APPENDIX K

COMPILATION OF BOREHOLE LOGS

Coffey & Partners Pty. Ltd.

engineering log – borehole

borehole no: 5
sheet 1 of 3

office and job no: Sydney 6063

project: TAYLOR THOMSON WHITTING DEPARTMENT OF PUBLIC WORKS HAYMARKET REDEVELOPMENT
borehole location: S.W. CORNER, NO. 6 MARKET

hole commenced: 11th May 1978
hole completed: 12th May 1978
supervised by: RJL
log checked by: JPM

drill model and mounting: Gemco + Truck
hole diameter: 100 mm
slope: 90 deg.
bearing: – deg.
R.L. surface: m
datum:

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency, rel. density	hand penetrometer kPa 100 200 300 400	structure and additional observations
DT / AD T								ASPHALT CONCRETE				FLOOR SLAB
							CH	GRAVELLY SANDY CLAY, high plasticity, grey-brown – FILL				
								CONCRETE				
					1		SC	GRAVELLY CLAYEY SAND, fine to medium grained, mottled orange, grey and black, gravel of ash fragments – FILL	M	MD		FILL
				3, 7, 5 N* = 12	2		CH	GRAVELLY CLAY, high plasticity, red, white mottled, gravel to 10 mm of strongly iron-cemented shale – FILL	M < PL	VSt/ H	x	400 kPa
		C	12th May 1978		3			SANDY CLAY, high plasticity, black, occasional layers of shell fragments		S		MARINE & ESTUARINE DEPOSITS
				1, 0, 2 N* = 2				CLAY, high plasticity, black, trace of sand				
					4							
				U50				CLAY, high plasticity, yellow-grey mottled				No sample
R				U50	5							No sample
				U50	6							
			WATER							St	x	250 kPa
					7							
					8							

key

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
DT die tube
* bit shown by suffix:
B – blank bit
V – "V" bit
T – TC bit
e.g. ADT

support
C casing
M mud

penetration
1 2 3
no resistance
ranging to
refusal

water
10 Oct, 73 water level on date shown
water inflow
water outflow

notes – samples and tests
U50 – undisturbed sample 50 mm diameter
D – disturbed sample
N – standard penetration test:figure = result
N* – SPT + sample
Nc – cone penetrometer

classification symbols and soil description
based on unified classification system

moisture
D – dry
M – moist
W – wet

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

Coffey & Partners Pty. Ltd.

engineering log – borehole

borehole no: 5

sheet 2 of 3

office and job no: Sydney 6063

project: TAYLOR THOMSON WHITTING
DEPARTMENT OF PUBLIC WORKS
HAYMARKET REDEVELOPMENT

borehole location: S.W. CORNER, NO. 6 MARKET

hole commenced: 11th May 1978
hole completed: 12th May 1978
supervised by: RJL
log checked by: JPM

drill model and mounting: Gemco + Truck
hole diameter: 100 mm
slope: 90 deg.
bearing: – deg.
R.L. surface: m
datum:

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency, rel. density	hand penetrometer kPa 100 200 300 400	structure and additional observations
ADT		WATER			8		CH	CLAY, as above	M <PL	St		MARINE & ESTUARINE DEPOSITS
							SC	CLAYEY SAND, fine to medium grained	W	MD		RESIDUAL SOIL E.W. SANDSTONE
					9			CONTINUED ON SHEET 3				

key

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
* bit shown by suffix:
B – blank bit
V – "V" bit
T – TC bit
e.g. ADT

support
C casing
M mud

penetration
1 2 3 no resistance ranging to refusal

water
10 Oct, 73 water level on date shown
water inflow
water outflow

notes – samples and tests
U50 – undisturbed sample 50 mm diameter
D – disturbed sample
N – standard penetration test:figure = result
N* – SPT + sample
Nc – cone penetrometer

classification symbols and soil description
based on unified classification system

moisture
D – dry
M – moist
W – wet

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

Coffey & Partners Pty. Ltd.

borehole no: 5
sheet 3 of 3

engineering log — cored borehole

office and job no: Sydney 6063

project: TAYLOR THOMSON WHITTING
DEPARTMENT OF PUBLIC WORKS
HAYMARKET REDEVELOPMENT

borehole location: S.W. CORNER, NO. 6 MARKET

hole commenced: 11th May 1978
hole completed: 12th May 1978
supervised by: RJL
log checked by: JPM

drill model and mounting: Gemco + Truck slope: 90 deg. R.L. surface: m

barrel type and length: T.T. 3.0 m fluid Water bearing: — deg. datum:

drilling information				rock substance				rock mass defects	
method	case-lift	water	pressure test, lugeons	R.L. depth metres	graphic log core loss	substance description (rock type: grain characteristics, colour, structure, minor components.)	weathering	strength Is (50)	defect spacing mm	defect description (thickness, type, inclination, planarity, roughness, coating) particular / general
				8		CONTINUED FROM SHEET 3				
NMLC						NO CORE 0.24 m				
				9		SANDSTONE, medium to coarse grained, brown-white, poorly developed bedding	HW			Joint and vesicle 45°, clean
				10		SANDSTONE, as above, but white	MW			Decomposed seam 0°, planar, EW rock, clay to 10 mm
				11		SHALE, fine grained, dark grey, well deveooped laminations at 0°	EW			Soil properties Joint, 45°, planar smooth Soil Properties Clayey Sand very stiff to hard Decomposed seam 0°, planar, clay to 5 mm
						SANDSTONE, as above	MW			
				12		NO CORE 0.11 m				
						SANDSTONE, medium grained, white, poorly developed bedding, occasional flakes of mudstone	SW			
				13						
						END OF HOLE AT 13.20 m				
				14						
				15						

Defects are joints 0° - 20°, planar, rough, coating of EW rock

Defects are joints 0° along laminations 1-2 mm apart

Defects are joints 0°, planar, rough clean

key

method
- AS auger screwing
- AD auger drilling
- R roller/tricone
- W washbore
- NMLC NMLC core drilling

case-lift
- casing used
- barrel withdrawn

water
- 10 Oct, 73 water level date shown
- water inflow
- partial drilling water loss
- complete drilling water loss

pressure test
- (350) maximum effective pressure in test (kPa)

graphic log/core loss
- core recovered (hatching indicates material)
- no core recovered

weathering
- Fr — fresh
- SW — slightly weathered
- MW — moderately weathered
- HW — highly weathered
- EW — extremely weathered

strength (indirect tensile strength)
- EL — extremely low
- VL — very low
- L — low
- M — medium
- H — high
- VH — very high
- EH — extremely high

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borehole no 7

sheet 1 of 3

engineering log – borehole

office and job no Sydney S6269

DEPT. OF PUBLIC WORKS, NSW

project HAYMARKET REDEVELOPMENT, PARKING STATION

borehole location Refer to Drawing 6269/1–1

hole commenced 28th June 1979

hole completed 29th June 1979

supervised by GS

log checked by RJL

drill model and mounting Gemco 210A + Truck

hole diameter 100 mm

slope 90 deg.

bearing — deg.

R.L. surface 1.459 m

datum AHD

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency, rel. density	hand penetrometer kPa 100 200 300 400	structure and additional observations
AS V / AD T / AS V		C	29 June 1979	1 N* = 0	1			ASPHALTIC CONCRETE	M			
							SC	CLAYEY GRAVELLY SAND, coarse grained, yellow, fines of medium plasticity, gravel is coarse grained		L		FILL RIPPED SANDSTONE
					2		SP	GRAVELLY SAND, medium grained, brown and yellow mottled. Some concrete, asphalt and sandstone fragments		VL		← SPT fell 0.70m under own weight
				1, <1, 0 N* = 1	3		CH	SANDY CLAY, high plasticity, dark grey, fine grained sand, some organic matter	W	VS		ESTUARINE SEDIMENTS & SLOPEWASH ← shell horizon
							SC	CLAYEY SAND, medium grained, grey-yellow, fines of low plasticity		VL		
				2, 4, 6 N = 10	4		CH	CLAY, high plasticity, dark grey, trace of fine grained sand		St		
					5			SANDY CLAY, high plasticity, yellow-brown mottled, some fine grained sand				← No SPT sample recovered
							SC	CLAYEY SAND, fine grained, yellow, fines of medium to high plasticity		MD		
					6		CH	CLAY, high plasticity, grey, trace fine grained sand		VSt	X	
				3, 4, 7 N* = 11	7		SC	CLAYEY SAND, fine grained, grey and yellow mottled, fines of high plasticity		MD		
					8		CH	CLAY, high plasticity, yellow brown mottled, some fine grained sand		VSt		

key

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
* bit shown by suffix
B – blank bit
V – "V" bit
T – TC bit
e.g. ADT

support
C casing
M mud

penetration
1 2 3 no resistance / ranging to refusal

water
10 Oct, 73 water level on date shown
water inflow
water outflow

notes – samples and tests
U50 – undisturbed sample 50 mm diameter
D – disturbed sample
N – standard penetration test: figure = result
N* – SPT + sample
Nc – cone penetrometer

classification symbols and soil description
based on unified classification system

moisture
D – dry
M – moist
W – wet

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

Coffey & Partners Pty. Ltd.

borehole no 7
sheet 2 of 3

engineering log – borehole

office and job no: Sydney S6269

DEPT. OF PUBLIC WORKS, NSW

project: HAYMARKET REDEVELOPMENT, PARKING STATION
borehole location: Refer to Drawing 6269/1–1

hole commenced: 28th June 1979
hole completed: 29th June 1979
supervised by: GS
log checked by: RJL

drill model and mounting: Gemco 210A + Truck
hole diameter: 100 mm
slope: 90 deg.
bearing: – deg.
R.L. surface: 1.459 m
datum: AHD

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. / depth metres	graphic log	classification symbol	material: soil type, plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency / rel. density	hand penetrometer kPa 100 200 300 400	structure and additional observations
A S V		C		4, 6, 8 N* = 14	8		CH	CLAY, as above, trace fine grained sand	M > PL	VSt	X	ESTUARINE SEDIMENTS & SLOPEWASH
					9		SC-CH	CLAYEY SAND, medium grained, yellow and brown. Layers of SANDY CLAY, sand fine grained		MD/D		
					10		CH	CLAY, high plasticity, dark grey, some organic matter		VSt	X	← trace shells
				4, 9, >7 N* >16	11		SC	SANDY CLAY, high plasticity, grey brown mottled, sand fine grained		MD/D		RESIDUAL SOIL SPT bouncing after 350mm
					12			Refusal at 11.40m – continued on Sheet 3				

key

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
* bit shown by suffix:
B – blank bit
V – "V" bit
T – TC bit
e.g. ADT

support
C casing
M mud

penetration
1 2 3
no resistance
ranging to
refusal

water
10 Oct, 73 water level on date shown
water inflow
water outflow

notes – samples and tests
U50 – undisturbed sample 50 mm diameter
D – disturbed sample
N – standard penetration test: figure = result
N* – SPT + sample
Nc – cone penetrometer

classification symbols and soil description
based on unified classification system

moisture
D – dry
M – moist
W – wet

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

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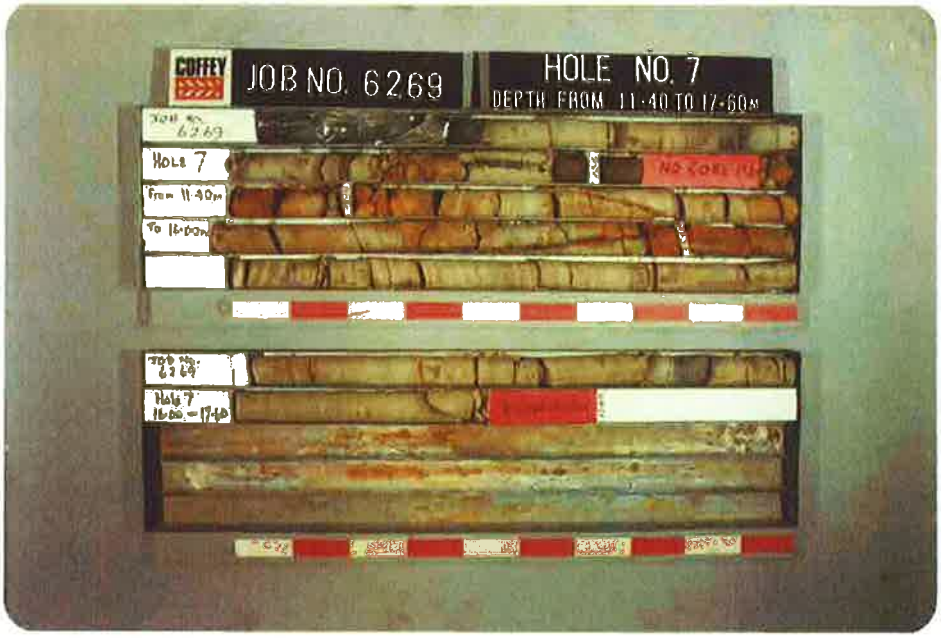


Coffey & Partners Pty. Ltd.

borehole no: 7

sheet 3 of 3

engineering log — cored borehole

office and job no: Sydney S6269

DEPT. OF PUBLIC WORKS, NSW

project: HAYMARKET REDEVELOPMENT, PARKING STATION

borehole location: Refer to Drawing 6269/1–1

hole commenced: 28th June 1979
hole completed: 29th June 1979
supervised by: GS
log checked by: RJL

drill model and mounting: Gemco 210A + Truck slope: 90 deg.
barrel type and length: T.T. 3.0m fluid Water bearing: — deg.

