

Appendix B

Borehole Logs

**Overarching Remedial Action Plan
Haymarket Precinct, Darling Harbour, Sydney NSW**

Borehole No. **BH1**

Sheet 1 of 3

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **7.6.2011**

Principal:

Date completed: **7.6.2011**

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

Logged by: **LJG**

Borehole Location: **Darling Drive, Haymarket, NSW**

Checked by: **SS**

drill model and mounting: Hydrapower Scout Truck Easting: slope: -90° R.L. Surface: 3.75
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information						material substance										
method	penetration			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- kPa	meter	structure and additional observations
	1	2	3													
ADT				C	C	E+0.5ppm					FILL: BRICK PAVERS: 0.08m. FILL: SAND: Medium grained, brown, with some roots, 0.02m. FILL: CONCRETE: Grey, 0.50m.	D				PAVEMENT
						E+0ppm	3	1			FILL: SAND: Coarse grained, red, brown, grey, trace of clay and fine to medium sandstone and brick gravel.	D				FILL
						SPT 7,11,10 N*=21										
						E+0ppm	2	2			FILL: Clayey SAND: Coarse grained, brown, low plasticity clay, with some medium grained sand, trace of shells, fibers and fine grained rounded sandstone and brick gravel.					
ADV						SPT 1,1,2 N*=3	1	3								
						E+0ppm	3			CL	Sandy CLAY: Low to medium plasticity clay, dark brown, coarse grained sand, with some shells.	M	F			POSSIBLY FILL?
							0	4			4.00m Band of red partially cemented sand and ironstone gravel.	W				
						SPT 3,2,1 N*=3				SC	Clayey SAND: Medium to coarse grained, brown, red, orange mottled, low to medium plasticity clay, with some shells.		L			ESTUARINE/ALLUVIUM
							-1	5		SW	SAND: Medium to coarse grained, brown, grey, red, with some clay and shells.					
						SPT 1,2,4 N*=6	-2	6		SP	SAND: Coarse grained, pale grey to grey, trace of clay and shells.		L-MD			RESIDUAL SOIL
							-3	7								
						SPT 8/70mm N*=R	-4	8			SANDSTONE: Extremely weathered, coarse grained, grey, red, brown, estimated to be low strength, remoulds to a sand. Borehole BH1 continued as cored hole					WEATHERED BEDROCK

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud	U ₅₀ undisturbed sample 50mm diameter	based on unified classification system	VS very soft
AD auger drilling*	C casing	U ₆₃ undisturbed sample 63mm diameter		S soft
RR roller/tricone	penetration	D disturbed sample		F firm
W washbore	1 2 3 4	N standard penetration test (SPT)		St stiff
CT cable tool		N* SPT - sample recovered		VSt very stiff
HA hand auger		Nc SPT with solid cone		H hard
DT diatube		V vane shear (kPa)		Fb friable
B blank bit		P pressuremeter		VL very loose
V V bit		Bs bulk sample		L loose
T TC bit		E environmental sample		MD medium dense
*bit shown by suffix e.g. ADT		R refusal		D dense
				VD very dense

Borehole No. **BH10**

Sheet 1 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **1.6.2011**

Principal:

Date completed: **10.6.2011**

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

Logged by: **LJG**

Borehole Location: **Little Pier Street, Haymarket, NSW**

Checked by: **SS**

drill model and mounting:	Ausroc 4000 Truck	Easting:	slope: -90°	R.L. Surface:	3
hole diameter:	100 mm	Northing	bearing: N/A	datum:	AHD

drilling information						material substance										
method	penetration			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	structure and additional observations	
	1	2	3													
ADT				C	C						BRICK PAVERS: FILL: Gravelly SAND: Medium to coarse, brown, fine to medium angular gravel.	D			PAVEMENT	
											CONCRETE: 0.20m					
											FILL: Clayey SAND: Coarse grained, brown	D			FILL	
											FILL: Sandy CLAY: Medium plasticity, red-brown/pale grey.					
						SPT 8/90mm N*=R	2	1			1.09m - With some asphalt gravel.				1m - Slight odour, tar and asphalt. 1.09m - Strong odour	
							1	2				M				
													D			
							SPT 3,2,3 N*=5	0	3			FILL: Silty CLAY: Low to medium plasticity, grey, brown, trace of sand. FILL: CLAY: Medium to high plasticity, red, brown, pale grey, orange mottled, with some fine gravel.				
WB										SM	Silty SAND: Medium to coarse grained, black, with some shells, trace of fine gravel.	W	VL		ESTUARINE	
						SPT 1,0,0 N*=0	-1	4		SC	Clayey SAND: Coarse grained, brown, medium to high plasticity clay.				ESTUARINE	

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH10**

Engineering Log - Borehole

Sheet 2 of 4
Office Job No.: **GEOTLCOV24303AA**

Client: **Sydney Harbour Foreshore Authority**

Date started: **1.6.2011**

Principal:

Date completed: **10.6.2011**

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

Logged by: **LJG**

Borehole Location: **Little Pier Street, Haymarket, NSW**

Checked by: **SS**

drill model and mounting:	Ausroc 4000 Truck	Easting:	slope: -90°	R.L. Surface:	3
hole diameter:	100 mm	Northing	bearing: N/A	datum:	AHD

drilling information						material substance													
method	penetration			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	structure and additional observations				
	1	2	3																
WB						SPT 6,7,9 N*=16				CH	CLAY: High plasticity, red brown, grey, with some coarse sand. (continued)	W	VSt	X X X X					
							-6	9		CH						CLAY: High plasticity, red, brown, dark grey, orange mottled, trace of ironstone gravel and fine sand.	St/VSt		
						SPT 5,5,7 N*=12		-7		10						SC	Clayey SAND: Coarse grained, grey, low to medium clay.	MD	RESIDUAL SOIL
								-8		11									
								-9	12		Borehole BH10 continued as cored hole								
								-10	13										
								-11	14										
								-12	15										
								-13	16										

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH11**

Engineering Log - Borehole

Sheet 1 of 3
Office Job 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: AHD

drilling information						material substance									
method	penetration			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	structure and additional observations
	1	2	3												
ADV				C	C	D E+0ppm					FILL: SAND: Medium to coarse grained, pale brown, with some quartz and shell fragments.	M			FILL
						E+0ppm					FILL: SAND: Fine to coarse grained, dark brown, black, with some fine to medium lithic gravels and sandstone.				0.70m distinct bitumen odour 0.80m SPT1 moved from 1.0m to 1.50m due to sandstone boulder.
						D	2				FILL: SANDSTONE BOULDER: Pale yellow and white				
						E+1.1ppm	1				FILL: SAND: Fine to coarse grained, dark brown, black, with some fine to medium lithic gravels and sandstone. 1.40m colour becoming brown				
						SPT 13,5,3 N*=8	1								
						E+0.3ppm	2			CL	Silty CLAY: Low plasticity, pale grey mottled red.	W	F		ALLUVIUM
										SC	Clayey SAND: Fine to medium grained, dark grey, clay rich and sand rich layers throughout		MD		3.00m distinct organic odour
							0								
						U ₅₀									
						E+0.6ppm									
							-1			CH	CLAY: High plasticity, dark grey, brown.		S-F		RESIDUAL SOIL
						SPT 3,4,10 N*=14	-2			CL	Silty CLAY: Low plasticity, pale grey mottled red and orange iron stained, with some red clay pockets throughout.		VSt	X X X X	
											5.70m increased iron staining				
						SPT 7,8,9 N*=17	-3								
							-4							X X X	WEATHERED BEDROCK
						SPT 3,5,30/120mm N*=R	-5				SANDSTONE: Extremely weathered, medium grained, pale grey, white, estimated to be very low strength.				
							8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T	M mud C casing penetration 1 2 3 4 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH11**

Engineering Log - Borehole

Sheet 2 of 3
Office Job 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: AHD

drilling information						material substance												
method	penetration			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				structure and additional observations
	1	2	3											100 kPa	200 kPa	300 kPa	400 kPa	
											Borehole BH11 continued as cored hole							
								-6	9									
								-7	10									
								-8	11									
								-9	12									
								-10	13									
								-11	14									
								-12	15									
								-13	16									

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud N nil	U ₅₀ undisturbed sample 50mm diameter	based on unified classification system	VS very soft
AD auger drilling*	C casing	U ₆₃ undisturbed sample 63mm diameter		S soft
RR roller/tricone	penetration 1 2 3 4	D disturbed sample		F firm
W washbore	 no resistance ranging to refusal	N standard penetration test (SPT)		St stiff
CT cable tool	water	N* SPT - sample recovered		VSt very stiff
HA hand auger	10/1/98 water level on date shown	Nc SPT with solid cone		H hard
DT diatube		V vane shear (kPa)	moisture	Fb friable
B blank bit		P pressuremeter	D dry	VL very loose
V V bit		Bs bulk sample	M moist	L loose
T TC bit		E environmental sample	W wet	MD medium dense
*bit shown by suffix e.g. ADT		R refusal	Wp plastic limit	D dense
			WL liquid limit	VD very dense

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **10.6.2011**

Principal:

Date completed: **10.6.2011**

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:	2.8
hole diameter:	100 mm	Northing	bearing: N/A	datum:	AHD

drilling information					material substance				
method	penetration	support	water	notes samples, tests, etc	depth metres	graphic log	classification symbol	material	structure and additional observations
ADT	1 2 3	C	C	E+0ppm				FILL: Clayey SAND: Fine to medium grained, brown, trace of gravel and rootlets.	TOPSOIL/FILL
				E+0ppm	2			FILL: CONCRETE: Pale grey (100mm)	FILL (Pavement?)
				E+0.7ppm	1			FILL: Silty SAND: Fine to medium grained, dark grey to black, with some clay and fine rounded gravel.	FILL slight odour
				SPT 4,4,3 N*=7	1			FILL: Very low strength shale remoulding as brown silty clay.	
				E+0.8ppm	2			FILL: Silty CLAY: High plasticity, red-brown mottled orange-brown, with some sand.	
					0			2.7m - With some fine to medium subangular ironstone gravel.	
ADV				SPT 0,0,1 N*=1	3		CH	3.4m - Band with some sand and shells (50mm). Silty CLAY: High plasticity, dark grey, with some bands of medium grained sand and some shells. 3.4m - Band with some sand and shells.	3.0m - SPT rods sunk 400mm under hammer weight ESTUARINE
				U ₅₀	-1			3.95m - With some fibres. 4.2m - Becoming grey.	
				SPT 2,2,4 N*=6	-2		CH	4.7m - Becoming mottled red. Sandy CLAY: High plasticity, pale grey mottled red and orange-brown, medium grained sand, trace of silt.	COLLUVIUM / SLOPE WASH
					-3				
				SPT 2,4,8 N*=12	-4				
					-5		SP	SAND: Medium grained, pale grey mottled brown, trace of clay.	RESIDUAL SOIL
				SPT 3,11,30/60mm N*=R	-5			7.75m - Becoming yellow and red.	WEATHERED BEDROCK
					8				

method	support	penetration	water	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud	1 2 3 4	no resistance ranging to refusal	U ₅₀ undisturbed sample 50mm diameter	VS very soft
AD auger drilling*	C casing			U ₆₃ undisturbed sample 63mm diameter	S soft
RR roller/tricone				D disturbed sample	F firm
W washbore				N standard penetration test (SPT)	St stiff
CT cable tool				N* SPT - sample recovered	VSt very stiff
HA hand auger				Nc SPT with solid cone	H hard
DT diatube				V vane shear (kPa)	Fb friable
B blank bit				P pressuremeter	VL very loose
V V bit				Bs bulk sample	L loose
T TC bit				E environmental sample	MD medium dense
*bit shown by suffix e.g. ADT				R refusal	D dense
					VD very dense

Borehole No. **BH13**

Sheet 1 of 3
Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information							material substance									
method	penetration			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	structure and additional observations	
	1	2	3													
ADT							3				FILL: Rectangular, red-brown concrete pavers (50mm) overlying medium grained pale brown sand (50mm)	D			PAVEMENT	
ADV							1				FILL: Sandy GRAVEL: Medium to coarse, grey, fine to medium grained sand.	M			FILL	
							2				FILL: Gravelly SAND: Fine to medium grained, brown, fine to coarse angular to subrounded gravel.	W				
							2				FILL: SAND: Medium grained, pale brown.					
							1		CH		1.8m - With some brown gravel.					
							3				Silty CLAY: High plasticity, dark grey.	>Wp	S		ESTUARINE	
							0								3m - With sulfuric odour	
							-1						F/St			
							5			CL		Sandy CLAY: Low plasticity, pale grey mottled, orange-brown, fine to medium grained sand with some fine to medium subangular ironstone gravel.		St-Vst		COLLUVIUM/SLOPE WASH
							6									
							-3									
						7					6.5m - Becoming red.					
						-4					6.8m - One rootlet.					
						8										
method						support		notes, samples, tests				classification symbols and soil description			consistency/density index	
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						M mud 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				based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit			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	

Borehole No. **BH13**

Engineering Log - Borehole

Sheet 2 of 3
Office Job 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: AHD

drilling information						material substance											
method	penetration			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- kPa 100 200 300 400	structure and additional observations		
	1	2	3														
ADV							-5			CL	Sandy CLAY: Low plasticity, pale grey mottled, orange-brown, fine to medium grained sand with some fine to medium 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		
							10										
NMLC					SPT R,30/140,R N*=R		-7				Borehole BH13 continued as cored hole				SPT hammer bouncing		
								11									
							-8										
								12									
							-9										
								13									
							-10										
								14									
							-11										
								15									
							-12										
								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		

Borehole No. **BH14**

Sheet 1 of 2

Office Job No.: **GEOTLCOV24303AA**

Date started: **17.6.2011**

Date completed: **17.6.2011**

Logged by: **RC**

Checked by: **SS**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

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

drill model and mounting: Hydrapower Scout Truck Easting: slope: -90° R.L. Surface: 3.3

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

drilling information						material substance									
method	penetration			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	structure and additional observations
	1	2	3												
ADT				C	C							D			PAVEMENT
						E+0.0ppm	3				FILL: ASPHALT: Dark grey, medium to coarse gravel, overlying medium to coarse, pale brown. Sandy GRAVEL.				FILL
						E+0.0ppm		1			Gravelly SAND: Fine to medium grained, brown, dark brown, fine to coarse gravel, with some basalt cobbles (70mm), trace of silt.				
						SPT 3,2,2 N*=4	2								
								2			FILL: CONCRETE: Pale grey				
								2			FILL: Gravelly SAND:	M			
							1								
						SPT 1,0,0 N*=0				CH	Silty CLAY: High plasticity, dark grey, grey, trace of medium grained sand.	>Wp	VS	X	ESTUARINE
							3								
							0				3.5m - With some bands of sand.				
							4								
						SPT 2,3,2 N*=5	-1			CH	Silty CLAY: High plasticity, red mottled pale grey.		S/F	X X X	COLLUVIUM / SLOPE WASH
								5							
							-2								
						SPT 3,3,5 N*=8				CH/SC	BANDS OF Silty CLAY/Clayey SAND: Clay is dark grey and highly plastic. Sand is medium to coarse grained and dark grey.	>Wp/W	S/L		ESTUARINE / ALLUVIUM
							6								
							-3								
						SPT R,20/90 N*=R									
							-4				SANDSTONE: Medium to coarse grained, pale grey to white, remoulds to a sand. Borehole BH14 continued as cored hole				WEATHERED BEDROCK
							8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud	N nil		VS very soft
AD auger drilling*	C casing			S soft
RR roller/tricone				F firm
W washbore				St stiff
CT cable tool				VSt very stiff
HA hand auger				H hard
DT diatube				Fb friable
B blank bit				VL very loose
V V bit				L loose
T TC bit				MD medium dense
*bit shown by suffix e.g. ADT				D dense
				VD very dense

Borehole No. **BH15**

Engineering Log - Borehole

Sheet 1 of 3
Office Job No.: **GEOTLCOV24303AA**

Client: **Sydney Harbour Foreshore Authority**

Date started: **21.6.2011**

Principal:

Date completed: **21.6.2011**

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

Logged by: **LJG**

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

Checked by: **SS**

drill model and mounting:	Ausroc 4000 Truck	Easting:	slope: -90°	R.L. Surface:	3.2
hole diameter:	100 mm	Northing	bearing: N/A	datum:	AHD

drilling information						material substance									
method	penetration			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- kPa 100 200 300 400	structure and additional observations
	1	2	3												
ADT				C	C		-3				FILL: BITUMEN: 0.30m				FILL
					E+0.3ppm						FILL: CONCRETE: 0.10m				
							1				FILL: Gravelly SAND: Medium to coarse grained, dark grey, brown, fine grained gravel of brick, sandstone, aggregate, trace of clay. 0.5m - Fine to medium grained gravel, with some clay. 1.0m - Crushed orange brick.	D M			No odour/ staining.
					SPT 8/160mm N*=R		2				1.50m - With some clay and coarse sandstone gravel, trace of cobbles.				1m - SPT refused on gravel
							2								
							1								
					SPT 3,1,2 N*=3		3		SC CL		Clayey SAND: Medium to coarse grained, black, dark grey, high plasticity clay, trace of organics. Silty CLAY: Low plasticity, dark brown, dark grey, with some organic material and some shells.	W M-W	MD F		ESTUARINE
							0		SC CH		Clayey SAND: Coarse grained, dark grey, brown, trace of shells. CLAY: High plasticity, pale grey mottled red brown, trace of sand. 3.5m - With some interbedded sand layers.	W	L-MD St-VSt		ALLUVIUM
					SPT 3,4,5 N*=9		4		SC CH		Clayey SAND: Coarse grained, dark grey, dark brown, low plasticity clay, trace of shells. CLAY: High plasticity, pale grey, trace of fine sand.		MD St		SLOPE WASH
							5				5.20m - Pale grey, pale brown mottled.	M			ALLUVIUM
							6				5.80m - Pale grey, red, brown mottled, trace of fine to coarse sand and fine ironstone.				SLOPE WASH
					SPT 2,4,6 N*=10		3								
							7								
							4		CL SC		Sandy CLAY: Low to medium plasticity, pale brown mottled red, coarse sand. Clayey SAND: Coarse grained, red, trace of fine ironstone gravel and burrows.		St MD		ALLUVIUM RESIDUAL SOIL
					SPT 7,5,6 N*=11		8				7.8m - Pale brown, mottled black and red, trace of	M			

