Appendix A Trial Pit Logs

KEY TO BOREHOLE, TRIAL PIT AND WINDOW SAMPLE LOGS

SOIL STRATA

SAMPLES

Grietblikey to soll BH/TP/WS RECORDS NOTTS 26/02/2015 11:00:22

J100 JT100 J38 D BLK C G J TUB ES W SS SS CSS -	Open Drive Tube Sample (100mm nominal diameter) - UNR denotes 'no recovery'. Open Drive Thin Wall Tube Sample (100mm nominal diameter) - UNR denotes 'no recovery'. Open Drive Tube Sample (38mm nominal diameter) Piston Sample (100mm nominal diameter unless noted otherwise) - PNR denotes 'no recovery'. Small Distrubed Sample Bulk Disturbed Sample Block Sample Rotary Core Sample (taken for laboratory testing) Gas Sample Jar Sample Tub Sample Environmental Sample Environmental Sample Split Spoon Sample Cutting Shoe Sample Liner Sample
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IN SITU TESTING

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C	Standard Penetration Test using the Split Spoon Sampler. Standard Penetration Test using a solid cone.
	Where a test has been completed the type of test and the N-value will

Where a test has been completed the type of test and the N-value will be reported. Where the full 300mm penetration of the main drive has not been completed, the number of blows (not an N-value) will be reported. The Field Records column on the log will show each set of blow counts per 75mm of penetration including seating blows and will also indicate the partial penetration achieved (mm) for incomplete tests.

V	Field vane test, vane shear strength quoted for neak (P) and remoulded (R) tests in kPa
PP	Pocket Penetrometer measurements (kN/m2).
k	Field Permeability Test, R denotes Rising Head, F denotes Falling Head, C Constant Head.
So	Field Soakage Test in a borehole.
PID	Photo lonisation Detector (PID) readings for volatile hydrocarbon screening (ppm).
CU	Undrained shear strength triaxial test result (kN/m2)

cu Undrained shear strength triaxial test result (kN/m2)

STRATA		BACKFILL / IN	STALLATIONS	WA	ATER
	Made Ground / Fill		Тор Сар	Į Ţ	Initial Level of Water Strike
$\frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}}$	Topsoil		Backfill With Arisings	Ţ	Level of Water Strike Rise After 20 Mins
	Cobbles and Boulders		Bentonite Seal		
	Gravel		Cement		
	Sand		Filter		
$\begin{array}{ccccc} \times & \times & \times \\ & \times & \times \\ \times & \times & \times \\ & \times & \times$	Silt		Grout		
	Clay		Slotted Pipe		
	Peat		Piezo Tip		
Composite so	il types shown by combined symbols				

Composite soil types shown by combined symbols (primary + secondary constituents)

AECOM

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12 Regan Way Chetwynd Business Park, Chilwell Nottingham, NG9 6RZ Tel: 0115 9077000 Fax: 0115 9077001 www.aecom.com

$\Lambda =$				AECOM		Tal: 01702 508500		Trial Pit N	NO. \$	SK50)1	
				Newbridge Square Swindon, SN1 1BY		Fax: 01793 508501 www.aecom.com		Sheet: 1 of 1				
Equipment & N	/lethods:	JCB 3C)	K	United Kingdom Project Name: S	St. Athan Nor	thern Access Road				Job No):	
				Project Location	: St. Athan					605	09148	
				Client: Welsh G	overnment							
				Co-ordinates: E: 298335.157		Ground L	evel (m): 44.96	AOD	Date S	tarted: 23	3/11/2016 · 23/11/2016	3
Sample	es and In	situ Tes	ting	N: 168941.925					2010 0	Reduced		- Depth
Depth	No.	Туре	Result	 Field Records 		DES	CRIPTION			Level (m)	Legend	(Thick (m)
(11)					TOPSOIL	.: Grass Over: Soft darl	k brown slightl	y gravelly sandy	CLAY		$\overline{z_{I,I}}$ $\overline{z_{I,I}}$ $\overline{z_{I}}$	-
					limestone	ent roots. Gravel is sul	bangular to roi e	unded fine to co	arse of		$\frac{I_f}{I_f} \cdot \frac{\chi \cdot I_f}{\chi} \cdot \frac{\chi \cdot I_f}{\chi}$	-
					(TOPSOIL	_)					11 N 12 N 14	(0.25)
										44.71		0.25
0.30		ES V	38 kPa(P)		MADE GF	ROUND: Soft becomino h rare rootlets. Gravel i	g firm brown sl is subrounded	ightly gravelly s to rounded fine	ilty to			*
			27 KPa(R)		medium b	orick and limestone						×
0.25- 0.65		в				- ,						(0.40)
0.50		ES V	36 kPa(P)									}_```
			∠ткРа(К)									1
					N4- "		-46			44.31		0.65
0.75					Recovere	strong to weak grey wea d as: Grey angular to s	athered crysta subangular col	Dine LIMESTON	۱E			1
0.75		ES			orangish I (DISTINC)	brown silty clay infill TLY WEATHERED POP	RTHKERRY M	EMBER)				
								,				Ī
												ŀ
												L
0.65- 1.40		В										(0.75
												┣
												I
												┣
										43.56		1.40
						End of (Thickn	f Trial Pit 1.40 ess of basal la	m ver				
						n	not proven)	, ,				
						1						
Groundwate Strike	er Observ Post	vations	Post	Pla Flow	n View	1. Machine-Excavated Tr	Remarks rial Pit located wit	hin Third Party Lar	nd in Plot	17 Bovert	on Court Far	m
Depth	Mins	i	Depth	← 0.6	8m -+	towards the west of the fi 2. Machine-Excavated T	ield. rial Pit completed	to 1.40m bgl after	encounte	ring natur	al rock (Med	lium
						Strong Limestone). 3. Soakaway Test under	taken (see separ	ate report sheet fo	results).			
				А	C 1.5m	4. Topography: Level gro 5. Groundwater not enco	ound. ountered.					
						6. No evidence of contan 7. Backfilled with arisings	mination. s upon completior	ı.				
					, +							
Notes: For expl	anation o	f symbo	Is and abbrev	viations, see Key Sh	eet.	Scale: 1:12.5	Logged I	By: MC	C	hecked B	y: MB	

