

APPENDIX E
COMPILATION OF BOREHOLE LOGS

PROJECT NAME: Darling Harbour - Western Boulevard

LOCATION: 49852N, 8442E
GROUND LEVEL: 5.13mAH

CASING DEPTH (BAZE)	SAMPLING & INSITU TESTING			CONSISTENCY		GROUP SYMBOL	LEGEND	STRATA		DESCRIPTION OF STRATA	WATER
	TYPE	DEPTH		COHESIVE	NON COHESIVE			DEPTH	REDUCED LEVEL		
		FROM	TO								
m (mm)		m	m	0 1 2 3 4 5 6 7 8 9	0 1 2 3 4 5 6 7 8 9			m	mAHD		
								0	5.13	Dark grey/black, sandy gravel FILL	
								1.0	4.13	Brown, medium plasticity, clay FILL	
	SPT N=4	2.00	2.45					2.0	3.13	Ripped sandstone FILL	
						CH		3.2	1.93	Dark grey, high plasticity CLAY	
	SPT N=6	3.50	3.95								
	SPT N=R	5.00	5.20					5.00	0.13	V-bit refusal	

REMARKS:

CONTRACTOR: McDermott Drill P/L

BORING METHOD:

Mole Pioneer rig using 100mm dia

MADE BY: GSV

DATE: 7.5.85

FIGURE **34**

JOB 3859

Coffey & Partners Pty. Ltd.

engineering log - borehole



borehole no:

6

sheet 1 of 2

office and job no: Sydney 6063

project: borehole location:		TAYLOR THOMSON WHITTING DEPARTMENT OF PUBLIC WORKS HAYMARKET REDEVELOPMENT RAILWAY YARDS				hole commenced: 12th May 1978 hole completed: 12th May 1978 supervised by: RJL log checked by: JPM					
drill model and mounting: Gemco + Truck		slope: 90 deg.		R.L. surface: m							
hole diameter: 100 mm		bearing: — deg.		datum:							
method	penetration 1 2 3	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log classification symbol	material soil type; plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency, rel. density	100 kPa hand penetro- meter	structure and additional observations
AD T						GW	SANDY GRAVEL, fine to medium grained, grey, gravel to 30 mm, some clay — FILL	D			BASALT AND ROAD METAL
AD V					1	SP	SAND, fine to medium grained, brown to black, trace of gravel to 5 mm — FILL	M			FILL
					2						
					3	SC	CLAYEY SAND, fine to medium grained, dark grey to black, trace of shells	W			ALLUVIUM & MARINE DEPOSITS
					4						
					5		CLAYEY SAND, fine to medium grained, light grey-white				RESIDUAL SOIL E.W. SANDSTONE
					6						
					7		CLAYEY SAND, as above but orange and grey mottled	M			
					8						

key method

AS auger screwing*
AD auger drilling
R roller/tricone
W washbore
CT cable tool

* bit shown by suffix:

B -- blank bit

V -- "V" bit

T -- TC bit

e.g. ADT

support

C casing

M mud

penetration

1 2 3 no resistance
ranging to
refusal

water

10 Oct, 73 water level
on date shown

water inflow

water outflow

notes -- samples and tests

U50 -- undisturbed sample
50 mm diameter

D -- disturbed sample

N -- standard penetration
test: figure = result

N* -- SPT + sample

Nc -- cone penetrometer

classification symbols and soil description

based on unified
classification system

moisture

D -- dry

M -- moist

W -- wet

consistency/relative density

VS -- very soft

S -- soft

F -- firm

St -- stiff

VSt -- very stiff

H -- hard

Fb -- friable

VL -- very loose

L -- loose

MD -- moderately dense

D -- dense

VD -- very dense

Coffey & Partners Pty. Ltd.



borehole no

6

sheet 2 of 2

engineering log - borehole

office and job no: Sydney 6063

project:

borehole location:

TAYLOR THOMSON WHITTING
DEPARTMENT OF PUBLIC WORKS
HAYMARKET REDEVELOPMENT
RAILWAY YARD

hole commenced: 12th May 1978

hole completed: 12th May 1978

supervised by: RJL

log checked by: JPM

drill model and mounting:

Gemco + Truck

slope: 90 deg.

