

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH07**

2 of 2 sheet:

GEOTFYSH09703AA project no.

12 May 2014 date started:

12 May 2014 date completed:

logged by: BC/RB

Queanbeyan, NSW checked by: BC

location: E: 704919; N: 6084551 (Datum Not Specified) surface elevation: 651.02m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R particular STSI I + I + I + II + I + I + I650 1.0 start coring at 1.80m NO CORE: 0.25 m Highly Fractured Zone: 300mm comprising closely spaced joints and partings at various orientations 2.0 **SANDSTONE**: fine to medium grained, brown, distinctly bedded at 40°. XW / HW a=0.92 44% - JT, 45°, PL, RO, Fe SN - PT, 30°, PL, RO, Fe SN HW / MW SILTSTONE: pale brown, distinctly bedded at d=1 15 CS, 40° ∼ Highly Fractured Zone: 800mm comprising joints and partings at various orientations 3.0 648 13% a=0.45 d=0.34 PL, RO, Fe SN, e described JT
 SM, Clay
 Highly Fractured Zone: 340mm
 comprising closely spaced joints and
 parting at various orientations 4.0 647 Defects are:JT, 40°, P unless otherwise Observable a=0.39 d=0.39 NMLC PT. 5°. ST. RO. Fe SN 93% Not 5.0 646 a=0.37 d=0.56 6.0 645 with some interlaminated quartzite veins 57% a=0.29 d=0.36 Highly Fractured Zone: 220mm comprising closely spaced joints and partings at various orientations, iron stained 7.0 28% JT, 30°, PL, RO, Fe SN Regrehole BH07 terminated at 8.00 regraphic log / core recovery Target depth weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support parting joint shear zone residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone shear surface stepped water inflow crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC core (51.9 mm) NMLC coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH07 Depth Range: 1.80 - 8.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd										
project:	Ellerton Dri Ellerton Drive, G										
title:	CORE PHO	OTOGRAPI 107	Н								
project no	GEOTFYSH09703AA	fig no:	21	rev:							



project:

Engineering Log - Borehole

BH08 1 of 2 sheet:

Borehole ID.

logged by:

GEOTFYSH09703AA project no.

BC/RB

Opus International Consultants NSW Pty Ltd client: date started: 13 May 2014

principal: Queanbeyan City Council date completed: 13 May 2014 Ellerton Drive Extension

location: Queanbeyan, NSW								checked by: BC			
position:	osition: E: 704845; N: 6084261 (Datum Not Specified) surface elevation: 648.12m (Datum Not Specified)gle from									orizontal: 9	90°
drill model: Camacchio mounting: Trailer casing diameter : HQ											
drilling info	ormati	ion			mate	rial sub	stance				
water (m) method & support and a support water water (m) Mater (m) depth (m)				depth (m)	bo joint and the properties of		consistency / relative density / meter (kba) 300 000 000 000 000 000 000 000 000 00		structure and additional observations		
A A	Observable		-648	-		ML	Sandy SILT: low liquid limit, pale brown, fine to medium grained sand with some fine grained angular gravel.		Fb		COLLUVIUM
- AS AS	Not Ot		_	-			SANDSTONE: pale brown, highly weathered, estimated low strength.				BEDROCK
	**		-647	- 1.0 - -			Borehole BH08 continued as cored hole				
			-646	2.0—							
			-645	3.0-							
			-644	4.0—							
			-643	5.0 — - -							
			-642	6.0							
			-641 -	7.0— - - -							
method AD auger of augers	crewing cone ore ool uger it	g*	pend wate	etration or or leve wate		ater shown	samples & field tests B		escription on Unification Systems	abol & on ed	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 medium dense D dense VD very dense



principal: Queanbeyan City Council

client:

Engineering Log - Cored Borehole

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH08**

sheet: 2 of 2

project no. **GEOTFYSH09703AA**

date started: 13 May 2014

date completed: 13 May 2014

project: Ellerton Drive Extension logged by: BC/ RB

location: Queanbeyan, NSW checked by: BC

positi	ion:				/an, NSW 6084261 (Datum Not Specified) surface elevati	on: 648	3.12	2m (E	atui	n Not Spec	ifi eat n)gl	checked e from horiz	·
drill n	node	el: Car	nacchi	0	mounting: Trailer			casir	ng di	ameter : H0	Q		
drilli	ng i	nform	ation	mate	erial substance						rock	mass defe	
method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characterisics, colour, structure, minor components	weathering & alteration	c	stimat streng & Is5 ×= axia >= diame	th 0 al; etral ₹ ⊞	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating thickness, other) particular gen
		-648 -	- - - - 1.0 -		start coring at 1.00m								
		-647 - -646	2.0 —		SANDSTONE: fine grained, pale brown/ pale grey, distinctly bedded at 65°.	SW		×p		a=0.76 d=1.14	94%		— PT, 65°, PL, RO, Fe SN JT, 60°, PL, RO, Fe SN — JT, 60°, PL, RO, Fe SN
NMLC	Not Observable	-645 -	3.0					×		a=0.47 d=0.10	100%		Defects are:PT, 65°, PL, RO, Fe SN,
		-644 -	- - -					8		a=0.89 d=0.92	100%		— PT, 20°, ST, RO, CN — PT, 20°, PL, RO, Fe SN -
		-643	5.0		NO CORE: 0.15 m SANDSTONE: fine grained, pale brown/ pale grey, distinctly bedded at 65°.	SW	1	*		a=0.57 d=0.68			— PT, 0°, PL, RO, CN
		-	- - -6.0								100%		_
		-642 -	- - -		Borehole BH08 terminated at 6.00 m Target depth								
		-641	7.0 — -				1						
		_	-				ΙÌ		Ιİ				
DT AS AD RR CB W		auger di coller/trid claw or li washbo NMLC di wireline wireline wireline	crewing rilling cone blade bi re ore (51 core (4 core (6	.9 mm) 7.6mm) 3.5mm) 5.0mm)	water inflow complete drilling fluid loss partial drilling fluid loss core run & RQE	covered mbols indicate recovere	e mate		%)	HW highly DW distinct MW moder	al soil nely weathe weathe ttly weat rately we y weathe ith A for a w	athered red hered eathered ered	defect type planarity PT parting PL planar JT joint CU curved SZ shear zone SN shear surface ST stepped CS crushed seam IR Irregular SM seam DB drilling break roughness SL slickensided POL polished SN stain SO smooth VN veneer RO rough CO coating VR very rough



PointID: BH08 Depth Range: 1.00 - 6.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd									
project:		ve Extension Quanbeyan, NSW								
title:		OTOGRAPH H08								
project no:	ect no: GEOTFYSH09703AA fig no: 22 rev:									

CDF_0_9_04BA.GLB GrfcTbl COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Draw



Engineering Log - Borehole

Borehole ID. **BH09** sheet: 1 of 2

project no. **GEOTFYSH09703AA**

Opus International Consultants NSW Pty Ltd date started: 14 May 2014

principal: Queanbeyan City Council date completed: 14 May 2014

project: Ellerton Drive Extension logged by: RB location: Queanbeyan, NSW checked by: BC

ocati	on:	Qu	eanbey	an, I	NSW	/				checl	ked by:	BC
ositio	n:	E: 7	04846; N: 6	08417	71 (Dat	tum No	t Specif	ied) surface elevation : 648.52m (Datum N	ot Specifieathgle	from h	orizontal:	90°
drill model: Camacchio mounting: Trailer casing diameter : HQ												
drillir	ng info	mati	on			mate	rial sub	estance				
support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
CASING		Not Observable		-	-			SANDSTONE : pale brown, highly weathered, estimated low strength.				BEDROCK
0		Not Ob		-648	-			Borehole BH09 continued as cored hole				
				_	1.0							
				647	-							
				-647	- -							
				-	2.0 —							
				-646	-							
				_	3.0							
				-645	-							
					-							
					4.0 —							
				-644								
				_	5.0							
				-643	-							
				_	6.0							
					-							
				-642	- -							
				_	7.0 —							
				-641	- -							
S & RR IV NOT COME TO THE COME	od auger dri auger sc roller/tric washbor cable toc nand au diatube clank bit V bit TC bit bit shown	rewing one e I ger		pene	etration		ater	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal	based	escription I on Unification System	n ed	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 medium dense D dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH09**

sheet: 2 of 2

project no. **GEOTFYSH09703AA**

date started: 14 May 2014

date completed: 14 May 2014

logged by: RB

location: Queanbeyan, NSW checked by: BC

E: 704846; N: 6084171 (Datum Not Specified) surface elevation: 648.52m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter : HQ mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests weathering ROCK TYPE: grain characterisics & ls(50) (MPa) Ξ core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R general STSI start coring at 0.40m NO CORE: 0.25 m I + I + I + II + I + I + I-648 Highly Fractured Zone: 950mm SANDSTONE: fine grained, pale brown, HW comprising joints and partings at various orientations, iron stained a=0.65 d=0.40 distinctly bedded at 45°. 0% 1.0 XW MW a=1.21 d=1.12 SW 2.0 86% 2.2m: trace of quartz lenses PL, RO, Fe SN, e described 646 a=2.36 d=1.67 NO CORE: 0.15 m SANDSTONE: fine grained, pale brown, SW 3.0 distinctly bedded at 45°. a = 1.05Defects are:PT, 45°, F unless otherwise d=2 28 3.2m to 3.9m: interlaminated siltstone, dark grey, Not Observable SM, 45°, UN, Fe SN, URO, Clay, CO approximately 30% 84% 645 NMLC PT, 40°, ST, RO, Fe SN 4.0 a=1.59 d=1.79 SM, Clay, Grey, HP 644 – PT, 45°, PL, RO, Fe SN PT, 30°, ST, RO, Fe SN 5.0 95% Highly Fractured Zone: 290mm comprising closely spaced patrings at 40° **QUARTZITE**: pale grey, phenocryst texture, indistinctly bedded, iron stained. -643 a=0.89 d=0.60 **SANDSTONE**: fine grained, pale brown, distinctly bedded at 45°. Highly Fractured Zone: 690mm comprising closely spaced joints and partings at various orientations 100% 6.0 642 82% a=0.84 d=0.88 Borehole BH09 terminated at 7.00 m Target depth 641 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support water graphic log / core recovery parting joint shear zone residual soil extremely weathered highly weathered diatube 10/10/12, water level on date shown AS AD RR auger screwing core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling stepped water inflow roller/tricone crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC core (51.9 mm) NMLC coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH09 Depth Range: 0.40 - 7.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd											
project:	Ellerton Dri Ellerton Drive, G	ve Extension Quanbeyan, N	ISW									
title:		OTOGRAPH 109										
project no:	GEOTFYSH09703AA	fig no:	23	rev:								



project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

BH10 1 of 3

sheet:

GEOTFYSH09703AA project no.

Borehole ID.

date started: 14 May 2014

date completed: 15 May 2015 logged by: RB

Ouganhovan NSW shooked by BC.

location:	Qu	eanbey	an,	NSN	/				check	ed by:	BC
position:	E: 7	'04854; N: 6	60840	71 (Dat	tum No	t Specif	ed) surface elevation: 648.26m (Datum Not Sp	ecifi eat)gle	from ho	orizontal: 9	90°
drill model:	Cama	cchio				mount	ng: Trailer casing diameter :	100 mm			
drilling inf	ormati	on			mate	rial sub	stance				
method & support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
^	vable					ML	Sandy SILT: low liquid limit, pale brown, fine	<wi< td=""><td>L</td><td>. </td><td>COLLUVIUM</td></wi<>	L	.	COLLUVIUM
CASING	Not Observable		-648	-			∖ grained sand			 	BEDROCK
			-647	1.0 —			Borehole BH10 continued as cored hole				
			-646	2.0							
			- -645	3.0 —							
			-644	4.0-							
			-643	5.0 —							
			-642	6.0							
			-641	7.0 —							
method AD auger of au	drilling* screwing icone ore ool uger		M r C c pen	etration or o		ater shown	HP hand penetrometer (kPa) D N standard penetration test (SPT) M N* SPT - sample recovered W W W	based Classifica	escription on Unified ation Sys	 	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 medium dense D dense VD very dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH10**

sheet: 2 of 3

project no. **GEOTFYSH09703AA**

date started: 14 May 2014

date completed: 15 May 2015

logged by: RB

location: Queanbeyan, NSW checked by: BC

E: 704854; N: 6084071 (Datum Not Specified) surface elevation: 648.26m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R STSI 648 I + I + I + II + I + I + Istart coring at 0.80m **SANDSTONE**: fine grained, pale brown, distinctly bedded at 55°, with a trace of interlaminated siltstone, dark grey. 1.0 46% нν 647 Highly Fractured Zone: 450mm comprising closely spaced partings at 20° to 70° a=0.16 45% PT, 50°, PL, RO, Clay CO 2.0 a=0.04 d=0.12 646 NO CORE: 0.40 m **SANDSTONE**: fine grained, pale brown, distinctly bedded at 55°, with a trace of interlaminated siltstone, dark grey. MW 3.0 96% a=1.82 d=2.32 -PT, 50°, PL, RO, Clay CO /able **NO CORE:** 0.15 m Not Obser 644 **SANDSTONE**: fine grained, pale brown, distinctly bedded at 55°, with a trace of interlaminated siltstone, dark grey. MW PT, 20°, UN, RO, CN NMLC Defects are:PT, 50°, PL, RO, Fe and unless otherwise described a=0.66 d=2.27 — PT, 20°, ST, RO, Fe SN — PT, 10°, ST, RO, CN — PT, 10°, ST, RO, CN 73% 5.0 -643 NO CORE: 0.30 m **SANDSTONE**: fine grained, pale brown, distinctly bedded at 55°, with a trace of interlaminated siltstone, dark grey. MW a=0.16 d=0.29 6.0 642 SW 88% d=1.42 7.0 - PT, 10°, UN, RO, CN 641 a=1.89 d=1.90 PT. 20°. PL. RO. Clay CO weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support graphic log / core recovery parting joint shear zone residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone shear surface stepped water inflow crushed seam IR Irregular claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL polished SO smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) rough very rough hiah RO CO coating very high



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH10**

3 of 3 sheet:

GEOTFYSH09703AA project no.

14 May 2014 date started:

15 May 2015 date completed:

RB logged by:

Queanbeyan, NSW BC

location: checked by: E: 704854; N: 6084071 (Datum Not Specified) surface elevation: 648.26m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 30 300 300 300 3000 R . > T 5 III -PT, 50°, PL, RO, Fe SN 88% 640 Borehole BH10 terminated at 8.20 m I + I + I + II + I + I + I9.0 639 10.0 $I \cup I \cup I$ 638 \square I + I + I11.0 637 12.0 $I \cup I \cup I$ \perp -636 \Box 13 0 -635 14.0 I I I I I I634 \Box 15.0 633 weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support water graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone shear surface diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone stepped water inflow crushed seam Irregular CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm) SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH10 Depth Range: 0.08 - 8.20 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	nsultants NS\	N Pty Ltd	
project:	Ellerton Driv Ellerton Drive, Q		sw	
title:	CORE PHO			
project no:	GEOTFYSH09703AA	fig no:	24	rev:



project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH11**

1 of 3 sheet:

GEOTFYSH09703AA project no.

date started: 15 May 2014

date completed: 15 May 2014

logged by: RB

Queanbevan. NSW вс checked by: location:

ocation:	Qи	eanbey	an, i	NSW	′				checl	ked by:	BC
osition:	E: 7	04857; N: 6	608402	21 (Dat	um No	t Specif	ed) surface elevation: 647.04m (Datum N	Not Specifieath)gle	from ho	orizontal:	90°
rill model:	Cama	cchio				mount	ng: Trailer casing diam	eter: 100 mm			
drilling info	ormati	on			mate	rial sub	stance				
support 1 2 penetration 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
A			-647	_		ML	Sandy SILT: low liquid limit, pale brown, trace to medium grained angular gravel.		L to MD		COLLUVIUM
- CASING	SI Not Observable		_	-			SANDSTONE : pale brown, highly weathered, estimated low strength.				BEDROCK
			-646	1.0			Borehole BH11 continued as cored hole				
			-645 -	2.0—							
			-644	3.0—							
111			-643	4.0—							
			-642	5.0—							
			-641	6.0—							
			-640 -	7.0-							
method AD auger of AS auger service roller/tri W washbot CT cable to HA hand at diatube B blank b V V bit T TC bit	crewing cone ore ool uger	9*	M r C c pend wate	etration		ater	samples & field tests B		escriptio on Unification Sys	n ed	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 medium dense



Engineering Log - Cored Borehole

Opus International Consultants NSW Pty Ltd

2 of 3 sheet:

BH11

GEOTFYSH09703AA project no.