		O		Tricentre 3	Tel: 01793	508500		10 . C		_	
				Newbridge Square Swindon, SN1 1BY United Kingdom	Fax: 01793 www.aecom	508501 i.com	Sheet: 1 of 1				
Equipment	& Methods:	JCB 3C)	(Project Name: S	St. Athan Northern Access	Road			Job No	:	
				Project Location	: St. Athan				6050	09148	
				Client: Welsh G	overnment	Ground Lovel (m):		Data St	arted: 00	/11/2016	
				E: 298511.703 N: 169002.432		44	AOD	Date St Date Co	ompleted:	23/11/2016	6
San	ples and In	situ Tes	ting	Field Records		DESCRIPTION			Reduced Level	Legend	De (Th
Depth (m)	No.	Туре	Result			22001			(m)		(n
					TOPSOIL: Grass Ov CLAY with frequent medium of limestone (TOPSOIL)	rer: Soft dark brown sli roots. Gravel is subang e, mudstone and rare b	ghtly gravelly silty s gular to rounded fir prick. Sand is fine t	sandy ne to o	44.51	$\frac{\underline{x}^{\dagger}\underline{b}_{2}}{\underline{b}_{1}} \cdot \frac{\underline{x}^{\dagger}\underline{b}_{2}}{\underline{b}_{1}} \cdot \frac{\underline{x}^{\dagger}\underline{b}_{2}}{\underline{b}_{2}} \cdot \frac{\underline{b}_{2}}{\underline{b}_{2}} \cdot \frac{\underline{b}_{2}} \cdot \frac{\underline{b}$	(0.: 0.:
0.30		ES V	38 kPa(P) 31 kPa(R)		Soft becoming firm of Gravel is angular to PROBABLE ALLUX	orangish brown slightly subrounded medium c /IUM)	gravelly silty CLA of limestone	Y.	44.41	<u>×o×</u> o ××× +××	- (0. 0.
0.35- 0.70 B		В			Medium strong to ve subhorizontal and si fractures with orang Recovered as: Grey brown clay infill (DISTINCTLY WEAT	ery weak grey weathere ubvertical closely space e surface staining and very angular to suban THERED PORTHKERR	ed LIMESTONE wi ed, planar rough, c soft brown clay inf gular cobbles with Y MEMBER)	th ppen ill soft	44.06		[[[[[[[] [] [] [] [] [] []
						End of Trial Pit 0 (Thickness of basi not proven)).70 m al layer)				
Groundv Strike Depth	vater Obserr Post Mins	/ations	Post	Flow -0.	n View 7m-+ to the nort 82. Machine	Remark e-Excavated Trial Pit locate hem boundary fence. e-Excavated Trial Pit compl	<u>s</u> d within Third Party La leted to 0.70m bgl afte	ind in Plot 1	16 Tremai	ns Field adja al rock (Med	acent
Groundv Strike Depth	vater Obser Post Mins	/ations F	Post Depth	Flow -0.	n View 7m-+ to the nort 8 2. Machine 3. Soakaw 4. Topogra 5. Ground 6. No evid 7. Backfille	Remark -Excavated Trial Pit locate hem boundary fence. -Excavated Trial Pit compl nestone). ray Test undertaken (see so aphy: Gently sloping. water not encountered. ence of contamination. d with arisings upon compl	s d within Third Party La leted to 0.70m bgl afte eparate report sheet fo letion.	nd in Plot 1 r encounter or results).	16 Tremai	ns Field adja al rock (Med	acent

Δ			M	AECOM Tricentre 3		Tel: 01793 508500		Trial Pit I	No.	SK50)3	
				Newbridge Square Swindon, SN1 1BY United Kingdom		Fax: 01793 508501 www.aecom.com		Sheet: 1 of 1				
Equipment & N	lethods:	JCB 3C)	K	Project Name: S	St. Athan Nort : St. Athan	thern Access Road				Job No	00148	
				Client: Welsh G	overnment					605	09146	
				Co-ordinates: E: 298759.892 N: 169081.211		G	ound Level (m)): 44.18 AOD	Date S	Started: 25 Completed	5/11/2016 : 25/11/2016	6
Sample	es and In	situ Tes	ting	- Field Records						Reduced Level	Legend	Depth (Thick
Depth (m)	No.	Туре	Result				DESCRIPTION			(m)	Legenu) (m)
-					TOPSOIL silty CLAY brick, lime (TOPSOIL	: Grass Over: So Y with roots and estone and mude -)	oft locally firm rootlets. Grav stone. Sand i	n slightly sandy slightly vel is subrounded med s fine	gravelly ium of	/		(0.30)
0.30		ES V	20 kPa(R)		Firm local cobble cor (PROBAB	lly soft dark brow ntent. Cobbles a BLE ALLUVIUM)	n slightly sar re subangula	ndy silty CLAY with me ar of limestone. Sand is	dium s fine	_ 43.88	<u> </u>	0.30
0.30- 0.70 0.50		B ES										(0.45)
0.75		V ES	12 kPa(R)		Medium si extremely infilled wit Recovered (DISTINCT	trong to weak gr closely spaced th orangish brow d as: Grey angu TLY WEATHERE	ey weathered (~2-5mm), pl n clay lar to subang D PORTHKE	d crystalline LIMESTO lanar rough, open fract gular cobbles of limesto RRY MEMBER)	NE with ures one	_ 43.43		0.75
												(0.55)
										_ 42.88		1.30
						(*	End of Trial I Thickness of not pro	Pit 1.30 m basal layer ven)				
Groundwate	er Observ Post	ations	Post	Pla Flow	n View	1. Machine-Exca	Rei vated Trial Pit In	marks ocated within Third Party La	nd in the	central field	d of Plot 14	
Depth 1.30	Mins 20.00	[Depth .20 Risi		7m→ 3 C 1.4m	 Machine-Exca Millands Farm. Machine-Exca Strong Limeston Soakaway Tes Topography: L Groundwater e No visual or of Backfilled with 	vated Trial Pit c e). t undertaken (s evel ground. incountered at factory evidenci arisings upon c	ompleted to 1.30m bgl afte see separate report sheet fo 1.30m bgl rising to 1.20m b e of contamination. completion.	r encount or results) gl after 20	ering natur Dmins.	al rock (Med	lium
Notes: For expl	anation of	f symbol	Is and abbrev	viations, see Kev Sh	eet.	Scale: 1:12 5		Loaged By: MC	(Checked R	v: MB	
								55 - 5			,	