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH15**

Sheet 2 of 3

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **21.6.2011**

Principal:

Date completed: **21.6.2011**

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

Logged by: **LJG**

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

Checked by: **SS**

drill model and mounting:	Ausroc 4000 Truck	Easting:	slope: -90°	R.L. Surface:	3.2
hole diameter:	100 mm	Northing	bearing: N/A	datum:	AHD

drilling information							material substance												
method	penetration			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				structure and additional observations	
	1	2	3											100 kPa	200 kPa	300 kPa	400 kPa		
ADT				C	C		-5				burrows. SANDSTONE: Extremely weathered, coarse grained, pale brown, pale grey, estimated to be very low strength, remoulds to a sand.							WEATHERED BEDROCK	
								9			Borehole BH15 continued as cored hole							TC Bit refusal at 8.50m	
							-6												
							10												
							-7												
							11												
							-8												
							12												
							-9												
							13												
							-10												
							14												
							-11												
							15												
							-12												
							16												
method						support		notes, samples, tests				classification symbols and soil description				consistency/density index			
AS auger screwing*						M mud		U ₅₀ undisturbed sample 50mm diameter				based on unified classification system				VS very soft			
AD auger drilling*						C casing		U ₆₃ undisturbed sample 63mm diameter								S soft			
RR roller/tricone								D disturbed sample								F firm			
W washbore								N standard penetration test (SPT)								St stiff			
CT cable tool								N* SPT - sample recovered								VSt very stiff			
HA hand auger								Nc SPT with solid cone								H hard			
DT diatube								V vane shear (kPa)								Fb friable			
B blank bit								P pressuremeter								VL very loose			
V V bit								Bs bulk sample								L loose			
T TC bit								E environmental sample								MD medium dense			
*bit shown by suffix								R refusal								D dense			
e.g. ADT																VD very dense			

Borehole No. **BH16**

Sheet 1 of 6

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **20.6.2011**

Principal:

Date completed: **21.6.2011**

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

Logged by: **LJG**

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

Checked by: **SS**

drill model and mounting: Hydrapower Scout Truck Easting: slope: -75° R.L. Surface: 3.30
hole diameter: 100 mm Northing bearing: 177.5° datum: AHD

drilling information						material substance												
method	penetration			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- kPa 100 200 300 400	meter	structure and additional observations		
	1	2	3															
PH				C	C			3			BRICK PAVERS: 0.06m FILL: Gravelly SAND: Fine to coarse, brown, dark brown, fine to rounded gravel with some clay and trace of medium to coarse gravel, roots, glass, metal piping, concrete, bricks.	D					FILL	
AD								2			FILL: SAND: Medium to coarse grained, brown, with some clay and fine gravel.	M						
WB					▶			1				W						
								3										
								0		CL/SC	Sandy CLAY/Clayey SAND: Low plasticity clay, medium to coarse grained sand, grey, brown, with some organic material.						ESTUARINE	
								4										
								-1										
								5		CH	CLAY: High plasticity, red, brown, grey, trace of sand.						SLOPE WASH	
						U ₅₀		-2										
								6										
								-3									ALLUVIUM	
								7		CH	Sandy CLAY: High plasticity, grey, coarse sand.							
								8		SP	SAND: Coarse grained, grey, brown, trace of clay.							
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	

Borehole No. **BH16**

Sheet 2 of 6

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **20.6.2011**

Principal:

Date completed: **21.6.2011**

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

Logged by: **LJG**

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

Checked by: **SS**

drill model and mounting: Hydrapower Scout Truck Easting: slope: -75° R.L. Surface: 3.30
hole diameter: 100 mm Northing bearing: 177.5° datum: AHD

drilling information						material substance													
method	penetration			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- kPa	meter	structure and additional observations			
	1	2	3																
WB				C	C							W							
							-5	9		SP	SAND: Coarse grained, grey, brown, trace of clay. <i>(continued)</i>								
										SC	Clayey SAND: Medium to coarse sand, pale grey, red, brown, high plasticity clay.								
							-6	10											
							-7	11		SP	SAND: Coarse grained, grey, pale grey, trace of clay.						RESIDUAL SOIL		
							-8	12											
							-9	13											
							-10	14			SANDSTONE: Extremely weathered, coarse grained, pale grey to red brown, estimated to be low strength. Remoulds to a sand. 13.45m - Highly weathered. Borehole BH16 continued as cored hole						WEATHERED BEDROCK		
							-11	15											
							-12	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			

Borehole No. **BH17**

Sheet 1 of 4
Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information							material substance									
method	penetration			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	
	1	2	3													
ADT				C	C		3				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	1			FILL: SAND: Coarse grained, grey, brown, yellow, red mottled, with some fine sandstone gravel, trace of clay.					
								2								
					▶		1				FILL: Silty CLAY: Low plasticity, black, with some organic material, trace of sand and fine gravel.	W				
						SPT 2,0,0 N*=0	3				3.10m - With some sand.					
							0									
						SPT 2,3,5 N*=8	-1	4	CH		CLAY: High plasticity, red, brown, grey, trace of fine ironstone gravel.	M	St-VSt	×	ALLUVIUM	
								5						×		
							-2		CH		CLAY: High plasticity, grey, red, brown, yellow, with some coarse sand, trace of fine to medium sandstone and ironstone gravel.		St-VSt	×	SLOPE WASH	
						SPT 2,5,6 N*=11	6							×		
							-3		CL		Gravelly CLAY: Low plasticity, brown, grey, red, fine angular sandstone and ironstone gravel.	W			ALLUVIUM	
								7	CH		CLAY: High plasticity, pale grey, red brown mottled, trace of sand.			×		
						SPT 4,7,8 N*=15	-4							×		
							8									
method						support		notes, samples, tests				classification symbols and soil description			consistency/density index	
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						M mud 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				based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit			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	

Borehole No. **BH17**

Sheet 2 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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:	AHD

drilling information							material substance										
method	penetration			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- kPa	meter	structure and additional observations	
	1	2	3														
ADT				C	C		-5			CH	CLAY: High plasticity, pale grey, red brown mottled, trace of sand. <i>(continued)</i> 8.10m - With some coarse sand.	W	St-VSt				RESIDUAL SOIL
						SPT 4,12,10 N*=22		9		SC	Clayey SAND: Coarse grained, pale grey, grey.		MD				
							-6			CH	Sandy CLAY: High plasticity clay, grey, pale grey, coarse sand.		St-VSt				
								10									WEATHERED BEDROCK
						SPT 4,16 N*=R	-7				SANDSTONE: Extremely weathered, coarse grained, pale grey, remoulds to a sandy clay. 10.30m - Highly weathered.						
								11			Borehole BH17 continued as cored hole						
							-8										
								12									
							-9										
								13									
							-10										
								14									
							-11										
								15									
							-12										
								16									
method						support		notes, samples, tests				classification symbols and soil description				consistency/density index	
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT						M mud 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				based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit				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	

Borehole No. **BH2**

Sheet 1 of 3

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **3.6.2011**

Principal:

Date completed: **3.6.2011**

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

Logged by: **RH**

Borehole Location: **Darling Drive, Haymarket, NSW**

Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck Easting: slope: -90° R.L. Surface: 3.5
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information						material substance									
method	penetration			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
	1	2	3												
DT				C	C						ASPHALT CONCRETE	D			PAVEMENT
ADT							-3				FILL: Sandy SILT: Low plasticity, pale brown, fine to medium grained sand with some clay. FILL: Clayey SAND: Fine to coarse grained, dark brown and black with red brown mottles, some pale brown sand pockets, fine to coarse grained sandstone and fine grained ironstone gravels throughout, trace of glass and wire refuse.	M			FILL
						E+0ppm		1							
						SPT 8,5,4 N*=9		2							
						E+1.0ppm									
						E+0ppm		2							
						SPT 4,3,3 N*=6		1			2.5m - Increasing clay content.				
								3							
								0							
										SW	SAND: Fine to coarse grained, grey, trace of silt.	VL			ALLUVIUM Slight organic odour.
NMLC								4							
						SPT 1,1,0 N*=1		-1							
									SC	Clayey SAND: Fine to medium to coarse grained, dark brown, low to medium plasticity clay.	L-MD				
								5		SC	Clayey SAND: Fine to coarse grained, pale grey, clay with some pockets of shells throughout.	W			
								-2							5.7m - Distinct organic odour
						SPT 1,2,3 N*=5		6							
								-3							
								7			SANDSTONE: Extremely weathered, medium to coarse grained, pale yellow and brown, estimated to be very low strength, remoulds to a sand.				WEATHERED BEDROCK
								-4							
								8							

method	support	penetration	water	notes	classification symbols and soil description	moisture	consistency/density index
AS AD RR W CT HA DT B V T	auger screwing* auger drilling* roller/tricone washbore cable tool hand auger diatube blank bit V bit TC bit	M mud C casing penetration 1 2 3 4 no resistance ranging to refusal	10/1/98 water level on date shown water inflow water outflow	AS undisturbed sample 50mm diameter U ₅₀ 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	based on unified classification system	D dry M moist W wet Wp plastic limit W _L liquid limit	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

method	support	penetration	water	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing no resistance ranging to refusal 10/1/98 water level on date shown water inflow water outflow	1 2 3 4		Borehole tests used as cored hole 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	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
				moisture D dry M moist W wet Wp plastic limit WL liquid limit	