Borehole ID.

date started: 15 May 2014

principal: Queanbeyan City Council date completed: 15 May 2014

project: Ellerton Drive Extension logged by: RB Ouganhovan NSW shooked by BC.

loc	atio	on:	G	ueai	nbey	ran, NSW						checked	d by: BC
pos	sitior	n:	Е	: 7048	57; N:	6084021 (Datum Not Specified)	surface elevation	on: 647	7.04m (Datu	m Not Spec	cifi eat n)gle	e from horiz	contal: 90°
-				nacchi		mounting: Tra	ailer		casing di	ameter : 10			
dri	lling	g in	form	ation	mate	rial substance	_		a ation at a d		rock	mass defe	1
method &	indel i	water	(m)	depth (m)	graphic log	ROCK TYPE: grain charac	ROCK TYPE: grain characterisics, colour, structure, minor components		samples, field tests & Is(50) (MPa) a = axial;	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness, coating, thickness, other)	
Ě	3		군 647	g	g			a K		d = diametral	8 ∞	3000	particular general
		-	-646			start coring at 0.90m SANDSTONE: fine to medium gr	ained, brown,	XW					
		-	-645	2.0 —		distinctly bedded at 70°, with a tra lenses, dark brown.	ace of siltstone	MW		a=1.52 d=3.32	72%		— JT, 70°, PL, RO, Fe SN — Quartz vein, 5mm thick — PT, 0°, UN, RO, Sand CO — JT, 60°, PL, RO, CN — PT, 20°, UN, RO, Fe SN — PT, 45°, PL, RO, Fe SN
		-	-644	3.0 —						a=1.63 d=1.78			— JT, 70°, ST, RO, Fe SN
– NMLC	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Observable	· ·643	4.0 —						a=1.29 d=1.42	79%		JT, 70°, ST, RO, Fe SN JTPT, 10°, ST, RO, Fe SN
NMLC	1 1 2	No.	642	5.0 —						a=0.65 d=0.86	59%		PT, 30°, PL, RO, Fe SN PT, 15°, PL, RO, Fe SN Highly Fractured Zone: 250mm comprising closely spaced joints and partings at various orientations SM 8mm, Clay PT, 15°, PL, RO, Fe SN
		-	641	6.0		Some interbedded siltstone band	ds, dark brown			d=1.33			PT, 15°, PL, RO, Fe SN
		-		- - -					 - -	a=0.59 d=0.00	75%		— SM, 10°, VR, 40 mm, XW - - - - SM, 70°, PL, Clay, 2 mm
		-	640	7.0 — - -									JT, 85°, PL, RO, Fe SN
										a=1.23 d=1.47	83%	i i -1 i i	— PT, 5°, PL, RO, Fe SN
D ^T AS AI RI CI W NI NI	method & support DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit W washbore NMLC NMLC core (51.9 mm) NQ wireline core (47.6mm) HQ wireline core (63.5mm)				9 mm) (.6mm)	water 10/10/12, water level on date shown water inflow complete drilling fluid loss partial drilling fluid loss	no core	covered nbols indicate recovere	material)	MW mode SW slightl FR fresh *W replaced w strength VL very lo L low	al soil nely wea weather tity weat rately we y weather with A for a	athered red hered eathered ered	defect type PT parting PT parting PL planar PL planar PL planar CU curved UN undulating SS shear surface CS crushed seam SM seam DB drilling break roughness Coating SL slickensided POL polished SN stain
SF			andaro	core (85 I penetr		water pressure test result (lugeons) for depth interval shown	I I RQD = Rock Qu	ality Des	ignation (%)	M mediur H high VH very hi EH extrem	gh		SO smooth VN veneer RO rough CO coating VR very rough



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH11**

3 of 3 sheet:

GEOTFYSH09703AA project no.

15 May 2014 date started:

15 May 2014 date completed:

RB logged by:

Queanbeyan, NSW BC checked by:

location: E: 704857; N: 6084021 (Datum Not Specified) surface elevation: 647.04m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and weathering & alteration strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R . > T 5 III SANDSTONE: fine to medium grained, brown, - JT, 45°, PL, RO, Fe SN - PT, 15°, PL, RO, Fe SN distinctly bedded at 70°, with a trace of siltstone lenses, dark brown. (continued) Not Observable SM 70mm, 60°, XW NMLC - SM 130mm, Clav 9.0 638 MW to Borehole BH11 terminated at 9.32 m Target depth 637 10.0 $I \cup I \cup I$ \square \Box 11.0 636 12.0 -635 $I \cup I \cup I$ \perp \Box 13.0 14.0 I I I I I I633 \Box 15.0 -632 weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support water graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone shear surface diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone stepped water inflow crushed seam Irregular claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH11 Depth Range: 0.90 - 9.30 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd									
project:	oject: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW									
title:	CORE PHOTOGRAPH BH11									
project no:	GEOTFYSH09703AA	fig no:	25	rev:						



Engineering Log - Borehole

1 of 2 sheet: GEOTFYSH09703AA

BH12

Borehole ID.

project no.

Opus International Consultants NSW Pty Ltd client: date started: 16 May 2014

principal: Queanbeyan City Council date completed: 16 May 2014

project: Ellerton Drive Extension logged by: RB Ouganhovan NSW shooked by BC.

location:	ocation: Queanbeyan, NSW checked by:							ked by:	BC		
position:	E: 7	04334; N: 6	0833	37 (Dat	um No	t Specif	ed) surface elevation : 603.12m (Datum Not	Specifiendh)gle	from ho	orizontal: 9	90°
drill model:	Cama	cchio				mounti	ng: Trailer casing diamete	er : 100 mm			
drilling info	ormati	on			mate	rial sub	stance				
method & support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
CASING —	Not Observable		-603	-		ML	Sandy SILT: low liquid limit, pale brown, fine grained sand, with some fine grained angular gravel.	<wi< td=""><td>MD</td><td></td><td>COLLUVIUM</td></wi<>	MD		COLLUVIUM
3 	Not		-	_			SILTSTONE: pale orange, highly weathered, estimated low strength.				BEDROCK
			-602	1.0 — - -			Borehole BH12 continued as cored hole				
111			-601	2.0-							
			-600	3.0-							
			-599	- 4.0 — - -							
			-598	5.0 — - -							
			-597	6.0 — - -							
			-596	7.0— - -							
method AD auger of AS auger of	drilling* screwing icone ore ool uger et it		pen wate	etration or or leve wate		ater shown	samples & field tests B		escriptio on Unification Sys	n ed	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 medium dense D dense VD very dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH12**

2 of 2 sheet:

GEOTFYSH09703AA project no.

16 May 2014 date started:

16 May 2014 date completed:

RB logged by:

Queanbeyan, NSW BC checked by:

location: E: 704334; N: 6083387 (Datum Not Specified) surface elevation: 603.12m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R STSI 603 I + I + I + II + I + I + Istart coring at 0.80m NO CORE: 0.25 m 1.0 602 SILTSTONE: pale brown, distinctly bedded at HW 0% 2.0 601 a=0.96 d=0.48 0% NO CORE: 0.06 m HW SILTSTONE: pale brown, distinctly bedded at 600 Not Observable a=0.14 d=0.40 NMLC HW 30% Highly Fractured Zone: Comprising partings along bedding at 40°, Fe, SN, PL, RO, with some perpendicular 4.0 599 4.3m to 4.7m: trace of fine grained quartz gravel a=0.17 d=0.37 lenses/ intrusions 0% 5.0 NO CORE: 0.07 m 598 SILTSTONE: pale brown, distinctly bedded at a=0.46 0% 6.0 597 Borehole BH12 terminated at 6.30 m Target depth 7.0 596 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone stepped water inflow crushed seam Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm slickensided VL POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH12 Depth Range: 0.80 - 6.30 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



Cli	ent:	Opus International Consultants NSW Pty Ltd									
pro	^{ject:} Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW										
titl	title: CORE PHOTOGRAPH BH12										
pro	oject no:	GEOTFYSH09703AA	fig no:	26	rev:						



Engineering Log - Borehole

BH13 1 of 3

sheet:

Borehole ID.

GEOTFYSH09703AA project no. Opus International Consultants NSW Pty Ltd client: date started: 19 May 2014

principal: Queanbeyan City Council 19 May 2014 date completed:

project: **Ellerton Drive Extension** logged by: RB

ocation:	Que	eanbey	an, I	NSW	<u> </u>				check	ed by:	ВС
osition:		04305; N: 6	608336	60 (Dat	um No	•	, and the second		from ho	orizontal:	90°
Irill model: drilling info					moto	mounti	ng: Trailer casing diameter	: 100 mm			
	Jimau	OH			mate		material description		£	hand	structure and
support 2 penetration		samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	penetro- meter (kPa)	additional observations
†	rvable		-	_		_ML_	Sandy SILT: low liquid limit, pale brown, fine ¬ grained sand.	<wi< td=""><td>MD_</td><td> </td><td>COLLUVIUM</td></wi<>	MD_		COLLUVIUM
CASING	Not Observable		-603	-			SHALE: pale brown, highly weathered, estimated low strength.				BEDROCK
				1.0 —			Borehole BH13 continued as cored hole				
			602	-							
			-602	_							
			_	2.0-							
			-601	-							
			_	3.0							
			-600	-							
			_	4.0							
			-599	-							
			_	5.0 —							
			-598	6.0							
			- -597	-							
			_	7.0							
			-596	- -							
nethod AD auger of Saugers of Sa	crewing cone ore ool uger	j*	pene E wate	etration	no res rangin ▼ refusa	ater	HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered		escriptio on Unifie ation Sys	n d	consistency / relative density VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose
V bit TC bit bit show	vn by su	ıffix		leve	el on date er inflow er outflow	shown		WI liquid lim			L loose MD medium dense D dense VD very dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

2 of 3 sheet:

GEOTFYSH09703AA project no.

BH13

19 May 2014 date started:

19 May 2014 date completed:

RB logged by:

Borehole ID.

Queanbeyan, NSW BC checked by:

location: E: 704305; N: 6083360 (Datum Not Specified) surface elevation: 603.58m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests strength & Is50 ROCK TYPE: grain characterisics, & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water R 300 300 300 300 300 STSI I + I + I + I603 I + I + I + Istart coring at 0.80m SM 240mm SHALE: fine grained, brown to pale brown, 1.0 distinctly bedded at 50°, trace of iron staining 40% HW Ф d=0.33 HW to 602 2.0 0% a=0.49 d=0.12 SM, XW $I \cup I \cup I$ NO CORE: 0.25 m -601 JT, 50°, PL, RO, Fe SN SHALE: fine grained, brown to pale brown, distinctly bedded at 50°, trace of iron staining. MW 3.0 H۱۸/ NO CORE: 0.15 m 0% -600 MW SHALE: fine grained, brown to pale brown, a=0.00 distinctly bedded at 50°, trace of iron staining. d=0.00 4.0 Observable a=0.64 d=0.45 NMLC PL, RO, Fe SN, e described Not PT, 5°, PL, SL, Fe SN 599 15% 5.0 Defects are:JT, 50°, F unless otherwise SANDSTONE: fine to coarse grained, pale brown, indistinctly bedded. SHALE: fine grained, brown to pale brown, distinctly bedded at 50°, trace of iron staining. 598 a=0.58 d=0.76 SHALE: fine grained, brown to pale brown, distinctly bedded at 50°, trace of iron staining. 6.0 47% 597 a=0.50 d=0.56 PT, 20°, ST, RO, Fe SN 7.0 Highly fractured zone, quartz 7.28m to 7.62m: quartz infilled seam, pale grey, 62% 596 PT. 5°. ST. VR. Fe SN weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support water graphic log / core recovery parting joint shear zone residual soil extremely weathered highly weathered diatube 10/10/12, water level on date shown AS AD RR auger screwing core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling shear surface stepped water inflow roller/tricone crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating interval shown very high



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH13**

sheet: 3 of 3

project no. **GEOTFYSH09703AA**

date started: 19 May 2014

date completed: 19 May 2014

logged by: **RB**

location: Queanbeyan, NSW checked by: BC

E: 704305; N: 6083360 (Datum Not Specified) surface elevation: 603.58m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support colour, structure, minor components Ξ graphic depth water 30 300 300 300 3000 R . > T 5 III SHALE: fine grained, brown to pale brown, NMLCdistinctly bedded at 50°, trace of quartz intrusions JT, 50°, PL, SL, Fe SN (approx. 5%). a=0.17 d=0.24 Fractured Zone 595 Borehole BH13 terminated at 8.63 m Target depth 9.0 594 10.0 $I \cup I \cup I$ -593 \square I + I + I11.0 -592 12.0 $I \cup I \cup I$ \perp I + I + I + I-591 \Box 13 0 590 14.0 I I I I I I589 \Box 15.0 588 weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone stepped water inflow crushed seam Irregular claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH13 Depth Range: 0.80 - 8.63 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd										
project:	Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW										
title:	title: CORE PHOTOGRAPH BH13										
project no	GEOTFYSH09703AA	fig no:	27	rev:							



principal: project:

Engineering Log - Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH14**

1 of 2 sheet:

GEOTFYSH09703AA project no.

date started: 20 May 2014

20 May 2014 date completed:

> logged by: RB

Queanbeyan, NSW checked by: BC location:

					VSVV						ked by:	
posit			04284; N: 6	08334	4 (Datu	m Not	•	· ·		from h	orizontal: 9	0°
drill model: Camacchio mounting: Trailer drilling information material substance									neter : 100 mm			
uiii		mati	OII			mate		material description		₹	hand	structure and
method & support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	SOIL TYPE: plasticity or particle characteristic colour, secondary and minor components	moisture condition	consistency / relative density	penetro- meter (kPa)	additional observations
1 1	1	Observable		-	1			SHALE: pale brown, extremely to highly weathered, estimated very low to low strength	1			BEDROCK
- AS -		Not Obse		-600	-			nouncied, commune very less to loss outerigu				
<u> </u>					1.0			Borehole BH14 continued as cored hole				
				_	-							
				-599								
				_	2.0 -							
				-598	-							
				=	3.0 —							
				-597	-							
				_	4.0-							
				-596	-							
				_	5.0							
				-595	-							
				_	6.0 —							
				-594	- - 7.0-							
				_	-							
				-593	-					41		
AS RR W CT HA DT B V T	auger dr auger so roller/tric washbor cable too hand aud diatube blank bit V bit TC bit bit shown	rewing one e ol ger		pene E wate	etration		ater shown	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal HB hammer bouncing	based	escription I on Unification Sys	n ed	consistency / relative density VS Very soft S S Soft F firm St St Stiff VSt Very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH14**

sheet: 2 of 2

project no. **GEOTFYSH09703AA**

date started: 20 May 2014

date completed: 20 May 2014

logged by: **RB**

location: Queanbeyan, NSW checked by: BC

E: 704284; N: 608334 (Datum Not Specified) surface elevation: 600.64m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R STSI 600 I + I + I + Istart coring at 0.84m SHALE: fine grained, pale brown, distinctly bedded at 50°, iron stained. 1.0 39% HW to PT, 15°, PL, RO, Fe SN 599 **SANDSTONE**: fine to medium grained, pale grey, distinctly bedded at 50°. MW a=3.11 d=1.17 - PT. 50°. PL. RO. CN 2.0 93% PT, 50°, PL, RO, CN 598 Defects are:PT, 50°, PL, RO, Fe unless otherwise described a=2.05 d=1.07 3.0 Not Observable JT. 80°. ST. VR. Fe SN Becoming pale brown-grey NMLC PT, 50°, PL, RO, Clay CO 80% -597 a=1.12 d=0.77 4.0 - PT, 10°, UN, RO, Fe SN √JT, 30°, PL, RO, Fe SN √JT, 30°, PL, RO, Fe SN 596 a=0.91 d=0.93 5.0 94% 595 6.0 100% Borehole BH14 terminated at 6.20 m Target depth 594 7.0 593 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone shear surface diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone stepped water inflow crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm slickensided VL POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH14 Depth Range: 0.85 - 6.10 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd									
project:	Ellerton Drive, C	ve Extension Quanbeyan, N	SW							
title:		TOGRAPH								
project no:	GEOTFYSH09703AA	fig no:	28	rev:						



project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH15** 1 of 2 sheet:

GEOTFYSH09703AA project no.

date started: 20 May 2014

20 May 2014 date completed:

logged by: RB

Queanbeyan, NSW ВС checked by: location:

ocation:		eanbey							chec	keu b	у.	BC
oosition:		'03900; N: (60828	24 (Dat	tum No				from h	orizont	tal:	90°
drill model:					moto		ng: Trailer casing diamet	er: 100 mm				
drilling info	ormati	ION			mate	rial sub			>-	Ι.	1	-4
method & support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	har pene met (kP:	tro- er a)	structure and additional observations
CASING —	Not Observable		-622	- -		SC	Clayey SAND: medium to coarse grained, orange-brown, low plasticity clay.	D	MD		 	COLLUVIUM
) 	ž		_	- 1.0			SILTSTONE: brown-grey, moderately weathered estimated low to medium strength.	d,			Ш	BEDROCK
			-621	-			Borehole BH15 continued as cored hole				 	
			- -620	2.0 —								
			_ −619	3.0 —							 	
			- -618	4.0								
			-617	5.0 —								
			-616	6.0								
			- -615	7.0 —							 	
method AD auger of AS auger of	drilling* screwing icone pore pool uger e	g*	M r C c pen	etration N m er 10-0 leve water	ı	ater shown	samples & field tests B		escription on Unification Sys	o n ed		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 medium dense D dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH15**

2 of 2 sheet:

GEOTFYSH09703AA project no.