ΔΞ			Μ	AECOM Tricentre 3		Tel: 01793 5085	00	Trial Pit	No.	SK50)4	
				Swindon, SN1 1BY United Kingdom		www.aecom.com		Sheet: 1 of 1				
Equipment & I	Methods:	JCB 3C>	K	Project Name: \$	St. Athan Nor	rthern Access Ro	ad			Job No	:	
				Project Location	: St. Athan	St. Athan				6050	09148	
				Client: Welsh G	overnment							
	A Methods: JCB 3CX A Meth		Co-ordinates: E: 298881.314 N: 169149.165			Ground Level (m): 43.26 AOD	Date Date	Started: 25 Completed:	/11/2016 25/11/2010	6	
Sampl	es and In	situ Tes	ting	Field Records			DESCRIPTI	ON		Reduced Level	Legend	Depth (Thick)
(m)	NU.	ES	Result		TOPSOIL silty CLA ^V are angul (TOPSOII	.: Grass Over: Y with abundar lar to rounded L)	Very soft to so nt rootlets and l of limestone. S	ft dark brown slightly s ow cobble content. C and is fine	sandy obbles		<u> </u>	(0.40)
0.30- 0.40		ES V B	8 kPa(R) 23 kPa(R)		Soft light cobble cc (PROBAE	yellowish brow ontent. Cobbles BLE ALLUVIUN	n slightly sand s are angular to 1)	y silty CLAY with med o rounded of limestone	lium e	42.86		0.40
					Medium s weathere (PARTIAL	strong locally w d LIMESTONE L LY WEATHEF	eak light grey ED PORTHKE	ocally yellowish oranç RRY MEMBER)	ge	42.51 42.46		0.75 0.005) 0.80
							End of Trial ((Thickness of not pro	Pit 0.80 m basal layer ven)				
Groundust	er Obson	ations			n View	I	Do	marks				
Strike Depth 0.80	Post Mins 20.00		Post Depth .71 Risir	Flow -0.	7m→ 3 C 1.5m	1. Machine-Ex Millands Farm. 2. Machine-Ex Strong Limestr 3. Soakaway 7 4. Topography 5. Groundwate 6. No evidence 7. Backfilled w	Re cavated Trial Pit k cavated Trial Pit c one). est undertaken (s c Level ground. r encountered at of contamination th arisings upon c	ocated within Third Party L ompleted to 0.80m bgl aft ee separate report sheet 0.80m bgl rising to 0.71m ompletion.	and in the er encoun for results bgl after 2	eastern fiel tering natur). Omins.	ld of Plot 14 al rock (Mec	lium
Notes: For exp	lanation of	f symbol	s and abbrev	iations, see Key Sh	ieet.	Scale: 1:12.5		Logged By: EW		Checked By	/: MB	

Δ=(7	M	AECOM Tricentre 3		Tel: 01793 508500	Trial Pit	No. S	SK50)5	
				Newbridge Square Swindon, SN1 1BY United Kingdom		Fax: 01793 508501 www.aecom.com	Sheet: 1 of 1				
Equipment & Met	thods: J	СВ 3СХ	<	Project Name: S	St. Athan Nor	thern Access Road			Job No):	
				Project Location	: St. Athan				605	09148	
				Client: Welsh G	overnment						
	Samples and In situ Testing samples and In situ Testing Res apth No. Type Res apth No. Type Res 0.90 B Samples and In situ Testing Samples and In situ Testing apth No. Type Res apth No. ES 27 kP b ES 32 kP 0.90 B Samples and In situ Testing apph Isotational approximation and the situation approximation and the situation approximation and the situation approximation approximation and the situation approximation ap		Co-ordinates: E: 299067.672 N: 169210.291		Ground Level (m)	: 43.03 AOD	Date S Date C	itarted: 24 Completed	4/11/2016 : 24/11/2016	6	
Samples	and In s	itu Test	ting Result	Field Records		DESCRIPTIC	ON		Reduced Level (m)	Legend	Dept (Thick
(m)		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			MADE GF sandy silt (TOPSOIL	ROUND: Grass Over: Very so y CLAY with numerous roots. -)	ft to soft dark brown s Sand is fine	lightly		<u>017</u> 017 0 <u>17</u> 0 0 <u>17</u>	- (0.40
0.30		ES V	27 kPa(P) 15 kPa(R)		MADE GF	ROUND: Soft light orangish br gravel and frequent rootlets. (rown slightly sandy sil Gravel is rounded fine	ty CLAY	42.63		- 0.40
0.50		ES V	32 kPa(P) 19 kPa(R)		and limes (MADE G	tone ROUND)	v mottled vellowish or	ange	42.38		0.2
0.65- 0.90		в			weathered rough pla slightly sa (DISTINC)	d LIMESTONE with extremely nar, open (~1-2mm) fractures indy silty clay TLY WEATHERED PORTHKE	(closely spaced (~2-5 infilled with soft dark RRY MEMBER)	5mm), brown	10.10		(0.2
						End of Trial F (Thickness of I not prov	Pit 0.90 m basal layer ven)				
Groundwater	Observa	ations		Pla	n View	Rer	narks				
Strike I Depth I	Post <u>Mins</u>	P C	Post Depth	+low -0.6	85m -	Machine-Excavated Trial Pit lo Froglands Farm. Machine-Excavated Trial Pit co Strong Limestone). Soakaway Test undertaken (so 4. Topography: Level ground.	cated within Third Party L ompleted to 0.90m bgl afte ee separate report sheet f	and in the v er encounte for results).	western fie ering natur	eld of Plot 12 al rock (Med	lium
					D 1.5m	 Groundwater not encountered No evidence of contamination. Backfilled with arisings upon contamination. 	ompletion.				

AECO	AECOM Tricentre 3 Newbridge Square		Tel: 01793 508500 Fax: 01793 508501	Trial Pit No.	SK50	06	
	Swindon, SN1 1BY United Kingdom		www.aecom.com	Sheet: 1 of 1			
Equipment & Methods: JCB 3	CX Project Name	St. Athan North	ern Access Road		Job No) :	
	Project Location	on: St. Athan			605	509148	
	Client: Welsh	Government					
	Co-ordinates: E: 299152.67 N: 169307.88	5 3	Ground Level (m): 42.97	7 AOD Dat	e Started: 24 e Completed	4/11/2016 I: 24/11/2016	
Samples and In situ Te	esting Field Records		DESCRIPTION		Reduced Level (m)	Legend	Depth (Thick) (m)
(m)		TOPSOIL: frequent ro (TOPSOIL)	Grass Over: Very soft to soft sligh ots. Sand is fine	tly sandy silty CLAY w	ith		- (0.35)
0.30 ES	;					$I_{\underline{I}} = \underbrace{\sqrt{I_{\underline{I}}}}_{\underline{N}} \cdot \underbrace{\sqrt{J_{\underline{I}}}}_{\underline{N}}$	-
v	32 kPa(P) 18 kPa(R)	Medium str subhorizon fractures w	ong to extremely weak grey weath tal and subvertical closely spaced ith orangish brown surface stainin	nered LIMESTONE wit , planar rough, open g and soft to firm	42.62 th		0.35 -
. 0.50 ES		orangish br Recovered soft to firm (DISTINCTI	rown siltý clay infill as: Grey angular to subangular co orangish brown silty clay infill LY WEATHERED PORTHKERRY N	obbles of limestone wi	th		-
0.35- 1.20 B							_ (0.85) _
							-
			End of Trial Pit 1.2 (Thickness of basal not proven)	0 m layer			
Groundwater Observations Strike Post Depth Mins	Post Flow Popth -	Plan View •0.76m ← B C 1.6m	Remarks 1. Machine-Excavated Trial Pit located v Froglands Farm. 2. Machine-Excavated Trial Pit complete Strong Limestone). 3. Soakaway Test undertaken (see sepa 4. Topography: Level ground. 5. Groundwater not encountered. 6. No visual or olfactory evidence of con 7. Backfilled with arisings upon completi	vithin Third Party Land in the set to 1.20m bgl after encours arate report sheet for result antamination.	ne eastern fie untering natur ts).	eld of Plot 12 ral rock (Med	ium
Notes: For explanation of symt	bols and abbreviations, see Key s	Sheet.	Scale: 1:12.5 Logged	d By: MC	Checked B	By: MB	