R.L. surface: 1.459 m
datum: AHD

drilling information					rock substance			rock mass defects	
method	case-lift	water	pressure test lugeons 3 10 30 100	R.L. depth metres	graphic log core loss	substance description rock type: grain characteristics, colour, structure, minor components.	weathering	strength Is (50) EL VL L M H VH EH	defect spacing mm 100 300 1000 3000	defect description thickness, type, inclination, planarity, roughness, coating: particular / general
				11		Continued from Sheet 2 Note change in depth scale				
NMLC				12		SANDSTONE, medium to coarse grained, grey, massive to poorly bedded	MW HW			decomposed seam, 0°, 30mm clayey sand. decomposed seam, 0°, 30mm clayey sand crushed zone, 0°, iron stained, clay coated. Joint, 80°, planar, rough, clay coated.
						MUDSTONE, fine grained, dark grey	MW			
						NO CORE 0.20m				
				13		SANDSTONE, medium to coarse grained, yellow-white, massive	HW			Joint, 75°, planar, rough, limonite staining Joint, 50--80°, planar, rough, limonite staining Joint, coating of clay 5m
				14						Joint, 80°, planar, rough, limonite & clay cover
				15						Partings, 5°, planar, rough, clay infilled
				16			MW/SW			clay inclusion. Joint, 85°, planar, rough, clean.
				17			HW MW			Decomposed zone, 20°, 100mm sandy clay
				18		End of Borehole 7 at 17.60m				

Partings, 0 -5°, planar, rough, clean, unless noted otherwise.

key

method

AS	auger screwing
AD	auger drilling
R	roller/tricone
W	washbore
NMLC	NMLC core drilling

case-lift
- casing used
- barrel withdrawn

water
- 10 Oct, 73 — water level date shown
- water inflow
- partial drilling water loss
- complete drilling water loss

pressure test
(350) maximum effective pressure in test (kPa)

graphic log/core loss
- core recovered (hatching indicates material)
- no core recovered

weathering

Fr	fresh
SW	slightly weathered
MW	moderately weathered
HW	highly weathered
EW	extremely weathered

strength (Indirect tensile strength)

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH5**
Sheet 1 of 4
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***14.6.2011***
Principal:
Date completed: ***15.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***LJG***
Borehole Location: ***Lackey Street, Haymarket, NSW***
Checked by: ***SS***

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.4
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
ADT		C							**FILL: BRICK PAVERS:**	D			FILL
					2				**FILL: SAND:** Coarse sand, brown, trace of roots. 0.3m - Medium to coarse sand with some clay, trace of gravel. 0.5m - Brown, yellow.				
				SPT 8,4,4 N*=8	1	1			**FILL: Clayey SAND:** Medium to coarse, brown mottled yellow, medium to high plasticity clay, with some fine gravel.				
						2			**FILL: CLAY:** Medium to high plasticity, pale grey, red brown, trace of fine rounded ironstone gravel and sand. (shale fill) 2.0m - Red brown mottled pale grey, grey.				
					0				2.50m - With some fine shale gravel.				
				SPT 1,2,5 N*=7					**FILL: Sandy CLAY:** Low to medium plasticity, pale grey, brown, coarse sand, trace of gravel.	M			
			►		-1	3		SM	**Silty SAND:** Coarse grained, black with some shells.	W	L		ALLUVIUM
						4		SC	**Clayey SAND:** Coarse grained, brown, medium plasticity clay, trace of shells and fine gravel.				
WB				SPT 2,1,2 N*=3	-2			CL-CH	**Sandy CLAY:** Low to medium plasticity, dark brown to dark grey, fine to medium sand, with some organic fiberous materials.	>Wp	S-F		
					-3	5							5.6m - Organic material in SPT sulphur odour
				SPT 2,1,2 N*=3		6		SC	**Clayey SAND:** Coarse grained, dark brown to black, low plasticity clay, trace of fine gravel.		L		
					-4			CH	**CLAY:** High plasticity, red brown, pale grey, trace of ironstone and sand.	>Wp	VSt-H		
				SPT 7,8,12 N*=20	-5	7			7.20m - Yellow, brown mottled. 7.40m - Pale grey with some fine sand.				
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH5**
Sheet 2 of 4
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***14.6.2011***
Principal:
Date completed: ***15.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***LJG***
Borehole Location: ***Lackey Street, Haymarket, NSW***
Checked by: ***SS***

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.4
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa (100 200 300 400)	structure and additional observations
WB		C						CH		>Wp	VSt-H		
					-6			CS	**Sandy CLAY:** Low to medium plasticity, pale grey, medium sand, with some silt.		St	× ×	
				SPT 4,6,6 N*=12		9							
					-7			CH	**CLAY:** High plasticity, dark grey, trace of silt.		VSt-H		
				SPT 7,9,13 N*=22	-8	10						× × × ×	
						11							
				SPT 4,3,2 N*=5	-9			SC	**Clayey SAND:** Medium to coarse, brown, grey, trace of gravel.	W	L-MD		11.50m - No sample recovered
					-10	12							
				SPT 4,7,14 N*=21	-11	13			13.0m - Fine to coarse, dark grey, grey, trace of organics.				
						14		CL	**Silty CLAY:** Low plasticity, dark brown, black, with some organic material (wood), very light.	>Wp	St		
				SPT 3,5,9 N*=14	-12	15		SC	**Clayey SAND:** Coarse grained, pale grey, dark grey, low plasticity clay, trace of silt.	W	L-MD		
					-13	16							WEATHERED BEDROCK

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH5**
Sheet 3 of 4
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***14.6.2011***

Principal:
Date completed: ***15.6.2011***

Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***LJG***

Borehole Location: ***Lackey Street, Haymarket, NSW***
Checked by: ***SS***

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.4
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
WB					-14	17			**SANDSTONE:** Extremely weathered, pale grey, brown, coarse grained, estimated to be very low strength, remoulds to SAND. *(continued)*				
					-15	18			Borehole BH5 continued as cored hole				
					-16	19							
					-17	20							
					-18	21							
					-19	22							
					-20	23							
					-21	24							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Core Borehole

Borehole No.	BH5
Sheet	4 of 4
Project No:	GEOTLCOV24303AA
Client:	Sydney Harbour Foreshore Authority
Date started:	14.6.2011
Principal:	
Date completed:	15.6.2011
Project:	Sydney International Convention & Entertainment Centre
Logged by:	LJG
Borehole Location:	Lackey Street, Haymarket, NSW
Checked by:	SS

drill model & mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.4
hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

Drilling information | Core description | Rock mass defects

method	core-lift	water	RL	depth metres	graphic log / core recovery	rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	Is(50) MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
NMLC		Not monitored	-14	17		Continued from non-cored borehole A Coarse grained, pale grey, with dark grey laminations, distinctly bedded at 5°-15°, with some black carbonaceous flecks	SW FR		D 0.76 A 0.31			JT, 80°, PL, RO, CN-VN, 80mm PT, 10°, PL, RO, CN 20mm 10mm PT, 15°, PL, RO, CN JT, 70°, PL, RO, CN, 60mm PT, 15°, PL, RO, CN PT, 15°, PL, RO, CN
			-15	18		At 16.85m - Indistinctly bedded at 10°-30°			D 1.56 A 2.3	72		10mm PT, 10°, PL, RO, VN
			-16	19		18.80m - Indistinctly bedded at 30°						JT, 80°, PL, RO, CN, 200mm SM, Clay and Sand filled, 70mm JT, 80°, PL, RO, CN, 200mm
			-17	20					D 2.72 A 2.37			PT, 10°-20°, PL-IR, RO, CN, 10mm 20mm 20mm 20mm 10mm
			-18	21					D 2.29 A 2.46	63		10mm PT, 10°, PL, RO, CN
			-19	22		Interbedded A Medium to coarse grained, grey sandstone with indistinct laminations at 0°-15°. Dark-grey shale with distinct laminations at 0°-15°. A Medium to coarse grained, pale grey to grey with indistinct laminations at 10°.			A 0.09 D 1.13			JT, 85°-90°, PL, RO, CN, VN, >10mm HFZ, 100mm SM, Clay and Gravel filled, 50mm SM, Sand filled, 100mm PT, 0°, PL, RO, CN
			-20	23		BH5 terminated at 22.35m						JT, 90°, PL, RO, CN, 90mm PT, 10°, IR, RO, CN PT, 10°, IR, RO, CN
			-21	24								

All defects are PT, 10°-30°, PL, RO, CN unless noted otherwise.

Drilling: DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

Core: casing used; barrel withdrawn; core recovered - graphic symbols indicate material; no core recovered

Water: 10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown (25)

Weathering: FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

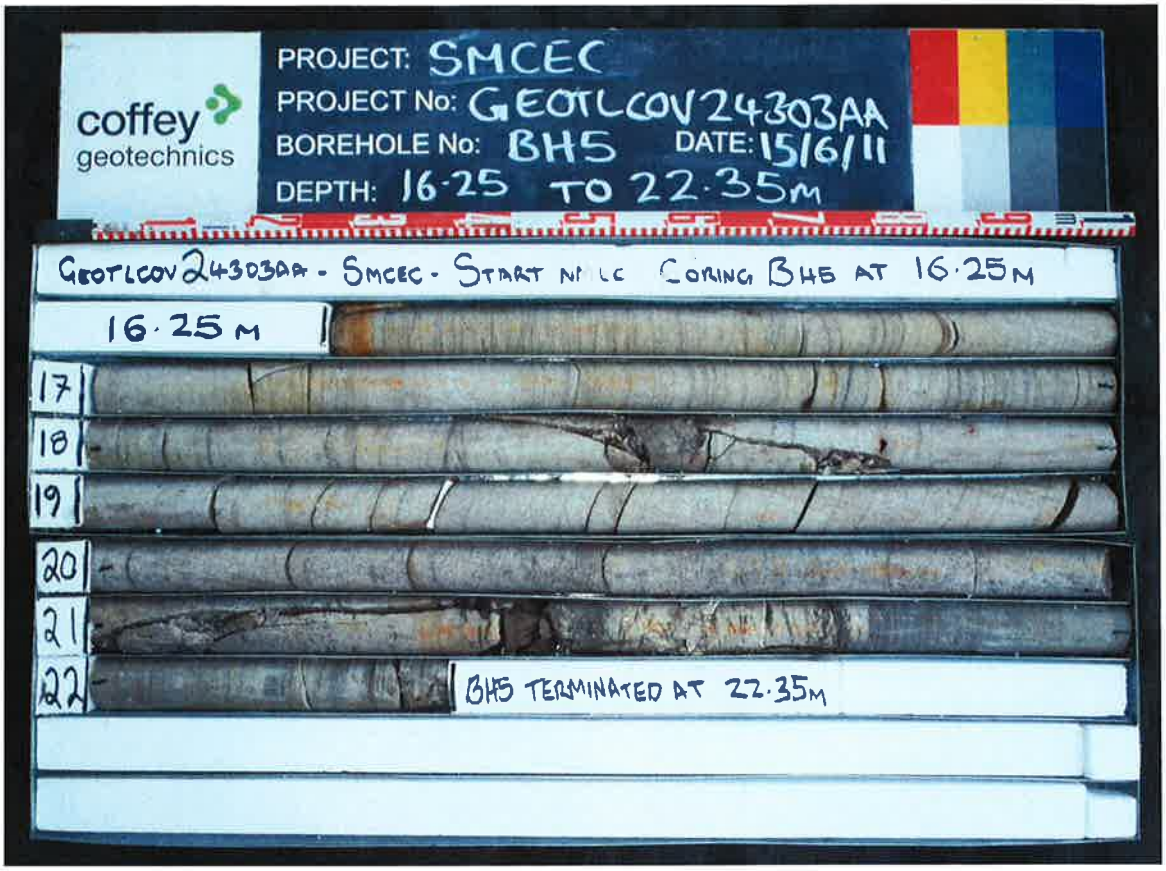
Strength: VL very low; L low; M medium; H high; VH very high; EH extremely high