20 May 2014 date started:

20 May 2014 date completed:

logged by: RB

Queanbeyan, NSW BC location: checked by:

E: 703900; N: 6082824 (Datum Not Specified) surface elevation: 622.28m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth (water 300 300 300 300 300 R . > T 5 III 622 I + I + I + II + I + I + Istart coring at 1.00m NO CORE: 0.05 m 0% **SILTSTONE**: dark grey, distinctly bedded at 40°, with a trace of quartz veins. 621 a=0.44 d=0.06 2.0 0% Highly Fractured Zone: 2050mm comprising closely spaced partings at 40° -620 a=0.94 d=0.63 Not Observable 3.0 NMLC 619 Defects are:PT, 40°, PL, RO, Fe SN, unless otherwise described 60% a=0.90 d=0.36 4.0 a=0.96 -618 — SM 5mm, Clay ∼ Highly Fractured Zone: 610mm comprising closely spaced partings at 0% 5.0 – JT. 80°. PL. RO. Fe SN 617 – JT, 80°, PL, RO, Fe SN Borehole BH15 terminated at 5.50 m 6.0 616 7.0 -615 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support water graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone stepped water inflow crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH15 Depth Range: 1.00 - 5.50 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



project no:	GEOTFYSH09703AA	fig no:	29	rev:
title:		TOGRAPH		
project:	Ellerton Drive, C	ve Extension luanbeyan, N	SW	
client:	Opus International Co	nsultants NS	W Pty Ltd	



Engineering Log - Borehole

BH16 1 of 2 sheet:

Borehole ID.

project no.

GEOTFYSH09703AA

Opus International Consultants NSW Pty Ltd client: date started: 21 May 2014

principal: Queanbeyan City Council 21 May 2014 date completed:

project: **Ellerton Drive Extension** logged by: RB

ocation:	Que	eanbey	an, I	NSW					check	ked by:	ВС
osition:)3814; N: 6	0827	74 (Dat	um No	•		. ,	from ho	orizontal:	90°
rill model: drilling info					moto		ing: Trailer casing diameter	: 100 mm			
	Jimauc	л			mate		material description		- ₹	hand	structure and
support 2 penetration	/ater	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	penetro- meter (kPa)	additional observations
	Not Observable		-629	- -		ML SM	TOPSOIL: Sandy SILT: low liquid limit, brown, fine grained sand. Silty SAND: fine to medium grained, pale orange, low liquid limit.				COLLUVIUM
CASING	Not Ok		_	1.0	+ + -		ADAMELLITE: brown, highly weathered, low to medium strength.				BEDROCK
			-628	-	+ +						
	***		-020	-			Borehole BH16 continued as cored hole				
			_	2.0							
			-627	-							
			_	3.0 —							
			-626	-							
			-625	4.0 —							
			-624	5.0 — - -							
			_	6.0							
			-623	- - -							
			-622	7.0-							
RR roller/tr V washbo CT cable to HA hand a OT diatube B blank b V bit TC bit	screwing icone ore ool uger		pene wate	etration or or leve wate		ater shown	HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered NS SPT with solid expose		escriptio on Unification Sys	n ed	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 medium dense D dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH16**

2 of 2 sheet:

GEOTFYSH09703AA project no.

21 May 2014 date started:

21 May 2014 date completed:

logged by: RB

Queanbeyan, NSW BC location: checked by:

E: 703814; N: 6082774 (Datum Not Specified) surface elevation: 629.36m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth (water 30 300 300 300 3000 R STSI 629 1.0 start coring at 1.40m NO CORE: 0.20 m ADAMELLITE: fine grained, pale brown, HW indistinct bedding, with interlaminated quartz, a=0.16 d=0.47 phorphyritic texture. 2.0 29% 627 MW to SW HW a=0.67 SW 3.0 NO CORE: 0.10 m SW ADAMELLITE: fine grained, pale grey, quartz Not Observable 626 phenocrysts, indistinct bedding. 29% NMLC **NO CORE:** 0.45 m 4.0 Highly Fractured Zone comprising closely spaced joints and partings orientated at 30° to 70°, Fe, SN, PL/ ADAMELLITE: fine grained, pale grey, with SW a=1.37 -625 interlaminated quartz phenocrysts 6% 5.0 Phorphyritic quartz texture 624 SW a=1.15 Borehole BH16 terminated at 6.00 m 623 7.0 622 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone shear surface diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone stepped water inflow crushed seam Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH16 Depth Range: 1.40 - 6.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd									
project:	roject: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW									
title:		OTOGRAPH H16								
project no:	GEOTFYSH09703AA	fig no:	rev:							

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Engineering Log - Borehole

1 of 2 sheet:

BH17

Borehole ID.

GEOTFYSH09703AA project no. Opus International Consultants NSW Pty Ltd date started: 21 May 2014

principal: Queanbeyan City Council 21 May 2014 date completed:

project: **Ellerton Drive Extension** logged by: RB

		anbey				· Cncair	ind) curface elevation : 620 44m /Det.im N=+ 0==	oifionh\~!-		ked by:	BC
oosition: drill model: ()3597; N: 6 chio	002/(JS (Dai	uIII NO	•	ied) surface elevation : 630.14m (Datum Not Spe ing: Trailer casing diameter : 1	,-	iioin no	JIIZONTAI:	9 U
drilling info					mate		ostance	00 111111			
support 2 penetration 3		samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
- CASING	Not Observable		-630 -	-		SC	TOPSOIL: Sandy SILT: low liquid limit, grey-brown, fine to medium grained sand. Clayey SAND: medium grained, orange-brown, medium plasticity clay, with some fine to medium grained, sub-rounded to sub-angular gravel.	- <wi M</wi 	MD	- - 	TOPSOIL
V			-629	1.0	+		ADAMELLITE: orange-grey, highly to moderately weathered, estimated low to medium strength.			 	BEDROCK
			-628	2.0			Borehole BH17 continued as cored hole				
			-627	3.0							
			-626 -	4.0 — - -							
			-625	5.0— - -							
			-624	6.0							
			-623	7.0— - -							
method AD auger dr AS auger sc roller/tric W washboi CT cable to- HA hand au Dilatube B blank bit V V bit T TC bit * bit show e.g. AD/T	crewing* cone re ol ger		pene	etration or or or leve wate		iter shown	B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered WE SPT - sample recovered WE SPT - sample recovered WE	classification classi	escriptio on Unification Sys	n ed	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 medium dense D dense VD very dense



project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **BH17**

2 of 2 sheet:

GEOTFYSH09703AA project no.

21 May 2014 date started:

21 May 2014 date completed:

RB logged by:

Queanbeyan, NSW BC checked by:

location: E: 703597; N: 6082703 (Datum Not Specified) surface elevation: 630.14m (Datum Not Specificatingle from horizontal: 90° drill model: Camacchio casing diameter: 100 mm mounting: Trailer drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R . > T 5 III 630 I + I + I + Istart coring at 1.00m NO CORE: 0.25 m 629 $I \cup I \cup I$ 0% Highly Fractured Zone: 230mm **ADAMELLITE**: fine grained, pale grey, indistinct bedding, interlaminated quartz gravels of fine to MW comprising closely spaced joints and partings at various orientations PT, 10°, PL, RO, Fe SN Fe SN, d=0.00 a=0.00 d=0.00 Not Observable medium grain size, trace of feldspar, phorphyritic PL, RO, F described NMLC 2.0 - PT. 10°. PL. RO. Fe SN -628 s are:JT, 30 - 40°, unless otherwise 49% d=0.12 PT, 20°, PL, RO, Fe SN SM, 40°, VR, Clay, 20 mm, HP HW to PT, 10°, PL, VR, Clay CO PT, 15°, PL, VR, CO MW SW Borehole BH17 terminated at 3.00 m 627 Target depth 4.0 $I \cup I \cup I$ \perp -626 \Box 5.0 6.0 I I I I I I-624 \Box 7.0 623 weathering & alteration defect type planarity method & support water graphic log / core recovery parting joint shear zone PL planar CU curved UN undulating residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone stepped water inflow crushed seam Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: BH17 Depth Range: 1.00 - 3.00 m

drawn	SB	
approved	ВС	C
date	24/06/2014	0
scale	N.T.S.	
original size	A4	



client:	Opus International Consultants NSW Pty Ltd										
project:	oject: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW										
title:	CORE PH	OTOGRA H17	PH								
project no	GEOTFYSH09703AA	fig no:	31	rev:							

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project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH01**

1 of 2 sheet:

GEOTFYSH09703AA project no.

date started: 29 May 2014

date completed: 26 May 2014

logged by: SB

Queanbevan. NSW BC checked by location:

loca	atio	n:	Qu	eanbey	an, i	NSW	<u> </u>				chec	ked by:	BC
pos	sitior	1:	E: 7	04213; N: 6	0832	53 (Dat	um No	t Specif	ed) surface elevation : 584.15m (Datum N	Not Specified)	gle from h	orizontal: 9	90°
_		del: T								neter : NMLC			
dri	illin	g info	mati	on			mate	rial sub					
method &	noddns	1 2 penetration 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic colour, secondary and minor components	moisture	consistency / relative density	hand penetro- meter (kPa) \$ 8 8 8	structure and additional observations
◆ ADV ◆	CASING		Observable		-584				SHALE : grey-brown, highly to moderately weathered, low to medium strength.				BEDROCK -
	. 83		Not		-583	1.0—			Borehole B-BH01 continued as cored hole				
4 16:07					-582	2.0— - -							
< <drawingfile>> 27/06/2014 16:07</drawingfile>					-581	3.0 — - -							- - - - - - - - - -
3AA - CBH LOGS.GPJ <<					-580	4.0 — - -							- - - - - - - - - - - - - - - -
EHOLE: NON CORED GEOTFYSH09703AA - CBH LOGS.GPJ					-579	5.0 — - -							- - - - - - - - - - - - - - - - - - -
COF BOREHOLE: NON C					-578	6.0 — - -							- - - - - - - - - - - - - - - - -
CDF_0_9_04BA.GLB Log					-577 -	7.0 — - - -							
AD AS RR W CT HA DT B V T	ethoe D at S at R ro W Ca ha di bl	duger dri uger sc oller/trice ashbore able too and aug atube ank bit bit C bit tt showr	rewing one e I ger		pend wate	etration or or leve wate		ater shown	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal HB hammer bouncing	soil bas	c limit	nbol & on ed	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 medium dense D dense VD very dense



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH01**

2 of 2 sheet:

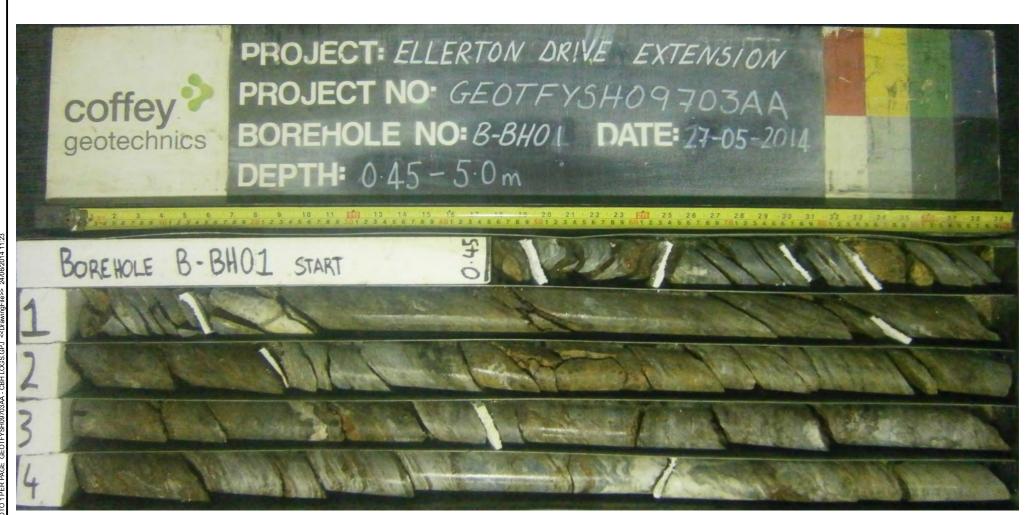
GEOTFYSH09703AA project no.

29 May 2014 date started:

26 May 2014 date completed:

SB logged by:

Queanbeyan, NSW BC location: checked by: E: 704213; N: 6083253 (Datum Not Specified) surface elevation: 584.15m (Datum Not Specificatingle from horizontal: 90° drill model: Track Rig casing diameter: NMLC mounting: Track drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) core run & RQD support colour, structure, minor components Ξ graphic depth water 300 300 300 300 300 R STSI 584 start coring at 0.45m **SHALE**: grey, iron stained, distinctly bedded at 60° to 70° with some quartz veins. 0% 0% 0% HW 1.0 0% 583 SW to 63% a=3.16 2.0 d=0.18 94% 582 35% 581 ΧО a=0.71 d=1.33 Observable Highly Fractured: Comprising closely spaced patrtings at 60° to 70°, PL, RO, SN FE 4.0 g Not 93% 580 LIMESTONE: grey with pale grey laminations, distinctly bedded at 70°. a=6.07 d=6.19 5.0 21% -579 0% 0% 6.0 -578 a = 3.5154% d=1.79 577 52% Borehole B-BH01 terminated at 7.60 m Target depth planarity
PL planar
CU curved
UN undulating weathering & alteration defect type method & support graphic log / core recovery parting joint shear zone residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone shear surface stepped water inflow crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm ΫĹ slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



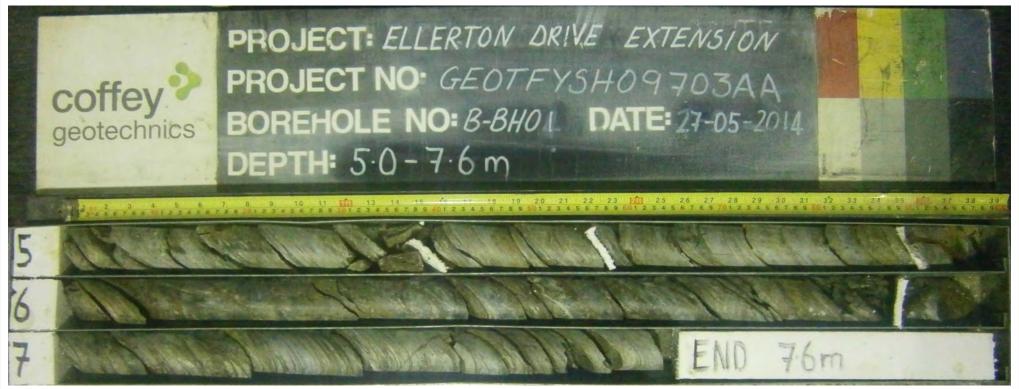
PointID: B-BH01 Depth Range: 0.45 - 5.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	onsultants N	SW Pty L	td
project:	Ellerton Dri Ellerton Drive, (ve Extensior Quanbeyan,	=	
title:		OTOGRAPH 3H01	ł	
project no:	GEOTFYSH09703AA	fig no:	1	rev:

CDF_0_9_04BA.GLB GrfcTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Drawing



PointID: B-BH01 Depth Range: 5.00 - 7.60 m

drawn	SB	
approved	ВС	coffey ?
date	24/06/2014	concy
scale	N.T.S.	
original size	Λ.4	

client:	Opus International Co	onsultants	NSW Pty Lt	d
project:	Ellerton Dri Ellerton Drive, (
title:	CORE PHO B-E	OTOGRAI 3H01	PH	
project no:	GEOTFYSH09703AA	fig no:	2	rev:

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client:

project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH02**

sheet: 1 of 3

project no. **GEOTFYSH09703AA**

date started: 26 May 2014

date completed: 27 May 2014

logged by: **SB**

location: Queanbeyan, NSW checked by: BC

ocation:	Qu	eanbey	an, i	NSN	/				chec	ked by:	BC
oosition:	E: 7	04199; N: 0	608322	26 (Da	tum No	t Specif	ied) surface elevation : 574.72m (Datum	Not Specifiedn)gl	e from h	orizontal:	90°
drill model:	Track	Rig				mount	ng: Track casing dian	neter : NMLC			
drilling info	ormati	on			mate		estance				
method & support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
				-		SM	Silty SAND: fine to coarse grained, brown.	D	L to MD		COLLUVIUM
- CASING	Not Observable	DS	-574 - - -573	1.0— - - -		CL	Sandy CLAY: low plasticity, pale orange-brow fine grained sand, with some sub-rounded gra		St to VSt	- 	
		U50	-	2.0 — - - -							
<u> </u>	-		-572				LIMESTONE: pale brown, highly to moderated weathered, medium strength.	ly /	-	11111	BEDROCK
			- -571	3.0 —			Borehole B-BH02 continued as cored hole				
			_ -570 _	- - - 5.0—							
			-569 -	- - 6.0—							
			-568 -	7.0—							
			-567	-				alana ^{iti} a	ation sym	 	
method AD auger of augers of augers of cable to than dau diatube B blank b V V bit T T C bit thouse.g. AD/T	crewing cone pre pol uger it		pend wate	etration or of the control of the c		iter shown	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS sylt spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal HB hammer bouncing	soil o	description description description description description Systems	o n ed	consistency / relative density VS Sery soft Soft Ffirm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense



principal: Queanbeyan City Council

client:

Engineering Log - Cored Borehole

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH02**

2 of 3 sheet:

GEOTFYSH09703AA project no.

date started: 26 May 2014

27 May 2014 date completed:

> logged by: SB

project: Ellerton Drive Extension Queanbevan NSW RC. checked by: location:

osition:	Е	: 704199	9; N: 6	6083226 (Datum Not Specified) surface elevat	ion : 574	1.72m (Datu	m Not Spec	ifi eat)gl	e from horiz	ontal: 90°	
rill mode	el: Trad	ck Rig		mounting: Track			iameter : NI				
Irilling i	nforma	ation	mate	rial substance				rock	mass defe	cts	
support water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 ×= axial; O= diametral	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, planarity, roughness thickness, other) particular	
	-574	1.0 —									· ·
	-573 -	2.0 —									
	-572	-		start coring at 2.80m							
NO Observable	-571 -570 -569	3.0		LIMESTONE: grey, distinctly bedded at 60° to 70°, with some quartz veins approximately 20mm to 50mm thick.	FR		a=0.90 d=0.19 a=1.77 d=0.98 a=1.33 d=1.09 a=1.72 d=0.59 a=2.37 d=1.14	20% 44% 47%	# - #	JT, 0 - 10°, IR, RO, CN JT, 10 - 20°, PL, VR, Fe SN CS 30mm CS 10mm JT, 20°, IR, RO, Fe SN JT, 10 - 20°, UN, RO, CN JT, 10°, UN, RO, Fe SN JT, 10°, UN, RO, CN JT, 10°, PL, RO, CN JT, 50°, IR, RO, Fe SN	Defects are.PT, 60 - 70°, PL, RO, CN,
AS a AD a RR r CB c W v NMLC N NQ v HQ v PQ v	diatube auger so auger dr oller/tric claw or b washbor NMLC co wireline o wireline o	rewing illing one olade bit	mm) mm) mm)	water inflow complete drilling fluid loss partial drilling fluid loss core run & RQI	covered mbols indicate e recovere	material)	a=2.25 d=0.58 weathering RS residu XW extren HW highly DW distinc. MW moder SW slightly FR fresh -Wrengled w strength VL very lov L low M medium	al soil nely wea weathe titly weat rately we y weathe ith A for a	athered red hered eathered ered	defect type PT parting PT parting PL plana JT joint SZ shear zone SZ shear zurface CS crushed seam SM seam DB drilling break roughness SL slickensided POL polished SN smooth VN venee	d ating ed lar



principal: Queanbeyan City Council

client:

Engineering Log - Cored Borehole

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH02**

sheet: 3 of 3

project no. **GEOTFYSH09703AA**

date started: **26 May 2014**

date completed: 27 May 2014

project: Ellerton Drive Extension logged by: SB

location: Queanbeyan, NSW checked by: BC

	loca	ition				van, NSW					checked	by: BC			
	posit				99; N: (6083226 (Datum Not Specified) surface elevat	ion : 574		-		e from horizo	ontal: 90°			
				ck Rig		mounting: Track		casing d	iameter : NI						
	drill	ing i	nform	ation	mate	rial substance						ass defects			
	method & support	water	RL (m)	depth (m)	graphic log	material description ROCK TYPE: grain characterisics, colour, structure, minor components	weathering & alteration	estimated strength & Is50 × = axial; O = diametral	samples, field tests & Is(50) (MPa) a = axial; d = diametral	core run & RQD	defect spacing (mm)	additional observations and defect descriptions (type, inclination, plananty, roughness, coating, thickness, other) particular general			
CDF_0_9_04BA.GLB Log COFBOREHOLE: CORED GEOTFYSH09703AA - CBH LOGS.GPJ < <drawingfile>> 27.06/2014 16:09</drawingfile>		Not Observable	-566 -563 -561 -560 -559	9.0 —		LIMESTONE: grey, distinctly bedded at 60° to 70°, with some quartz veins approximately 20mm to 50mm thick. (continued) Borehole B-BH02 terminated at 9.75 m Target depth	FR		a=3.48 d=0.68	0%		Highly Fractured Zone: 60mm comprising closely spaced partings at 60° Highly Fractured Zone: 530mm comprising closely spaced partings at 60° Highly Fractured Zone: 530mm comprising closely spaced partings at 60°			
	DT AS AD RR CB W	d a a r c v V LC N v v v v	auger d oller/tricklaw or washbo MMLC o wireline wireline wireline	crewing rilling cone blade bit	9 mm) 7.6mm) 8.5mm) 6.0mm)	water inflow complete drilling fluid loss partial drilling fluid loss core run & RQI	covered mbols indicate e recovered	e material)	HW highly DW disting MW moder	al soil nely wea weathe ttly weat rately we y weathe ith A for a w	athered red hered eathered ered	defect type PT parting PT parting PT parting PT parting PT parting PP planarity PL planar CU curved UN undulating SS shear surface CS crushed seam SM seam DB drilling break roughness SL slickensided POL polished SO smooth VN veneer RO rough VR very rough			



PointID: B-BH02 Depth Range: 2.80 - 7.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	onsultants N	ISW Pty L	₋td
project:	Ellerton Dr Ellerton Drive, (ve Extensio Quanbeyan,		
title:		OTOGRAP 3H02	Н	
project no	GEOTFYSH09703AA	fig no:	3	rev:

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PointID: B-BH02 Depth Range: 7.00 - 9.75 m

drawn	SB	
approved	ВС	(
date	24/06/2014	`
scale	N.T.S.	
original size	A4	



client:	Opus International Co	nsultants NS	W Pty Ltd	
project:	Ellerton Dri Ellerton Drive, (ve Extension Quanbeyan, N	ISW	
title:		OTOGRAPH 3H02		
project no	GEOTFYSH09703AA	fig no:	4	rev:

CDF_0_9_04BA.GLB GricTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Draw



client:

principal: project:

Engineering Log - Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

sheet: 1 of 3

project no. **GEOTFYSH09703AA**

B-BH03

date started: 30 May 2014

date completed: 31 May 2014

logged by: **SB**

Borehole ID.

location: Queanbeyan, NSW checked by: BC

				earibey									kea by:	<u> </u>	
posi				04167; N: 6	50831	58 (Dat	um No	•	,		,-	from ho	orizontal: 9	90°	
		del: Ti infor					mate		ng: Track casing dian	ieter: INI	VILU				
un	IIIIg		mati	011			mate		material description			. ≱	hand	etr	ucture and
method &	1000	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	SOIL TYPE: plasticity or particle characteristic colour, secondary and minor components	C ,	moisture condition	consistency / relative density	penetro- meter (kPa)	addition	al observations
	A						0	SM GP	Silty SAND: fine to medium grained, dark bro	wn.	М	MD		ALLUVIUM	
		 		DS U50	-576	1.0		SM	\sub-rounded, brown. Silty SAND: fine grained, grey.						
— AD/V —					_	-									
		.———			-575	2.0-	0 0	 SP	Sandy GRAVEL: medium grained,			 L to			
ļ,				SPT 1, 4, 14 N=18		-	0 0		brown/white/orange, fine to coarse grained sa			MD — — –			
					-574 -	3.0			\text{LIMESTONE:} brown-grey, highly weathered, I strength. Borehole B-BH03 continued as cored hole	ow _				BEDROCK	
					-573 -	4.0 —									
	1 1 1 1				-572 -	5.0									
					-571 -	6.0-									
	 				-570	7.0-									
					-569	-									
	augroll wa cal ha dia bla V t TC bit	iger dri iger sciller/trica ashbora ible too and aug atube ank bit bit C bit	rewing one e l ger		pene	etration or or or or or or or o		ater shown	samples & field tests B	mois D M W		escription on Unified ition Systems	n ed	consistency VS S F St VSt H Fb VL L MD D VD	/ relative density very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH03**

sheet: 2 of 3

project no. **GEOTFYSH09703AA**

date started: 30 May 2014

date completed: 31 May 2014

logged by: SB

location: Queanbeyan, NSW checked by: BC

E: 704167; N: 6083158 (Datum Not Specified) surface elevation: 576.95m (Datum Not Specificatingle from horizontal: 90° drill model: Track Rig casing diameter: NMLC mounting: Track drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support graphic colour, structure, minor components $\widehat{\mathbf{E}}$ depth water 30 300 300 300 3000 R . > T F H I + I + I + II + I + I + II + I + I + I-576 1.0 575 2.0 start coring at 2.90m -574 3.0 NO CORE: 0.35 m 21% LIMESTONE: grey, distinctly bedded at 60° to MW a = 0.23d=0.00 -573 4.0 NO CORE: 0.15 m I I II I I I IHighly Fractured Zone: 2000mm MW LIMESTONE: grey, distinctly bedded at 60° to comprising closely spaced partings at 60° to 70°, PL, RO, CN a=0.26 d=0.00 -572 5.0 a=0.06 d=0.00 g NO CORE: 0.45 m -571 MW LIMESTONE: grey, distinctly bedded at 60° to 6.0 NO CORE: 0.42 m LIMESTONE: grey, distinctly bedded at 60° to MW NO CORE: 1.30 m -570 7.0 0% LIMESTONE: grey, distinctly bedded at 60° to weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone shear surface stepped water inflow Irregular crushed seam CB claw or blade bit
W washbore
NMLC NMLC core (51.9 mm) SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm) wireline core (63.5mm) wireline core (85.0mm) slickensided VL POL polished SO smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



client:

Engineering Log - Cored Borehole

3 of 3 sheet:

B-BH03

Borehole ID.

GEOTFYSH09703AA project no. Opus International Consultants NSW Pty Ltd date started: 30 May 2014

principal: Queanbeyan City Council 31 May 2014 date completed:

project: Ellerton Drive Extension logged by: SB Ouganhovan NSW shooked by BC.

position: E: 704167; N: 6083158 (Datum Not Specified) surface elevation: 576.95m (Datum Not Specified)	varizantal: 00°
	IUIIZUIILAI. 9U
drill model: Track Rig mounting: Track casing diameter: NMLC	
drilling information material substance rock mass of	
material description ROCK TYPE: grain characterisics, colour, structure, minor components Colour, structure, minor components Colour, struct	ng defect descriptions n) (type, inclination, planarity, roughness, coating, thickness, other)
700	
NO CORE: 0.05 m	-
LIMESTONE: grey, distinctly bedded at 60° to 70°.	Highly Fractured Zone: 350mm comprising closely spaced partings at
-568 9.0 LIMESTONE: grey, distinctly bedded at 60° to	60° to 70°, PL, RÖ, CN Highly Fractured Zone: 200mm
NO CORE: 0.24 m	comprising closely spaced partings at 60° to 70°, PL, RO, CN
LIMESTONE: grey, distinctly bedded at 60° to 70°. NO CORE: 0.14 m	PT, 80°, PL, RO, CN
LIMESTONE: grey, distinctly bedded at 60° to	JT, 20°, UN, RO, Silt VN
70°. NO CORE: 0.44 m	PL. RO,
LIMESTONE: grey, distinctly bedded at 60° to MW 23%	70°.° -
	JT, 20°, UN, RO, Silt VN O Da Ta Control Table 1 JT, 30°, UN, RO, CN JT, 30°, UN, RO, CN CS 30mm CS 40mm JT, 30°, UN, RO, CN CS 30mm CS 40mm JT, 30°, UN, RO, CN CS 30mm CS 40mm
NO CORE: 0.25 m	T
LIMESTONE: grey, distinctly bedded at 60° to MW 000 3-0.50	++
	☐ PT, 30°, UN, RO, CN
	PT, 80°, PL, RO, Silt CO
565 12.0	
NO CORE: 0.50 m	-
LIMESTONE: grey, distinctly bedded at 60° to MW	
NO CORE: 0.40 m	<u> </u>
NO CORE: 0.25 m LIMESTONE: grey, distinctly bedded at 60° to 70°. NO CORE: 0.50 m	 -
NO CORE: 0.50 m	-
LIMESTONE: grey, distinctly bedded at 60° to MW	
14.0 70°.	Highly Fractured Zone: 420mm
	comprising closely spaced partings at 60° to 70°, PL, RO, CN
LIMESTONE: grey, distinctly bedded at 60° to	
	Highly Fractured Zone: 150mm
15.0 15.0 160 CORE. 0.13 17 18 18 18 18 18 18 18	comprising closely spaced partings at 60° to 70°, PL, RO, CN
Solution	1. 1. 1.
1 1 1	ii
method & support water graphic log / core recovery RS residual soil	defect type planarity PT parting PL planar
DT diatube XW extremely weathered	JT joint CU curved SZ shear zone UN undulating
AD auger drilling AD auger drilling RR roller/tricone Water inflow RR roller/tricone Water inflow AD auger drilling (graphic symbols indicate material) W moderately weathered W moderately weathered	SS shear surface ST stepped
CB claw or blade bit W upphpers which is a complete drilling fluid loss no core recovered SW slightly weathered SW slightly weathered	SM seam
NMLC NMLC core (51.9 mm) NO wireling core (47.6 mm) NO wireling core (47.6 mm) NO wireling core (47.6 mm)	DB drilling break roughness coating
HQ wireline core (63.5mm) barrel withdrawn VL very low L low	SL slickensided CN clean POL polished SN stain
PQ wreline core (85.0mm) water pressure test result	SO smooth VN veneer RO rough CO coating
test interval shown interval shown WH very high	VR very rough



PointID: B-BH03 Depth Range: 2.90 - 7.00 m

drawn	SB		client:	Opus International Co	nsultants NS\	W Pty Ltd	
approved	ВС	coffey	project:		ve Extension	CW	
date	24/06/2014		Ellerton Drive, Quanbeyan, NSW				
scale	N.T.S.	CORE PHOTOGRAPH B-BH03					
original size	A 4		project no:	GEOTFYSH09703AA	fig no:	5	rev:

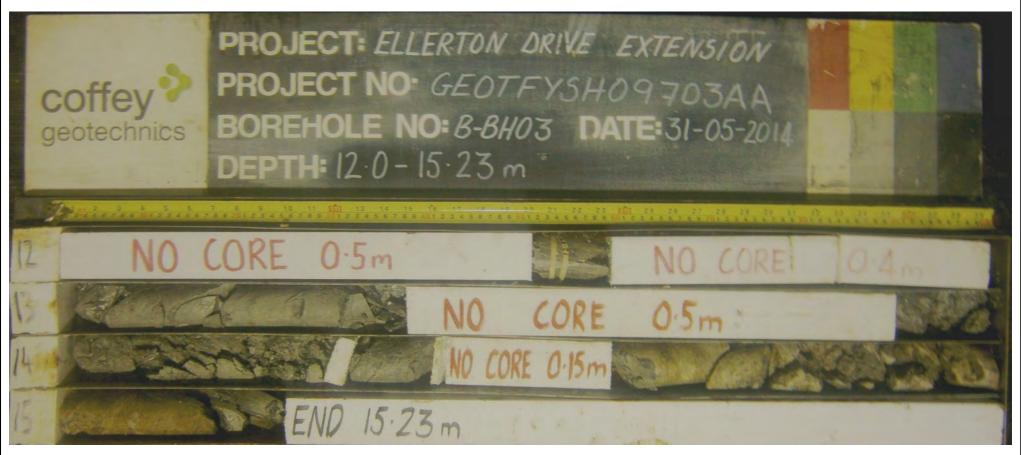
PointID: B-BH03 Depth Range: 7.00 - 12.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	onsultants NS	SW Pty L	.td
project:	Ellerton Dri Ellerton Drive, (ve Extension Quanbeyan, N		
title:		OTOGRAPH 3H03		
project no:	GEOTFYSH09703AA	fig no:	6	rev:

CDF_0_9_04BA.GLB GrfcTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Drain



PointID: B-BH03 Depth Range: 12.00 - 15.23 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Cor	nsultants NS\	N Pty Ltd	
project:	Ellerton Driv Ellerton Drive, Q		SW	
title:	CORE PHO B-B			
project no:	GEOTFYSH09703AA	fig no:	7	rev:



client:

project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

B-BH04

1 of 3 sheet:

Borehole ID.