	ΛΞ				AECOM		Tel: 01703 5085	00	Trial I	Pit No.	SK50)7		
		ipment & Methods: JCB 3CX			Newbridge Square Swindon, SN1 1BY		Fax: 01793 5083 www.aecom.con	501 1	Sheet: 1 (of 1				
	Equipment &	Methods:	JCB 3C)	κ	United Kingdom Project Name: \$	St. Athan No	rthern Access Ro	ad	Sheet. 1 C		Job No):		
	-4-6				Project Location	: St. Athan					605	09148		
					Client: Welsh G	overnment					00000140			
					Co-ordinates: E: 299452 038			Ground Level (m	I): 42.02 AOD	Date	e Started: 23	3/11/2016		
					N: 169293.941	1			42.02 AOD	Date	Completed	: 23/11/2010	6	
	Depth	No.	situ Tes	ting Result	- Field Records			DESCRIPT	ION		Level (m)	Legend	(Thick) (m)	
	(iii) - - 0.30		ES			TOPSOIL abundant (TOPSOIL	L: Grass Over: t roots L)	Soft dark brow	rn slightly sandy C	CLAY with	41.77		0.25	
	0.35 - 0.30- 0.55 - 0.50 0.55		V B ES	30 kPa(P) 20 kPa(R)		imestone (PROBAE	and mudston BLE ALLUVIUN	e A)					(0.45)	
7	-			20 kPa(R)										
anuary 201	- 0.70- 0.80 0.75		B ES V	30 kPa(P)		Firm light (PROBAE	t grey mottled I BLE ALLUVIUI	ight orangish t /i)	prown CLAY		41.32		0.70 (0.10) 0.80	
Date: 10 J	-					Medium s (PARTIAI	strong light gre	y weathered c RED PORTHKE	rystalline LIMEST RRY MEMBER)	ONE	41.12		(0.10) 0.90	
PIT LOG - SWINDON Project: ST. ATHAN ACCESS ROAD 10.01.2017 MC.GPJ LIbrary: AECOM AGS 4_0 LIBRARY V6_251020	Groundwa	ter Observ Post Mine	rations	Post	Pla Flow -0	n View	1. Machine-Ex	End of Trial (Thickness of not pro	Pit 0.90 m basal layer oven)	arty Land in ce	entre of Plot (5 Great Hou		
ID: STANDARD TRIAL P	Depth 0.80	<u>Mins</u> 20.00		<u>Depth</u> 0.80 Star	nding	8m→ 3 C 2.1m	Farm adjacen 2. Machine-Ex Strong Limest 3. Soakaway 4. Topography 5. Groundwate 6. No evidenc 7. Backfilled w	to hedgerow. cavated Trial Pit one). Fest undertaken (r: Level ground. er encountered at e of contamination ith arisings upon	completed to 0.90m b see separate report s 0.80m bgl rising to 0. 1. completion.	gl after encou heet for result 70m after 20n	ntering natur s). nins.	al rock (Mec	lium	
Report	Notes: For exp	planation o	f symbo	Is and abbrev	viations, see Key Sh	leet.	Scale: 1:12.5		Logged By: MC		Checked B	y: MB		

Λ 💳		n		AECOM	Tel: 017	93 508500	Trial Pit I	No. S	SK50	8	
				Newbridge Square Swindon, SN1 1BY	Fax: 017 www.ae	793 508501 com.com	Sheet 1 of 1				
Equipment & N	/lethods:	JCB 3C>	<	United Kingdom Project Name: 5	St. Athan Northern Acc	ess Road			Job No	:	
1.1.				Project Location: St. Athan				60509148			
				Client: Welsh G	overnment						
				Co-ordinates:		Ground Level (m):	Date S	ate Started: 22/11/2016		
				N: 169171.911			41.97 AOD	Date C	ompleted:	23/11/2016	6
Sample	es and In	situ Test	ing	Field Records		DECODIE	ON		Reduced Level		Dep (Thic
Depth	No.	Туре	Result			DESCRIPTI			(m)	Legena	(m
(11)		+			TOPSOIL: Grass	Over: Soft brown slig	htly gravelly sandy CLA	AY with		<u>7/ 1</u> / 7/ 1/ 7/	-
					abundant roots. C	Bravel is angular to su	ubangular firm to mediu	im of		$\frac{1}{2} \cdot \frac{\sqrt{1}}{2} \cdot \frac{\sqrt{1}}{2}$	- (0 2
					(TOPSOIL)					111 111 11	
					Firm friable brown	mottled light grev sl	ightly sandy gravelly CI	ΔΥ	41.77	<u>1/ 1/1/ 1/1/</u>	0.2
1 30		ES			with very frequen	t roots. Gravel is suba	angular to subrounded	firm to			1
).20- 0.50		B	56 kPa(P)		(PROBABLE ALL	one and mudstone. S UVIUM)	band is fine to medium				F ?
		v	34 Kra(K)								1,0.3
.50		ES			Firm becomina st	iff orangish brown mo	ottled light arev sliahtly	gravellv	41.47		+ 0.ŧ
.6			60 LD: (D)		CLAY. Gravel is a	angular to subrounde	d firm to medium of mu	dstone			1
		V	оо кРа(Р) 34 kPa(R)		(PROBABLE ALL	UVIUM)					[
50-0.95		_				-					+ ,
										<u> </u>	1 (0.4
											ł
											1
					Medium strong la	cally weak light group	locally vellowish orong	•	41.03		0.9
					weathered LIMES	STONE		-	- 1.UZ		0.9
			(DISTINCTLY WE	ATHERED PORTHKE	ERRY MEMBER)						
				Fnd of Trial	Pit 0.95 m						
						(Thickness of	basal layer				
						not pro	oven)				
Groundwat	er Observ	/ations		Pla	n View	Re	marks				
Strike	Post	F	'ost	Flow	8m-+ 1. Mac	hine-Excavated Trial Pit lo	ocated within Third Party La	nd in Plot	9 Great He	ouse Farm	
0.95	20.00		.60 Risir	ng i	B Adjace	hine-Excavated Trial Pit c	completed to 0.95m bgl after	encounte	ering natur	al rock (Med	lium
					3. Soal	kaway Test undertaken (s	see separate report sheet fo	r results).			
				A	c 1.6m 4. Topo 5. Grou	ograpny: Level ground. Indwater encountered at	0.95m bgl rising to 0.60m bę	gl after 20	mins.		
					6. No e	vidence of contamination	n. completion.				
1											