Borehole No. **BH3**

Sheet 1 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **2.6.2011**

Principal:

Date completed: **2.6.2011**

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

Logged by: **RH**

Borehole Location: **Darling Drive, Haymarket, NSW**

Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck Easting: slope: -90° R.L. Surface: 3.5
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information						material substance										
method	penetration			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- kPa 100 200 300 400	structure and additional observations	
	1	2	3													
DT				C	C						ASPHALT: 0.05m CONCRETE: 0.45m				PAVEMENT	
ADV							3					M				
						D					FILL: Sandy SILT: Low plasticity, pale brown, fine grained sand, with some clay.				FILL	
						SPT 9,6,8 N*=14		1			FILL: Clayey SAND: Fine to medium grained, dark brown, trace of pale brown sand pockets, fine to coarse grained sandstone and fine grained ironstone gravel.					
						E+1.4ppm		2								
						E+0.4ppm		2								
								1								
						SPT 4,5,10 N*=15		3								
								0								
								4	SW		SAND: Fine to coarse grained, with some low plasticity fines.		L		ALLUVIUM	
						SPT 4,3,2 N*=5		-1								
								5	SC		Clayey SAND: Fine grained, dark brown, clay.	W				
								-2	SW		SAND: Medium to coarse grained, pale grey, trace of fines.		L-MD			
						SPT 5,4,3 N*=7		6								
								-3								
								7	SC		Clayey SAND: Fine to coarse grained, pale grey, pale orange brown, with some silt.	M			RESIDUAL SOIL	
						SPT 3,2,5 N*=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 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	

Borehole No. **BH3**

Sheet 2 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **2.6.2011**

Principal:

Date completed: **2.6.2011**

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

Logged by: **RH**

Borehole Location: **Darling Drive, Haymarket, NSW**

Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck Easting: slope: -90° R.L. Surface: 3.5
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information					material substance										
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter	structure and additional observations
	1	2	3												
ADV				C	C		-5		SC	SANDSTONE: Extremely to highly weathered, fine to coarse grained, pale orange brown, estimated to be very low to low strength. Borehole BH3 continued as cored hole	M	L-MD			WEATHERED BEDROCK
							-6								
							-7								
							-8								
							-9								
							-10								
							-11								
							-12								
							-13								
							-14								
							-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
U₅₀ undisturbed sample 50mm diameter
U₆₃ 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
WL 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

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

Borehole Location: **Darling Drive, Haymarket, NSW**

Borehole No. **BH4**

Sheet 1 of 4

Office Job No.: **GEOTLCOV24303AA**

Date started: **6.6.2011**

Date completed: **6.6.2011**

Logged by: **RH**

Checked by: **SS**

drill model and mounting: Ausroc 4000 Truck Easting: slope: -90° R.L. Surface: 3.3
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information						material substance										
method	penetration			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	
	1	2	3													
DT				C	C			3			ASPHALT: CONCRETE:	D			PAVEMENT	
ADV						E+0.4ppm		1			FILL: SAND: Fine to medium grained, pale brown with some low plasticity fines, ironstone inclusions. FILL: Clayey SAND: Fine to medium grained, dark grey/dark brown, low plasticity, fines with a trace of light brown sand pockets and fine to medium grained sandstone and ironstone gravels.	M			FILL	
						SPT 4,5,6 N*=11		2								
						E+0ppm										
						E+0.7ppm		2			2m - Band of partially cemented sand.					
								1							2.3m - Slight hydrocarbon odour.	
						SPT 2,2,4 N*=6		3								
						E+0ppm		0								
								4								
						SPT 8,8,5 N*=13		-1			4m - Band of red, partially cemented sand.		W			
								5		SC	Clayey SAND: Fine to medium grained, grey.			L		ALLUVIUM
							-2									
						SPT 5,3,2 N*=5		6		Clayey SAND: Fine to coarse grained, pale grey, with some silt. Trace of bivalves and shell fragments in bands throughout layer.				5.7m - organic odour		
							-3									
							7			Clayey SAND: Fine to coarse grained, pale grey with red/orange brown mottles, with some silt and fine to medium grained sandstone gravels.		D		RESIDUAL SOIL		
						SPT 8,14,11 N*=25		-4								
							8									
method						support		notes, samples, tests				classification symbols and soil description			consistency/density index	
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT						M mud C casing penetration 1 2 3 4 water 10/1/98 water level on date shown water inflow water outflow		N nil 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				based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit			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	

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH4**

Sheet 2 of 4

Office Job No.: **GEOTLCOV24303AA**

Date started: **6.6.2011**

Date completed: **6.6.2011**

Logged by: **RH**

Checked by: **SS**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

Borehole Location: **Darling Drive, Haymarket, NSW**

drill model and mounting:		Ausroc 4000 Truck		Easting:		slope: -90°		R.L. Surface: 3.3					
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- kPa 100 200 300 400	structure and additional observations	
ADV		C		-5			SM	Clayey SAND: Fine to coarse grained, pale grey with red/orange brown mottles, with some silt and fine to medium grained sandstone gravels.	W	D		RESIDUAL SOIL	
NMLC								Silty SAND: Medium to coarse grained, pale grey with orange brown mottles.	M			WEATHERED BEDROCK	
Borehole BH4 continued as cored hole													
					9								
					-6								
					10								
					-7								
					11								
					-8								
					12								
					-9								
					13								
					-10								
					14								
					-11								
					15								
					-12								
					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 WL 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	

Borehole No. **BH5**

Engineering Log - Borehole

Sheet 1 of 4
Office Job 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:	AHD

drilling information						material substance									
method	penetration			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
	1	2	3												
ADT				C	C						FILL: BRICK PAVERS: FILL: SAND: Coarse sand, brown, trace of roots. 0.3m - Medium to coarse sand with some clay, trace of gravel. 0.5m - Brown, yellow.	D			FILL
						SPT 8,4,4 N*=8	-2	1			FILL: Clayey SAND: Medium to coarse, brown mottled yellow, medium to high plasticity clay, with some fine gravel. 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.				
						SPT 1,2,5 N*=7	-1	2			2.50m - With some fine shale gravels.				
							-0	3		SM	FILL: Sandy CLAY: Low to medium plasticity, pale grey, brown, corase sand, trace of gravel.	M			
							-1	4		SC	Silty SAND: Coarse grained, black with some shells. Clayey SAND: Coarse grained, brown, medium plasticity clay, trace of shells and fine gravel.	W	L		ESTUARINE/ALLUVIUM
WB						SPT 2,1,2 N*=3	-2	5		CL-CH	Sandy CLAY: Low to medium plasticity, dark brown to dark grey, fine to medium sand, with some organic fibrous materials.	>Wp	S-F		
						SPT 2,1,2 N*=3	-3	6		SC	Clayey SAND: Coarse grained, dark brown to black, low plasticity clay, trace of fine gravel.		L		5.6m - Organic material in SPT sulphur odour
						SPT 7,8,12 N*=20	-4	7		CH	CLAY: High plasticity, red brown, pale grey, trace of ironstone and sand. 7.20m - Yellow, brown mottled. 7.40m - Pale grey with some fine sand.	>Wp	VSt-H		SLOPE WASH
							-5	8							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH5**

Sheet 2 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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:	AHD

drilling information						material substance												
method	penetration			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- kPa	structure and additional observations			
	1	2	3															
WB				C	C					CH		>Wp	VSt-H		ALLUVIUM			
								CS	Sandy CLAY: Low to medium plasticity, pale grey, medium sand, with some silt.	St								
						</												

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH5**

Sheet 3 of 4

Office Job No.: **GEOTLCOV24303AA**

Date started: **14.6.2011**

Date completed: **15.6.2011**

Logged by: **LJG**

Checked by: **SS**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

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

drill model and mounting: Ausroc 4000 Truck Easting: slope: -90° R.L. Surface: 2.4

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

drilling information						material substance							
method	penetration	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- kPa	structure and additional observations
1	2	3											
WB									SANDSTONE: Extremely weathered, pale grey, brown, coarse grained, estimated to be very low strength, remoulds to SAND. <i>(continued)</i> Borehole BH5 continued as cored hole				
					-14								
						17							
					-15								
						18							
					-16								
						19							
					-17								
						20							
					-18								
						21							
					-19								
						22							
					-20								
						23							
					-21								
						24							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud N nil	U ₅₀ undisturbed sample 50mm diameter	based on unified classification system	VS very soft
AD auger drilling*	C casing	U ₆₃ undisturbed sample 63mm diameter		S soft
RR roller/tricone		D disturbed sample		F firm
W washbore		N standard penetration test (SPT)		St stiff
CT cable tool		N* SPT - sample recovered		VSt very stiff
HA hand auger		Nc SPT with solid cone		H hard
DT diatube		V vane shear (kPa)		Fb friable
B blank bit		P pressuremeter		VL very loose
V V bit		Bs bulk sample		L loose
T TC bit		E environmental sample		MD medium dense
*bit shown by suffix e.g. ADT		R refusal		D dense
				VD very dense