GEOTFYSH09703AA project no.

date started: 02 Jun 2014

02 Jun 2014 date completed:

logged by: SB

lo	cati	on:	Q	ıeanbe	yan,	NSN	/			check	ked by:	BC
ро	position: E: 704154; N: 6083131 (Datum Not Specified) surface elevation: 580.47m (Datum Not Specified) gle from horizontal: 90°					0°						
\vdash			Edsc						ng: Truck casing diameter : HQ			
d	rillir	_	orma	tion			mate	rial sub		>		
method &	support	2 penetration	water	samples field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	condition consistency /	hand penetro- meter (kPa)	structure and additional observations
	1					_	$ \rangle $		TOPSOIL: Silty SAND: fine to medium grained, dark brown.	М		TOPSOIL -
					-580	- - 1.0-		CH		Wp F	4 1 1 1 1 1	ALLUVIUM
Ш				U50		-						-
AD/V	CASING —		Not Observable		 	2.0						- - - - -
	Q		<u>2</u> 	SPT 14, 24/100mr	578 n,	- - -			LIMESTONE: grey, extremely to highly weathered, very low to low strength.			BEDROCK -
J < <drawingfile>> 27/06/2014 16:07</drawingfile>				N=R	-577	3.0						
CDF_0_9_04BA.GLB Log COF BOREHOLE: NON CORED GEOTFYSH08703AA - CBH LOGS.GPJ ←	V				-576	4.0 - - - -			Borehole B-BH04 continued as cored hole			
: NON CORED GEOTFYS					-575	5.0 —						- - - - - - - - -
ILB LOG COF BOREHOLE			i		-574	- - - 7.0-						-
CDF_0_9_04BA.6					-573	-						
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	S a R r V V T C A h T C L L	auger auger roller/ti washb cable the hand a diatube blank I V bit TC bit	ool luger e	ng*	M C pen	10-i	ı	ater shown	B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Ns SPT - sample recovered Ns SPT - sample recovered Wy pla	y oist	n ed	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 medium dense D dense VD very dense



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH04**

sheet: 2 of 3

project no. **GEOTFYSH09703AA**

date started: 02 Jun 2014

date completed: 02 Jun 2014

logged by: SB

location: Queanbeyan, NSW checked by: BC

position: E: 704154; N: 6083131 (Datum Not Specified) surface elevation: 580.47m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support colour, structure, minor components Ξ graphic depth (water 30 300 300 300 3000 R . > T F H I + I + I + I580 I + I + I + II + I + I + I1.0 -579 2.0 $I \cup I \cup I$ -578 3.0 -577 start coring at 4.00m LIMESTONE: grey, distinctly bedded at 60° to NO CORE: 0.32 m -576 **LIMESTONE**: grey, iron stained, distinctly bedded at 60° to 70°. 0% 5.0 JT, 20°, UN, RO, Fe SN a=1.64 -JT, 20°, UN, RO, Fe SN 575 d=5.3113% Not Observable JT, 20 - 30°, UN, RO, Fe SN -NMLC 6.0 , PL, RO, Fe SN, described NO CORE: 0.72 m 574 9% LIMESTONE: grey, distinctly bedded at 60° to s are:PT, 60 - 70°, unless otherwise of 7.0 фĸ a=3.96 d=2.88 ΜW 573 JT, 20°, UN, RO, Silt CO SW to FR JT, 60 - 70°, PL, RO, CN weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support water graphic log / core recovery parting joint shear zone residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high auger drilling roller/tricone shear surface stepped water inflow crushed seam IR Irregular claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH04**

3 of 3 sheet:

GEOTFYSH09703AA project no.

02 Jun 2014 date started:

02 Jun 2014 date completed:

SB logged by:

Queanbeyan, NSW checked by: BC location:

position: E: 704154; N: 6083131 (Datum Not Specified) surface elevation: 580.47m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, colour, structure, minor components & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support graphic Ξ depth (water 300 300 300 300 300 R . > T F H LIMESTONE: grey, distinctly bedded at 60° to - JT, 60 - 70°, PL, RO, CN - JT, 60 - 70°, PL, RO, CN 572 a=2.80 d=7.30 38% 9.0 -571 a=1.30 d=1.76 44% 10.0 Highly Fractured Zone: 250mm comprising closely spaced partings at 60° to 70° -570 a=1.33 d=2.78 JT, 10°, UN, RO, CN Ċ, 11.0 vable Defects are:PT, 60 - 70°, PL, RO, 0 unless otherwise described CS 20mm Not Obser ·NMLC 50% 569 a=3.13 d=1.25 12.0 a=4.07 d=0.77 -568 - CS 30mm - JT. 10°. UN. RO. CN 0% Highly Fractured Zone: 360mm comprising closely spaced partings at 60° to 70° 13 0 JT, 20°, PL, RO, CN 567 a=3.06 d=1.35 14 N 78% - JT, 20°, UN, RO, CN 566 Borehole B-BH04 terminated at 14.90 m 15.0 Target depth 565 weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support water graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone stepped water inflow Irregular crushed seam IR claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm slickensided VL POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: B-BH04 Depth Range: 4.00 - 8.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	onsultants NS	W Pty Ltd	
project:	Ellerton Dr Ellerton Drive, (ve Extension Quanbeyan, N	SW	
title:		OTOGRAPH 3H04		
project no	O: GEOTEYSH09703AA	fig no:	8	rev:

CDF_0_9_04BA.GLB G16Tbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<DrawingF



PointID: B-BH04 Depth Range: 8.00 - 13.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Co	onsultants N	SW Pty L	.td
project:	Ellerton Dri Ellerton Drive, (ve Extensior Quanbeyan,	=	
title:		OTOGRAPH 3H04	ł	
project no	GEOTFYSH09703AA	fig no:	9	rev:

CDF_0_9_04BA.GLB GrfcTbl COFPHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Drawnin



PointID: B-BH04 Depth Range: 13.00 - 14.90 m

drawn	SB	
approved	ВС	cof
date	24/06/2014	
scale	N.T.S.	
original size	A4	

client:	Opus International Consultants NSW Pty Ltd					
project: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW						
CORE PHOTOGRAPH B-BH04						
project no:	GEOTFYSH09703AA	fig no:	10	rev:		

CDF_0_9_04BA.GLB GrfcTbl COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<DrawingFil



client:

project:

Engineering Log - Borehole

principal: Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH05**

sheet: 1 of 3

project no. **GEOTFYSH09703AA**

date started: 03 Jun 2014

date completed: 04 Jun 2014

logged by: **BC**

location: Queanbeyan, NSW checked by: BC

location:	: Qı	Queanbeyan, NSW chec				check	ked by:	BC			
position: E: 704141; N: 6083104 (Datum Not Specified) surface elevation: 583.11m (Datum Not Specified)gle from horizontal: 90°					90°						
drill mode	el: Edso	n				mounti	ng: Truck casing diameter :	HQ			
drilling i	informa	tion			mate	rial sub	stance				
method & support	z penetration 3 water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
	Not Observable	U50	-583 - -582	- - - 1.0 —			TOPSOIL: Sandy SILT: low liquid limit, dark brown, fine grained sand. FILL: Clayey SAND: medium to coarse grained, orange-brown, medium plasticity clay fines, with some large cobbles.	<wi M</wi 			TOPSOIL
			-581	2.0 —			Borehole B-BH05 continued as cored hole				
<u> </u>	 		-580	3.0-							
			-579	- 4.0— - -							
			-578	5.0							
			-577	6.0							
	 		-576 -	7.0— - - -							
method AD auge AS auge RR roller W wash CT cable HA hanc DT diatu B blanl V V bit T TC b	er screwii r/tricone hbore e tool d auger ube ik bit t bit hown by	ng*	pend E wate	etration or or or leve wate		ter shown	HP hand penetrometer (kPa) D N standard penetration test (SPT) M N* SPT - cample recovered	based Classifica noisture dry moist moist wet plastic li	escriptio on Unification Sys	n d	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 medium dense D dense VD very dense



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH05**

2 of 3 sheet:

GEOTFYSH09703AA project no.

03 Jun 2014 date started:

04 Jun 2014 date completed:

> BC logged by:

Queanbeyan, NSW BC location: checked by:

position: E: 704141; N: 6083104 (Datum Not Specified) surface elevation: 583.11m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & ls(50) (MPa) core run & RQD support colour, structure, minor components $\widehat{\Xi}$ graphic depth water 30 300 300 300 3000 R . > T S II 583 I + I + I + II + I + I + I1.0 582 start coring at 1.40m Sandy CLAY (CH): medium to high plasticity orange, medium to coarse grained sand, with some coarse grained, sub-rounded gravel. (ALLUVIUM) 2.0 $I \cup I \cup I$ 581 0% 580 NO CORE: 0.18 m **LIMESTONE**: grey with dark grey laminations, distinctly bedded at 60° to 70°. SW a=2.70 d=2.17 52% JT, 15°, IR, RO, Fe SN 579 PT, 60°, ST, RO, Fe SN 50% Not Observable d=1.05 JT. 10°, ST. RO, Fe SN - CBHL NMLC. - Highly Fractured Zone: 300mm 0% comprising closely spaced joints and partings at various orientations 0% 5.0 578 SM 130mm Silty Clay 18% S a=2.51 d=2.00 JT, 5°, IR, RO, Fe SN Ъ Highly Fractured Zone: 100mm comprising closely spaced joints and partings at various orientations , PL, SO, F described NO CORE: 0.12 m 6.0 SW LIMESTONE: grey with pale grey and white -577 - CS 200mm laminations, distinctly bedded at 60° to 70°, with pyrite and calcite mineralisation. Defects are:PT, 50 - 60°, unless otherwise a=4 88 d=0.19 JT, 60°, PL, SO, Fe SN CS 50mm -576 ~JT x2, 10°, IR, RO, Fe SN HW 23% a=1 80 SW d=2.05 - Highly Fractured Zone: 500mm comprising closely spaced joints and 0% weathering & alteration defect type planarity method & support water graphic log / core recovery parting joint shear zone PL planar CU curved UN undulating residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered distinctly weathered auger drilling roller/tricone shear surface stepped distinctly weathered
/ moderately weathered
slightly weathered
fresh
eplaced with A for alteration
ngth
very low
low
medium
high water inflow Irregular crushed seam IR claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth veneer standard penetration RQD = Rock Quality Designation (%) rough very rough hiah RO CO coating interval shown very high



Engineering Log - Cored Borehole

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH05**

sheet: 3 of 3

project no. **GEOTFYSH09703AA**

date started: 03 Jun 2014

principal: Queanbeyan City Council date completed: 04 Jun 2014

project: Ellerton Drive Extension logged by: BC location: Queanbeyan, NSW checked by: BC

position: E: 704141; N: 6083104 (Datum Not Specified) surface elevation: 583.11m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics, & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support colour, structure, minor components $\widehat{\Xi}$ graphic X = axial; O = diametra depth water 300 300 300 300 300 R . > T F H partings at various orientations SM 40mm 575 LIMESTONE: grey with pale grey and white SM 40mm, Clay
PT, 20°, CU, RO, Fe SN
PT, 30°, CU, RO, Clay VN
CS 50mm
JT, 90°, ST, VR, CN
SM 20mm, Clay
JT, 0°, ST, RO, CN laminations, bedding becoming distinctly twisted and wavv. 0% Becoming distinctly bedded at 30° to 40° 24% 9.0 574 − JT, 5°, UN, RO, Silty Clay VN Highly Fractured Zone: 100mm comprising closely spaced joints and partings at various orientations

JT, 70°, CU, RO, Sandy clay CO Becoming indistinctly bedded a=3.23 d=5.34 85% PT, 50°, PL, RO, Pale grey SN 10.0 d× -573 a=5.26 d=2.45 SM 60mm, Silty Clay CS 20mm CS 40mm JT, 5°, IR, VR, Silt CO 572 Not Observable – JT, 60°, UN, RO, Silty Clay CO – PT, 30°, PL, RO, Silty Clay CO NMLC a=4.21 d=4.63 69% - JT, 30°, UN, RO, CN 12.0 571 — JT, 60°, PL, SO, Calcite VN → JT, 40°, ST, RO, CN lol a=1.23 d=0.17 Becoming distinctly bedded at 30° to 40° CS 5mm CS 10mm 55% 13 0 -570 — CS 30mm → PT, 30°, UN, RO, Silt CO a=4.86 d=5.62 – JT, 5°, UN, RO, Silt CO 15% 14.0 569 Highly Fractured Zone: 850mm comprising closely spaced crushed seams and partings at 30° to 40° H 33% JT x2, 60°, UN, RO, Fe SN Borehole B-BH05 terminated at 15.00 m -568 Target depth $I \mid I \mid I \mid I$ weathering & alteration planarity
PL planar
CU curved
UN undulating defect type method & support water graphic log / core recovery residual soil extremely weathered highly weathered parting joint shear zone diatube auger screwing 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling SS stepped water inflow Irregular roller/tricone crushed seam IR claw or blade bit washbore NMLC core (51.9 mm) SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL polished SO smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



PointID: B-BH05 Depth Range: 1.40 - 5.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd					
project:	project: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW					
CORE PHOTOGRAPH B-BH05						
project no	GEOTFYSH09703AA	fig no:	rev:			

CDF_0_9_04BA.GLB G4cTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<DrawingFil



PointID: B-BH05 Depth Range: 5.00 - 10.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd							
project:	oject: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW							
title: CORE PHOTOGRAPH B-BH05								
project no:	GEOTFYSH09703AA	fig no:	12	rev:				

CDF_0_9_04BA.GLB_GrfTbl_COFPHOTO_CORE_PHOTO_1 PER PAGE_GEOTFYSH09703AA - CBH LOGS.GPJ_<<DrawningF



PointID: B-BH05 Depth Range: 10.00 - 15.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



	client:	Opus International Consultants NSW Pty Ltd					
	project:	Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW					
	title: CORE PHOTOGRAPH B-BH05						
ľ	project no:	GEOTFYSH09703AA	fig no:	13	rev:		

CDF_0_9_04BA.GLB GricTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<DrawingFile



client:

Engineering Log - Borehole

Opus International Consultants NSW Pty Ltd

1 of 3 sheet:

Borehole ID.

GEOTFYSH09703AA project no.

B-BH06

date started: 05 Jun 2014

principal: Queanbeyan City Council date completed: 06 Jun 2014

project: Ellerton Drive Extension logged by: BC

location: Queanbeyan, NSW checked by: BC				ВС								
position: E: 704127; N: 6083078 (Datum Not Specified) surface elevation: 586.21m (Datum Not Specified) gle from horizontal: 90°												
-	nodel: E							ng: Truck casing diame	eter : HQ			
drilli	ing infor	mati	on			mate	rial sub					
method & support	1 2 penetration 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations
				-586				FILL: Silty CLAY: medium plasticity, red-brown trace fine grained sand.	n, =Wp			FILL -
	-	able		-585	1.0 — - - -		GC	Clayey GRAVEL: fine to coarse grained, sub-rounded, orange-brown, medium to high plasticity clay fines.		MD	J i i i i L	ALLUVIUM -
—— AD/V ——		Not Observable		-584	2.0— - -	8 8						
CASING				-583	3.0 —	\$ \$ 8 8						
				-582	- 4.0 - - - -			Borehole B-BH06 continued as cored hole				
				-581	5.0 — - -							
				-580	6.0							
<u> </u>	-			-579 -	7.0 — - - -							
AS RR W CT HA DT B V T	auger dri auger sc roller/trice washbore cable too hand aug diatube blank bit V bit TC bit bit showr AD/T	ewing one e I er		pene E wate	etration or or leve wate		ater shown	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal HB hammer bouncing	based	lescription I on Unification Sys	on ed	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 medium dense D dense VD very dense



Engineering Log - Cored Borehole

Borehole ID. **B-BH06**

Opus International Consultants NSW Pty Ltd

GEOTFYSH09703AA project no. 05 Jun 2014 date started:

Queanbeyan City Council principal:

2 of 3

06 Jun 2014

Ellerton Drive Extension

logged by: BC

project:

checked by: BC

date completed:

sheet:

Queanbeyan, NSW location: position: E: 704127; N: 6083078 (Datum Not Specified) surface elevation: 586.21m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and strength & Is50 defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests ROCK TYPE: grain characterisics & Is(50) (MPa) core run & RQD support graphic colour, structure, minor components Ξ depth (water 30 300 300 300 3000 R . > T F H 586 I + I + I + I \Box 1.0 585 2.0 $I \cup I \cup I$ 584 \square I + I + I3.0 583 start coring at 4.00m NO CORE: 0.70 m 582 0% Clayey GRAVEL (GC): medium grained, sub-rounded, orange-brown, medium to high plasticity clay fines. (ALLUVIUM) 5.0 581 Observable -NMLC 6.0 I I I I I INot 580 7.0 579 LIMESTONE: grey with pale grey laminations, SW - Highly Fractured Zone: 300mm comprising closely spaced partings at 20°, PL, RO, SN pale grey distinctly bedded at 60° d=6.00SM 60mm, Clayey silt 62% SM 100mm, Clayey silt weathering & alteration defect type planarity
PL planar
CU curved
UN undulating method & support water graphic log / core recovery parting joint shear zone residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered Inignly weathered distinctly weathered moderately weathered slightly weathered fresh eplaced with A for alteration on the medium high shear surface auger drilling roller/tricone SS stepped water inflow crushed seam IR Irregular claw or blade bit washbore SM seam
DB drilling break complete drilling fluid loss no core recovered partial drilling fluid loss NMLC NMLC core (51.9 mm) coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth interval shown veneer standard penetration RQD = Rock Quality Designation (%) RO rough very rough hiah CO coating very high



principal:

project:

Engineering Log - Cored Borehole

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants NSW Pty Ltd

Borehole ID. **B-BH06**

3 of 3 sheet:

GEOTFYSH09703AA project no.