Sector (Str.) Description Description Description Upper Id. Methods. JCD SOX Project Looding. St. Allies Adv Not: Stocols and the st. Allies Stocols and	ΔΞ		\mathbf{O}	Μ	AECOM Tricentre 3 Newbridge Square	T	el: 01793 5085 ax: 01793 508	500 501	I rial Pit	NO.	SK5U)9	
Deprine & Methods JCG SCX Project Name SL ANIA Northern Access Red Control Leaver (m): Contreaver (m): Control Leaver (m): Control Leaver (m): Co					Swindon, SN1 1BY United Kingdom	w	ww.aecom.com	n	Sheet: 1 of 1				
Project Location: Si. Man Ground Level (in): Bit With Sick Wath Semples and In situ Testing Prof Resold Cound Level (in): 41.71 AOD Die Stands: 2011/0316 Semples and In situ Testing Prof Resold DESCRIPTION Mate Size (in): Mate Size (in): Mate Size (in): 30 V V 27.95 (in): TOPSOIL: Crass Over Soft Seconing firm dark known slightly gravely CLAV with frequent roots. Give I is subangutati medium of gree Visit (in): In seconing firm light yellowith brown slightly gravely CLAV. 30 V V 27.95 (in): Soft Seconing firm light yellowith brown slightly gravely CLAV. In seconing firm light yellowith brown slightly gravely CLAV. 50 SS SS Soft Seconing firm light yellowith brown slightly gravely CLAV. In seconing firm light yellowith brown slightly gravely CLAV. 51 SS SS Soft Seconing firm light yellowith brown slightly gravely CLAV. In seconing firm light yellowith brown slightly gravely CLAV. 52 SS SS Soft Seconing firm light yellowith brown slightly gravely CLAV. In seconing firm light yellowith brown slightly gravely CLAV. 53 SS SS Soft Seconing firm light yellowith brown slightly gravely CLAV. In seconing firm light yellowith brown slightly gravely CLAV. 60 SS SS SS SS SS <	Equipment & N	/lethods:	JCB 3C)	<	Project Name: S	St. Athan Northe	rn Access Ro	bad			Job No):	
Clear Weak Downlinet Original Covernance Proceedings Original Clear Mark Downlinet Desc Status Desc Status <thdesc status<="" th=""> <thdesc status<="" th=""> Desc S</thdesc></thdesc>					Project Location	: St. Athan					605	09148	
End and in the Testing Piel Records COORD (Single) 11.1 ADD Date Setting 2.2011/2016 Samples and in the Testing Piel Records DESCRPTION Records <					Client: Welsh G	overnment						144/0040	
Sample and In sulf retring Pail Records Description Records Description 000 No Tope Records TOPSOIL_Grass Over-Soft becoming firm dark brown slightly gravely class of the first subangual medium of the subangual medium					Co-ordinates: E: 299981.456 N: 169255.033			Ground Level (m):	41.71 AOD	Date	Started: 22 Completed:	2/11/2016 : 23/11/2016	6
Logn No <	Sample	es and In	situ Tes	ting	Field Records			DESCRIPTION	١		Reduced Level (m)	Legend	Dept (Thick
00-0.30 8 Image: Constraint of the second of the seco	(m)	No.	Туре	Result		TOPSOIL: G gravelly CLA limestone an	Grass Over: AY with frequent	Soft becoming fi uent roots. Grave	rm dark brown slight el is subangural med	ly ium of		$\frac{\sqrt{1}}{1} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}}$	(m)
30 E3 37 Beg(P) 37 Beg(P) 30 KPg(P) 50 Soft becoming frm light yellowish hown slightly gravelly CLAY. (PROBABLE ALLIVIUM) 11.30 11.30 11.30 E3 Soft becoming till groupish hown slightly gravelly CLAY. Gravel is subangular fine to medium of limestone and mudstone (PROBABLE ALLIVIUM) 40.01 80-1.30 13 13 Heat and the subangular fine to medium of limestone and mudstone (PROBABLE ALLIVIUM) 40.01 80-1.30 13 14 Medium strong locally weak hown weathered thinky laminated subangular fine to medium of limestone and mudstone (PROBABLE ALLIVIUM) 40.01 80-1.30 13 Medium strong locally weak hown weathered thinky laminated subangular fine to medium of mestone and imudstone (DISTINCTLY WEATHERE PORTHERENY MEMBER) 40.01 60 MUDSTONE incrededed with medium strong group UMESTONE Recovered as: Brown and grey medium to coarse angular to subangular gravel of mudstone and immestone think below. 40.01 10 10 NUDSTONE Recovered as: Brown and grey medium to coarse angular to subangular gravel of mudstone and immestone the strong how to be able of the strong how to common the strong how to be able of the strong how to common the strong how to be able of t	0.00- 0.30		В			(TOPSOIL)						$\frac{\langle I_j \rangle}{I_j} \frac{\langle V_j \rangle}{\langle V_j \rangle} \frac{\langle V_j \rangle}{\langle V_j \rangle} \frac{\langle V_j \rangle}{\langle V_j \rangle}$	(0.3
50 Image: Solution of the soluti).30		ES V	37 kPa(P) 22 kPa(R)		Soft becomir Gravel is sub	ng firm ligh bangular fir	t yellowish brown m of limestone a	slightly gravelly CLA	AY.	41.36	<u>1/ \// \// \//</u> - <u></u> 	0.3
75 ES 40.91 40.91 80-1.30 B Medium strong locally weak brown welightly gravely CLAY. Gravel is ubangular fine to medium of imestone and mudstone 40.91 80-1.30 B 80-1.30 B Medium strong locally weak brown weathered thinky laminated MUDSTONE Recovered as: Brown and gray medium to coarse angular to subangular of mudstone and imestone with medium coable content. Cobles are subangular of mudstone and imestone with medium coable content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum cobble content. Cobles are subangular of mudstone and limestone Minedum and Minedum Minety of Delence (MoD) base notto of the Egyste Heres Roat. This Pit complete to 1.32m bit after encountering natural rock (Medium 1.32m b	0.50 0.35- 0.80		ES V B	34 kPa(P) 30 kPa(R)				wi)					(0.4
Ba-1.30 B Firm becoming stiff greyish brown slightly gravelly CLAY. Gravel is subangular fire to medium of limestone and mudstone. 40.91 Ba-1.30 B Medium strong locally weak brown weathered thinly laminated MUDSTONE interbedded with medium strong grey LINESTONE Recovered as Stroor analysis medium focuse angular to be contend. Stroot analysis medium focuse angular to be contend as Stroor analysis medium focuse angular to be contend. Cobbles are subangular of mudstone and limestone (DISTINCTLY WEATHERED PORTHKERKY MEMBER) Groundwater Observations Plan View Remarks Stoke Post Post Stoke Post Post 1:20 20.00 1.10 Reing 1:20 1.10 Reing 1 1:20 1.10 Reing 1 1:20 0.01 1.01 Reing to the strong support stress of contending to the strong brains of the	0.75		ES								40.01		
B0-1.30 B Hedium strong locally weak brown weathered thinky laminated MUDSTONE Interbedded with medium strong grey LIMESTONE Recovered as: Brown and grey medium to coarse angular to subangular gravel of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone with medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular of mudstone and limestone medium cobble content. Cobbles are subangular to su						Firm becomi subangular f (PROBABLE	ng stiff gre ïne to med ALLUVIUI	yish brown slightl ium of limestone M)	y gravelly CLAY. Gra and mudstone	avel is	U.91		- - - -
Groundwater Observations Plan View Remarks Croundwater Observations Plan View Remarks Strike Post Post Logh Maxime Framework 1.0 20.00 1.10 Reing Imaging 0 1.10	0.80- 1.30		В										(0.5
Groundwater Observations Plan View End of Trial Pit 1.32 m (Thickness of basal layer not proven) Groundwater Observations Plan View Remarks Strike Post Post Depth Mins Depth 1.20 20.00 1.10 Rising Image: Construction of the String Update Internation of the String Update International of the String Update Internation of the String Update Int						Medium stro MUDSTONE Recovered a subangular g	ng locally v interbedd as: Brown a gravel of m obles are si	weak brown weat ed with medium s and grey medium udstone and lime ubangular of mud	hered thinly laminate trong grey LIMESTC to coarse angular to stone and limestone	d DNE cobble	40.41 40.39		1.3 (0.0 1.3
Groundwater Observations Plan View Remarks Groundwater Observations Plan View Remarks Strike Post Post Deptin Post Post 1.20 20.00 1.10 Rising **** ************************************							Y WEATHE	RED PORTHKER	RY MEMBER)				
Groundwater Observations Plan View Remarks Strike Post Post Plan View 1.20 20.00 1.10 Rising +0.8m+ 1 20 1.10 Rising +0.8m+ 1.20 20.00 1.10 Rising +0.8m+ 2.8 Groundwater countered Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 2.800 3.5 Groundwater countered Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 2.800 3.5 Groundwater encountered at 1.20m bg								(Thickness of ba not prove	asal layer n)				
Groundwater Observations Plan View Remarks Strike Post Post Plan View Strike Post Depth Flow 0 20.00 1.10 Rising +-0.8m+ 0 1.10 Rising +-0.8m+ 1. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 1.20 20.00 1.10 Rising +-0.8m+ 0 -0.5m+ -0.5m+ -0.5m+ -0.5m+ 0 -0.5m+ -0.5m+ -0.5m+ -0.5m+ </td <td></td>													
Groundwater Observations Plan View Remarks Strike Post Post Flow Depth Mins Depth +0.8m++ 1.20 20.00 1.10 Rising +0.8m++ B -0.8m++ 0.8m++ 0.8m++													
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Strike Post Post Flow Depth Mins Depth I. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 2. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 1.20 20.00 1.10 Rising B I. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD) base north of the Eglwys Brewis Road. 3. Soakaway Test undertaken (see separate report sheet for results). 3. Soakaway Test undertaken (see separate report sheet for results). 4. Topography: Level ground. 5. Groundwater encountered at 1.20m bgl rising to 1.10m bgl after 20mins. 6. No evidence of contamination. 7. Backfilled with arisings upon completion.	Groundwate	er Observ	vations		Pla	In View		Rema	arks				
1.20 20.00 1.10 Rising B 2. Machine-Excavated Trial Pit completed to 1.32m bgl after encountering natural rock (Medium Strong Limestone). 1.20 20.00 1.10 Rising B 2. Machine-Excavated Trial Pit completed to 1.32m bgl after encountering natural rock (Medium Strong Limestone). 3. Soakaway Test undertaken (see separate report sheet for results). 3. Soakaway Test undertaken (see separate report sheet for results). 4. Topography: Level ground. 5. Groundwater encountered at 1.20m bgl rising to 1.10m bgl after 20mins. 6. No evidence of contamination. 7. Backfilled with arisings upon completion.	Strike Depth	Post Mins	F	Post Depth	Flow +-0.	8m→ 1	. Machine-Ex	cavated Trial Pit loca ewis Road.	ated in the St. Athan Min	istry of De	efence (Mol	D) base nort	h of
	1.20	20.00		.10 Risi	ng A	B 2 S 3 C 2m 5 6 7	2. Machine-E) Strong Limest 5. Soakaway 4. Topograph 5. Groundwat 5. No evidenc 7. Backfilled w	Acavated Trial Pit cor cone). Test undertaken (see y: Level ground. er encountered at 1.2 e of contamination. vith arisings upon cor	npleted to 1.32m bgl afte e separate report sheet fo 20m bgl rising to 1.10m b npletion.	er encount or results) ogl after 2	tering natur). Omins.	al rock (Mec	lium
es; For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:12.5 Longed Bv: MC Checked Bv: MB	otes: For expl	anation	f symbo	s and abbrev	viations, see Kev Sh	neet.	cale: 1:12 5	1	ogged By: MC		Checked B	v: MB	