Borehole No. **BH6**

Sheet 1 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information						material substance										
method	penetration			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- kPa	structure and additional observations	
	1	2	3													
ADT				C	C	E+0ppm					FILL: ASPHALT: 0.02m thick FILL: GRAVEL: Medium to coarse, subangular to subrounded, black, grey, trace of sand and clay.	D			PAVEMENT	
DT						E, QC06, QC07+0ppm	2				FILL: CONCRETE: 0.08m FILL: GRAVEL: Medium to coarse angular to subangular, grey/brown, trace of fine gravel and sand.	D				
								1			FILL: CONCRETE: 0.16m FILL: GRAVEL: Medium to coarse, angular to subrounded, trace of fine gravel and cobbles.	D			FILL	
ADT						SPT 2,3,3 N*=6	1				FILL: SANDSTONE BOULDER: Coarse grained, yellow/orange, rounded. FILL: CLAY: High plasticity, red brown, pale grey, grey mottled, trace of fine gravel, ironstone and shale. (shale fill)	<Wp				
						E+0.4ppm	2				1.80m - Grey, with some fine shale angular gravel.	M				
						E+0ppm	0				FILL: SAND: Coarse grained, grey/brown, trace of silt and rubber.	W				
						SPT 5,2,2 N*=4	3									
							-1									
						E+0ppm	4									
										SC	Clayey SAND: Coarse grained, brown, grey, low plasticity clay.				ESTUARINE	
										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 red, brown, with some fine sand.					
							-3									
						E+0ppm	6			CH	Sandy CLAY: High plasticity, red, brown, pale grey, medium to coarse sand.		St		ALLUVIUM	
										SC	Clayey SAND: Coarse grained, pale grey, red-brown, medium plasticity clay.		L-MD			
							-4			CL	Sandy CLAY: Low to medium plasticity, pale grey.		St			
						SPT 5,3,5 N*=8	7									
										CH	CLAY: High plasticity, red-brown, pale grey, micaceous.		Vst		SLOPE WASH	
							-5									
										CL-CH	Sandy CLAY: Medium to high plasticity, grey, pale grey, coarse sand.				ALLUVIUM	
							8									
method						support		notes, samples, tests				classification symbols and soil description			consistency/density index	
AS AD RR W CT HA DT B V T						M mud C casing penetration 1 2 3 4		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				based on unified classification system			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	
auger screwing* auger drilling* roller/tricone washbore cable tool hand auger diatube blank bit V bit TC bit						no resistance ranging to refusal 10/1/98 water level on date shown water inflow water outflow						moisture D dry M moist W wet Wp plastic limit WL liquid limit				
*bit shown by suffix e.g. ADT																

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **BH6**

Sheet 2 of 4

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information						material substance										
method	penetration			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	structure and additional observations	
	1	2	3													
W				C	C	U ₅₀				CL-CH	Sandy CLAY: Medium to high plasticity, grey, pale grey, coarse sand. <i>(continued)</i>	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		SLOPE WASH	
						SPT 5,6,7 N*=13	-8	11		CH	Silty CLAY: High plasticity, dark grey, brown, black, micaeous.		VSt-H		ALLUVIUM	
						SPT 5,8,10 N*=18	-9	12		SP	SAND: Coarse grained, grey, dark grey, with some clay.		MD			
						SPT 0,5,7 N*=12	-10	13			14m - Dark grey, black, trace of organics.					
							-11	14								
							-12	15			At 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	
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 penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow		Borehole 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	

Borehole No. **BH7**

Sheet 1 of 6

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information							material substance								
method	penetration			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	1	2	3	C	C						FILL: ASPHALT: (70mm thickness) overlying sandy gravel; medium to coarse grained, brown, dark grey.	D			PAVEMENT
							2	1			FILL: Gravelly SAND: Fine to medium grained, brown, fine to coarse gravel, trace of clay.				FILL
					D										
							1	2			FILL: Gravelly CLAY: Low plasticity, brown, orange brown.	<Wp			
					D							>Wp			
							0	3							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud	N nil		VS very soft
AD auger drilling*	C casing			S soft
RR roller/tricone				F firm
W washbore				St stiff
CT cable tool				VSt very stiff
HA hand auger				H hard
DT diatube				Fb friable
B blank bit				VL very loose
V V bit				L loose
T TC bit				MD medium dense
*bit shown by suffix e.g. ADT				D dense
				VD very dense

Borehole No. **BH7**

Sheet 2 of 6

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

drilling information						material substance																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
method	penetration			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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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WRR				C	C					CH		>Wp	F																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

Borehole No. **BH7**

Sheet 3 of 6

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

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: AHD

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

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud N nil	U ₅₀ undisturbed sample 50mm diameter	based on unified classification system	VS very soft
AD auger drilling*	C casing	U ₆₃ undisturbed sample 63mm diameter		S soft
RR roller/tricone	penetration 1 2 3 4	D disturbed sample		F firm
W washbore	no resistance ranging to refusal	N standard penetration test (SPT)		St stiff
CT cable tool	water	N* SPT - sample recovered		VSt very stiff
HA hand auger	10/1/98 water level on date shown	Nc SPT with solid cone		H hard
DT diatube	water inflow	V vane shear (kPa)		Fb friable
B blank bit	water outflow	P pressuremeter		VL very loose
V V bit		Bs bulk sample		L loose
T TC bit		E environmental sample		MD medium dense
*bit shown by suffix e.g. ADT		R refusal		D dense
			moisture	VD very dense
			D dry	
			M moist	
			W wet	
			Wp plastic limit	
			WL liquid limit	

Borehole No. **BH8**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AA**

Date started: **14.6.2011**

Date completed: **14.6.2011**

Logged by: **RC**

Checked by: **SS**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

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

drill model and mounting:				Hydrapower Scout Truck		Easting:		slope: -90°		R.L. Surface: 2.5			
hole diameter:				100 mm		Northing		bearing: N/A		datum: AHD			
drilling information						material substance							
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- kPa	structure and additional observations
1	2	3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
ADT		C	C		2				FILL: ASPHALT: Dark grey, 70mm thickness overlying sands gravel: medium grained, grey, fine grained.	D			PAVEMENT
									FILL: SAND: Fine to medium grained, dark brown, with some clay and fine gravel.	M			
									FILL: ASPHALT: Dark grey.				
NMLC					1				FILL: CONCRETE: Pale grey to grey. 1m - With some dark grey gravel aggregate and steel.	D			1m - TC Bit Refusal
					1				VOID:				
					2								
					3								
					0								
					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	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS auger screwing*	M mud	N nil		VS very soft
AD auger drilling*	C casing			S soft
RR roller/tricone				F firm
W washbore				St stiff
CT cable tool				VSt very stiff
HA hand auger				H hard
DT diatube				Fb friable
B blank bit				VL very loose
V V bit				L loose
T TC bit				MD medium dense
*bit shown by suffix e.g. ADT				D dense
				VD very dense

Borehole No. **BH9**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

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

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AA**Date started: **15.6.2011**Date completed: **15.6.2011**

Logged by: **RC**

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: AHD														
drilling information								material substance																						
method		penetration			support		water		notes samples, tests, etc		RL		depth metres		graphic log		classification symbol		material				moisture condition		consistency/ density index		pocket penetro- meter kPa		structure and additional observations	
ADT					Not Observed				E+0.0ppm		-		-						soil type: plasticity or particle characteristics, colour, secondary and minor components.				D						PAVEMENT SUB BASE FILL PREVIOUS PAVEMENT	
											-2		1						soil type: plasticity or particle characteristics, colour, secondary and minor components.								BH9 was terminated at shallow depth due to obstructions after many attempts.			
											-1		2																	
											0		3																	
											-1		4																	
											-2		5																	
											-3		6																	
											-4		7																	
											-5		8																	
method		auger screwing*				support		M mud		N nil		notes, samples, tests		classification symbols and soil description				moisture		consistency/density index										
AS		auger drilling*				C casing						U ₉₀ undisturbed sample 50mm diameter		based on unified classification system				D dry		VS very soft										
AD		roller/tricone				penetration		1 2 3 4				U ₆₃ undisturbed sample 63mm diameter						M moist		S soft										
RR		washbore				no resistance ranging to refusal						D disturbed sample						W wet		F firm										
W		cable tool										N standard penetration test (SPT)						Wp plastic limit		St stiff										
CT		hand auger										N* SPT - sample recovered						W _L liquid limit		VSt very stiff										
HA		diatube										Nc SPT with solid cone								H hard										
DT		blank bit										V vane shear (kPa)								Fb friable										
B		V bit										P pressuremeter								VL very loose										
V		TC bit										Bs bulk sample								L loose										
T		*bit shown by suffix e.g. ADT										E environmental sample								MD medium dense										
												R refusal								D dense										
																				VD very dense										

Borehole No. **EB1**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **10.6.2011**

Principal:

Date completed: **10.6.2011**

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

Logged by: **AN**

Borehole Location: **Sydney Entertainment Centre, Haymarket, NSW**

Checked by:

drill model and mounting:		Truck		Easting:		slope: -90°		R.L. Surface:					
hole diameter:		mm		Northing		bearing:		datum: AHD					
drilling information				material substance									
method	penetration	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	structure and additional observations
	1 2 3			E+0.0ppm		0.5			ASPHALT Gravelly SAND: Medium to coarse grained, grey to brown, fine to medium grained gravel.	D/M			50mm Asphalt. FILL.
				E+0.0ppm		1.0			Sandy CLAY: Low plasticity, red to brown, fine to medium grained.	D/M			Sandstone flecks.
				E+2.7ppm		1.5			Sandy CLAY: Low plasticity, dark brown to brown, fine to medium grained.	M			Mild organic odour.
				E+0.6ppm		2.0			Sandy CLAY: Medium plasticity, grey to brown, fine grained.	M			Residual clays.
				E+0.0ppm		3.0							
						3.5			Borehole EB1 terminated at 3.1m				
						4.0							
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 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		

Borehole No. **EB2**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AA**

Date started: **10.6.2011**

Date completed: **10.6.2011**

Logged by: **AN**

Checked by:

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Principal:

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

Borehole Location: **Sydney Entertainment Centre, Haymarket, NSW**

drill model and mounting:				Truck		Easting:		slope: -90°		R.L. Surface:			
hole diameter:				mm		Northing		bearing:		datum: AHD			
drilling information						material substance							
method	penetration	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
				E+0.0ppm					ASPHALT	D	S		50mm Asphalt.
									GRAVEL: Road base, grey.	M	S		Porcelain flecks, broken bricks.
				E+0.0ppm		1			Sandy CLAY: Low plasticity, dark brown to black, fine grained.				
				E+0.3ppm									
						2			Sandy CLAY: Low to medium plasticity, grey, fine grained.	M	S		Residual.
				E+0.0ppm					Sandy CLAY: Medium plasticity, red mottled brown, fine grained.	M	F		
						3			Sandy CLAY: Low plasticity, brown, red to orange, fine to medium grained.	W	F		
				E+0.0ppm									
						4			Silty SAND: Fine to medium grained, grey to brown.	W	F		Sediments, organic odour.
				E+0.0ppm									
						5			Sandy CLAY: Medium to high plasticity, yellow to brown, medium to coarse grained. Trace of coarse grained, angular gravel (siltstone flecks).	M	St		Residual clays.
				E									
						6			Borehole EB2 terminated at 6m				
				E									
						7							
						8							

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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

Borehole No. **EB3**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AA**

Engineering Log - Borehole

Client: **Sydney Harbour Foreshore Authority**

Date started: **10.6.2011**

Principal:

Date completed: **10.6.2011**

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

Logged by: **AN**

Borehole Location: **Sydney Entertainment Centre, Haymarket, NSW**

Checked by:

drill model and mounting:		Truck		Easting:		slope: -90°		R.L. Surface:											
hole diameter:		mm		Northing		bearing:		datum: AHD											
drilling information				material substance															
method	penetration	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	structure and additional observations						
	1 2 3			E+0.0ppm					ASPHALT	D	L		50mm Asphalt.						
				E+0.1ppm					Sandy GRAVEL: Medium to coarse grained, brown to red, fine grained sand. Trace of angular, coarse grained gravel.				FILL, 5% glass and brick fragments.						
				E+0.0ppm		1													
				E+3.7ppm					Sandy CLAY: Medium plasticity, grey, fine grained.	M	F		Residual.						
				E+2.6ppm		2			SAND: Fine grained, yellow to brown.	M	F		Mild hydrocarbon odour.						
				E+7.6ppm		3			SAND: Fine grained, grey to brown.	M/W	F		Mild hydrocarbon odour.						
				E+1.1ppm		4			Sandy CLAY: Medium plasticity, yellow to brown, fine grained.	W	St		Residual clays.						
				E+0.0ppm		5													
									Sandy CLAY: Medium to high plasticity, yellow mottled grey, fine grained.	M	St								
				E+0.0ppm		6													
									Borehole EB3 terminated at 6.1m										
						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 WL 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			

Engineering Log - Borehole

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

Borehole No. **NBH23**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: **17.4.2012**

Date completed: **24.4.2012**

Logged by: **JW**

Checked by: **DS**

drill model and mounting: XP60 Ute Easting: 333727 slope: -90° R.L. Surface: 2.7
hole diameter: 100 mm Northing: 6249937 bearing: N/A datum: AHD

drilling information						material substance												
method	penetration			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			structure and additional observations	
	1	2	3											100	200	300	400	
DT				N							FILL: Red Brick (0.08m)	D						PAVEMENT
											FILL: SAND: Coarse grained, pale brown, mottled yellow-brown, with some shell fragments	M						FILL
HA					E		2				FILL: Concrete: (0.25m)	D						CONCRETE SLAB
								1			FILL: Sandy GRAVEL: Fine grained, subangular, dark grey, fine to medium grained sand	M						FILL No Odour, PID = 0.4ppm
											FILL: Clayey SAND: Fine grained, pale brown, mottled red-brown							
ADT						SPT 3,2,4 N*=6	1				FILL: CLAY: High plasticity, dark grey, mottled orange-brown, pale grey, trace fine grained sand, and medium grained, subangular sandstone gravel	<Wp						No Odour, PID = 0.8ppm
							2											
							0			CL	Sandy CLAY: Low plasticity, dark grey, mottled black, fine grained sand	>Wp	VS	X				ALLUVIUM
						SPT 1,0,1 N*=1	3							X				No Odour, PID = 0.3ppm
							-1				Borehole NBH23 terminated at 3.45m							
							4											
							-2											
							5											
							-3											
							6											
							-4											
							7											
							-5											
							8											

method	support	notes, samples, tests	classification symbols and soil description based on unified classification system	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud 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	moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Borehole

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

Borehole No. **NBH24**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: **24.4.2012**

Date completed: **24.4.2012**

Logged by: **JW**

Checked by: **DS**

drill model and mounting: Ausrock 3000 Truck Easting: 333604 slope: -90° R.L. Surface: 3.9
hole diameter: 100 mm Northing 6249930 bearing: N/A datum: AHD

drilling information							material substance										
method	penetration			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	structure and additional observations		
	1	2	3														
HA				N		E					FILL: Red Brick (0.08m)	D			PAVEMENT		
						E					FILL: SAND: Fine to medium grained, pale brown, trace fine to medium grained, subangular sandstone gravel	M			FILL		
							3	1			FILL: Gravelly Sandy CLAY: Low plasticity, dark grey, mottled dark brown, fine to medium grained sand and fine to medium grained, subangular gravel	<Wp			No Odour, PID = 1.9ppm		
ADT				▲							FILL: CLAY: High plasticity, pale grey, mottled orange-brown, dark grey, trace fine grained sand	>Wp					
						SPT 5/20, N*=R	2	2			FILL: Gravelly CLAY: Low plasticity, dark grey, mottled red-brown, medium to coarse grained, subangular gravel	W			No Odour, PID = 6.9ppm		
											FILL: Clayey GRAVEL: Fine to medium grained, subangular, dark grey, mottled black, low plasticity clay, with some medium to coarse grained sandstone gravel						
										CL	CLAY: Low plasticity, dark grey, mottled black, trace of organics	>Wp	VS		ALLUVIUM		
						SPT 0,0,1 N*=1				CL	Sandy CLAY: Low plasticity, dark grey, mottled black, fine grained sand, with some shell fragments		xxx		Organic Odour, PID = 18.2ppm		
											Borehole NBH24 terminated at 3.45m						
							0	4									
							-1	5									
							-2	6									
							-3	7									
							-4	8									
method							support		notes, samples, tests				classification symbols and soil description			consistency/density index	
AS auger screwing*							M mud N nil		U ₅₀ undisturbed sample 50mm diameter				based on unified classification system			VS very soft	
AD auger drilling*							C casing		U ₆₃ undisturbed sample 63mm diameter							S soft	
RR roller/tricone							penetration		D disturbed sample				moisture			F firm	
W washbore							1 2 3 4		N standard penetration test (SPT)							St stiff	
CT cable tool							no resistance ranging to refusal		N* SPT - sample recovered				D dry			VS _t very stiff	
HA hand auger									Nc SPT with solid cone							H hard	
DT diatube							water		V vane shear (kPa)				M moist			Fb friable	
B blank bit							10/1/98 water level on date shown		P pressuremeter							VL very loose	
V V bit							▲ water inflow		Bs bulk sample				Wp plastic limit			L loose	
T TC bit							▲ water outflow		E environmental sample							W _L liquid limit	
*bit shown by suffix e.g. ADT									R refusal								
																VD very dense	

BOREHOLE GINTGEOTLCOV24303AC_COMBINED WITH AA GINT.GPJ COFFEY.GDT 24.5.12

Engineering Log - Piezometer

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

Borehole No. **NBH25**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: **18.4.2012**