Defect: JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

Planarity: PL planar; CU curved; UN undulating; ST stepped; IR irregular

Roughness: VR very rough; RO rough; SO smooth; SL slickensided

Coating: CN clean; SN stained; VN veneer; CO coating



drawn	DB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Sydney Harbour Foreshore Authority
approved	SS		project:	Sydney International Convention and Entertainment Centre
date	23.6.11		title:	CORE PHOTOGRAPH
scale	NTS		project no.: GEOTLCOV24303AA	figure no.: BH5 – 1 OF 1
original size	A4			

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH6**
Sheet 1 of 4
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***9.6.2011***
Principal:
Date completed: ***9.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***LJG***
Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: ***SS***

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.6
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa (100 200 300 400)	structure and additional observations
ADT		C							**FILL: ASPHALT:** Dark grey, 0.02m **FILL: GRAVEL:** Medium to coarse, subangular to subrounded, black, grey, trace of sand and clay.	D			PAVEMENT
					2				**FILL: CONCRETE:** Grey, 0.08m **FILL: GRAVEL:** Medium to coarse grained, angular to subangular, grey-brown, trace of fine gravel and sand.	D			
DT						1				D			FILL
									FILL: CONCRETE: Grey, 0.16m **FILL: GRAVEL:** Medium to coarse grained, angular to subrounded, trace of fine gravel and cobbles.				
ADT				SPT 2,3,3 N*=6	1				**FILL: SANDSTONE BOULDER:** Coarse grained, yellow/orange, rounded.	<Wp			
						2			**FILL: CLAY:** High plasticity, mottled, red-brown, pale-grey, and grey, trace of fine gravel, ironstone and shale. (shale fill) 1.80m - Grey, with some fine shale angular gravel.	M			
			▼		0				**FILL: SAND:** Coarse grained, grey-brown, trace of silt and rubber.	W			
				SPT 5,2,2 N*=4		3							
					-1								
						4		SC	**Clayey SAND:** Coarse grained, brown-grey, low plasticity clay.				ALLUVIUM
								CL	**Sandy CLAY:** Low plasticity, brown-black, coarse sand, trace of silt.		F		
W				SPT 0,2,3 N*=5	-2	5		CL	**CLAY:** Low to medium plasticity, red-brown, with some fine sand.				
					-3			CH	**Sandy CLAY:** High plasticity, red, brown, pale grey, medium to coarse sand.		St		
						6		SC	**Clayey SAND:** Coarse grained, pale grey, red-brown, medium plasticity clay.		L-MD		
				SPT 5,3,5 N*=8	-4			CL	**Sandy CLAY:** Low to medium plasticity, pale grey.		St	×	
						7		CH	**CLAY:** High plasticity, red-brown, pale grey, micaceous.		VSt	××	
					-5			CL-CH	**Sandy CLAY:** Medium to high plasticity, grey, pale grey, coarse grained sand.				
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH6**
Sheet 2 of 4
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: **9.6.2011**
Principal:
Date completed: **9.6.2011**
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: **LJG**
Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.6
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
W		C		U_{50}				CL-CH	**Sandy CLAY:** Medium to high plasticity, grey, pale grey, coarse grained sand. *(continued)*	W	VSt		
				SPT 0,4,5 N*=9	-6	9		SC	**Clayey SAND:** Medium to coarse grained, grey, pale grey.		MD		
				SPT 5,6,9 N*=15	-7	10		CH	**CLAY:** High plasticity, red-brown, pale grey, grey, trace of coarse sand and fine grained.		VSt-H	× × ×	
					-8	11		CH	**Silty CLAY:** High plasticity, dark grey, brown, black, micaeous.		VSt-H	× × ×	
				SPT 5,6,7 N*=13	-9	12		SP	**SAND:** Coarse grained, grey, dark grey, with some clay.		MD		
				SPT 5,8,10 N*=18	-10	13							
					-11	14			14m - Dark grey, black, trace of organics.				
				SPT 0,5,7 N*=12	-12	15			15m - With some silt and organic material.				RESIDUAL SOIL?
				SPT 9,R N*=R	-13	16			**SANDSTONE:** Extremely weathered, coarse grained, black, dark grey, estimated low strength, with some organic matter.				WEATHERED BEDROCK

Borehole terminated as cored hole

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT dialube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Core Borehole

Borehole No.	**BH6**
Sheet	3 of 4
Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**
Date started:	**9.6.2011**
Principal:	
Date completed:	**9.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**
Logged by:	**LJG**
Borehole Location:	**Back of House of Sydney Entertainment Centre**
Checked by:	**SS**

drill model & mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.6

hole diameter: 100 mm Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

Drilling information | **Core description** | **Rock mass defects**

method	core-lift	water	RL	depth metres	graphic log core recovery	rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
NMLC		Not monitored	-14	16		Continued from non-cored borehole 0.10m	MW					Highly fractured zone 30mm
						A Coarse grained, pale grey to grey, indistinctly bedded at 10°-15°, with some black carbonaceous flecks and laminations and fine gravel inclusions. 15.95m to 16.05m - Ironstained.	FR		D 2.7 A 2.39	26		16.40m - 17.33m - Multiple vertical 75°-90° JT, PL-CU, RO, CN HFZ 50mm HFZ of multiple PT, 15°, PL, RO, CN SM, 10°, Clay and sand filled 10mm
			-15	17								JT, 45°, PL, RO, CN HFZ 110mm PT x2 10mm
			-16	18					D 1.53 A 0.74			PT, CS, JT, 50mm 10°-90°, PL, RO, CN JT, 45°, CU, RO, CN, 80mm JT, 80°, PL, RO, CN, 250mm Multiple at 200mm
				19		0.20m			D 2.36 A 0.48	13		PT/JT, 80°, PL, RO, CN, 80mm PT/JT, 90°, PL, RO, CN, 90mm PT/JT, 75°, PL, RO, CN, 80mm PT/JT, 45°, PL, RO, CN HFZ of multiple JT and PT
			-17	20		A Coarse grained, pale grey, indistinctly bedded at 30°, with some black carbonaceous flecks and laminations, micaceous.	FR			0		HFZ of multiple JT and PT
			-18			HA Black, thinly laminated at 0°, with some sandstone gravel inclusions.	FR		D 1.15 A 1.37	0		JT, 85, PL, RO, CN, 190mm PT/JT, 90°, PL, RO, CN Highly fractured zone of multiple PT/JT XW, SM, Silt/clay filled 100mm
				21		0.25m A Coarse grained, pale grey, distinctly bedded at 0°-10°, with some black carbonaceous laminations and flecks. 21.27m - Massive. 21.70m - Indistinctly bedded at 10°.						Highly fractured zone of multiple JT/PT 590mm
			-19	22		A Coarse grained, grey, pale grey, brown, distinctly bedded at 30°, with some black carbonaceous laminations and flecks, micaceous, trace of voids.			D 1.29 A 1.57	46		JT, 80°, PL, RO, CN, 240mm PT/JT, 90°, PL, Closed, 180mm JT, 50°, PL, RO, CN PT, 30°, PL, RO, Clay, CO HFZ 40mm PT, 30°, PL, RO, CN JT, 80°, PL-CU, RO, CN PT, 35°, PL, RO, CN JT PT, 15°, PL, RO, Black CO - coal/carbonaceous material CS, 10°, PL, Gravel filled
			-20	23								PT/JT, 30°, PL, RO, CN-UN
			-21						D 1.48 A 1.2	85		PT x2, 10°, PL, RO, CN

All defects are; PT, 10°-30°, PL, RO, CN unless otherwise noted

CORED BOREHOLE GEOTLCOV24303AA_REV2.GPJ COFFEY.GDT 4.8.11

Form GEO 5.5 Issue 3 Rev. 3

Method

DT	diatube
AS	auger screwing
AD	auger drilling
RR	roller/tricone
CB	claw or blade bit
NMLC	NMLC core
NQ, HQ, PQ	wireline core

Core loss

- casing used
- barrel withdrawn

Core recovery

- core recovered - graphic symbols indicate material
- no core recovered

Water

- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

Weathering

FR	fresh
SW	slightly weathered
MW	moderately weathered
HW	highly weathered
XW	extremely weathered
DW	distinctly weathered (covers MW and HW)

Strength

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

Defect type

JT	joint
PT	parting
SM	seam
SZ	sheared zone
SS	sheared surface
CS	crushed seam

Planarity

PL	planar
CU	curved
UN	undulating
ST	stepped
IR	irregular

Roughness

VR	very rough
RO	rough
SO	smooth
SL	slickensided

Coating

CN	clean
SN	stained
VN	veneer
CO	coating

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Engineering Log - Cored Borehole

Borehole No.	**BH6**
Sheet	4 of 4
Project No:	**GEOTLCOV24303AA**
Date started:	**9.6.2011**
Date completed:	**9.6.2011**
Logged by:	**LJG**
Checked by:	**SS**

Client: ***Sydney Harbour Foreshore Authority***

Principal:

Project: ***Sydney International Convention & Entertainment Centre***

Borehole Location: ***Back of House of Sydney Entertainment Centre***

drill model & mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.6

hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

drilling information | material substance | rock mass defects

method	core-lift	water	RL	depth metres	graphic log / core recovery	material: rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NMLC		◄		24		SANDSTONE: Medium to coarse grained, grey with brown, black and dark grey laminations, distinctly bedded at 10°-20°, with black carbonaceous flecks and laminations, micaceous *(continued)*	FR			85		PTx2, 10°, PL, RO, CN
			-22									PT, 5°, PL, RO, CN
												Multiple JT, 160mm infilled with clay 45°-75°
				25		BH6 terminated at 24.94m			D 0.27 A 0.22			PT, 10°, PL, RO, VN
			-23									
				26								
			-24									
				27								
			-25									
				28								
			-26									
				29								
			-27									
				30								
			-28									
				31								
			-29									

method
DT diatube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NQ, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn

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

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)

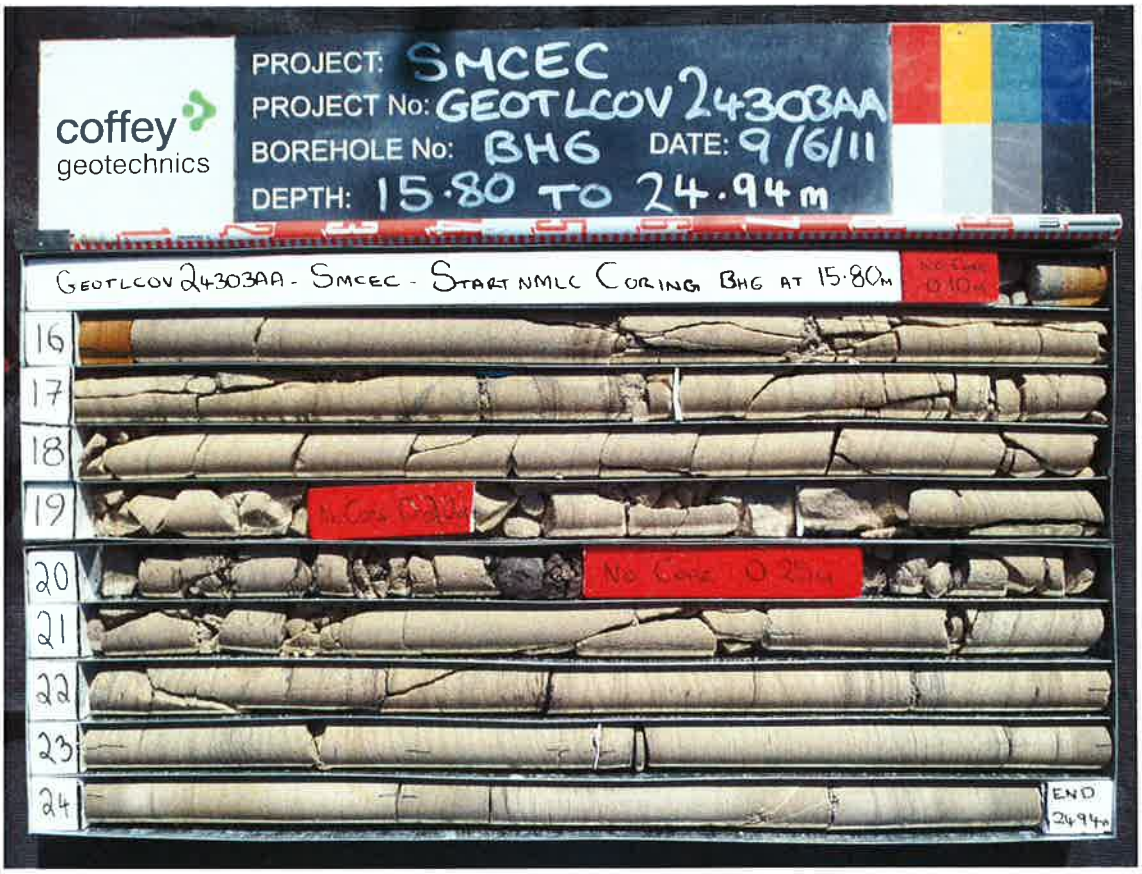
strength
VL very low
L low
M medium
H high
VH very high
EH extremely high