	ΛΞ				AECOM		Tel: 01793 508500		Trial Pit I	No. S	SK51	0	
					Newbridge Square Swindon, SN1 1BY		Fax: 01793 508501 www.aecom.com		Sheet: 1 of 1				
	Equipment 8	& Methods	: JCB 3C	x	United Kingdom Project Name: S	St. Athan Nor	rthern Access Road				Job No):	
					Project Location	: St. Athan					605	09148	
					Client: Welsh G	overnment							
					Co-ordinates: E: 300129.129		Grour	nd Level (m): 41.5	3 AOD	Date S	tarted: 22	2/11/2016 · 22/11/2016	3
	Sam	ples and li	n situ Tes	stina	N: 169202.376					Duic C	Reduced		Depth
	Depth (m)	No.	Туре	Result	- Field Records		E	DESCRIPTION			Level (m)	Legend	(Thick) (m)
-	- 0.00- 0.30 -		В			TOPSOIL CLAY wit subangul (TOPSOII	.: Grass Over: Firm h frequent roots. Gr ar of crystalline lime L)	greyish brown s avel is fine to co stone. Sand is	andy very gravel barse angular to fine to medium	ly		$\frac{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}} \frac{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}} \frac{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}} \frac{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}} \frac{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}{\underline{\lambda}^{\dagger} \underline{\lambda}_{s}}$	(0.35)
-	_ 0.30 -		ES V	76 kPa(P) 32 kPa(R)		Medium s	strong to weak grey	weathered crys	talline LIMESTO	NE with	41.18		0.35
_	0.35- 0.60 — 0.50		B ES			open with Recovere gravel of subangul	a firm orangish brow of as: Grey clayey fi limestone with high ar of limestone	n closely spaced n clay infill ne to coarse an cobble content.	a, pianar rougn, p gular to subangu . Cobbles are ang	lar gular to			
10 January 2017	_ 0.6 -		v	82 kPa(P) 31 kPa(R)		(DISTINC	TLY WEATHERED	Porthkerry	MEMBER)				
LIBRARY V6_25102016.GLB Date: 1	- -												(1.05)
J Library: AECOM AGS 4_C	-					At 1.40m	bgl hard layer of st	rong grey limes	tone present.		40.13		1.40
Project: ST. ATHAN ACCESS ROAD 10.01.2017 MC.GP							End (Thid	d of Trial Pit 1.4 kness of basal not proven)	0 m layer				
NODNIWS - 5													
б Ц	Groundw Strike	ater Obse Post	rvations	Post	Pla	n View	1. Machine-Excavate	Remarks	in the St. Athan Mini	stry of Def	ence (Mol	D) base sout	h of
1 ID: STANDARD TRIAL P	Depth	Mins		Depth		3m → C 1.6m	the Eglwys Brewis R 2. Machine-Excavate Strong Limestone). 3. Soakaway Test ur 4. Topography: Leve 5. Groundwater not 6 6. No evidence of co 7. Backfilled with aris	ad. d Trial Pit complet dertaken (see sep I ground. ncountered. ntamination. ings upon complet	ed to 1.40m bgl afte arate report sheet fo	r encounte or results).	ering natur	ral rock (Med	ium
Repor	Notes: For ex	xplanation	of symbo	ls and abbrev	viations, see Key Sh	eet.	Scale: 1:12.5	Logge	d By: MC	С	hecked B	y: MB	