R.L. surface:

m

hole diameter: 100 mm

bearing: — deg.

datum:

method	penetration	support	water	notes samples, tests, etc.	R.L. depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency, rel. density	hand penetro- meter	structure and additional observations
1	2	3										
AD					8		SC	CLAYEY SAND, as above	M			RESIDUAL SOIL E.W. SANDSTONE
AD					9			SANDSTONE				Cuttings are light brown - indicating HW-MW Sandstone
					10			END OF HOLE AT 9.30 m				
					11							
					12							
					13							
					14							

key method	support	notes	classification symbols and soil description	consistency/relative density
AS — auger screwing*	C — casing	U50 — undisturbed sample 50 mm diameter	based on unified classification system	VS — very soft
AD — auger drilling	M — mud	D — disturbed sample	moisture	S — soft
R — roller/tricone	penetration	N — standard penetration test: figure = result	D — dry	F — firm
W — washbore	1 2 3 — no resistance ranging to refusal	N* — SPT 1 sample	M — moist	St — stiff
CT — cable tool		Nc — cone penetrometer	W — wet	VSst — very stiff
* bit shown by suffix:	water			H — hard
B — blank bit	10 Oct, 73 water level on date shown			Fb — friable
V — "V" bit				VL — very loose
T — TC bit	water inflow			L — loose
e.g. ADT	water outflow			MD — moderately dense
				D — dense
				VD — very dense



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH 13

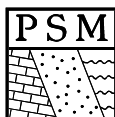
job no: PSM 828
client: Energy Australia
project: City West Cable Tunnel
drilling subcontractor: Terratest
date hole commenced: 22/08/05
date hole complete: 30/08/05

drill information: Hydrapower 500-Truck Mounted
core diameter: HQ
datum: MGA
borehole location: Darling Harbour
inclination/azimuth: -90° /
surface R.L.: 3.7 m

Sheet 1 of 3
Logged by: PLW

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
Auger				3		CONCRETE					
				1		FILL - Sandy clay with rock fragments					
				2							
				2							
				1							
				3		SANDY CLAY / CLAYEY SAND - dark brown					
				0							
				4							
				1							
				5							
				2							
				6							
				3							
				7							
				4							
				8		SANDSTONE - medium to coarse grained, yellow brown, red brown & light grey, with indistinct cross-bedding					
				5					D0.8 A1.0		BG, 0°, PL, Ro2, KL, 1 JN, 45°, PL, Ro3, KL, 1 BG, 0°, PL, Ro3, KL, 2 JN, 45°, PL, Ro3, KL, 1 BG, 20°, PL, Ro3, KL, 2
				9							BG, 25°, PL, Ro3, KL, 1 BG, 20°, PL, Ro3, KL, 1 BG, 0°, PL, Ro3, KL, 1
				6					D0.9 A1.3		BG, 10°, PL, Ro3, KL, 1

CIVIL BOREHOLE PSM828 EA BOREHOLES AUG. 05.GPJ PSM LIB JAN04.GDT 08/09/05



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH 13

job no: PSM 828
client: Energy Australia
project: City West Cable Tunnel
drilling subcontractor: Terratest
date hole commenced: 22/08/05
date hole complete: 30/08/05

drill information: Hydrapower 500-Truck Mounted
core diameter: HQ
datum: MGA
borehole location: Darling Harbour
inclination/azimuth: -90° /
surface R.L.: 3.7 m

Sheet 2 of 3

Logged by: PLW

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R4 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
HQ				-7		SANDSTONE - medium to coarse grained, yellow brown, red brown & light grey, with indistinct cross-bedding			D0.8 A1.4		JN, 15°, PL, Ro3, KL, 1 BG, 10°, PL, Ro3, KL, 1 BG, 20°, IR, Ro4, CL, VN, 1 BG, 0°, IR, Ro4, CL, VN, 1 BG, 10°, PL, Ro3, KL, 2 JN, 60°, PL, Ro3, KL, 1 BG, 2°, PL, Ro3, FE, VN, 1 BG, 65°, PL, Ro3, FE, ST, 1
				-8					D1.6 A0.9		BG, 5°, IR, Ro4, KL, 1
				-9					D1.4 A1.5		BG, 0 to 10, IR, Ro3, FE, ST, 4 JN, 65°, PL, Ro3, FE, ST, 2
				-10					D1.4 A0.7		JN, 30°, PL, Ro3, KL, 1
				-11					D0.9 A1.0		JN, 25°, PL, Ro3, KL, 1 BG, 20°, PL, Ro2, CL, VN, 1 20mm hole BG, 20°, PL, Ro3, FE, ST, 1 BG, 20°, PL, Ro3, KL, 1 BG, 30°, PL, Ro3, CL, VN, 1
				-12		SANDSTONE - fine to medium grained, light grey, with carbonaceous flecks and some indistinct cross-bedding			D0.9 A1.1		DB, DB, DB, DB,
				-13					D0.8 A1.2		DB, 16.30 to 16.90m
				-14		NO CORE 1.25m. Core left down hole then ground up during redrilling					
				-15		SANDSTONE - fine to medium grained, light grey, with carbonaceous flecks and some indistinct cross-bedding			D1.0 A1.5		BG, 10°, PL, Ro2, CL, VN, 1 BG, 10°, PL, Ro2, CL, VN, 1
				-16					D1.8 A2.6		BG, 10°, PL, Ro2, CL, VN, 1