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness
VR very rough
RO rough
SO smooth
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating



drawn	DB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Sydney Harbour Foreshore Authority
approved	SS		project:	Sydney International Convention and Entertainment Centre
date	23.6.11		title:	CORE PHOTOGRAPH
scale	NTS		project no.: GEOTLCOV24303AA	figure no.: BH6 – 1 OF 1
original size	A4			

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH7**
Sheet 1 of 6
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***15.6.2011***
Principal:
Date completed: ***17.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***RC***
Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6
hole diameter: 100 mm | Northing | bearing: 213.5° | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa (100 200 300 400)	structure and additional observations
ADT		C							**FILL: ASPHALT:** Dark grey, 70mm, overlying medium to coarse grained, brown-dark grey sandy gravel.	D			PAVEMENT
									FILL: Gravelly SAND: Fine to medium grained, brown, fine to coarse gravel, trace of clay.				FILL
				D	2	1							
					1	2			**FILL: Gravelly CLAY:** Low plasticity, brown, orange-brown.	<Wp			
				D						>Wp			
					0	3							
			▶	D				CL	**Silty CLAY:** Low plasticity, dark grey, grey, trace of white shells.		S		ALLUVIUM
WRR						4		SP	**SAND:** Medium grained, grey, with some clay.	W	L		
		C		U_{50}	-1			CH	**SILTY CLAY:** High plasticity, grey, trace of shells and plant fibres with some sandy bands.	>Wp	F	x	
						5							
					-2								
						6			6.5m - Becoming mottled brown and pale grey.				
					-3								
		C				7							
					-4								
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing
penetration 1 2 3 4 — no resistance ranging to refusal
water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description based on unified classification system

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

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

Form GEO 5.3 Issue 3 Rev.2

BOREHOLE GEOTLCOV24303AA_REV2.GPJ COFFEY.GDT 4.8.11

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH7**
Sheet 2 of 6
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***15.6.2011***
Principal:
Date completed: ***17.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***RC***
Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6
hole diameter: 100 mm | Northing | bearing: 213.5° | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
WRR		C						CH		>Wp	F		
								CH	**CLAY:** High plasticity, red brown, orange brown, pale grey, with some fine grained sand.				
			◁		-5	9							
								SC	**Clayey SAND:** Medium to coarse grained, grey, with bands of clay.				
					-6	10							
					-7	11							
						12							
					-8								
						13							
				D	-9								
						14							
					-10								
						15							
					-11				**SANDSTONE:** Medium to coarse grained, pale grey to white, extremely weathered to highly weathered.				WEATHERED BEDROCK
						16							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration 1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH7**
Sheet 3 of 6
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***15.6.2011***
Principal:
Date completed: ***17.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***RC***
Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6
hole diameter: 100 mm | Northing | bearing: 213.5° | datum: mAHD

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
WRR		C							**SANDSTONE:** Medium to coarse grained, pale grey to white, extremely weathered to highly weathered. *(continued)*				
									Borehole BH7 continued as cored hole				
					-12	17							
					-13	18							
						19							
					-14								
						20							
					-15								
						21							
					-16								
						22							
					-17								
						23							
					-18								
						24							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on dale shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

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Engineering Log – Core Borehole

Borehole No.	**BH7**
Sheet	4 of 6
Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**
Date started:	**15.6.2011**
Principal:	
Date completed:	**17.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**
Logged by:	**RC**
Borehole Location:	**Back of House of Sydney Entertainment Centre**
Checked by:	**SS**

drill model & mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6

hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: 213.5° | datum: mAHD

Drilling information | **Core material** | **Rock mass defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular / general
NQ		No mud used	-12	17		Continued from non-cored borehole						
						A Coarse grained, pale brown, indistinctly bedded at 20°-40°.	HW/MW		D 1.32 A 1.79			PT, 15°, PL, RO, SN PT, 20, PL, RO, SN PT, 30°, PL, RO, SN PT, 25°, PL, RO, SN
						16.90m - Red band, 200mm	SW					
			-13	18								PT, 30°, PL, RO, SN
									D 1.56 A 2.2			PT, 20°, PL, RO, VN, Clay PT, 30°, PL, RO, VN, Clay
												PT, 5°, PL, RO, SN PT, 5°, PL, RO, VN, Clay JT, 60°, UN, RO, VN, Clay PT, 15°, PL, RO, VN, Clay
				19								PT,15°, PL,RO, VN clay
			-14									
									D 0.52 A 0.41			PT, 10°, PL, RO, SN JT, 70°, PL, RO, SN
						0.40m						
				20		A Medium grained, pale grey, indistinctly bedded at 10°-30°.	FR					JT, 0°, IR, RO, SN
			-15									
				21		0.10m			D 1.33 A 1.4			PT, 20°, UN, RO, CN
						HA A A Dark grey, grey.	FR		D 0.17 A 0.41			
			-16									
				22		A Medium grained, pale grey, massive contact angle = 20°.						SM, 20°, PL, RO, Clay, 10mm PT, 10°, PL, RO, SN
												SM, 25°, PL, RO, Clay, 35mm JT, 45°, PL, RO, VN SM, 25°, IR, RO, Clay, 40mm
			-17						D 1.58 A 1.91			PT, 20°, PL, RO, VN
				23		A Medium grained, pale grey, distinctly bedded at 40°.						SM, 20°, PL, RO, Clay, 50mm
			-18									JT, 70°, PL, RO, CN, Sand, 20mm
				24					D 1.8 A 1.69			

Unless noted defects are; PT, 10°-40°, PL, RO, CN

Drilling information

DT	diatube
AS	auger screwing
AD	auger drilling
RR	roller/tricone
CB	claw or blade bit
NMLC	NMLC core
NQ, HQ, PQ	wireline core

Core material

- casing used
- barrel withdrawn

Core recovery

- core recovered - graphic symbols indicate material
- no core recovered

Water

- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss
- 25 — water pressure test result (lugeons) for depth interval shown

Weathering

FR	fresh
SW	slightly weathered
MW	moderately weathered
HW	highly weathered
XW	extremely weathered
DW	distinctly weathered (covers MW and HW)

Strength

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

Defect type

JT	joint
PT	parting
SM	seam
SZ	sheared zone
SS	sheared surface
CS	crushed seam

Roughness

VR	very rough
RO	rough
SO	smooth
SL	slickensided

Planarity

PL	planar
CU	curved
UN	undulating
ST	stepped
IR	irregular

Coating

CN	clean
SN	stained
VN	veneer
CO	coating

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Engineering Log - Core Borehole

Borehole No.	BH7
Sheet	5 of 6
Project No:	GEOTLCOV24303AA
Client:	Sydney Harbour Foreshore Authority
Date started:	15.6.2011
Principal:	
Date completed:	17.6.2011
Project:	Sydney International Convention & Entertainment Centre
Logged by:	RC
Borehole Location:	Back of House of Sydney Entertainment Centre
Checked by:	SS

drill model & mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6

hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: 213.5° | datum: mAHD

Drilling information | Material substance | Rock mass defects

method	core-lift	water	RL	depth metres	graphic log / core recovery	rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness — particular	general
NQ			-19	25		Medium grained, pale grey, distinctly bedded at 40° *(continued)*	FR					PT, 20°, UN, RO, CN JT, 40°, PL, RO, CN	
						0.10m							
						Medium to coarse grained, pale grey, indistinctly bedded at 40°.	FR					JT, 20°, PL, RO, CO, Clay, 3mm JT, 70°, PL, RO, CN PT, 30°, PL, RO, CO, Clay, 2mm	
			-20	26		Coarse grained, pale grey, massive.			D 3.01 A 3.26			JT, 60°, PL, RO, CN	
				27								JT, 60°, PL, RO, CN	
			-21						D 2.21 A 1.67			SM, 20°, PL, RO, XW, 40mm JT, 50°, PL, RO, CN	
						Medium grianed, pale grey, indistinctly bedded at 20°.						JT, 60°, PL, RO, CN JT, 80°, PL, RO, CN	
				28								JT, 70°, PL, RO, CN	
			-22									JT, 75°, PL, RO, CN JT, 85°, UN, RO, VN	
				29		28.90m - Interface angle = 30°.						PT, 30°, PL, RO, VN	
						Coarse grained, pale brown, grey, speckled white and green.	HA					JT, 30°, PL, RO, CO, Clay JT, 30°, PL, RO, CO, Clay	
			-23						D A 1.48 1.29			SM, 30°, PL, RO, Clay, 40mm, pp = 100kPa JT, 45°, PL, RO, CN SM, 35°, PL, RO, Clay, unknown thickness	
						0.40m							
				30		Coarse grained, pale brown, grey, speckled green.	HA						
			-24									SM, 30°, PL, RO, Clay, 12mm	
				31					D A 1.11 1.06				
						Coarse grained, dark grey, speckled green.	FR					JT, 60°, PL, RO, CN JT, 50°, PL, RO, CN	
			-25									JT, 25°, PL, RO, VN, Calcium JT, 35°, PL, RO, CN, Calcium	
				32		0.10m						JT, 30°, PL, RO, SN JT, 30°, PL, RO, SN	
						Coarse grained, dark grey, speckled green.	FR		D 13.45			JT, 15°, IR, RO, CN JT, 15°, IR, RO, CN	

Unless noted defects are: PT, 10°-40°, PL, RO, CN

Unless noted defects are: JT, 10°-40°, PL, RO, CN

Method

DT	diatube
AS	auger screwing
AD	auger drilling
RR	roller/tricone
CB	claw or blade bit
NMLC	NMLC core
NQ, HQ, PQ	wireline core

Core loss

- casing used
- barrel withdrawn

Core recovery

- core recovered - graphic symbols indicate material
- no core recovered

Water

- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

Weathering

FR	fresh
SW	slightly weathered
MW	moderately weathered
HW	highly weathered
XW	extremely weathered
DW	distinctly weathered (covers MW and HW)

Strength

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

Defect type

JT	joint
PT	parting
SM	seam
SZ	sheared zone
SS	sheared surface
CS	crushed seam

Roughness

VR	very rough
RO	rough
SO	smooth
SL	slickensided

Planarity

PL	planar
CU	curved
UN	undulating
ST	stepped
IR	irregular

Coating

CN	clean
SN	stained
VN	veneer
CO	coating

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Engineering Log – Core Borehole

Borehole No.	**BH7**
Sheet	6 of 6
Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**
Date started:	**15.6.2011**
Principal:	
Date completed:	**17.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**
Logged by:	**RC**
Borehole Location:	**Back of House of Sydney Entertainment Centre**
Checked by:	**SS**

drill model & mounting: Hydrapower Scout Truck | Easting: | slope: -60° | R.L. Surface: 2.6

hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: 213.5° | datum: mAHD

drilling information					material substance						rock mass defects		
method	core-lift	water	RL	depth metres	graphic log core recovery	rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	defect spacing mm 30 100 300 1000 3000	defect description: type, inclination, planarity, roughness, coating, thickness — particular	general
NQ			-26	33		Coarse grained, dark grey, speckled green *(continued)*	SA / MA					JT, 20°, PL, RO, VN JT, 45°, PL, RO, VN, Calcium 32.65m - 33.03m - Highly fractured rock	
						From 32.95, with bands of pale brown, pale grey.			A 4.21			JT, 20°-40°, PL, RO, VN JT, 55°, PL, RO, CN JT, 55°, PL, RO, CN JT, 55°, PL, RO, CN JT, 60°, PL, RO, VN JT, 30°, PL, RO, VN JT, 40°, PL, RO, VN 33.80m - 33.94m - Highly fractured rock JT, 30°, PL, RO, VN JT, 30°, PL, RO, VN 34.20m - 35.10m - Highly fractured rock	Unless noted defects are: JT, 10°-40°, PL, RO, CN
			-27	34		33.65m - Becoming pale grey, pale brown bands of dark grey.							
			-28	35					D 4.88				
				36		0.90m							
			-29			Pale grey	HA		D 0.32	A 0.27		SM, 30°, IR, RO, Clay, 20mm	
				37		37m - Interface angle = 60°	XA						
			-30			Medium grained, dark grey to black, distinctly bedded at 40°.	FR		D 3.38	A 4.87		JT, 70°, PL, RO, SN JT, 80°, PL, RO, SN JT, 70°, PL, RO, SN SM, 20°, PL, RO, XA, 10mm JT, 65°, PL, RO, CO Clay, 5mm JT, 30°, PL, RO, SN JT, 30°, PL, VR, CN	Unless noted defects are: PT, 40°, PL, RO, SN
			-31	38									
				39		0.35m							
			-32	40		Medium to coarse grained, pale grey, grey, indistinctly bedded at 40°.	FR		D 2			JT, 30°, PL, VR, CN	
						BH7 terminated at 40m							