Interint a square Swindon, SN1 1BY United Kingdom Fax: 0179 3508501 www.aecom.com Sheet: 1 of 1 Equipment & Methods: JCB 3CX Project Name: St. Athan Northern Access Road Job No. Project Location: St. Athan 6050 Client: Welsh Government Co-ordinates: E: 300313.446 Ground Level (m): E: 300313.446 Date Started: 22 Samples and In situ Testing Field Records DESCRIPTION Description Meduced (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with	: 09148
Equipment & Methods: JCB 3CX Project Name: St. Athan Northern Access Road Job No Project Location: St. Athan Client: Welsh Government Ground Level (m): E: 300313.446 N: 169301.712 Date Started: 22 Date Completed: Samples and In situ Testing (m) Field Records Field Records DESCRIPTION Reduced Level (m) Depth (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with Image: Completed:	: 09148
Examples and In situ Testing Field Records Ground Level (m): 41.66 Date Started: 22 Date Completed: Minimum distribution Depth (m) No. Type Result	09148
Samples and In situ Testing Field Records Ground Level (m): E: 300313.446 N: 169301.712 Date Started: 22 Date Completed: Depth No. Type Result Field Records TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots	J9148
Sound Hold Solution Co-ordinates: E: 300313.446 N: 169301.712 Ground Level (m): 41.66 AOD Date Started: 22 Date Completed: Samples and In situ Testing (m) Field Records Field Records DESCRIPTION Reduced Level (m) Depth (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) TOPSOIL)	
E: 300313.446 N: 169301.712 41.66 AOD Date Completed: Samples and In situ Testing (m) Field Records Field Records DESCRIPTION Reduced Level (m) Depth (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) Image: Complete Classical Clascical Clascical Classical Classical Classical Clascical Classical	/11/2016
Samples and In situ Testing Field Records Description Reduced Level (m) Depth (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL)	22/11/2016
Depth (m) No. Type Result Field Records DESCRIPTION Level (m) Depth (m) No. Type Result TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL) TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with	De
(m) TOPSOIL: Grass Over: Soft brown gravelly sandy CLAY with frequent roots (TOPSOIL)	Legend (Thi
frequent roots (TOPSOIL)	ALX SULVE
(TOPSOIL)	17 817 817
	<u>. 16</u> - (0.2
41.46	1/ <u>1/1/ 1/2</u> 0.2
Firm brown slightly sandy gravelly CLAY. Gravel is angular to subangular fine to coarse gravel of limestone. Sand is fine to coarse	
0.30 ES 35 kPa(P) (PROBABLE ALLUVIUM)	
0.20- 0.65 B B	(0.4
0.50 ES ES	
	- <u> </u>
^{1.6} V 69 kPa(P) V 37 kPa(B)	
Medium strong to weak grey weathered crystalline LIMESTONE with	
fossil fragments (~2-5mm Ø) and subhorizontal and subvertical extremely closely spaced, planar rough, partly open fractures with	
orange surface staining	
recovered as: Grey subangular cobbles of limestone with firm orangish brown clay infill	
(DISTINCTLY WEATHERED PORTHKERRY MEMBER)	
0.65- 1.40 B	(0.7
40.26	L 1.4
End of Trial Pit 1.40 m	
(Thickness of basal layer not proven)	
Groundwater Observations	
Groundwater Observations Plan View Remarks Strike Post Post Flow	D) base south of
Groundwater Observations Plan View Remarks Strike Post Post Depth Mins Depth B 4 0.8m++ Constructionarcharter 1.4mechine-Excavated Trial Pit completed to 1.40m bgl after encountering nature	D) base south of al rock (Medium
Groundwater Observations Plan View Remarks Strike Post Plan View Remarks Strike Post Flow 1. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoE the Eglwys Brewis Road. 2. Machine-Excavated Trial Pit completed to 1.40m bgl after encountering natura Strong Limestone). 3. Topography: Level ground.	D) base south of al rock (Medium
Groundwater Observations Plan View Remarks Strike Post Post Depth +-0.8m-+ 1. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoE the Eglwys Brewis Road. 2. Machine-Excavated Trial Pit completed to 1.40m bgl after encountering nature Strong Limestone). 3. Topography: Level ground. 4 - 1.5m	D) base south of al rock (Medium
Groundwater Observations Plan View Remarks Groundwater Observations Plan View Remarks Strike Post Post Flow Depth Mins Depth +:0.8m++ 8 -:0.8m++ 1. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD the Eglwys Brewis Road. 2. Machine-Excavated Trial Pit completed to 1.40m bgl after encountering nature Strong Limestone). 3. Topography: Level ground. 4. Groundwater not encountered. 5. No evidence of contamination. 6. Backfilled with arisings upon completion.	D) base south of al rock (Medium
Groundwater Observations Plan View Remarks Strike Post Post Flow Depth Mins Depth Flow 1. Machine-Excavated Trial Pit located in the St. Athan Ministry of Defence (MoD the Egyws Brewis Road. 2. Machine-Excavated Trial Pit completed to 1.40m bgl after encountering nature Strong Linestone). 3. Topography: Level ground. 3. Topography: Level ground. 4. Groundwater of contamination. 6. Backfilled with arisings upon completion.	D) base south of al rock (Medium