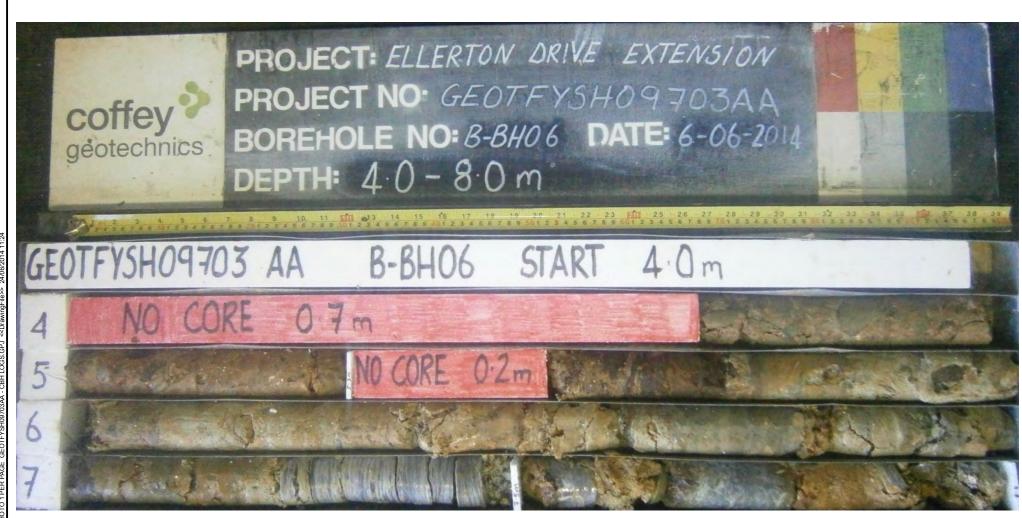
05 Jun 2014 date started:

06 Jun 2014 date completed:

BC logged by:

Queanbeyan, NSW BC location: checked by:

position: E: 704127; N: 6083078 (Datum Not Specified) surface elevation: 586.21m (Datum Not Specificatingle from horizontal: 90° drill model: Edson casing diameter : HQ mounting: Truck drilling information material substance rock mass defects material description estimated defect additional observations and defect descriptions
(type, inclination, planarity, roughness, coating, thickness, other) field tests strength & Is50 ROCK TYPE: grain characterisics & ls(50) (MPa) $\widehat{\Xi}$ core run & RQD support colour, structure, minor components $\widehat{\Xi}$ graphic depth water R 300 300 300 300 300 general . > T 5 III NO CORE: 0.30 m 578 LIMESTONE: orange-grey, distinctly bedded at Highly Fractured Zone: 500mm I + I + Icomprising closely spaced partings and joints at various orientations **NO CORE**: 0.45 m 9.0 577 **LIMESTONE**: grey with pale grey laminations, distinctly bedded at 40° to 60°. SW CS 80mm a=3.46 d=0.35 29% PT, 50°, PL, RO, Calcite VN SO, Pale grey SN, described 10.0 a=2.01 576 NO CORE: 0.20 m Highly Fractured Zone: 110mm **LIMESTONE**: grey with pale grey laminations, distinctly bedded at 40° to 60°. SW comprising closely spaced partings and joints at various orientations -JT, 0°, IR, VR, Fe SN -JT, 0°, PL, RO, Calcite VN -JT, 0°, PL, RO, Calcite VN , 60°, PL, S otherwise 11% 11.0 are:PT, unless o HW Highly Fractured Zone: 300mm 575 comprising closely spaced partings NO CORE: 0.30 m and joints at various orientations Not Observable · JT, UN, RO, Calcite VN · SM 50mm, Gravelly Clay · JT, 45°, UN, RO, Calcite VN **LIMESTONE**: grey with pale grey laminations, distinctly bedded at 40° to 60°. SW 0% NMLC 12.0 NO CORE: 0.20 m SW **LIMESTONE**: grey with pale grey laminations, distinctly bedded at 40° to 60°. SM 15mm, Sandy clay 574 a=5.01 34% CS 30mm d=0.66 13 0 573 b 90% 14 N a=2.35 d=3.06 572 JT, 70°, UN, RO, Calcite VN 88% 15.0 571 ─JT, 10°, CU, RO, CN CS 10mm a=0.73 Borehole B-BH06 terminated at 15.80 m weathering & alteration defect type planarity method & support graphic log / core recovery parting joint shear zone PL planar CU curved UN undulating residual soil diatube auger screwing extremely weathered highly weathered 10/10/12, water level on date shown AS AD RR core recovered distinctly weathered shear surface auger drilling roller/tricone stepped distinctly weathered
/ moderately weathered
slightly weathered
fresh
eplaced with A for alteration
ngth
very low
low
medium
high water inflow crushed seam IR Irregular claw or blade bit washbore seam drilling break complete drilling fluid loss no core recovered DB partial drilling fluid loss NMLC core (51.9 mm) NMLC coating CN clean SN stain VN venee core run & RQD roughness wireline core (47.6mm wireline core (63.5mm wireline core (85.0mm VL slickensided POL SO polished smooth barrel withdrawn water pressure test result (lugeons) for depth veneer standard penetration RQD = Rock Quality Designation (%) rough very rough hiah RO CO coating interval shown very high



PointID: B-BH06 Depth Range: 4.00 - 8.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants NSW Pty Ltd					
project: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW						
CORE PHOTOGRAPH B-BH06						
project no:	GEOTFYSH09703AA	fig no:	14	rev:		

CDF_0_9_04BA.GLB GrfcTbl COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<Draw

PointID: B-BH06 Depth Range: 8.00 - 13.00 m

drawn	SB
approved	вс
date	24/06/2014
scale	N.T.S.
original size	A4



Opus International Consultants NSW Pty Ltd											
project: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW											
title:	CORE PHO B-B										
project no:	GEOTFYSH09703AA	fig no:	15	rev:							



PointID: B-BH06 Depth Range: 13.00 - 15.80 m

drawn	SB	
approved	ВС	
date	24/06/2014	
scale	N.T.S.	
original size	A4	



client:	Opus International Consultants NSW Pty Ltd										
project: Ellerton Drive Extension Ellerton Drive, Quanbeyan, NSW											
title: CORE PHOTOGRAPH B-BH06											
project no	GEOTFYSH09703AA	fig no:	16	rev:							

CDF_0_9_04BA.GLB GricTbi COF PHOTO CORE PHOTO 1 PER PAGE GEOTFYSH09703AA - CBH LOGS.GPJ <<DrawingF



project no. **GEOTFYSH09703AA**

A-BH011 of 1

Borehole ID.

sheet:

client: Opus International Consultants Pty Ltd date started: 02 Jun 2014

principal: Queanbeyan City Council date completed: 02 Jun 2014

project: Ellerton Drive Extension logged by: SB location: Queanbeyan NSW checked by: BC

_	ocai	ion:	Qu	eanbey	an N	1311					cneci	ked by:	BC			
- 1		E: 704147; N: 6085783 (WGS84 Zone 55) surface elevation : 602.54m (AHD)										angle from horizontal: 90°				
Ľ				ne Excava	tor				ng: Track hole diameter : 300	mm						
ŀ	arıllı	ng infor	mati	on			mate	rial sub			>	Ι				
:	method & support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations			
CDF_0_9_04BA.GLB Log COF BOREHOLE: NON CORED GEOTFYSH09703AA - EXISTING ELLERTON DRIVE GI.GPJ < <drawingfile>> 27/06/2014 16:49</drawingfile>	N-		None Observed	BS	-602			SC	FILL: Gravelly SAND: medium grained, grey, fine to coarse grained, sub-angular gravel. FILL: Gravelly SAND: medium grained, orange-brown, medium to coarse grained, sub-angular gravel, with some small cobbles. Clayey SAND: fine grained, brown, medium plasticity clay, trace fine to medium grained sub-angular gravel. Borehole A-BH01 terminated at 1.5 m Target depth	М	MD		ROAD SEAL ROAD BASE FILL - COLLUVIUM			
	AD AS RR W CT HA DT B V T	S auger screwing* R roller/tricone / washbore T cable tool A hand auger T diatube blank bit V bit T C bit bit shown by suffix				etration or or or or or or or or or		g to ter shown	B bulk disturbed sample D disturbed sample E environmental sample SS split spoon sample	based Classifica sture dry moist wet	escriptio on Unification Sys	n ed	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 medium dense D dense VD very dense			



sheet: 1 of 1

A-BH02

GEOTFYSH09703AA

Borehole ID.

project no.

client: Opus International Consultants Pty Ltd date started: 02 Jun 2014

principal: Queanbeyan City Council date completed: 02 Jun 2014

project: Ellerton Drive Extension logged by: SB location: Queanbeyan NSW checked by: BC

location:	Qu	eanbey	an N	vsw					checked by: BC			
position:	E: 7	04244; N:	60856	41 (WC	3S84 Z	one 55)	surface elevation: 603.89m (AHD)	angle	e from he	orizontal: 9	90°	
drill model:	13 Tor	nne Excava	ator		_	mounting: Track hole diameter : 300 mm						
drilling info	rmati	on			mate		stance					
method & support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations	
1 1					XXXX		ROAD SURFACE: ASPHALT.	/			ROAD SEAL	
		BS		- -			FILL: Clayey Sandy GRAVEL: fine to medium grained, sub-angular, grey, fine to coarse grained sand, medium plasticity clay.				ROAD BASE	
			_	0.5—			FILL: Clayey SAND: fine to medium grained, pale orange, medium plasticity clay.				FILL	
Abu	None Observed		603		₽	CLAY: medium to high plasticity, orange, with some fine grained sand.	=Wp	St		RESIDUAL SOIL		
			_	- - - 1.5			SANDSTONE: fine to medium grained, orange, extremely to highly weathered, estimated very low strength. Borehole A-BH02 terminated at 1.5 m Target depth				BEDROCK	
method AD auger d AS augers R R R roller/ri W washbo	crewing cone	9*		mud casing		nil	samples & field tests B bulk disturbed sample D disturbed sample E environmental sample	based	ation sym lescriptio I on Unifie ation Sys	n ed	consistency / relative density VS very soft S soft F firm	
CT cable to HA hand au DT diatube B blank bi V V bit T TC bit	blank bit V bit TC bit bit shown by suffix			er 10-leve wat		ater shown	SS split spoon sample U## undisturbed sample ##mm diameter HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shear; peak/remouded (kPa) R refusal HB hammer bouncing	moisture D dry M moist W wet Wp plastic WI liquid li			St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense	



1 of 1 sheet: GEOTFYSH09703AA

A-BH03

Borehole ID.

project no.

Opus International Consultants Pty Ltd client: date started: 02 Jun 2014

principal: Queanbeyan City Council 02 Jun 2014 date completed:

project: Ellerton Drive Extension logged by: SB Queanbeyan NSW ВС checked by: location:

locatio	,, i.	Qu	eanbey	aii i	1311					checked	ı by:	BC
position	tion: E: 704414; N: 6085549 (WGS84 Zone 55) surface elevation : 606.76m (AHD) model: 13 Tonne Excavator mounting: Track hole diameter : 300								_	from horiz	ontal:	90°
				tor					300 mm			
drilling information					mate	rial sub						
method & support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	nsistency ative dens	hand enetro- meter (kPa) 응용용	structure and additional observations
A A					-			ROAD SURFACE: ASPHALT. FILL: Clayey Sandy GRAVEL: fine to medium grained, sub-angular, grey, fine to coarse grained sand, medium plasticity clay.	_			ROAD SEAL ROAD BASE
			D	-	0.5—			FILL: Clayey GRAVEL: medium grained, sub-angular, orange, medium plasticity clay, with some fine to medium grained sand.	M			FILL
—— AD/T ————————————————————————————————————		None Observed		-606	-			Clayey SAND: fine to medium grained, red-brown, medium plasticity clay, with some fine to medium grained, sub-angular gravel.	=Wp	St		COLLUVIUM
				_	- 1.0 -							
					- - 1.5 - -			Borehole A-BH03 terminated at 1.5 m Target depth				
 				-605	-				Classification			
V V bit T TC bit * bit shown by suffix					etration or o	ı	iter shown	HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered NC SPT with solid cope	soil de based	escription on Unified ation System		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 medium dense D dense VD very dense



project no. **GEOTFYSH09703AA**

A-BH041 of 1

Borehole ID.

sheet:

client: Opus International Consultants Pty Ltd date started: 02 Jun 2014

principal: Queanbeyan City Council date completed: 02 Jun 2014

project: Ellerton Drive Extension logged by: SB location: Queanbevan NSW checked by: BC

	loca	tion:	Qu	eanbey	an N	<i>ISW</i>	checked			ked by:	BC											
ſ	positi	on:	E: 7	04582; N: 6	08550	09 (WG	S84 Z	one 55)	surface elevation: 608.13m (AHD)	angle	from ho	orizontal: 9	90°									
L	drill m	nodel:	I3 Toı	nne Excava	tor			mount	ng: Track hole diameter : 30	00 mm												
L	drill	ing info	rmati	on			mate	rial sub	estance													
	method & support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	structure and additional observations									
ı	1 1						XXXX		ROAD SURFACE: ASPHALT.	<u></u>			ROAD SEAL									
					-608	-			FILL: Clayey Sandy GRAVEL: fine to medium grained, sub-angular, grey, fine to coarse grained sand, medium plasticity clay.	D			ROAD BASE									
16:49				D		_			FILL: Gravelly CLAY: medium to high plasticity, orange, medium grained, sub-rounded gravel.	=Wp			FILL									
27/06/2014 16:49						0.5-							_									
< <drawingfile>></drawingfile>			None Observed	BS	_	-		SC	Clayey SAND: medium grained, red-brown, medium plasticity clay, with some fine to medium grained, sub-angular gravel.	_	MD		COLLUVIUM									
	———AD/T		None												-							
ELLERTON D						1.0-	1.0						_									
A - EXISTING				BS	-607	_																
GEOTFYSH09703AA - EXISTING ELLERTON DRIVE GI.GPJ						-																
EHOLE: NON CORED GEO						_																
REHOLE: NO	↓ ↓					1.5			Borehole A-BH04 terminated at 1.5 m Target depth													
9 04BA.GLB Log COF BOR					_	_																
CDF_0_9_04BA.GLB						- -																
	V V DIT						no res rangin refusa Oct-12 wa el on date er inflow	ater shown	HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered NC SPT with solid cope V	based of Classifica	scriptio on Unification Sys	n ed	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 medium dense D dense									



Soil Description Explanation Sheet (1 of 2)

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μm to 2.36 mm
	medium	200 μm to 600 μm
	fine	75 μm to 200 μm

MOISTURE CONDITION

Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Soil feels cool and darkened in colour. Cohesive Moist soils can be moulded. Granular soils tend to cohere.

As for moist but with free water forming on hands Wet when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH S _U (kPa)	FIELD GUIDE			
Very Soft	<12	A finger can be pushed well into the soil with little effort.			
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.			
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.			
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.			
Very Stiff	100 - 200	The surface of the soil can be marke but not indented with thumb pressur			
Hard	>200	The surface of the soil can be marked only with the thumbnail.			
Friable	_	Crumbles or powders when scraped by thumbnail.			