Drilling method
DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

Core loss
casing used; barrel withdrawn

Core recovery
core recovered - graphic symbols indicate material; no core recovered

Water
10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown (25)

Weathering
FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

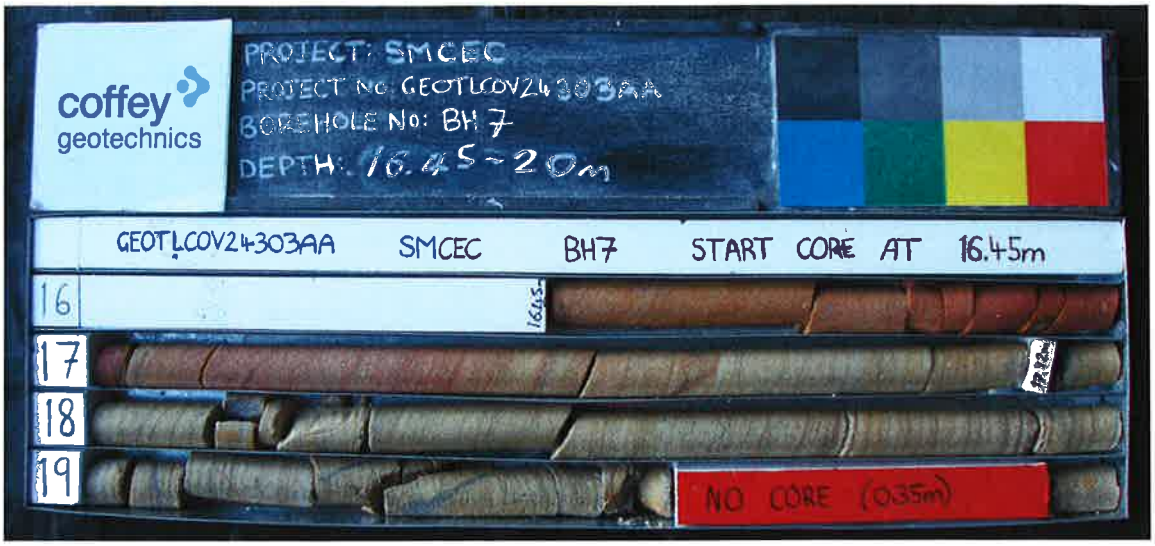
Strength
VL very low; L low; M medium; H high; VH very high; EH extremely high

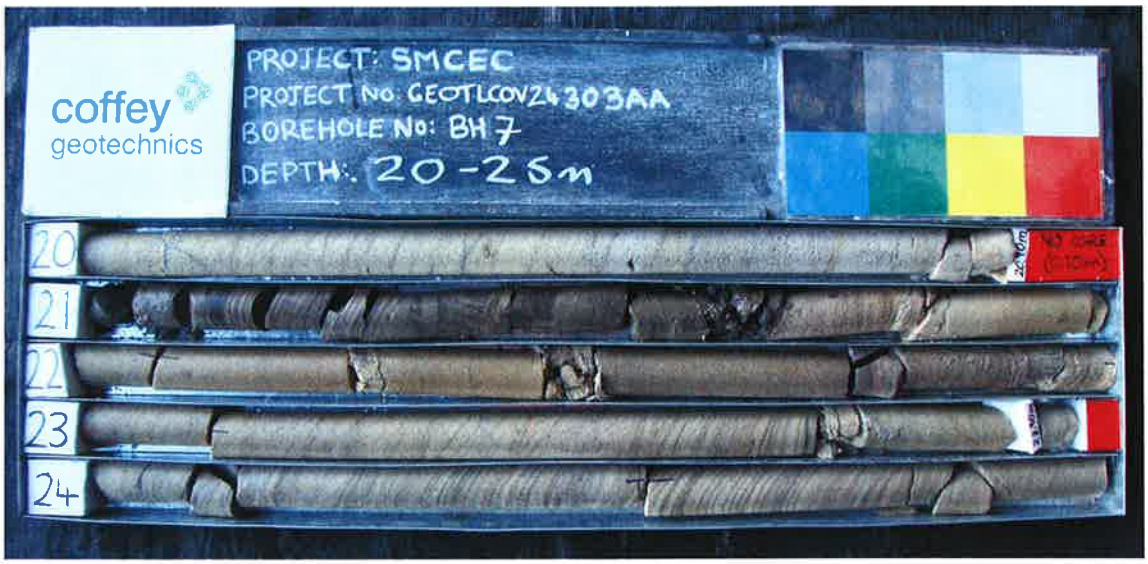
Defect type
JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

Defect shape
PL planar; CU curved; UN undulating; ST stepped; IR irregular

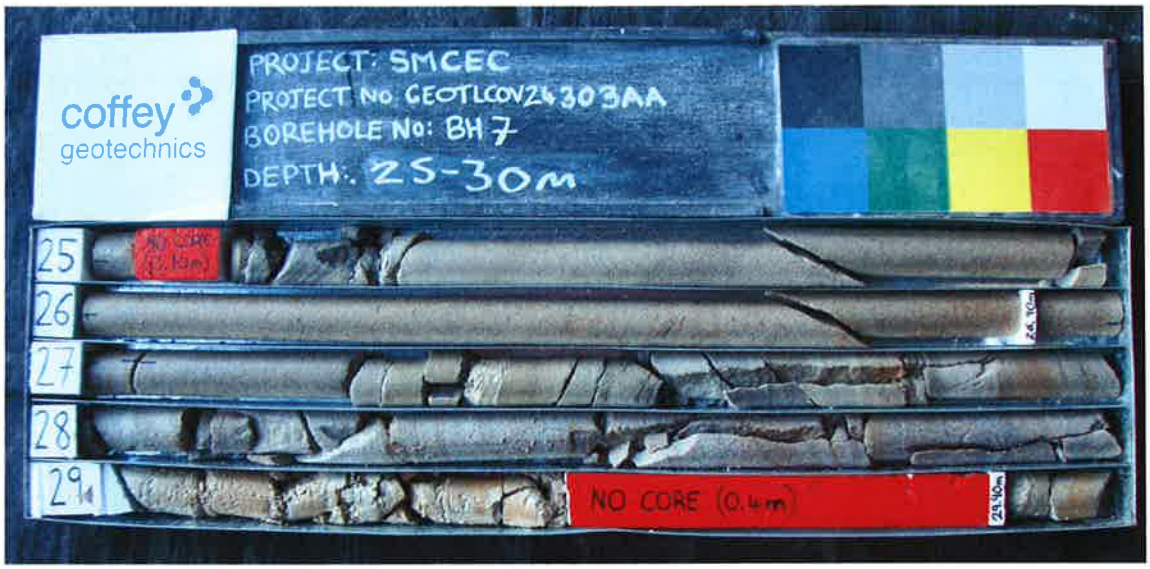
Roughness
VR very rough; RO rough; SO smooth; SL slickensided

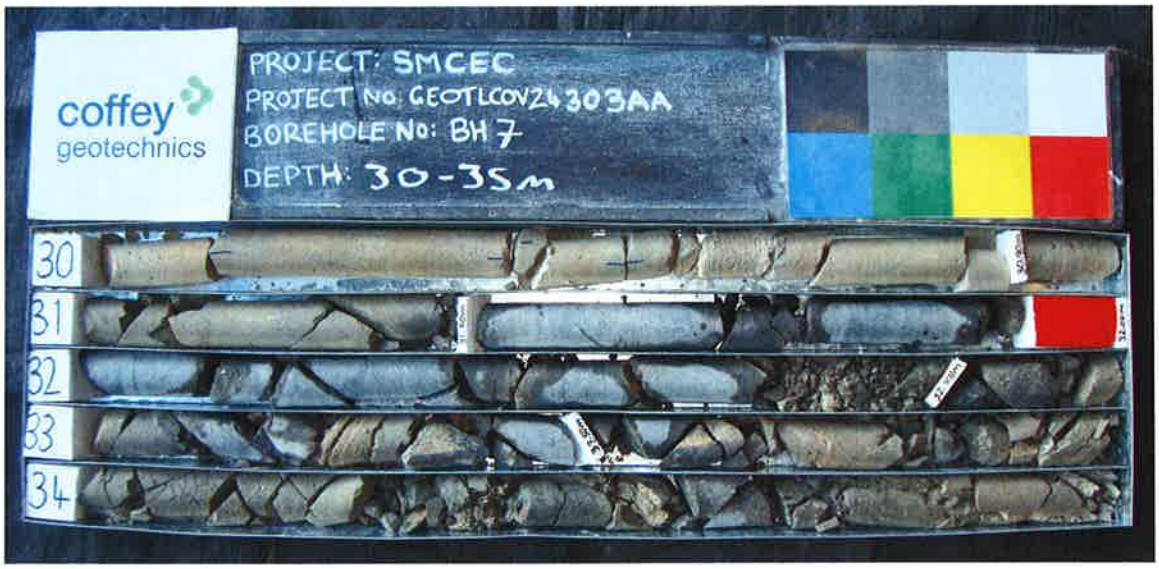
Coating
CN clean; SN stained; VN veneer; CO coating



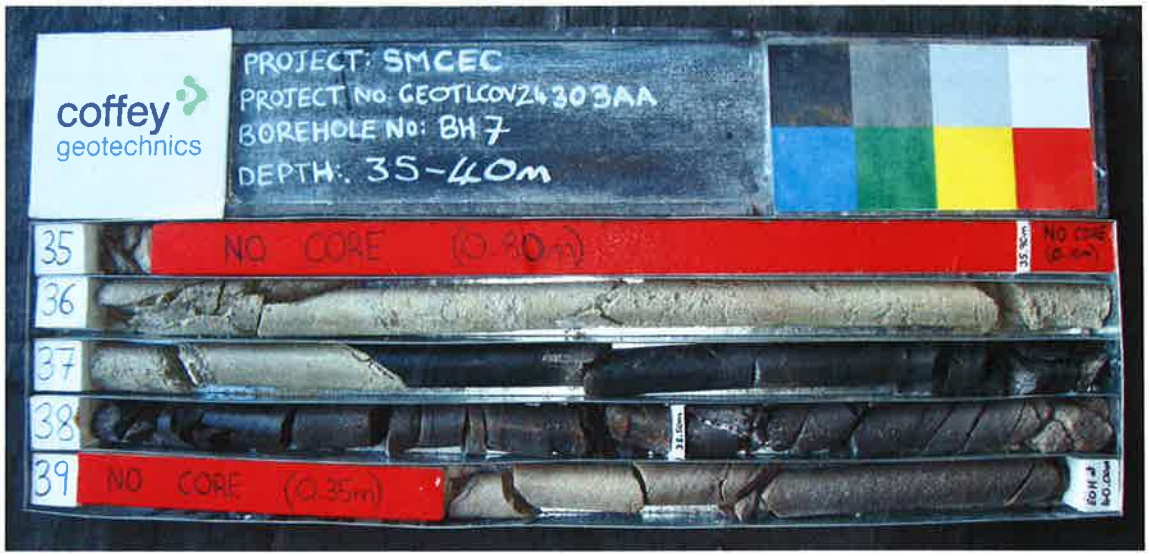


drawn	DB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Sydney Harbour Foreshore Authority
approved	SS		project:	Sydney International Convention and Entertainment Centre
date	23.6.11		title:	CORE PHOTOGRAPH
scale	NTS		project no.: GEOTLCOV24303AA	figure no.: BH 7 – 1 OF 3
original size	A4			





drawn	DB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Sydney Harbour Foreshore Authority
approved	SS		project:	Sydney International Convention and Entertainment Centre
date	23.6.11		title:	CORE PHOTOGRAPH
scale	NTS		project no.: GEOTLCOV24303AA	figure no.: BH7 – 2 OF 3
original size	A4			



drawn	DB	coffey geotechnics SPECIALISTS MANAGING THE EARTH	client:	Sydney Harbour Foreshore Authority
approved	SS		project:	Sydney International Convention and Entertainment Centre
date	23.6.11		title:	CORE PHOTOGRAPH
scale	NTS		project no.: GEOTLCOV24303AA	figure no.: BH7-3 OF 3
original size	A4			

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH8**

Sheet 1 of 1

Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***

Date started: ***14.6.2011***

Principal:

Date completed: ***14.6.2011***

Project: ***Sydney International Convention & Entertainment Centre***

Logged by: ***RC***

Borehole Location: ***Back of House of Sydney Entertainment Centre***

Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -90° | R.L. Surface: 2.5

hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa (100 200 300 400)	structure and additional observations
ADT		C			2	1			**FILL: ASPHALT:** Dark grey, 70mm thickness	D			PAVEMENT
									sandy gravel: medium grained, grey sand, fine grained, grey gravel	M			
									FILL: SAND: Fine to medium grained, dark brown, with some clay and fine gravel.				
									FILL: ASPHALT: Dark grey, 250mm.				
									FILL: CONCRETE: Pale grey, 410mm.	D			
NMLC			◄		1				1m - With some dark grey gravel aggregate and steel.				1m - TC Bit Refusal
									VOID:				
			►		0	2							
						3			Borehole BH8 terminated at 3m				BH8 was terminated at 3m, due to obstructions.
					-1	4							
					-2	5							
					-3	6							
					-4	7							
					-5	8							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil

C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH9**
Sheet 1 of 1
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***15.6.2011***

Principal:
Date completed: ***15.6.2011***

Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***RC***

Borehole Location: ***Back of House of Sydney Entertainment Centre***
Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -90° | R.L. Surface: 2.75
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADT			Not Observed		2				**FILL: ASPHALT:** Dark grey 70mm, overlying sandy gravel, medium grained, brown sand, dark grey gravel.	D			PAVEMENT
									FILL: SAND: Medium to coarse grained, yellow, with some fine to coarse sandstone gravel. 0.60m - Becoming brown, with some coarse dolerite gravel.				SUB BASE FILL PREVIOUS PAVEMENT
					1	1			**FILL: ASPHALT:** Grey. 150mm **FILL: CONCRETE:** Pale grey, 50mm. Borehole BH9 terminated at 0.85m				BH9 was terminated at shallow depth due to obstructions after many attempts.
					0	2							
					-1	3							
					-2	4							
					-3	5							
					-4	6							
					-5	7							
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH11**
Sheet 1 of 3
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority*** Date started: **1.6.2011**
Principal: Date completed: **1.6.2011**
Project: ***Sydney International Convention & Entertainment Centre*** Logged by: **RH**
Borehole Location: ***Sydney Entertainment Centre, Haymarket, NSW*** Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.9
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV		C		D					**FILL: SAND:** Medium to coarse grained, pale brown, with some quartz and shell fragments.	M			FILL
				D	2	1			**FILL: SAND:** Fine to coarse grained, dark brown, black, with some fine to medium lithic gravels and sandstone.				
									FILL: SANDSTONE BOULDER: Pale yellow and white				0.70m distinct bitumen odour 0.80m SPT1 moved from 1.0m to 1.50m due to sandstone boulder.
				SPT 13,5,3 N*=8	1	2			**FILL: SAND:** Fine to coarse grained, dark brown, black, with some fine to medium lithic and sandstone gravel. 1.40m colour becoming brown				
								CL	**Silty CLAY:** Low plasticity, pale grey mottled red.	W	F		ALLUVIUM
					0	3		SC	**Clayey SAND:** Fine to medium grained, dark grey, clay rich and sand rich layers throughout		MD		3.00m distinct organic odour
				U_{50}									
					-1	4		CH	**CLAY:** High plasticity, dark grey, brown.		S-F		
				SPT 3,4,10 N*=14	-2	5		CL	**Silty CLAY:** Low plasticity, pale grey mottled red and orange iron stained, with some red clay pockets throughout.		VSt		RESIDUAL SOIL
					-3	6			5.70m increased iron staining				
				SPT 7,8,9 N*=17									
					-4	7							
				SPT 3,5,30/120mm N*=R	-5	8			**SANDSTONE:** Extremely weathered, medium grained, pale grey, white, estimated to be very low strength.				WEATHERED BEDROCK

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud N nil
C casing

penetration 1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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

coffey geotechnics

Engineering Log - Borehole

Borehole No.	**BH11**
Sheet	2 of 3
Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**
Date started:	**1.6.2011**
Principal:	
Date completed:	**1.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**
Logged by:	**RH**
Borehole Location:	**Sydney Entertainment Centre, Haymarket, NSW**
Checked by:	**SS**

drill model and mounting:	Ausroc 4000 Truck	Easting:		slope:	-90°	R.L. Surface:	2.9
hole diameter:	100 mm	Northing		bearing:	N/A	datum:	mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
									Borehole BH11 continued as cored hole				
					-6	9							
					-7	10							
					-8	11							
					-9	12							
					-10	13							
					-11	14							
					-12	15							
					-13	16							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	dialube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil
C casing

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description
based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Borehole No.	**BH11**
Sheet	3 of 3
Project No:	**GEOTLCOV24303AA**

Engineering Log - Cored Borehole

Client:	*Sydney Harbour Foreshore Authority*	Date started:	*1.6.2011*
Principal:		Date completed:	*1.6.2011*
Project:	*Sydney International Convention & Entertainment Centre*	Logged by:	*RH*
Borehole Location:	*Sydney Entertainment Centre, Haymarket, NSW*	Checked by:	*SS*

drill model & mounting: Ausroc 4000 Truck | Easting: | slope: -90° | R.L. Surface: 2.9
hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

Drilling information | **Material substance** | **Rock mass defects**

Method: NMLC. Material description: rock type; grain characteristics, colour, structure, minor components. Continued from non-cored borehole. Is(50) MPa: D - diametral, A - axial.

RL	depth (metres)	material description	weathering & alteration	Is(50) MPa	RQD %	defect description (type, inclination, planarity, roughness, coating, thickness)
		CORE LOSS 0.30m			25	
		SANDSTONE: Medium to coarse grained, red brown, indistinct laminations at 5°-15°.	MW	D 0.39, A 0.37		
-6	9	8.7m colour change to orange brown				JT, 80°, PL, RO, CN
-7	10	9.8m colour change to pale grey and orange	SW		97	
				D 0.16, A 0.33		
-8	11					SM, 0°-10°, clay filled, 70mm
		SHALE: Pale grey, with distinct dark grey laminations at 10°-15°	FR	D 0.03, A 0		PT, 5°, CU, RO, CN
-9	12	SANDSTONE: Coarse grained, pale grey and orange, indistinct laminations at 5°-15°.	SW		50	PT, 5°-10°, PL, RO, Clay CO (1mm)
				D 0.47		JT, 85°, PL, RO, CN
		CORE LOSS 0.14m				
		SANDSTONE: Coarse grained, pale grey and orange, indistinct laminations at 5°-15°. 12.7m becoming fine grained	SW			SM, 5°-15°, clay filled, 80mm
-10	13					SM, 10°-20°, clay filled, 30mm
		13.3m becoming massivly bedded	FR	D 0.43		SM, 10°, clay filled, 70mm
-11	14					JT, 25°, PL, RO, CN
				D 2.15, A 1.14	82	SM, 0°-5°, clay filled, 30mm
-12	15	14.6m sandstone becoming indistinctly laminated with some iron staining	MW/SW			JT, 85°, PL, RO, FeSN
			SW/FR			PT, 5°, PL, RO, FeSN
				D 0.56, A 0.92		PT, 5°, PL, RO, FeSN
		15.45m laminations becoming increasingly distinct		A 1.46		PT, 5°-10°, PL, RO, CN
-13	16	BH11 terminated at 15.9m				PT, 5°-10°, PL, RO, CN

All defects are: JT, 0°-15°, PL, RO, CN, unless noted otherwise

method
DT diatube; AS auger screwing; AD auger drilling; RR roller/tricone; CB claw or blade bit; NMLC NMLC core; NQ, HQ, PQ wireline core

core-lift
casing used; barrel withdrawn

graphic log / core recovery
core recovered - graphic symbols indicate material; no core recovered

water
10/1/98 water level on date shown; water inflow; partial drill fluid loss; complete drill fluid loss; water pressure test result (lugeons) for depth interval shown

weathering
FR fresh; SW slightly weathered; MW moderately weathered; HW highly weathered; XW extremely weathered; DW distinctly weathered (covers MW and HW)

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

defect type
JT joint; PT parting; SM seam; SZ sheared zone; SS sheared surface; CS crushed seam

planarity
PL planar; CU curved; UN undulating; ST stepped; IR irregular

roughness
VR very rough; RO rough; SO smooth; SL slickensided

coating
CN clean; SN stained; VN veneer; CO coating

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH13**
Sheet 1 of 3
Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***
Date started: ***9.6.2011***
Principal:
Date completed: ***9.6.2011***
Project: ***Sydney International Convention & Entertainment Centre***
Logged by: ***RC***
Borehole Location: ***Sydney Entertainment Centre, Haymarket, NSW***
Checked by: ***SS***

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -90° | R.L. Surface: 3.15
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa (100 200 300 400)	structure and additional observations
ADT / ADV					3				**FILL:** Rectangular, red-brown concrete pavers (50mm) overlying medium grained pale brown sand (50mm)	D			PAVEMENT FILL
						1			**FILL: Sandy GRAVEL:** Medium to coarse grained, grey, fine to medium grained gravel. **FILL: Gravelly SAND:** Fine to medium grained, brown, fine to coarse angular to subrounded gravel.				
				SPT 10,8,2 N*=10	2					M			
						2			**FILL: SAND:** Medium grained, pale brown. 1.8m - With some brown gravel.	W			
			▼ 4m at 12pm on 9/6/2011		1			CH	**Silty CLAY:** High plasticity, dark grey.	>Wp	S		ALLUVIUM
				SPT 1,1,1 N*=2		3							
				U_{50}	0								3m - With sulfuric odour
						4					F/St		
				SPT 3,6,6 N*=12	-1								
						5		CL	**Sandy CLAY:** Low plasticity, pale grey mottled, orange-brown, fine to medium grained sand with some fine to medium grained subangular ironstone gravel.		St-VSt		
					-2								
				SPT 5,4,4 N*=8		6			6.5m - Becoming red.				
					-3								
						7			6.8m - One rootlet.				
				SPT 6,6,7 N*=13	-4								
						8							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	dialube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH13**
Sheet 2 of 3
Project No: **GEOTLCOV24303AA**

Client: **Sydney Harbour Foreshore Authority**
Date started: **9.6.2011**

Principal:
Date completed: **9.6.2011**

Project: **Sydney International Convention & Entertainment Centre**
Logged by: **RC**

Borehole Location: **Sydney Entertainment Centre, Haymarket, NSW**
Checked by: **SS**

drill model and mounting: Hydrapower Scout Truck | Easting: | slope: -90° | R.L. Surface: 3.15
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information							material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADV					-5			CL	**Sandy CLAY:** Low plasticity, pale grey mottled, orange-brown, fine to medium grained sand with some fine to medium grained subangular ironstone gravel. *(continued)*	>Wp	St-VSt	×	
				SPT 4,5,3 N*=8		9		SP	**SAND:** Medium to coarse grained, dark grey to grey, with some high plasticity clay.	W	L-MD		RESIDUAL SOIL?
					-6								WEATHERED ROCK
NMLC				SPT R,30/140,R N*=R	-7	10			Borehole BH13 continued as cored hole				SPT hammer bouncing
					-8	11							
					-9	12							
					-10	13							
					-11	14							
					-12	15							
						16							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil
C casing

penetration

1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description
based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Engineering Log - Cored Borehole

Borehole No.	BH13
Sheet	3 of 3
Project No:	GEOTLCOV24303AA
Client:	Sydney Harbour Foreshore Authority
Principal:	
Project:	Sydney International Convention & Entertainment Centre
Borehole Location:	Sydney Entertainment Centre, Haymarket, NSW
Date started:	9.6.2011
Date completed:	9.6.2011
Logged by:	RC
Checked by:	SS

drill model & mounting:	Hydrapower Scout Truck	Easting:		slope:	-90°
R.L. Surface:	3.15	hole diameter:	100 mm	Drilling fluid:	
Northing:		bearing:	N/A	datum:	mAHD

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

Columns: method, core-lift, water, RL, depth metres, graphic log, core recovery, material (rock type; grain characteristics, colour, structure, minor components), weathering alteration, estimated strength (VL L M H VH EH), $Is_{(50)}$ MPa (D- diametral, A- axial), RQD %, defect spacing mm (30 100 300 1000 3000), defect description (type, inclination, planarity, roughness, coating, thickness; particular, general)