CIVIL BOREHOLE PSM828 EA BOREHOLES AUG. 05.GPJ PSM LIB JAN04.GDT 08/09/05



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH 13

job no: PSM 828
client: Energy Australia
project: City West Cable Tunnel
drilling subcontractor: Terratest
date hole commenced: 22/08/05
date hole complete: 30/08/05

drill information: Hydrapower 500-Truck Mounted
core diameter: HQ
datum: MGA
borehole location: Darling Harbour
inclination/azimuth: -90° /
surface R.L.: 3.7 m

Sheet 3 of 3

Logged by: PLW

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R4 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
HQ				-17		SANDSTONE - fine to medium grained, light grey, with carbonaceous flecks and some indistinct cross-bedding					
				21					D1.3 A2.1		
				-18					D1.6 A2.4		JN, 10°, CU, Ro3, KL, 1 BG, 0°, PL, Ro3, CL, VN, 1 BG, 0°, PL, Ro3, KL, 1
				22					D1.5 A2.8		
				-19							BG, 0°, PL, Ro3, KL, 1 BG, 15°, PL, Ro3, CL, VN, 1
				23							
				-20							BG, 30°, PL, Ro3, KL, 1
				24					D3.2 A3.6		
				-21							BG, 0°, IR, Ro2, CB, VN, 1
				25					D2.2 A2.6		BG, 25°, PL, Ro2, Mica, VN, 1 BG, 25°, PL, Ro2, CB, 2mm, 1
				-22							DB,
				26					D5.3 A4.1		
				-23					D2.6 A3.0		BG, 3°, CU, Ro3, KL, 1 BG, 0°, PL, Ro2, KL, 1 BG, 15°, IR, Ro3, CB, VN, 1
				27							
				-24							BG, 5°, PL, Ro3, CL, VN, 3
				28					D0.6 A0.7		DB, DB, DB,
				-25					D2.3		BG, 0°, PL, Ro3, KL, 1 BG, 5°, IR, Ro3, KL, 1 BG, 0°, CU, Ro3, KL, 1
				29							JN, 25°, PL, Ro3, KL, 1 BG, 5°, PL, Ro3, Pebbles, 20mm, 1
				-26					D1.6 A1.6		BG, 3°, PL, Ro2, CB, VN, 1

End of Hole at 30m.

Refer to Explanation Sheets Attached for Classification Systems

CIVIL BOREHOLE PSM828 EA BOREHOLES AUG. 05.GPJ PSM LIB JAN04.GDT 08/09/05

Borehole Log

Hole No: EA-BH14

job no: PSM828
client: ENERGY AUSTRALIA
project: City North Cable Tunnel
drilling subcontractor: APS Drilling
date hole commenced: 12/01/04
date hole complete: 12/03/04

drill information: EDSO3000
core diameter:
datum: AGM
borehole location: Darling Drive and Hay Street
inclination/azimuth: -90° / 360°
surface R.L.:

Sheet 1 of 4
Logged by: AGS & DA

[illegible]



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH14

job no: PSM828
client: ENERGY AUSTRALIA
project: City North Cable Tunnel
drilling subcontractor: APS Drilling
date hole commenced: 12/01/04
date hole complete: 12/03/04

drill information: EDSON3000
core diameter:
datum: AGM
borehole location: Darling Drive and Hay Street
inclination/azimuth: -90° / 360°
surface R.L.:

Sheet 2 of 4
Logged by: AGS & DA

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R4 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
HQ				11		yellow, no obvious bedding SANDSTONE, coarse grained, heavily iron stained, red bedding at -0°. cross bedding at 20°			D1.2 A1.8 D1.2		BG, 5°, pl, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 25°, ro4, Kl, -, 1 BG, 25°, ro4, Kl, -, 1 BG, 25°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 0°, ro4, cl, vn, 1
				12		CORE LOSS SANDSTONE, coarse to very coarse grained, orange 'sugary' SANDSTONE, medium grained, white / grey 0 10° bedding			A1.8		
				13		CORE LOSS (associated with grinding for stress test #2) SANDSTONE, medium to coarse grained, white, faint bedding at 0 to 15°			D2.3 A2.2 D2.3 A2.2		BG, 15°, ro4, Kl, -, 1
				14							di, 0°, ro4, Kl, -, 1 BG, 5°, ro3, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro3, cl, vn, 1 BG, 10°, ro3, cl, vn, 1 BG, 5°, ro4, cl, vn, 1 BG, 10°, ro4, cl, vn, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1
				15		CORE LOSS (associated with grinding for stress test #4) SANDSTONE, medium to coarse grained, white faint bedding at 15°			D1.6 A2.4 D1.6 A2.4		BG, 15°, ro4, cb, vn, 1 BG, 15°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1
				16		SHALE BRECCIA piece, 10mm x 40mm, low (R2) strength Coarse grained SANDSTONE and some SHALE BRECCIA pieces SANDSTONE, medium to coarse grained, white, faint bedding.			D2.8 A2.7 D2.8 A2.7		BG, 10°, ro5, cn, 2, 1 BG, 10°, ro4, cb, vn, 1 BG, 0°, ro4, cb, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 0°, ro4, cl, vn, 1 BG, 0°, ro4, cb, vn, 1
				17		CORE LOSS coarse grained SANDSTONE and some SHALE BRECCIA SANDSTONE, medium grained, white with carbonaceous flecks SANDSTONE, coarse grained, white, faint bedding at 0 to 15°			A2		BG, 0°, ro4, Kl, -, 1 BG, 5°, ro4, cl/rf, 10, 1 BG, 0°, ro4, Kl, -, 1 BG, 20°, ro4, Kl, -, 1 BG, 20°, ro4, Kl, -, 1 BG, 0°, ro5, cl/cb, 2, 1 BG, 25°, ro4, Kl, -, 1 BG, 20°, ro4, Kl, -, 1 BG, 20°, ro4, Kl, -, 1 BG, 20°, ro4, Kl, -, 1 BG, 20°, ro4, cl, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 0°, ro4, cl, vn, 1 BG, 35°, ro4, cl, vn, 1 BG, 30°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 jn, 85°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1
				18					A3.3 D3.5 A3.3 D3.5		
				19					D1.6 A2.4 D1.6 A2.4		
						bedding becoming more distinct, -15°					

CIVIL BOREHOLE PSM828 EA BOREHOLES.GPJ PSMV3.GDT 27/01/05



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH14

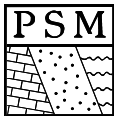
job no: PSM828
client: ENERGY AUSTRALIA
project: City North Cable Tunnel
drilling subcontractor: APS Drilling
date hole commenced: 12/01/04
date hole complete: 12/03/04

drill information: EDSON3000
core diameter:
datum: AGM
borehole location: Darling Drive and Hay Street
inclination/azimuth: -90° / 360°
surface R.L.:

Sheet 3 of 4
Logged by: AGS & DA

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R4 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
HQ				20		SHALE, horizontally bedded, black			D0.8		BG, 15°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 BG, 10°, ro4, cl/cb, 20, 1 BG, 0°, ro3, cl/cb, 7, 1 BG, 0°, ro3, cl, 5, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, cl, 5, 1
				21		CORE LOSS SANDSTONE, medium grained, massive with carbonaceous flecks			D1.7 A1.5 D1.7 A1.5		
				22					D1.7		BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, Kl, -, 1
				23					D2.6 A2.4 D2.6 A2.4		
				24					D2.7 A2.2 D2.7 A2.2		
				25					D2.1 A1.7 D2.1 A1.7		
				26							
				27					D2 A2.1 D2 A2.1		
				28							
				29		Interbedded shale and Sandstone 50/50 SANDSTONE, medium grained, massive, white with carbonaceous flecks SHALE piece bedding at 20°					di, 0°, ro4, Kl, -, 1 BG, 0°, ro4, cl, 2, 1 BG, 10°, ro4, cl, 2, 1 BG, 0°, ro4, cl, 1, 1 BG, 20°, ro4, cl, vn, 1 BG, 30°, ro4, cl, vn, 1 BG, 30°, ro4, cl, vn, 1 BG, 0°, ro4, cl, vn, 1

