							9						JT, 0°, Clay VNR, UN, S JT, 90°, CN, UN, S JT, 5 - 10°, Clay VNR, UN, S JT, 45°, CN, UN, S JT, 10 - 15°, Clay VNR, UN, S JT, 5 - 10°, Clay VNR, ST, S JT, 0 - 5°, Clay VNR, UN, S JT, 0°, Clay VNR, UN, S JT, 40°, Clay VNR, UN, S JT, 0°, Clay VNR, UN, S JT, 5 - 10°, Clay VNR, UN, S JT, 5 - 10°, Clay VNR, UN, S FZ, Clay VNR JT, 0 - 5°, Clay VNR, UN, S JT, 5 - 10°, Clay VNR, UN, S JT, 0 - 5°, CN, UN, S JT, 0 - 5°, Clay VNR, UN, S JT, 0°, CN, UN, S JT, 0 - 5°, Clay VNR, UN, S JT, 0 - 5°, Clay VNR, UN, S JT, 5 - 10°, Clay VNR, UN, S SM, 0 - 5°, Clay VNR, UN, S JT, 10 - 15°, Clay VNR, UN, S JT, 0 - 5°, CN, UN, S JT, 0 - 5°, CN, UN, S JT, 30 - 35°, Clay VNR, UN, S JT, 30 - 35°, Clay VNR, UN, S JT, 0°, CN, UN, S JT, 0°, CN, UN, S JT, 0 - 5°, Clay VNR, UN, S JT, 0°, CN, UN, S JT, 5 - 10°, Fe SN, UN, S JT, 0°, CN, UN, S JT, 0°, CN, UN, S JT, 60°, Clay VNR, UN, S JT, 0°, CN, UN, S JT, 0°, CN, PR, S JT, 0°, CN, PR, S	
							10							
							11							
							12							
							13							
							14							
							15							

Method
AS - Auger Screwing
WB - Washbore
HQ3 - HQ3 Core Barrel
NQ3 - NQ3 Core Barrel

Water
Level (Date)
Inflow
Partial Loss
Complete Loss

Support
C - Casing

Graphic Log/Core Loss
Core recovered (hatching indicates material)
Core loss

Weathering
FR - Fresh
SW - Slightly Weathered
MW - Moderately Weathered
HW - Highly Weathered
XW - Extremely Weathered
RS - Residual Soil

Strength
(indirect tensile strength)
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High