RL: -5, -6, -7, -8, -9, -10, -11, -12
Depth (m): 9, 10, 11, 12, 13, 14, 15, 16

Water: Full water return

Depth	Material	Weathering	$Is_{(50)}$ (D / A)	RQD %	Defects
to ~10.3	Continued from non-cored borehole				
~10.3	NO CORE 0.70m				
~11.0	SANDSTONE: Medium to coarse grained, pale grey mottled orange-brown, indistinctly bedded at 5°-15°	XW SW		0	pp= 100kPa PT, 10°, PL, RO, UN, Clay JT, 80°, PL, RO, VN, Clay PT, 20°, PL, RO, VN, Clay JT, 30°, PL, RO, VN, Clay JT, 80°, UN, RO, VN, Clay JT, 75, PL, RO, VN, Clay SM, 35°, PL, RO, Clay, 50mm, 50kPa JT, 80°, UN, RO, SN
~11.7		SW-MW	1.38 / 2.01		JT, 75°, PL, RO, CN JT, 85°, PL, RO, VN PT, 15°, PL, RO, SN JT, 80°, UN, RO, VN PT, 15°, PL, RO, CO, Sandy Clay, 2mm
	12.40m to 13.0m - Distinctly bedded		1.04 / 1.18	47	PT, 15°, PL, RO, SN PT, 15°, PL, RO, SN SM, 10°, PL, RO, Sandy Clay, 12mm, pp = 20kPa PT, 5°, PL, RO, SN JT, 85°, UN, RO, SN JT, 65°-85°, CU, RO, SN PT, 5°, PL, RO, SN PT, 10°, PL, RO, SN PT, 10°, PL, RO, CO, Sandy Clay, 1mm PT, 15°, IR, VR, CO, fine gravel
	14.43m to 14.50m - with some fine grained quartz gravel		1.53 / 2.25		
14.7	BH13 terminated at 14.7m				

method
DT diatube
AS auger screwing
AD auger drilling
RR roller/tricone
CB claw or blade bit
NMLC NMLC core
NQ, HQ, PQ wireline core

core-lift
casing used
barrel withdrawn

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

water
10/1/98 water level on date shown
water inflow
partial drill fluid loss
complete drill fluid loss
25 water pressure test result (lugeons) for depth interval shown

weathering
FR fresh
SW slightly weathered
MW moderately weathered
HW highly weathered
XW extremely weathered
DW distinctly weathered (covers MW and HW)

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

defect type
JT joint
PT parting
SM seam
SZ sheared zone
SS sheared surface
CS crushed seam

planarity
PL planar
CU curved
UN undulating
ST stepped
IR irregular

roughness
VR very rough
RO rough
SO smooth
SL slickensided

coating
CN clean
SN stained
VN veneer
CO coating

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH17**

Sheet 1 of 4

Project No: **GEOTLCOV24303AA**

Client: ***Sydney Harbour Foreshore Authority***

Date started: ***16.6.2011***

Principal:

Date completed: ***16.6.2011***

Project: ***Sydney International Convention & Entertainment Centre***

Logged by: ***LJG***

Borehole Location: ***Harbour Street, Haymarket, NSW***

Checked by: ***SS***

drill model and mounting: Edson 3000 Truck | Easting: | slope: -90° | R.L. Surface: 3.2

hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADT		C			3	1			**FILL: BRICK PAVERS:** Brown, 0.08m **FILL: Clayey Gravelly SAND:** Medium to coarse grained, brown, grey, fine gravel, medium plasticity clay.	D			FILL
				SPT 6,7,4 N*=11	2	2			**FILL: SAND:** Coarse grained, grey, brown, yellow, red mottled, with some fine sandstone gravel, trace of clay.				
			►		1				**FILL: Silty CLAY:** Low plasticity, black, with some organic material, trace of sand and fine gravel.	W			
				SPT 2,0,0 N*=0	0	3			3.10m - With some sand.				
				SPT 2,3,5 N*=8	-1	4		CH	**CLAY:** High plasticity, red, brown, grey, trace of fine grained ironstone gravel.	M	St-VSt	× ×	ALLUVIUM
					-2	5		CH	**CLAY:** High plasticity, grey, red, brown, yellow, with some coarse sand, trace of fine to medium grained sandstone and ironstone gravel.		St-VSt	× ×	
				SPT 2,5,6 N*=11	-3	6		CL	**Gravelly CLAY:** Low plasticity, brown, grey, red, fine angular sandstone and ironstone gravel.	W			
				SPT 4,7,8 N*=15	-4	7		CH	**CLAY:** High plasticity, pale grey, red brown mottled, trace of sand.			× ×	
						8							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil

C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **BH17**
Sheet 2 of 4
Project No: **GEOTLCOV24303AA**

Client: **Sydney Harbour Foreshore Authority**
Date started: **16.6.2011**
Principal:
Date completed: **16.6.2011**
Project: **Sydney International Convention & Entertainment Centre**
Logged by: **LJG**
Borehole Location: **Harbour Street, Haymarket, NSW**
Checked by: **SS**

drill model and mounting: Edson 3000 Truck | Easting: | slope: -90° | R.L. Surface: 3.2
hole diameter: 100 mm | Northing | bearing: N/A | datum: mAHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
ADT		C			-5			CH	**CLAY:** High plasticity, pale grey, red brown mottled, trace of sand. *(continued)* 8.10m - With some coarse sand.	W	St-VSt		
				SPT 4,12,10 N*=22		9		SC	**Clayey SAND:** Coarse grained, pale grey, grey.		MD		RESIDUAL SOIL
					-6			CH	**Sandy CLAY:** High plasticity clay, grey, pale grey, coarse sand.		St-VSt	×	
				SPT 4,16 N*=R	-7	10			**SANDSTONE:** Extremely weathered, coarse grained, pale grey, remoulds to a sandy clay. 10.30m - Highly weathered.			×	WEATHERED BEDROCK
									Borehole BH17 continued as cored hole				
					-8	11							
					-9	12							
					-10	13							
					-11	14							
					-12	15							
						16							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix
e.g. ADT

support
M mud
C casing
N nil

penetration
1 2 3 4
no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

consistency/density index

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

coffey geotechnics

Engineering Log - Core Borehole

		Borehole No.	**BH17**
		Sheet	3 of 4
		Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**	Date started:	**16.6.2011**
Principal:		Date completed:	**16.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**	Logged by:	**LJG**
Borehole Location:	**Harbour Street, Haymarket, NSW**	Checked by:	**SS**

drill model & mounting: Edson 3000 Truck | Easting: | slope: -90° | R.L. Surface: 3.2

hole diameter: 100 mm | Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

Drilling Information | **Material Description** | **Rock Mass Defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
NMLC		Not monitored	-8	11		Continued from non-cored borehole 0.30m A Coarse grained, pale grey, with some darker grey laminations, indistinctly bedded at 10°-25°, with some black carbonaceous flecks.	FR		D 0.42 A 0.39	13		XW, SM, Sand filled, multiple PT, 250mm PT, 10°, PL, RO, VN PT, 20°, PL, RO, Clay, VN PT, 10°, PL, RO, VN PT, 20°, PL, RO, VN PT, 10°, PL, RO, VN
			-9	12		11.89m - Fine grained rounded gravel inclusions. 0.05m A Coarse grained, pale grey, bedded at 10°-20°, with some black carbonaceous flecks. 12.50m - Slightly iron stained yellow, red, orange.	FR SW		D 1.51 A 1.38	85		PT, 10°, PL, RO, VN PT, 10°, PL, RO, VN PT, 10°, PL, RO, VN PT, 10°, PL, RO, VN SM, Clay and fine gravel filled 10mm PT, 15°, PL, RO, VN PT, 10°, PL, RO, VN
			-10	13								
			-11	14					D 2.64 A 2.08			Wedge, 15°-25°, PL, RO, CN
			-12	15					D 1.23 A 2.19			PT, 25°, PL, RO, VN-CN
			-13	16		15.30m - Indistinctly bedded 20°-30°. 15.50m - Indistinctly cross-bedded 40°. 15.56m - Indistinctly bedded 10°-20°. 15.75m - Thinly laminated 0°-10°. 15.87m - Indistinctly bedded 10°-25°.	SW-FR			79		PT, 0°, PL, RO, Fe SN PT, 0°, PL, RO, CN JT, 45°, PL, RO, VN PT, 0°, PL, RO, VN
			-14	17		16.40m - Heavily iron stained. 16.80m - Slightly iron stained. 16.96m - Heavily iron stained, medium grained. 17.05m - Slightly iron stained, coarse grained.	MW-SW		D 1.02 A 0.97			PT, 10°, PL, RO, SN JT, 5°, PL, RO, SN HFZ 50mm JT, 85°, PL, RO, SN, 200mm PT, 10°, PL, RO, SN PT, 10°, PL, RO, SN PT, 10°, PL, RO, SN PT, 25°, PL, RO, SN PT, 15°, PL, RO, SN
			-15	18		0.05m A Coarse grained, pale grey (stained red orange brown to 17.58m), with some black and dark grey laminations. Indistinctly bedded at 10°-30°, with some black carbonaceous flecks and some fine gravel inclusions.	SW FR		D 2.67 A 2.17	96		PTx2, 15°, PL, RO, SN, 10mm PT, 25°, PL, RO, black carbonaceous SN

All defects are PT, 10°-25°, PL, RO, CN unless noted

Method
- DT diatube
- AS auger screwing
- AD auger drilling
- RR roller/tricone
- CB claw or blade bit
- NMLC NMLC core
- NQ, HQ, PQ wireline core

Core Loss
- casing used
- barrel withdrawn

Graphic Log / Core Recovery
- core recovered - graphic symbols indicate material
- no core recovered

Water
- 10/1/98 water level on date shown
- water inflow
- partial drill fluid fluid loss
- complete drill fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

Weathering
- FR fresh
- SW slightly weathered
- MW moderately weathered
- HW highly weathered
- XW extremely weathered
- DW distinctly weathered (covers MW and HW)

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

Defect Description
- JT joint
- PT parting
- SM seam
- SZ sheared zone
- SS sheared surface
- CS crushed seam

Roughness
- VR very rough
- RO rough
- SO smooth
- SL slickensided

Orientation
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR irregular

Coating
- CN clean
- SN stained
- VN veneer
- CO coating

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Engineering Log – Core Borehole

Borehole No.	**BH17**
Sheet	4 of 4
Project No:	**GEOTLCOV24303AA**
Client:	**Sydney Harbour Foreshore Authority**
Date started:	**16.6.2011**
Principal:	
Date completed:	**16.6.2011**
Project:	**Sydney International Convention & Entertainment Centre**
Logged by:	**LJG**
Borehole Location:	**Harbour Street, Haymarket, NSW**
Checked by:	**SS**

drill model & mounting: Edson 3000 Truck | Easting: | slope: -90° | R.L. Surface: 3.2

hole diameter: 100 mm Drilling fluid: | Northing: | bearing: N/A | datum: mAHD

Drilling information | **Core description** | **Core defects**

method	core-lift	water	RL	depth metres	graphic log / core recovery	rock type; grain characteristics, colour, structure, minor components	weathering / alteration	estimated strength (VL L M H VH EH)	$Is_{(50)}$ MPa D-diametral A-axial	RQD %	defect spacing mm (30 100 300 1000 3000)	defect description: type, inclination, planarity, roughness, coating, thickness (particular / general)
NMLC			-16	19		Coarse grained, pale grey (stained red orange brown to 17.58m), with some black and dark grey laminations. Indistinctly bedded at 10°-30°, with some black carbonaceous flecks and some fine gravel inclusions *(continued)* 19.20m - Heavily iron stained 40mm	FR			96		SM, 0°, PL, RO, Fe SN Clay CO 10mm
			-17	20		19.95m - Trace of coal			D 3.36 A 3.28			PT, 10°, PL, RO, SN, Black PT, 10°, PL, VR, SN Black
						0.10m						
			-18	21		Medium grained, grey, indistinctly bedded 10°, with black carbonaceous flecks.	FR			100		PT, 0°, PL, RO, CN PT, 0°, PL, RO, CN
				22		Coarse grained, pale grey, with grey laminations indistinctly bedded at 20°, black carbonaceous flecks.			D 2.13 A 1.94			
			-19			BH17 terminated at 22m						
			-20	23								
			-21	24								
			-22	25								
			-23	26								

All defects are PT, 10°-25°, PL, RO, CN unless noted

Drilling
- DT diatube
- AS auger screwing
- AD auger drilling
- RR roller/tricone
- CB claw or blade bit
- NMLC NMLC core
- NQ, HQ, PQ wireline core

Core lifting
- casing used
- barrel withdrawn

Core recovery
- core recovered - graphic symbols indicate material
- no core recovered

Water
- 10/1/98 water level on date shown
- water inflow
- partial drill fluid loss
- complete drill fluid loss
- 25 water pressure test result (lugeons) for depth interval shown

Weathering
- FR fresh
- SW slightly weathered
- MW moderately weathered
- HW highly weathered
- XW extremely weathered
- DW distinctly weathered (covers MW and HW)

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

Defect type
- JT joint
- PT parting
- SM seam
- SZ sheared zone
- SS sheared surface
- CS crushed seam

Roughness
- VR very rough
- RO rough
- SO smooth
- SL slickensided

Inclination
- PL planar
- CU curved
- UN undulating
- ST stepped
- IR irregular

Coating
- CN clean
- SN stained
- VN veneer
- CO coating

Form GEO 5.5 Issue 3 Rev. 3

CORED BOREHOLE GEOTLCOV24303AA_REV2.GPJ COFFEY.GDT 4.8.11

Coffey & Partners Pty. Ltd.

engineering log borehole

COFFEY

borehole no.: HY 45
sheet 1 of 3

CO-ORDINATES 8657.7 E, 49763.3 N

office and job no: S7769/1

Client: GUTTERIDGE HASKINS & DAVEY PTY. LTD.

hole commenced: 25/3/86
hole completed: 25/3/86
supervised by: M.A.B.
checked by: P.K.W.

project: DARLING HARBOUR LIGHT MONORAIL - PART A
borehole location: HAY STREET CH. 1222m approx.

drill model and mounting: MOBILE TRUCK
hole diameter: 100 mm
slope: 90 deg.
bearing: - deg.
R.L. surface: 3.14 m
datum: A.H.D.