CIVIL BOREHOLE PSM828 EA BOREHOLES.GPJ PSMV3.GDT 27/01/05



Pells Sullivan Meynink Pty Ltd

Engineering Consultants
Rock-Soil-Water

A.C.N. 061447621

Borehole Log

Hole No: EA-BH14

job no: PSM828
client: ENERGY AUSTRALIA
project: City North Cable Tunnel
drilling subcontractor: APS Drilling
date hole commenced: 12/01/04
date hole complete: 12/03/04

drill information: EDSON3000
core diameter:
datum: AGM
borehole location: Darling Drive and Hay Street
inclination/azimuth: -90° / 360°
surface R.L.:

Sheet 4 of 4
Logged by: AGS & DA

Method	Testing	Water	RL (m)	Depth (m)	Graphic Log	Material Description (ROCK TYPE: Colour, grain size, major and minor components)	Weathering EW HW MW SW FR S0 S1 S2 S3 S4 S5 R0 R1 R2 R3 R4 R5	Estimated Strength	Point Load Is (50) MPa	Fracture Spacing (mm) 10 30 100 300 1000	Defect Description / Comments (Type, inclination, shape, roughness, infill type, infill thickness, number.)
HQ				31		SANDSTONE, medium grained, massive, white with carbonaceous flecks SANDSTONE, medium grained, white and grey with			D1.4 A1.8 D1.4 A1.8		BG, 15°, ro3, cb, 3, 1 BG, 0°, ro4, cb, vn, 1 BG, 10°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 10°, ro4, cb, vn, 1 BG, 5°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1 BG, 10°, ro4, cb, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 10°, ro4, cl, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 10°, ro4, cl, vn, 1 BG, 10°, ro4, cl, vn, 1 cn, 0°, ro3, cb, vn, 1
				32					D2.1 A2.2 D2.1 A2.2		BG, 0°, ro4, Kl, -, 1 BG, 10°, ro4, cl, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 5°, ro4, Kl, -, 1 BG, 10°, ro4, cl, vn, 1 BG, 10°, ro4, cl, vn, 1 cn, 0°, ro3, cb, vn, 1
				33		COAL, black SHALE BRECCIA SANDSTONE, Fine to medium grained, grey, horizontally bedded			D1.3 A2.3 D1.3 A2.3		BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, cb, vn, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, cl, vn, 1 jn, 85°, ro4, cl, vn, 1 jn, 85°, ro4, cl, vn, 1 BG, 0°, ro3, cl, 1, 1 BG, 0°, ro3, cl, 1, 1 BG, 0°, ro3, cl and RF, 10, 1
				34					D2.8 A2.4 D2.8 A2.4		BG, 5°, ro3, cb, vn, 1 BG, 0°, ro3, cb, vn, 1 jn, 85°, ro4, cl, 2, 1
				35		black laminations SANDSTONE, horizontally bedded with a trace of fine carbonaceous laminae			D3.2 A3.4 D3.2 A3.4		BG, 10°, ro3, cl, vn, 1 BG, 0°, ro3, cl, vn, 1
				36							BG, 5°, ro3, cb, 3, 1 BG, 0°, ro3, cb, vn, 1 BG, 5°, ro4, Kl, -, 1 BG, 10°, ro4, cb, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 15°, ro4, Kl, -, 1 BG, 5°, ro4, cb, vn, 1 BG, 0°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 10°, ro4, Kl, -, 1 jn, 85°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 0°, ro4, Kl, -, 1 BG, 10°, ro3, Kl, -, 1
				37							BG, 10°, ro3, Kl, -, 1 BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, Kl, -, 1
				38		SANDSTONE, coarse grained, horizontally bedded, white with a trace of fine carbonaceous laminatae with some small shale chips			D2.4 A2.5 D2.4 A2.5		BG, 10°, ro3, Kl, -, 1 BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, Kl, -, 1
				39		broken up due to drilling End of Hole at 38.8m.			D1.6 A2 D1.6 A2		BG, 10°, ro3, Kl, -, 1 BG, 0°, ro3, Kl, -, 1 BG, 0°, ro3, cl, vn, 1 BG, 0°, ro3, Kl, -, 1