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)			
Very loose	Less than 15			
Loose	15 - 35			
Medium Dense	35 - 65			
Dense	65 - 85			
Very Dense	Greater than 85			

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

	ZONING	CEMENTING			
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.		
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.		
Pockets	Irregular inclusions of different material.				

GEOLOGICAL ORIGIN WEATHERED IN PLACE SOILS

Extremely Structure and fabric of parent rock visible. weathered material

Residual soil Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil Deposited by wind. Alluvial soil Deposited by streams and rivers. Colluvial soil Deposited on slopes (transported downslope

by gravity).

Fill Man made deposit. Fill may be significantly more variable between tested locations than

naturally occurring soils.

Lacustrine soil Deposited by lakes.

Marine soil Deposited in ocean basins, bays, beaches

and estuaries.



Soil Description Explanation Sheet (2 of 2)

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

(Exclu	ıding				ON PROCEDURE and basing fractions		USC	PRIMARY NAME							
GRAINED SOILS % of material less than maler than 0.075 mm COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm		arse 36 mm	CLEAN RAVELS (Little or no fines)		range in grain size a unts of all intermediat		GW	GRAVEL							
		YELS If of co than 2.	CLEAN GRAVELS (Little or no fines)	Predowith 1	ominantly one size or more intermediate siz	a range of sizes zes missing.	GP	GRAVEL							
	eye)	GRAVELS than half of is larger than	SRAVELS ITH FINES ppreciable amount of fines)		plastic fines (for iden edures see ML below		GM	SILTY GRAVEL							
	e naked	GRAVELS More than half of coarse fraction is larger than 2.36 mm	GRAVELS WITH FINES (Appreciable amount of fines)		ic fines (for identificat CL below)	tion procedures	GC	CLAYEY GRAVEL							
	ble to th		:AN IDS IDS tte or or ss)		range in grain sizes a		SW	SAND							
	icle visi	DS If of cos than 2.3	CLEAN SANDS (Little or no fines)		Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	SAND							
	lest part	SANDS More than half of coarse fraction is smaller than 2.36 mm	SANDS WITH FINES (Appreciable amount of fines)		plastic fines (for iden edures see ML below		SM	SILTY SAND							
	the sma	More fraction i	SAI WITH (Appre am	Plastic fines (for identification prosper CL below).		tion procedures	SC	CLAYEY SAND							
	out		IDENTIFICAT	ON PROCEDURES ON FRACTIONS <0.2 mm.											
n n	s ab		DRY STREN	GTH	DILATANCY	TOUGHNESS									
ILS less th 75 mn	rticle is	CLAYS limit an 50	None to Low	'	Quick to slow	None	ML	SILT							
ED SC aterial ıan 0.0	nm pa	SILTS & CLAY? Liquid limit less than 50	SILTS & C Liquid less tha	SILTS & (Liquid less tha	SILTS & (Liquid less tha	SILTS & (Liquid less tha	SILTS & C Liquid less tha	TS & (liquid less tha	LTS & Liquid ess tha	Medium to H	ligh	None	Medium	CL	CLAY
SRAIN of ma	.075 r							Low to medi	um	Slow to very slow	Low	OL	ORGANIC SILT		
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm	(A 0	LAYS mit an 50	Low to medi	um	Slow to very slow	Low to medium	МН	SILT							
		SILTS & CLAYS Liquid limit greater than 50	High		None High		CH	CLAY							
M ₀		SILT Lik grea	Medium to H	ligh	None	Low to medium	ОН	ORGANIC CLAY							
HIGHL'	Y OF	RGANIC	Readily identification		y colour, odour, spon	gy feel and	Pt	PEAT							

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM	TERM						
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.		SOFTENI ZONE						
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.		TUBE						
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.		TUBE CAST						
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.		INFILLED SEAM						

TEI	RM	DEFINITION	DIAGRAM
SOI	FTENED NE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	NAME OF THE OWNER, WHEN
TUE	BE .	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	N
TUE		Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INF SEA	ILLED AM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	



Rock Description Explanation Sheet (1 of 2)

The descriptive terms used by Coffey are given below. They are broadly consistent with Australian Standard AS1726-1993.

DEFINITIONS: Rock substance, defect and mass are defined as follows:

Rock Substance In engineering terms rock substance is any naturally occurring aggregate of minerals and organic material which cannot be

disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively

homogenous material, may be isotropic or anisotropic.

Defect Discontinuity or break in the continuity of a substance or substances.

Any body of material which is not effectively homogeneous. It can consist of two or more substances without defects, or one or Mass

more substances with one or more defects.

SUBSTANCE DESCRIPTIVE TERMS:

ROCK NAME Simple rock names are used rather than precise

geological classification.

PARTICLE SIZE Grain size terms for sandstone are:

Mainly 0.6mm to 2mm Coarse grained Medium grained Mainly 0.2mm to 0.6mm

Mainly 0.06mm (just visible) to 0.2mm Fine grained

FABRIC Terms for layering of penetrative fabric (eg. bedding,

cleavage etc.) are:

Massive No layering or penetrative fabric.

Indistinct Layering or fabric just visible. Little effect on properties.

Distinct Layering or fabric is easily visible. Rock breaks more

easily parallel to layering of fabric.

CLASSIFICATION OF WEATHERING PRODUCTS

Abbreviation Definition Term

Residual Soil derived from the weathering of rock; the

mass structure and substance fabric are no longer evident; there is a large change in volume but the soil has not been significantly

transported.

Extremely Weathered Material

Soil

Material is weathered to such an extent that it has soil properties, ie, it either disintegrates or can be remoulded in water. Original rock fabric

still visible.

Highly Weathered Rock

Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the

extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the

deposition of minerals in pores.

Moderately MW Weathered Rock

The whole of the rock substance is discoloured, usually by iron staining or bleaching , to the extent that the colour of the fresh rock is no

longer recognisable.

Slightly SW Weathered Rock

Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by

limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the

fresh rock substance.

Fresh Rock FR Rock substance unaffected by weathering.

Notes on Weathering:

- 1. AS1726 suggests the term "Distinctly Weathered" (DW) to cover the range of substance weathering conditions between XW and SW. For projects where it is not practical to delineate between HW and MW or it is judged that there is no advantage in making such a distinction. DW may be used with the definition aiven in AS1726.
- 2. Where physical and chemical changes were caused by hot gasses and liquids associated with igneous rocks, the term "altered" may be substituted for "weathering" to give the abbreviations XA, HA, MA, SA and DA.

ROCK SUBSTANCE STRENGTH TERMS

Term Abbrev- Point Load iation

Index, I_{s(50)} (MPa)

Field Guide

Very Low VL Less than 0.1 Material crumbles under firm

blows with sharp end of pick; can be peeled with a knife: pieces up to 30mm thick can be broken by finger pressure.

0.1 to 0.3 Low

Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break

during handling.

Medium 0.3 to 1.0

Readily scored with a knife: a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.

High 1 to 3 A piece of core 150mm long by 50mm can not be broken by hand but can be broken by a pick with a single firm blow; rock rings under

hammer.

Very High VH 3 to 10

Hand specimen breaks after more than one blow of a pick; rock rings under

hammer.

Extremely EH High

More than 10 Specimen requires many blows with geological pick to break; rock rings under

hammer.

Notes on Rock Substance Strength:

- 1. In anisotropic rocks the field guide to strength applies to the strength perpendicular to the anisotropy. High strength anisotropic rocks may break readily parallel to the planar anisotropy.
- 2. The term "extremely low" is not used as a rock substance strength term. While the term is used in AS1726-1993, the field guide therein makes it clear that materials in that strength range are soils in engineering terms.
- 3. The unconfined compressive strength for isotropic rocks (and anisotropic rocks which fall across the planar anisotropy) is typically 10 to 25 times the point load index $I_{8(50)}$. The ratio may vary for different rock types. Lower strength rocks often have lower ratios than higher strength rocks.

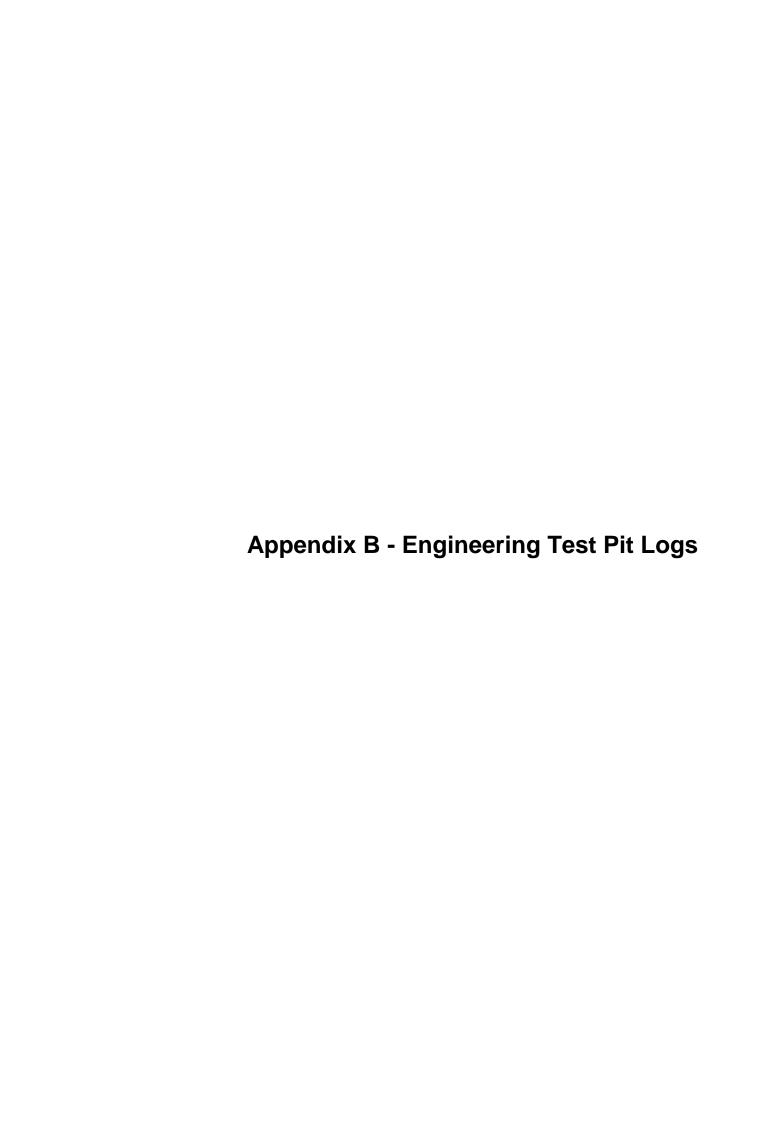


Rock Description Explanation Sheet (2 of 2)

COMMON ROCK MA Term	DEFECTS IN SSES Definition	Diagram	a i i	i phic Log Note 1)	DEFECT SHAPE Planar	TERMS The defect does not vary in orientation
Parting	A surface or crack across which the rock has little or no tensile strength.		20	[84]	Curved	The defect has a gradual change in orientation
	Parallel or sub parallel to layering (eg bedding) or a planar anisotropy		Bedding 20		Undulating	The defect has a wavy surface
	in the rock substance (eg, cleavage). May be open or closed.		Cleavage	(Note 2)	Stepped	The defect has one or more well defined steps
Joint	A surface or crack across which the rock has little or no tensile strength.	\			Irregular	The defect has many sharp changes of orientation
	but which is not parallel or sub parallel to layering or planar anisotropy in the rock substance.		60	(Note 2)		ment of defect shape is partly by the scale of the observation.
	May be open or closed.			(NOIC Z)	ROUGHNESS Slickensided	FERMS Grooved or striated surface, usually polished
Sheared Zone (Note 3)	Zone of rock substance with roughly parallel near planar, curved or				Polished	Shiny smooth surface
(Note o)	undulating boundaries cut by closely spaced joints, sheared surfaces or other defects. Some of		35		Smooth	Smooth to touch. Few or no surface irregularities
	the defects are usually curved and intersect to divide the mass into lenticular or wedge shaped blocks.	711.1		%	Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
Sheared Surface (Note 3)	A near planar, curved or undulating surface which is usually smooth, polished or slickensided.		40	3500	Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.
Crushed Seam	Seam with roughly parallel almost planar boundaries, composed of				COATING TER	MS No visible coating
(Note 3)	disoriented, usually angular fragments of the host rock substance which may be more		50	~~ ~~	Stained	No visible coating but surfaces are discoloured
	weathered than the host rock. The seam has soil properties.			17 1	Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface.		65		Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (eg, infilled seam). Thicker rock strength material is usually described as a vein.
Extremely	Seam of soil substance, often with		, 32		BLOCK SHAPE Blocky	E TERMS Approximately equidimensional
Weathered Seam	gradational boundaries. Formad by weathering of the rock substance in place.		TIME	ZVZ	Tabular	Thickness much less than length or width
	F.mo.	Seam	-	[2]	Columnar	Height much greate than cross section

Notes on Defects:

- 1. Usually borehole logs show the true dip of defects and face sketches and sections the apparent dip.
- 2. Partings and joints are not usually shown on the graphic log unless considered significant.
- 3. Sheared zones, sheared surfaces and crushed seams are faults in geological terms.





Excavation ID. **TP01**

project no.

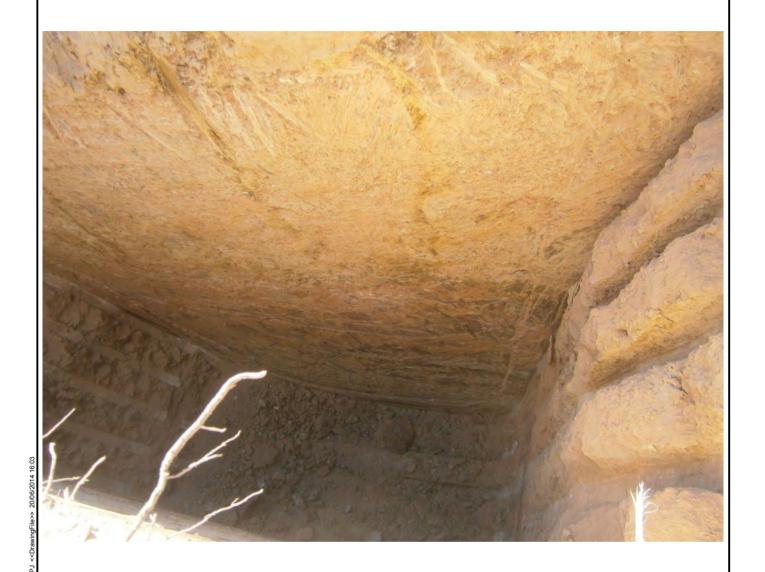
sheet: 1 of 1 GEOTFYSH9703AA

Opus International Consultants Pty Ltd client: date excavated: 15 May 2014

principal: Queanbeyan City Council date completed: 15 May 2014

Ellerton Drive Extension project: logged by: BC Ouganhovan NSW ahaakad bu NΒ

location: Queanbeyan NSW			,				checked by:		DB		
position: E: 704651; N: 6085474 (WGS				74 (WC	3S84 Z	4 Zone 55) surface elevation: 615.85m (AHD)			pit orientation:		
equipment ty	/pe: 1	3 Tonne E	xcavat	or		excava	tion method: Excavator exc	avation d	imensions: 2.9 m lo	ong 1.1 m	wide DCP id.:
excavation	inforr	nation			mate	rial sub	stance				
method support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density / metative density / weten (kba) 200 (kba) 400 (400 (400 kba) / 400 (400 kba)	DCP (blows/ 100 mm)	structure and additional observations
MATION + PSP/DCP GEOIFYSH09703AA GPJ < <drawning-lie>> Z7.06/2014 15.41 ▲</drawning-lie>	None Observed	D	-615.5 -614.5 -614.5			CL	Sandy CLAY: low plasticity, pale brown, fine grained sand, with some fine to medium grained, sub-angular gravel. Sandy CLAY: low plasticity, red-brown, fine to medium grained sand.	<wp< td=""><td>F </td><td></td><td>COLLUVIUM</td></wp<>	F		COLLUVIUM
method N natura X existin BH backh	l exposo g g exca pe buck er blac	ure vation ket de	<u>-</u>	3.5 —		to	Test pit TP01 terminated at 3.1 m Target depth samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remouded (uncorrected kPa) R refusal	M moistu D dr M mo W we W _P pla	sification symbol & soil description based on Unified assification System are	\	firm St stiff St very stiff H hard b friable /L very loose L loose MD medium dense



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants Pty Ltd								
project:	Ellerton Drive Extension								
title:	title: TEST PIT PROFILE								
project no:	GEOTFYSH9703AA	fig no:	1	rev:					



Excavation ID. **TP02**

sheet: 1 of 1

project no.