Date completed: **18.4.2012**

Logged by: **JW**

Checked by: **DS**

drill model & mounting: XP60 Ute Easting: 323628 slope: -90° R.L. Surface: 3.3
hole diameter: 100 Northing: 6249852 bearing: N/A datum: AHD

drilling information							material substance								
method	penetration			support	water	notes samples, tests, etc	well details	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations
DT	1	2	3									CONCRETE: (0.4m) with 10mm reinforcement	D		CONCRETE SLAB
HA						E						FILL: Sandy CLAY: Low plasticity, pale brown, fine grained sand, trace fine to medium grained, subangular gravel	<Wp		FILL
ADT						E			1			FILL: Clayey SAND: Fine grained, dark grey, with some fine to medium grained, subangular sandstone gravel	M		No Odour, Dup 2 + Dup 2a, PID = 8.3ppm
									2			2m - Becoming dark grey, mottled red-brown			No Odour, PID = 5.9ppm
						SPT 12/120, N*=R			3						
									4						
									5						
						SPT 4,2,10/80 N*=R			6			FILL: Gravelly Sandy CLAY: High plasticity, dark grey, fine to medium grained, angular gravel, fine to medium grained sand	<Wp		No Odour, PID = 1.2ppm
									7						
									8						
									9						
						SPT 11,13,7 N*=20			10		CH	Sandy CLAY: High plasticity, dark grey/grey, fine grained sand		F-St	ALLUVIUM
									11						
									12						
									13						
						SPT 2,2,3 N*=5			14				>Wp		No Odour, PID = 1.0ppm
									15						
									16					St	
									17						
						SPT 4,7,11 N*=18			18			7.5m - Becoming dark grey/grey, mottled yellow-brown			No Odour, PID = 1.0ppm

method	auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool DT diatube B blank bit V V bit T TC bit TBX Tubex *bit shown by suffix e.g. ADT	support C casing N nil	penetration 1 2 3 4 no resistance ranging to refusal	notes, samples, tests SPT - sample recovered SPT with solid cone pressure meter bulk sample refusal environmental sample PID measurement water sample piezometer air lift test	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit well details betonite sand slotted PVC	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 - Borehole

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

Borehole No. **NBH26**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: **24.4.2012**

Date completed: **24.4.2012**

Logged by: **ACM**

Checked by: **DS**

drill model and mounting: XC Drill Track Easting: slope: -90° R.L. Surface: 3.3
hole diameter: 100 mm Northing bearing: N/A datum: AHD

drilling information					material substance									
method	penetration	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	structure and additional observations	
ADT	1 2 3	N	None Observed						ASPHALT: (0.3m)				PAVEMENT	
				E	3				FILL: Silty GRAVEL: Fine to medium grained, subangular, pale grey, mottled pale brown, with some fine to medium grained sand and red brick fragments	M			FILL	
									SANDSTONE: Fine to medium grained, pale grey to orange-brown, highly weathered, low to medium strength				BEDROCK	
						1			Borehole NBH26 terminated at 0.8m					
						2								
						2								
						1								
						3								
						0								
						4								
						-1								
						5								
						-2								
						6								
						-3								
						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  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 W _p 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 - Borehole

Borehole No. **NBH29**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: 17.4.2012

Date completed: **17.4.2012**

Logged by: **JW**

Checked by: **DS**

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

drilling information						material substance									
method		penetration		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	structure and additional observations
		1	2	3											
ADT				N							FILL: Red Brick (0.08m)	D			PAVEMENT
					E						FILL: SAND: Coarse grained, yellow-brown, with some shell fragments and quartz grains	M			FILL
ADT DT											FILL: Sandy GRAVEL: Medium to coarse grained, angular, dark grey, fine to coarse grained sand	D			No Odour, PID = 1.7ppm
					E	2	1				Concrete: (0.2m) with 10mm reinforcement	M			CONCRETE SLAB
					SPT 2,2,4 N*=6						FILL: Clayey SAND: Fine grained, dark grey, low plasticity clay				FILL
					E	1	2					<Wp			Stong Hydrocarbon Odour, PID = 75.3ppm
											FILL: CLAY: High plasticity, pale grey, mottled orange-brown with some iron oxide staining				
											2m - Becoming dark grey.				No Odour, PID = 35.2ppm
					SPT 1,2,1 N*=3	0	3		CH		CLAY: High plasticity, pale grey, mottled orange-brown		F-St		ALLUVIUM
					E	-1	4								No Odour, PID = 3.4ppm
					SPT 3,4,6 N*=10	-2	5				Borehole NBH29 terminated at 4.95m				
						-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

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

U₅₀ undisturbed sample 50mm diameter

U₆₃ 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

WL 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

Engineering Log - Piezometer

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 3**

Borehole No. **NBH30**

Sheet 1 of 1

Project No: **GEOTLCOV24303AC**

Date started: **27.4.2012**

Date completed: **27.4.2012**

Logged by: **ACM**

Checked by: **DS**

drill model & mounting: XP60 Truck

Easting:

slope: -90°

R.L. Surface: 2.7

hole diameter: 100

Northing:

bearing: N/A

datum: AHD

drilling information

material substance

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

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool DT diatube B blank bit V V bit T TC bit TBX Tubex *bit shown by suffix e.g. ADT	support 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 D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone P pressure meter Bs bulk sample R refusal E environmental sample PID PID measurement WS water sample PZ piezometer ALT air lift test	classification symbols and soil description based on unified classification system moisture D dry W wet M moist Wp plastic limit WL liquid limit well details betonite sand slotted PVC	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 - Borehole

Client: **INSW**

Principal:

Project: **SICEEP, Darling Harbour, Sydney NSW**

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH5**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**

Date started: **25.7.2012**

Date completed: **25.7.2012**

Logged by: **PD**

Checked by: **ML**

drill model and mounting: B80 MOBILE DRILL TRACK Easting: slope: -90° R.L. Surface:
hole diameter: 120 mm Northing bearing: datum:

drilling information					material substance							
method	penetration	support	water	notes samples, tests, etc	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	pocket penetrometer kPa	structure and additional observations
1	2	3		RL				soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
ADV								BRICK:	D	F		No odour or staining.
					0.5			SAND: Yellow brown, medium grained.				
ADT				E+-3.1ppm				ROADBASE:				Dup 4
					1.0			FILL: Gravelly clayey sand, grey brown, fine grained gravel dark grey rock material.				
				E+-4.2ppm								
					1.5			White gravel fragments.				
				E+-5.8ppm				FILL: Gravelly clay, low plasticity, dark grey gravel, glass/shell fragments.				
					2.0							
				E+-6.2ppm								
					2.5			Borehole CBH5 terminated at 2.2m				
					3.0							
					3.5							
					4.0							
					4.5							
					5.0							

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

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

U₅₀ undisturbed sample 50mm diameter

U₅₃ 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

Engineering Log - Borehole

Client: **INSW**

Principal:

Project: **SICEEP, Darling Harbour, Sydney NSW**

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH5A**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**

Date started: **27.7.2012**

Date completed: **27.7.2012**

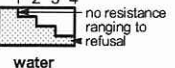
Logged by: **PD**

Checked by: **ML**

drill model and mounting: B80 MOBILE DRILL TRACK Easting: slope: -90° R.L. Surface:
hole diameter: 120 mm Northing bearing: datum:

drilling information						material substance												
method	penetration			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				structure and additional observations
	1	2	3											100 kPa	200 kPa	300 kPa	400 kPa	
ADV											BRICK.	D	F				No odour, No staining observed.	
										SAND: Medium grained, yellow and brown.								
									ROADBASE:									
						E+ 0.7ppm		1			FILL: GRAVELLY CLAYEYSAND, fine grained, grey brown. Gravel fine to medium grained, dark grey.							
						E+ 1.9ppm												
						E+ 5.0ppm					Some white gravel fragments.							
						E+ 3.0ppm		2			GRAVELLY CLAY: Low plasticity, dark grey, 1-5 cm rockpieces, some white shell fragments.							
						E+ 1.3ppm												
						E+ 2.0ppm		3			Becoming brown, minor shell and shell fragments..	M					Dup8	
						E+ 1.1ppm					Orange brick fragments, shells and shell fragments.							
						E+ 0.6ppm		4			Increasing sand content.	W					ASS1	
						E+ 0.9ppm					Becoming grey.							
						E+ 1.3ppm		5										
											Ironstone band, red grey.	D	H					
						E+ 1.9ppm		6			SAND, Highly weathered. Sandstone, medium to fine grained, red.	F					ASS2	
										Borehole CBH5A terminated at 6m								
							7											

method		support	notes, samples, tests		classification symbols and soil description		consistency/density index		
AS	auger screwing*	M mud	N nil	U ₅₀ undisturbed sample 50mm diameter	based on unified classification system		VS	very soft	
AD	auger drilling*	C casing		U ₅₃ undisturbed sample 63mm diameter			S	soft	
RR	roller/tricone	penetration			D	disturbed sample	F	firm	
W	washbore	1	2	3	4	N	standard penetration test (SPT)	St	stiff
CT	cable tool	no resistance ranging to refusal			N*	SPT - sample recovered	VSt	very stiff	
HA	hand auger				Nc	SPT with solid cone	H	hard	
DT	diatube	water			V	vane shear (kPa)	Fb	friable	
B	blank bit	10/1/98 water level on date shown			P	pressuremeter	VL	very loose	
V	V bit				Bs	bulk sample	L	loose	
T	TC bit				E	environmental sample	MD	medium dense	
*bit shown by suffix e.g. ADT					R	refusal	D	dense	
							VD	very dense	

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  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 WL 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 - Piezometer

Borehole No. **CBH6/MW6**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**Client: **INSW**

Date started: 25.7.2012

Principal:

Date completed: **25.7.2012**Project: **SICEEP, Darling Harbour, Sydney NSW**

Logged by: *PD*

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Checked by: **ML**

drilling information						material substance						
method	penetration 1 2 3	support	water	notes samples, tests, etc		graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	structure and additional observations	
ADV								BRICK:	D	S	No odour or staining.	
ADT				E+9.0ppm				SAND: Yellow brown, medium grained. ROADBASE: FILL: Gravelly clayey sand, fine grained, dark grey, fine gravel.		F		
				E+9.0ppm	1			GRAVELLY SANDY CLAY: Low-medium plasticity, brown, coarse grey, cream, white gravel, igneous rocks and sandstone. CLAY: Medium plasticity, red-grey.				
				E+8.6ppm								
				E+10.0ppm	2			Becoming slightly paler in colour.				
				E+10.2ppm				GRAVELLY CLAY: medium plasticity, red. Coarse grey and orange gravel.	M		(ASS1)	
				E+9.7ppm	3			CLAYEY SAND: Fine grained, dark grey, shell fragments.			(ASS2)	
				E+9.6ppm				SANDY CLAY: Medium plasticity, dark grey, shell fragments.	W		(ASS3)	
				E+9.7ppm	4			CLAY: High plasticity, dark grey.	M		(ASS4)	
				E+10.0ppm				CLAYEY SAND: Medium grained, dark grey.		H	(ASS5)	
				E+13.9ppm	5			Orange grey mottled.			(ASS6)	
				E+15.8ppm				Borehole terminated at 5.6m			(ASS7)	
					6							
					7							

method

AS auger screwing*

AD auger drilling*

RR roller/tricone

W washbore

CT cable tool

DT diatube

B blank bit

V V bit

T TC bit

TBX Tubex

*bit shown by suffix e.g. ADT

support

C casing N nil

penetration

water

10/1/98 water level on date shown

water inflow

water outflow

notes, samples, tests

U₅₀ undisturbed sample 50mm diameter

D disturbed sample

N standard penetration test (SPT)

N* SPT - sample recovered

Nc SPT with solid cone

P pressure meter

Bs bulk sample

R refusal

E environmental sample

PID PID measurement

WS water sample

PZ piezometer

ALT air lift test

classification symbols and soil description

based on unified classification system

moisture

D dry

M moist

W wet

Wp plastic limit

WL 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

Engineering Log - Borehole

Client: **INSW**

Principal:

Project: **SICEEP, Darling Harbour, Sydney NSW**

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH7**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**

Date started: **25.7.2012**

Date completed: **25.7.2012**

Logged by: **PD**

Checked by: **ML**

drill model and mounting: KOMATSU 05 TRACK Easting: slope: -90° R.L. Surface:
hole diameter: 120 mm Northing bearing: datum:

drilling information						material substance									
method	penetration			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	1	2	3												
V-BIT															
			</												

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 W _p 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 - Borehole

Client: **INSW**

Principal:

Project: **SICEEP, Darling Harbour, Sydney NSW**

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH7A**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**

Date started: **27.7.2012**

Date completed: **27.7.2012**

Logged by: **PD**

Checked by: **ML**

drill model and mounting: KOMATSU 05 TRACK Easting: slope: -90° R.L. Surface:
hole diameter: 120 mm Northing bearing: datum:

drilling information						material substance														
method	penetration			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			structure and additional observations			
	1	2	3											100 kPa	200 kPa	300 kPa		400 kPa		
ADTDV											ASPHALT: ROADBASE: FILL: Gravelly sandy CLAY, ow plasticity, yellow brown. 1mm - 3 cm Gravel, dark grey and cream crushed stones/ rock pieces	D	F				No odour, no staining observed.			
					E+ 1.3ppm		1			Becoming dark grey.										
					E+ 1.1ppm															
						E+ 5.4ppm		2			GRAVELLY CLAY: Low plasticity, yellow brown, gravel (1-5cm), dark grey rock.		S							
						E+ 7.0ppm				GRAVELLY SAND CLAY: Low plasticity, dark grey (1-5mm), grey.										
						E+ , 8.0ppm		3					F				Dup 7, Dup 7A, ASS4.			
						E+ 9.7ppm														
						E+ 9.9ppm		4			Becoming grey brown, medium plasticity, medium shale gravel.									
						E+ 9.2ppm				CL	CLAY: Redish brown, gravel (1-5cm), red brown, grey sandstone. GRAVELLY SANDY CLAY: Medium plasticity, dark grey, medium grained gravel.	M								
						E+ 9.3ppm		5									ASS1			
						E+ 11.4ppm					CLAY: Less sandy, white shell and shell fragments.									
						E+ 12.1ppm		6			Borehole CBH7A terminated at 6m						ASS3			
								7												
	method						support		notes, samples, tests				classification symbols and soil description				consistency/density index			
	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						M mud C casing penetration 1 2 3 4 water 10/1/98 water level on date shown		U ₅₀ undisturbed sample 50mm diameter U ₅₃ 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				moisture D dry M moist W wet Wp plastic limit W _L liquid limit				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			
*bit shown by suffix e.g. ADT						no resistance ranging to refusal water inflow water outflow														

BOREHOLE GEOTLCOV24303AD.GPJ COFFEY.GDT 15.8.12

Engineering Log - Borehole

Client: **INSW**

Principal:

Project: **SICEEP, Darling Harbour, Sydney NSW**

Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH8**

Sheet 1 of 1

Office Job No.: **GEOTLCOV24303AD**

Date started: **24.7.2012**

Date completed: **24.7.2012**

Logged by: **PD**

Checked by: **ML**

drill model and mounting: KOMATSU 05 TRACK Easting: slope: -90° R.L. Surface:
hole diameter: 120 mm Northing bearing: datum:

drilling information						material substance										
method	penetration			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	structure and additional observations	
	1	2	3													
V-BTS											ASPHALT: FILL: Gravelly clayey silt, dark grey, medium dark grey gravel.	D	F		No odour or staining.	
						E+9.9ppm		1			GRAVEL: Some sand, orange, clay/brick fragments.					
						E+10.9ppm					GRAVELLY CLAY: Low plasticity, grey, medium crushed shale gravel, some orange fragments.				ASS1	
						E+11.2ppm		2			GRAVELLY SANDY CLAY: Low-medium plasticity, grey brown, gravelly gravel, orange-grey.					
						E+11.1ppm						M				
						E+11.3ppm					Becoming orange in colour.					
						E+14.6ppm		3			CLAYEY SAND: Medium-fine grained, dark grey.				Organic matter odour, no staining.	
						E+12.9ppm					Increasing clay content, some white shell fragments.				Dup1, Dup 1A	
						E+12.5ppm		4							ASS2	
						E+11.8ppm									ASS3	
						E+12.8ppm		5			GRAVELLY SANDY CLAY: Medium plasticity, yellow brown, medium dark yellow grey gravel.				ASS4	
						E+11.8ppm									ASS5	
						E+12.7ppm		6							Dup2, ASS6,	
															ASS7	
								7				Borehole CBH8 terminated at 6m				
method						support		notes, samples, tests				classification symbols and soil description			consistency/density index	
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						M mud C casing penetration 1 2 3 4 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				based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit			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	

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 W _p 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 - Piezometer

Client: **INSW**
Principal:
Project: **SICEEP, Darling Harbour, Sydney NSW**
Borehole Location: **SICEEP Darling Harbour, Sydney NSW**

Borehole No. **CBH9 / MW9**
Sheet 1 of 1
Office Job No.: **GEOTLCOV24303AD**
Date started: **26.7.2012**
Date completed: **26.7.2012**
Logged by: **PD**
Checked by: **ML**

drilling information						material substance						
method	penetration	support	water	notes samples, tests, etc	well details	depth metres	graphic log	classification symbol	material	moisture condition	consistency/density index	structure and additional observations
1	2	3			RL				soil type: plasticity or particle characteristics, colour, secondary and minor components.			
Sand									BRICK: SAND: GRAVELLY CLAYEY SAND: Fine grained, dark grey. Fine, dark grey gravel, minor orange rock shards.	D	F	FILL. No odour, no staining observed.
				E+ 3.1 ppm		1			Some yellow coarse grained sand, plus dark grey clayey sand, fragments of orange bricks.			
				E+ 5.2 ppm					Increasing clay content, orange brick fragments and ceramic pieces.			
				E+ 6.4 ppm		2			CLAY: < Medium plasticity, yellow brown.			Dup 5A
				E+ 6.8 ppm					Becoming grey-red.			
				E+ 7.0 ppm		3			SANDY CLAY: Medium plasticity, dark grey.	M		ASS1
				E+ 6.7 ppm					Minor white shell fragments.			ASS2
				E+ 5.8 ppm		4			White shells and shell fragments (1mm-7cm).	W		ASS3
				E+ 3.0 ppm					CLAY: Medium plasticity, red. slight yellow grey mottled.	D		ASS4
				E+ 5.0 ppm		5			Grey, red mottled.			ASS5
				E+ 4.2 ppm								ASS6
				E+ 4.5 ppm								
						6			Borehole terminated at 5.8m			
						7						

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT DT B V T TBX *bit shown by suffix e.g. ADT	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	U ₅₀ D N N* Nc P Bs R E PID WS PZ ALT undisturbed sample 50mm diameter disturbed sample standard penetration test (SPT) SPT - sample recovered SPT with solid cone pressure meter bulk sample refusal environmental sample PID measurement water sample piezometer air lift test	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	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