CIVIL BOREHOLE PSM828 EA BOREHOLES.GPJ PSMV3.GDT 27/01/05

ARUP

GEOTECHNICS

BOREHOLE RECORD

HOLE **HS2**

SHEET **1**
OF **3**

PROJECT NAME: DARLING HARBOUR - HAY STREET SEWERAGE SUB-MAIN

LOCATION: 49809N
8483E
GROUND LEVEL: 3.18m

SLOPE: 90°
BEARING: -

METHOD	SUPPORT	SAMPLING & INSITU TESTING				CONSISTENCY				GROUP SYMBOL	LEGEND	STRATA		DESCRIPTION OF STRATA	WATER	MOISTURE CONDITION	
		TYPE	DEPTH		COHESIVE	NON COHESIVE		DEPTH	REDUCED LEVEL DATUM								
			FROM	TO		VS	ST					VL	LL				HH
0	AD												0	3.18	SAND; brown, medium to fine grained, with boulders, cobbles and gravel. (FILL)		M
	TC																
1																	
2																W/M	
		SPT	2.30	2.75													
		N=2															
3																W	

REMARKS:

CONTRACTOR:
ENGINEERING EXPLORATION PTY. LIMITED
DRILLING EQUIPMENT: EDSON 3000
TYPE:
MOUNTING: TRUCK
DIAMETER: 100mm AUGER
CASING:

MADE BY: KF DATE: 6/1/87

FIGURE **A3**

Job 4456

GEOTECHNICS

HOLE HS2

OF 3

GROUND LEVEL: 3.18m

REMARKS

MADE BY: KF DATE: 6/1/87

FIGURE A4

JOB 4456

GEOTECHNICS

CORED BOREHOLE RECORD

PROJECT NAME: DARLING HARBOUR - HAY STREET SEWERAGE SUB-MAIN

HOLE HS2

SHEET 3

OF 3

LOCATION: 49809N
8483E
GROUND LEVEL: 3.18m

DEPTH m

REMARKS

CONTRACTOR:

ENGINEERING EXPLORATION PTY, LIMITED

DRILL TYPE (MOUNTING): EDSON 3000 (TRUCK)

BARREL TYPE (LENGTH): NMLC (3m)

HOLE DIAMETER: BIT:

CASING DIAMETER: FLUID

SLOPE: 90° BEARING -

MADE BY: KF DATE: 6/1/87

FIGURE A5

JOB 4456

54

ARUP

GEOTECHNICS

BOREHOLE RECORD**HOLE HS3**SHEET **1**OF **3**

PROJECT NAME: DARLING HARBOUR - HAY STREET SEWERAGE SUB-MAIN

LOCATION: 49869N

8441E

GROUND LEVEL: 2.92m

SLOPE: 90°

BEARING:

METHOD	SUPPORT	SAMPLING & INSITU TESTING				CONSISTENCY		GROUP SYMBOL	LEGEND	STRATA		DESCRIPTION OF STRATA	WATER	MOISTURE CONDITION
		TYPE	DEPTH		COHESIVE	NON COHESIVE	DEPTH			REDUCED LEVEL DATUM				
			FROM	TO										
			m	m										
0														
AD								SP		0	2.92	Gravelly SAND; brown, medium grained, with diesel and lumps of high plasticity clay. (FILL)		M
TC										0.50	2.42			W/M
								CH				CLAY; mottled pink and brown, high plasticity, with a trace of medium gravel. (FILL)		M

REMARKS:

CONTRACTOR:

ENGINEERING EXPLORATION PTY. LIMITED

DRILLING EQUIPMENT: EDSON 3000

TYPE:

MOUNTING: TRUCK

DIAMETER: 100mm AUGER

CASING:

MADE BY: KP

DATE: 5/1/87

FIGURE A6**JOB 4456**

ARUP

GEOTECHNICS

CORED BOREHOLE RECORDHOLE **HS3**SHEET **2**OF **3**

PROJECT NAME: DARLING HARBOUR - HAY STREET SEWERAGE SUB-MAIN

LOCATION: 49869N

8441E

GROUND LEVEL: 2.92m

ROCK CORE DETAILS					ROCK STRATA DETAILS			DISCONTINUITY DETAILS				
DEPTH m	REC.	WEATHERING EL V L J K V H E H	ESTIMATED ROCK STRENGTH V L J K V H E H	LEGEND	DEPTH	REDUCED LEVEL	MATERIAL DESCRIPTION	DEPTH	THICK- NESS	DIP	SPACING (mm)	DESCRIPTION
					m	m		m	mm	deg.	500 1000 2000 3000	