GEOTFYSH9703AA

client: Opus International Consultants Pty Ltd date excavated: 01 May 2014

principal: Queanbeyan City Council date completed: 01 May 2014

project: Ellerton Drive Extension logged by: BC

le	location: Queanbeyan NSW			ISW	•					checked by:		DB											
p	position: E: 704676; N: 6085447 (WGS84 Zone 8				17 (WG	SS84 Z	one 55)	surface elevation: 617.54m (AHD)	1	oit orien	tation:												
e	qu	iipr	ment typ	e: 6	Tonne Exc	avato	r		excava	tion method: Excavator exca	vation di	imensio	ns: 2.0 m long 0	.5 m w	ride DCP id.:								
L	ex	ca	vation i	nfor	nation			mate	rial sub	stance	_												
2004		support	1 2 penetration 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand DCi penetro- (blow meter 100 m (kPa)	vs/ nm)	structure and additional observations								
		z		None Observed	BX2	-617.5 -617.0	0.5 —		CL	Sandy CLAY: low plasticity, pale brown, fine grained sand, with some fine to medium grained, sub-angular gravel.	<wp< th=""><th>Н</th><th>320796</th><th></th><th>COLLUVIUM</th></wp<>	Н	320796		COLLUVIUM								
Ι,					D	-616.5	1.0 —		CL	Sandy CLAY: low plasticity, mottled orange/grey, fine grained sand, with some clay.					-								
27/06/2014 15:41						-616.0	1.5—			Test pit TP02 terminated at 1.2 m Bucket Refusal					- - - -								
< <drawingfile>></drawingfile>						-615.5	2.0—								- - - -								
AVATION + PSP/DCP GEOTFYSH09703AA.GPJ						-615.0	2.5— - -								- - - -								
COF EXCAVATION + PSP/I														-614.5	3.0								- - - -
CDF_0_9_04BA.GLB Log (-614.0	- 3.5— - - -								- - - - -								
	N X B B R E	h H	natural existing backhor bulldoze ripper excaval port none shoring	excar e buck er blad	sure vation ket de	vater	10-Oct		to er	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remouded	moistu D dry M mo W we	soil desc pased on assificatio re / pist t stic limit		con VS S F St VSt H Fb VL L MD D VD	very soft soft firm stiff very stiff hard friable very loose loose medium dense dense very dense								



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants Pty Ltd											
project: Ellerton Drive Extension												
title:	title: TEST PIT PROFILE											
project no:	GEOTFYSH9703AA	fig no:	2	rev:								



Excavation ID. **TP03**

GEOTFYSH9703AA

sheet: 1 of 1

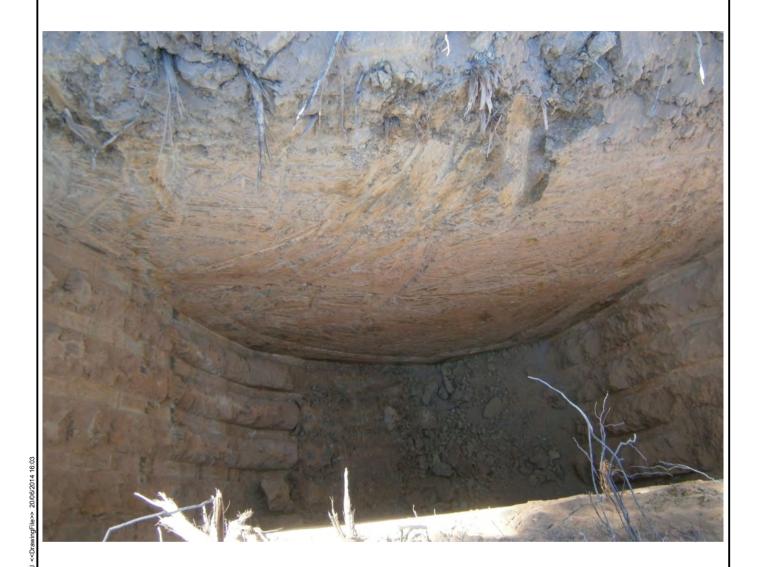
project no.

client: Opus International Consultants Pty Ltd date excavated: 15 May 2014

principal: Queanbeyan City Council date completed: 15 May 2014

project: Ellerton Drive Extension logged by: BC

lo	location: Queanbeyan NSW		ISW				checked by:	DB				
р	position: E: 704698; N: 6085422 (WGS				22 (WC	S84 Z	one 55)	surface elevation: 618.55m (AHD)	pit orientation:			
е	equipment type: 13 Tonne Excavator exca					cavat	or		excava	tion method: Excavator exca	avation dimensions: 2.7 m long 1.0 m	wide DCP id.:
L	exc	cava	tion i	nforr	nation			mate	rial sub	stance		
podtem	חופנווסם		2 penetration 3	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	and size to the control of the contr	structure and additional observations
	A 1	V		None Observed	BX2	-618.5 -618.0	0.5—		CL	Sandy CLAY: low plasticity, pale grey-brown, fine grained sand, with some fine grained, sub-angular gravel. Sandy CLAY: low plasticity, mottled orange/grey, fine grained sand.		COLLUVIUM
AVATION + PSP/DCP GEOTFYSH09703AA.GPJ < <drawingfile>> 27/06/2014 15:41</drawingfile>	<u>, </u>			ON .		-616.5 -616.5	2.0 — 2.0 — 2.5 — - - - - -					- - - - -
CDF_0_9_04BA.GLB Log COF EXCAVATI	me N X	ethod	atural e		r ure	-615.5 -615.0	3.5 —	no resis		Samples & field tests U## undisturbed sample B bulk disturbed sample B bulk disturbed sample	based on Unified S	soft
	BH backhoe B bulldoze R ripper		existing excavation backhoe bucket bulldozer blade ripper excavator ort none		ranging refusal t-12 wate n date s nflow	to	B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remouded (uncorrected kPa) R refusal	moisture V D dry H M moist F W wet V W _P plastic limit L W _L liquid limit D	t stiff St very stiff I hard b friable IL very loose loose medium dense			



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client:	ient: Opus International Consultants Pty Ltd										
project: Ellerton Drive Extension											
title:	title: TEST PIT PROFILE										
project no:	GEOTFYSH9703AA	fig no:	3	rev:							



Excavation ID. **TP04**

sheet: 1 of 1 GEOTFYSH9703AA

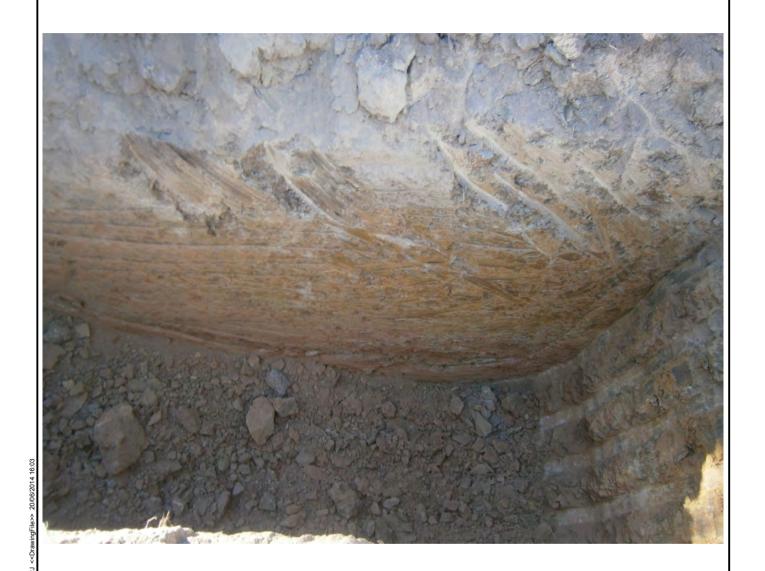
project no.

Opus International Consultants Pty Ltd client: date excavated: 15 May 2014

principal: Queanbeyan City Council date completed: 15 May 2014

project: **Ellerton Drive Extension** logged by: BC

location:	Qu	eanbey	an N	<i>ISW</i>	•				С	hecked I	by:	DB
position:		04676; N:		•	9S84 Z	,	, ,	p avation di	it orien		lona O O	m wide DCP id.:
equipment t	-		Cavalo	1	mate		ation method: Excavator exceptance	avalion uii	HEHSIO	115. 0.0 111	iong 0.0	III wide DCP Id
method support	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	DCP (blows/ 100 mm	n)
# W W W W W W W W W W	None Observed	BX2	-613.5 -613.6 -612.5 -611.6		3	CL CL	Sandy CLAY: low plasticity, pale grey, fine grained sand, trace fine grained, sub-angular gravel. Gravelly Sitty CLAY: low plasticity, pale orange, medium plasticity clay, medium grained, sub-angular to sub-rounded gravel, trace fine grained sand. SHALE: grey, highly weathered, low to medium strength. Test pit TP04 terminated at 2.1 m Refusal on Bedrock	<wp< td=""><td>F_ H</td><td></td><td></td><td>BEDROCK</td></wp<>	F_ H			BEDROCK
X existing BH backh	rator	ure vation ket de	water	10-Oc level c	no resis ranging refusal t-12 wate on date s inflow outflow	to	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N' SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remouded (uncorrected kPa) R refusal	moistur D dry M mo W wet	oil desc ased on ssificatio re			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 medium dense D dense VD very dense



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client: Opus International Consultants Pty Ltd											
project: Ellerton Drive Extension											
title:	title: TEST PIT PROFILE										
project no:	GEOTFYSH9703AA	fig no:	4	rev:							



Excavation ID. **TP05**

project no.

sheet: 1 of 1 GEOTFYSH9703AA

Opus International Consultants Pty Ltd client: date excavated: 01 May 2014

principal: Queanbeyan City Council date completed: 01 May 2014

Ellerton Drive Extension project: logged by: BC Ouganhovan NSW ahaakad bu NΒ

lo	location: Queanbeyan NSW			•					checked by:			DB			
ро	position: E: 704718; N: 6085386 (WGS84 Zo			3S84 Z	one 55)	surface elevation: 618.48m (AHD) pit orientation:									
eq	uipme	nt typ	e: 6	Tonne Exc	cavato	r		excava	tion method: Excavator exc	avation d	imensio	ns: 1.9 m	long 0	.5 m	wide DCP id.:
e	xcavat	tion in	forn	nation			mate	rial sub	stance						
method		2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	consistency / relative density	hand penetro- meter (kPa)	DCI (blow 100 m	vs/ nm)	structure and additional observations
-E	2		None Observed		-618.0	- - - - 0.5—		CL	Sandy CLAY: low plasticity, pale brown, fine grained sand.	<wp< td=""><td><u>F</u> -</td><td></td><td>25/80</td><td>mm </td><td>COLLUVIUM</td></wp<>	<u>F</u> -		25/80	mm 	COLLUVIUM
			2	D	-617.5	- 1.0 — -		CL	Sandy CLAY: low plasticity, mottled orange/grey, fine grained sand, with some fine to medium grained, sub-angular gravel.					 	
				D	-617.0	- -			SHALE : grey, highly weathered, low to medium strength.						BEDROCK
					-616.6 -615.6	2.5			Test pit TP05 terminated at 1.5 m Refusal on Bedrock	Class	sification				onsistancy / relative density
1 2 6 6 6 6 8	X ex BH ba B bu R rip E ex support N no	atural e cisting e ackhoe illdozei oper ccavato	excav buck blad	ure ration et e	water	10-Oc		to	samples & field tests U## undisturbed sample ##mm diameter D disturbed sample B bulk disturbed sample E environmental sample HP hand penetrometer (kPa) N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone VS vane shearpeak/remouded (uncorrected kPa) R refusal	moistu D dry M mo W we	pased on assification re poist t stic limit	ription		V S F S V H F V L	soft firm t stiff St very stiff hard b friable L very loose loose ID medium dense dense



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants Pty Ltd												
project:	project: Ellerton Drive Extension												
title:	title: TEST PIT PROFILE												
project no:	GEOTFYSH9703AA	fig no:	5	rev:									



Excavation ID. **TP06**

sheet: 1 of 1

project no.

GEOTFYSH9703AA

client: Opus International Consultants Pty Ltd date excavated: 15 May 2014

principal: Queanbeyan City Council date completed: 15 May 2014

project: Ellerton Drive Extension logged by: BC

location:		Queanbeyan NSW								checked by	DB		
position: E			E: 7	E: 704707; N: 6085333 (WGS8				S84 Zone 55) surface elevation: 615.64m (AHD)			it orientation:		
е	equipment type: 13 Tonne Excavator excav					or		excava	vation method: Excavator excavation dimensions: 3.0 m long 1.0 m wide DCP id.:			wide DCP id.:	
Ľ	excavation information material substa								stance				
method	support	2 penetration	water	samples & field tests	RL (m)	depth (m)	graphic log	classification symbol	material description SOIL TYPE: plasticity or particle characteristic, colour, secondary and minor components	moisture condition	meter 1	DCP (blows/ 00 mm)	structure and additional observations
			None Observed		-615.5	0.5		CL	Sandy CLAY: low plasticity, pale brown, fine grained sand, trace fine grained, angular gravel.	<wp< td=""><td>VSt </td><td>5/80 mm</td><td>COLLUVIUM</td></wp<>	VSt	5/ 8 0 mm	COLLUVIUM
				BX2	-615.0	- -			SHALE: grey, highly weathered, low to medium strength.	-			BEDROCK
		 			-614.5	1.0 —			Test pit TP06 terminated at 0.9 m Refusal on Bedrock				-
27/00/2014 15:41					-614.0	1.5— - - -							
SAN GEO SCIDIAMINGFILESS		111			-613.5	2.0 — - -							
AVATION + PSP/DCP GEOTEYSH09/03AA.GFJ					-613.0	2.5— - - -							
COPEXC					-612.5	3.0							
CDF_U_9_04BA.GLB L0g					-612.0	3.5— - - - -							
method N natural exposur X existing excava BH backhoe bucket B bulldozer blade R ripper E excavator support N none S shoring				cavation ucket blade water			ranging refusal t-12 wate n date s nflow	N standard penetration test (SPT) N standard penetration test (SPT) 12 water N* SPT - sample recovered date shown NC SPT with solid cone VS vane shearpeak/remouded (upporteded kPa)		soil description based on Unified Classification System moisture D dry M moist W wet W _p plastic limit W _L liquid limit			firm stiff St very stiff I hard b friable L very loose loose medium dense



drawn	SB
approved	ВС
date	20/06/2014
scale	N.T.S.
original size	A4



client:	Opus International Consultants Pty Ltd										
project:	Ellerton Drive Extension										
title:	itle: TEST PIT PROFILE										
project no:	GEOTFYSH9703AA	fig no:	6	rev:							



client:

principal:

project:

Engineering Log - Excavation

Queanbeyan City Council

Ellerton Drive Extension

Opus International Consultants Pty Ltd

Excavation ID. **TP07**

1 of 1 sheet:

GEOTFYSH9703AA project no.

very dense

15 May 2014 date excavated:

15 May 2014 date completed: BC

logged by:

Queanbeyan NSW DB location: checked by: E: 704738; N: 6085330 (WGS84 Zone 55) surface elevation: 619.21m (AHD) equipment type: 13 Tonne Excavator excavation method: Excavator excavation dimensions: 3.1 m long 1.0 m wide DCP id.: excavation information material substance consistency / relative density material description DCP hand structure and classification penetro (blows/ 100 mm) samples & $\widehat{\Xi}$ moisture condition **SOIL TYPE**: plasticity or particle characteristic, colour, secondary and minor components field tests method graphic $\widehat{\mathbf{E}}$ depth (water (kPa) R 00 00 00 CL Gravelly CLAY: low plasticity, pale brown, fine <Wp VSt COLLUVIUM H to Fb -619.0 1111 25/\$0 mm 0.5 -618.5 1.0 618.0 1.5 -617.5 2.0 -617 d SHALE: grey, highly weathered, low to BEDROCK 2.5 Test pit TP07 terminated at 2.5 m Refusal on Bedrock -616.5 3.0 -616.0 3.5 -615.5 classification symbol & samples & field tests consistency / relative density method penetration soil description undisturbed sample ##mm diameter very soft based on Unified natural exposure D disturbed sample soft no resistance Classification System existing excavation bulk disturbed sample F St вн backhoe bucket ranging to environmental sample hand penetrometer (kPa) F stiff moisture bulldozer blade ΗP VSt very stiff standard penetration test (SPT) SPT - sample recovered dry moist R ripper Ν D hard friable excavator 10-Oct-12 water level on date shown Nc VS SPT with solid cone vane shearpeak/remouded W wet
W_P plastic limit ٧L very loose support loose water inflow MD none (uncorrected kPa) liquid limit medium dense water outflow shoring dense