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency/ density index	hand penetrometer 100 200 300 400 kPa	structure and additional observations
A D V			25/3/86 NTL		0		SP	SAND, ranging from coarse to medium grained, black	M	S		FILL
				D	1		SC	CLAYEY SAND, fine to medium grained, dark brown, low to medium plasticity clay (≅50-40%)	M	L S/F		ALLUVIAL
				D	2		CL	SANDY CLAY, low plasticity grading to CLAY, dark grey.	M >PL	F		
					3		CL	CLAY, medium plasticity, light brown & light grey.	M	St		
					4		SP	SAND, medium grained, brown				
					5		CH	CLAY, high plasticity, light brown & light grey Red streaks occurring at 6m - predominant at 6.4m.	M >PL	St		
				D	6							
					7							
					8		SC	CLAYEY SAND, medium-fine grained, light grey.	W	F		Residual

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
*bit shown by suffix:
B blank bit
V "V" bit
T TC bit
e.g. ADT

support C casing, M mud
penetration 1 2 3 — no resistance, ranging to refusal
water 10 Jan 76 water level on date shown; water outflow; water inflow

notes
U50 undisturbed sample 50 mm diameter
D disturbed sample
N standard penetration test: figure = result
N* SPT + sample
Nc cone penetrometer

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet

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

T83-001

Coffey & Partners Pty. Ltd.

engineering log borehole

COFFEY

borehole no.: HY 45
sheet 2 of 3

office and job no: S7769/1

CO-ORDINATES 8657.7 E, 49763.3 N

Client: GUTTERIDGE HASKINS & DAVEY PTY. LTD.
project: DARLING HARBOUR LIGHT MONORAIL - PART A
borehole location: HAY STREET. CH. 1222m approx.

hole commenced: 25/3/86
hole completed: 25/3/86
supervised by: M.A.B.
checked by: P.K.W.

drill model and mounting: MOBILE TRUCK
hole diameter: 100 mm
slope: 90 deg.
bearing: - deg.
R.L. surface: 3.14 m
datum: A.H.D.

method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. / depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components	moisture condition	consistency/ density index	hand penetrometer kPa 100 200 300 400	structure and additional observations
AD V			NIL		8		SL	Clayey Sand, as above				Residual
					9			Coring commenced @ 8.4m Continued on sheet 3 of 3				Near V-Bit refusal
					10							
					11							
					12							
					13							
					14							
					15							

method
AS auger screwing*
AD auger drilling*
R roller/tricone
W washbore
CT cable tool
*bit shown by suffix:
B blank bit
V "V" bit
T TC bit
e.g. ADT

support C casing, M mud
penetration 1 2 3 — no resistance, ranging to refusal
water
10 Jan 78 water level on date shown
water outflow
water inflow

notes
U50 undisturbed sample 50 mm diameter
D disturbed sample
N standard penetration test: figure = result
N* SPT + sample
Nc cone penetrometer

classification symbols and soil description based on unified classification system

moisture
D dry
M moist
W wet

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

T83-001

Coffey & Partners Pty. Ltd.
Incorporated in Queensland.

engineering log — cored borehole

COFFEY

borehole no: HY 45
sheet 3 of 3

CO-ORD 8657.7E , 49763.3 N.

office and job no: S7769/1

client:	GUTTERIDGE HASKINS & DAVEY PTY. LTD.	hole commenced:	25/3/86
principal:		hole completed:	25/3/86
project:	DARLING HARBOUR LIGHT MONORAIL - PART A	supervised by:	M.A.B.
borehole location:	HAY STREET - CH. 1223m approx.	log checked by:	P.K.W.
drill model and mounting:	MOBILE TRUCK	slope: 90 deg.	R.L. surface: m
barrel type and length:		fluid WATER bearing: - deg.	datum: A.H.D.

drilling information					rock substance					rock mass defects	
method	case-lift	water	*CLASS	depth metres	graphic log core loss	substance description: rock type; grain characteristics, colour, structure, minor components	weathering	Est. Strength EL VL L M H VH EH	Is(50) MPa	defect spacing mm 30 100 300 1000 3000	defect description: thickness, type, inclination, planarity, roughness, coating — particular / general
				8		See non cored borehole log. Coring commenced at 8.4m.					
NMLC						CORE LOSS 0.6m.					
			SST III/IV	9		SANDSTONE, medium to coarse grained, brown with red staining, massive to very poorly developed bedding at 5 to 10°.	MW -HW		D=0.17 A=0.21		Clayey Sand 15mm
				10					D=0.47 A=0.95		Sugary sandstone 30mm parting with clay coating.
				11		As above, becoming light grey to brown with red staining.	MW		D=1.7 A=1.3		Joint 70°,planar,rough,clean. Sandy clay pocket,20mm. Sugary Sandstone, 20mm.
						CORE LOSS 0.38m					
			SST V	12		SANDSTONE, as above.	SW		D=0.75 A=0.7		Sandy clay, 40mm, slightly carbonaceous.
						SANDSTONE, fine to medium grained, light grey, massive to poorly developed bedding at 20°, very thin, black lamination.	EW		D=0.33 A=0.28		Completely decomposed to sand and clayey sand, 160mm.
			SST II	13		As Above, massive.	SW Fr		D=1.8 A=3.1		Joint 85-90°,planar,rough & irregular, clean.
				14		HY 45 terminated at 13.88m.					

Defects are drill breaks or bedding partings, unless specified otherwise.

KEY

method
- AS auger screwing
- AD auger drilling
- R roller/tricone
- W washbore
- NMLC NMLC core drilling
- NQ,HQ Wireline core drilling
- * REFER TO TEXT

case-lift
- casing used
- barrel withdrawn
- 10 Oct. 63 water level date shown
- water inflow
- partial drilling water loss
- complete drilling water loss

pressure test
- (350) maximum effective pressure in test (kPa)

graphic log/core loss
- core recovered (hatching indicates material)
- no core recovered

weathering
- Fr - fresh
- SW — slightly weathered
- MW — moderately weathered
- HW — highly weathered
- EW — extremely weathered

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

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Engineering Log - Borehole

Borehole No.	**NBH27**
Sheet	1 of 1
Project No:	**GEOTLCOV24303AC**
Client:	**Infrastructure NSW**
Date started:	**27.4.2012**
Principal:	
Date completed:	**27.4.2012**
Project:	**SICEEP**
Logged by:	**ACM**
Borehole Location:	**See Figure 1**
Checked by:	**DS**

drill model and mounting: XP60 Truck | Easting: | slope: -90° | R.L. Surface: 2.7

hole diameter: 100 mm | Northing | bearing: N/A | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetrometer kPa 100 200 300 400	structure and additional observations
ADT				E					**ASPHALT:** (0.15m)	D			PAVEMENT
				E	2	1			**FILL: Gravelly SAND:** Fine grained, dark brown, mottled dark grey, fine to medium grained, subangular to angular gravel	M			FILL No Odour
									CONCRETE: (0.4m)	D			CONCRETE
				SPT 2,2,4 N*=6	1	2		CL	**CLAY:** Medium plasticity, pale brown, mottled orange-brown, red-brown	<Wp	F		ALLUVIUM No Odour, PID = 2.1ppm
					0	3		SP	**SAND:** Coarse grained, dark grey, mottled black, with some fine grained, subangular gravel	M	L		
			▼	SPT 2,1,2 N*=3	-1	4		SC	**Clayey SAND:** Fine to medium grained, dark grey, mottled black, with some organics	W	VL		No odour, PID = 2.8ppm Organic Odour
				SPT 3,3,3 N*=6	-2	5		CH	**CLAY:** Medium to high plasticity, pale brown, mottled dark grey	>Wp	St		No Odour, PID = 0.4ppm
					-3	6			Borehole NBH27 terminated at 5m				
					-4	7							
					-5	8							

method

AS	auger screwing*
AD	auger drilling*
RR	roller/tricone
W	washbore
CT	cable tool
HA	hand auger
DT	diatube
B	blank bit
V	V bit
T	TC bit

*bit shown by suffix e.g. ADT

support

M mud N nil
C casing

penetration 1 2 3 4 — no resistance ranging to refusal

water

▼ 10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests

U_{50}	undisturbed sample 50mm diameter
U_{63}	undisturbed sample 63mm diameter
D	disturbed sample
N	standard penetration test (SPT)
N*	SPT - sample recovered
Nc	SPT with solid cone
V	vane shear (kPa)
P	pressuremeter
Bs	bulk sample
E	environmental sample
R	refusal

classification symbols and soil description

based on unified classification system

moisture

D	dry
M	moist
W	wet
Wp	plastic limit
W_L	liquid limit

consistency/density index

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

coffey geotechnics

Engineering Log - Borehole

Borehole No. **NBH30**
Sheet 1 of 1
Project No: **GEOTLCOV24303AC**

Client: ***Infrastructure NSW***
Date started: ***27.4.2012***

Principal:
Date completed: ***27.4.2012***

Project: ***SICEEP***
Logged by: ***ACM***

Borehole Location: ***See Figure 1***
Checked by: ***DS***

drill model and mounting: XP60 Truck | Easting: | slope: -90° | R.L. Surface: 2.7
hole diameter: 100 mm | Northing | bearing: N/A | datum: AHD

drilling information | **material substance**

method	penetration 1 2 3	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material: soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro-meter kPa 100 200 300 400	structure and additional observations
HA		N		E					**ASPHALTIC CONCRETE:** (0.1m)	D			PAVEMENT
									FILL: Clayey GRAVEL: Medium to coarse grained, subangular to angular sandstone, pale brown, medium plasticity clay fines	M			FILL No Odour, PID = 0.3ppm
				E				CL	**FILL: SAND:** Fine to medium grained, pale grey, mottled pale brown, cement stablized	D	VS		ALLUVIUM
					2				**Sandy CLAY:** Medium to low plasticity, pale brown, mottled orange-brown, fine to medium grained sand	<Wp			No Odour, Dup 12 + Dup 12a
						1							
ADT				SPT 1,0,0 N*=0	1			CH	**Sandy CLAY:** Medium to high plasticity, pale brown, mottled red-brown, medium to coarse grained sand				No Odour, PID = 0.9ppm
						2							
					0			CL	**Silty CLAY:** Medium plasticity, dark grey, mottled black		F		
						3				>Wp			No Odour, PID = 1.7ppm
				SPT 1,3,1 N*=4	-1								
						4							
				SPT 0,0,1 N*=1	-2			CL	**CLAY:** Medium plasticity, pale grey		VS		No Odour, PID = 1.8ppm
						5							
					-3				Borehole NBH30 terminated at 5m				
						6							
					-4								
						7							
					-5								
						8							

method
AS auger screwing*
AD auger drilling*
RR roller/tricone
W washbore
CT cable tool
HA hand auger
DT diatube
B blank bit
V V bit
T TC bit
*bit shown by suffix e.g. ADT

support
M mud N nil
C casing

penetration
1 2 3 4 no resistance ranging to refusal

water
10/1/98 water level on date shown
water inflow
water outflow

notes, samples, tests
U_{50} undisturbed sample 50mm diameter
U_{63} undisturbed sample 63mm diameter
D disturbed sample
N standard penetration test (SPT)
N* SPT - sample recovered
Nc SPT with solid cone
V vane shear (kPa)
P pressuremeter
Bs bulk sample
E environmental sample
R refusal

classification symbols and soil description
based on unified classification system

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

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