REMARKS

CONTRACTOR:

ENGINEERING EXPLORATION PTY. LIMITED

DRILL TYPE (MOUNTING): EDSON 3000 (TRUCK)

BARREL TYPE (LENGTH): NMLC (3m)

HOLE DIAMETER: 76mm BIT: DIAMOND

CASING DIAMETER: NX FLUID WATER

SLOPE: 90° BEARING: -

MADE BY: KF

DATE: 5/1/87

FIGURE **A7**JOB **4456**

ARUP

GEOTECHNICS

CORED BOREHOLE RECORDHOLE **HS3**SHEET **3**OF **3**

PROJECT NAME: DARLING HARBOUR - HAY STREET SEWERAGE SUB-MAIN

LOCATION: 49869N

8441E

GROUND LEVEL: 2.92m

ROCK CORE DETAILS							ROCK STRATA DETAILS							DISCONTINUITY DETAILS								
DEPTH m	REC%	WEATHERING	ESTIMATED ROCK STRENGTH					LEGEND	DEPTH	REDUCED LEVEL	MATERIAL DESCRIPTION	DEPTH	THICKNESS	DIP	SPACING (mm)				DESCRIPTION			
			EL	VL	J	M	H		VH	EH		m	MAHD	m	mm	deg.	200	300		500	1000	2000
8		MW							8.00	-5.08	SANDSTONE; as previously.									Partings; as previously.		
100																						
9		(8.90)																				
		MW							9.23	-6.31	Fine gravel sized grains between 9.23 and 9.33m.	9.23								Rough partings.		
10		(10.10)							10.06	-7.14	CORE LOSS (0.04m).	10.06										
									10.10	-7.18	Borehole terminated at 10.10m.											

REMARKS

- 4mm core lost down the bottom of the hole.

CONTRACTOR:

ENGINEERING EXPLORATION PTY. LIMITED

DRILL TYPE (MOUNTING): EDSON 3000 (TRUCK)

BARREL TYPE (LENGTH): NMLC (3m)

HOLE DIAMETER: 76mm BIT: DIAMOND

CASING DIAMETER: 50mm core FLUID WATER

SLOPE: 90° BEARING -

MADE BY: KF

DATE: 5/1/87

FIGURE **A8**JOB **4456**

Engineering Log - Borehole

Client: **Infrastructure NSW**

Principal:

Project: **SICEEP**

Borehole Location: **See Figure 1**

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 and mounting: XP60 Ute Easting: 323628 slope: -90° R.L. Surface: 3.3
hole diameter: 100 mm Northing 6249852 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	
DT	1	2	3								CONCRETE: (0.4m) with 10mm reinforcement	D			CONCRETE SLAB	
HA						E	3				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	
						SPT 12/120 N*=R	2				2m - Becoming dark grey, mottled red-brown				No Odour, PID = 5.9ppm	
							2									
						SPT 4,2,10/80 N*=R	0				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	
							4									
						SPT 11,13,7 N*=20	-1								No Odour, PID = 4.5ppm	
							5			CH	Sandy CLAY: High plasticity, dark grey/grey, fine grained sand	F-St			ALLUVIUM	
							-2					>Wp				
						SPT 2,2,3 N*=5	-3								No Odour, PID = 1.0ppm	
							7									
							-4				7.5m - Becoming dark grey/grey, mottled yellow-brown		St		No Odour, PID = 1.0ppm	
						SPT 4,7,11 N*=18	8									
method						support		penetration			classification symbols and soil description			consistency/density index		
AS auger screwing*						M mud N nil		U ₅₀ undisturbed sample 50mm diameter			D dry			VS very soft		
AD auger drilling*						C casing		U ₆₃ undisturbed sample 63mm diameter			M moist			S soft		
RR roller/tricone								D disturbed sample			W wet			F firm		
W washbore								N standard penetration test (SPT)			Wp plastic limit			St stiff		
CT cable tool								N* SPT - sample recovered			WL liquid limit			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 GINTGEOTLCOV24303AC_COMBINED WITH AA GINT.GPJ COFFEY.GDT 5.16.12

Form GEO 5.3 Issue 3 Rev.2