Appendix B TRL Probe Results























Appendix C Soakaway Test Results

Project Name:	St. Athan Northern Access Road					
Site Location:	. Athan					
Client:	Velsh Government					
Test Location ID:	SK501	Test No:	1 of 1			
Weather Conditions:	Dry	Test Date:	23-Nov-16			

TRIAL PIT DIMENSIONS:

Width (m):	0.70	Length (m):	1.80
Depth (m bgl):	1.40	Start level (m bgl):	0.80

SOAKAGE RESULTS:

SOAKAGE		S:					Time	e elapsed (mins)				
Depth to	Capacity	Time elapsed (min)	100%	100	200	300	400	500	600	700	800	900 1000
Water (m	(%)											
bgl)			90%									
0.800	100.00%	0										
0.800 0.800	100.00% 100.00%	2 4	80%									
0.810	98.33%	10	70%									
0.820	97.50% 96.67% 95.83%	20 30 40	60%					•				
0.828 0.830	95.33% 95.00%	50 60	bac ity (%)						•			
1.000 1.100	66.67% 50.00%	480 600	ଞ 40%									
*Extrapolated	d 25% value	1000	30%									
			20%									
			10%									
			0%									
Test durat	ion (mins):	600										

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	0.378000	m ³ **	Soil Infiltration Rate, f =	Vp75-25
aP50	=	2.7600	m²		aP50 x Tp75-25
Тр75-25	=	680.00	mins		
					7

Test depth range (m bgl)	Soil Infiltration Rate, f (m/s) ***
0.800 to 1.100	3.36E-06
** Trial Pit stable - granular fill not required	

*** Trial Pit stable - granular fill not required *** Indicative unfactored infiltration rate (75% - 25%).

Departures from BRE365 test method: Only 1no. Test was undetaken due to length of time taken for drainage.

Remarks:	 Trial Pit dry during excavation and preparation of the Soakaway Test. Water level brought to 0.80m bgl using water from towed bowser. Water level recorded using tape measure (measured in m bgl). Soakaway Test incomplete due to drainage time exceeding 8 hours. Trial Pit backfilled with arisings upon completion. 						
Prepared	MC	INFILTRATION TEST RESULTS					
Checked	AEL	St. Athan Northarn Assass Boad					
Job No.	60509148	St. Athan Northern Access Road AECOM					
Date	Jan-17	Welsh Government					

Project Name:	St. Athan Northern Access Road				
Site Location:	t. Athan				
Client:	Velsh Government				
Test Leastion ID:	SKE02	Tost No:	1 of 2		
Test Location ID.	38302	Test NO.	1012		
Weather Conditions:	Dry	Test Date:	23-Nov-16		

TRIAL PIT DIMENSIONS:

Width (m):	0.70	Length (m):	1.40
Depth (m bgl):	0.70	Start level (m bgl):	0.20

SOAKAGE RESULTS:

SUANAGE	RESULT	5:				Time elapsed (mins)		
Depth to	Capacity	Time elapsed (min)	100%	100	200	300	400	500 600
Water (m bgl)	(%)		90%					
0.200 0.200 0.200	100.00% 100.00% 100.00%	0 2 5	80%					
0.200 0.200 0.200	100.00% 100.00%	10 20	70%					
0.210 0.700	98.00% 0.00%	30 480	60%					
			50% Cabactry					
			40%					
			30%					
			20%					
			10%					
Test drainage	time (mins):	480	0%					

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	0.245000	m ³ *	Soil Infiltration Rate, $f =$	١	/p75-25	
aP50	=	2.0300	m ²		aP50	х Тр75-25	
Тр75-25	=	230.00	mins				
		Test d	onth range (m hal)	Soil Infiltration Data f (m/s) **			

Tes	st depth ra	ange (r	n bgl)	Soil Infiltration Rate, f (m/s) **
	0.200	to	0.700	8.75E-06
* Trial Pit s	table - aranu	lar fill no	t required	

 granu fill not required

** Indicative unfactored infiltration rate (75% - 25%).

Departures from BRE365 test method:

Date

Jan-17

1. Test commenced late PM, run for 30 mins, then left open over night. Pit dry AM 2. Approximate 25% and 75% points determined from graph.

Remarks:	1. Trial Pit dry during excavation at 2. Water level recorded using tape 3. Water level in trial pit raised rap	 Trial Pit dry during excavation and preparation of the Soakaway Test. Water level recorded using tape measure (measured in m bgl). Water level in trial pit raised rapidly to 0.20m bgl using water from towed bowser. 									
	4. Soakaway Test ran overnight - dry AM.										
Prepared	MC	INFILTRATION TEST RESULTS									
Checked	AEL	St. Athan Northern Access Road	ATCOM								
Liob No 60509148 St. Athan Northern Access Road A-St											

Welsh Government

Project Name:	St. Athan Northern Access Road								
Site Location:	St. Athan								
Client:	Nelsh Government								
Test Location ID:	SK502	Test No [.]	2 of 2						
Weather Conditions:	Dry	Test Date:	24-Nov-16						
Test Location ID: Weather Conditions:	SK502 Dry	Test No: Test Date:	2 of 2 24-Nov-16						

TRIAL PIT DIMENSIONS:

Width (m):	0.70	Length (m):	1.40
Depth (m bgl):	0.70	Start level (m bgl):	0.35

SOAKAGE RESULTS:

Depth to	Canacity	Time elansed (min)		2	10	20	30	40	50	60)	70	8
Water (m	(%)		100%										
	(70)												
bgi)			90%	•									
0.050	400.000/	0		•									
0.350	100.00%	0	0.007										
0.380	91.43%	2	80%										
0.400	85.71%	4		•									
0.440	74.29%	6	70%	•									
0.455	70.00%	8			* •								
0.460	68.57%	10											
0.470	65.71%	12	60%										
0.530	48.57%	17	%) /										
0.540	45.71%	22	10 50% ·										
0.560	40.00%	27	Cap		•	•							
0.580	34.29%	32											
0.600	28.57%	37	40%				•						
0.620	22.86%	42					•						
0.650	14.29%	47	30%					•					
0.660	11.43%	52						•					
0.670	8 57%	57						•					
0 700	0.00%	62	20%										
0.100	0.0070	02							•				
			10%						•	-			
										•			
4		63	0%								•		

INFILTRATION RATE CALCULATIONS:

	=	0.171500	m	Soil Infiltration Rate, $f =$	· ·	/p75-25
aP50	=	1.7150	m²		aP50	х Тр75-25
Тр75-25	=	34.25	mins			

Test depth r	ange (ı	n bgl)	Soil Infiltration Rate, f (m/s)				
0.350	to	0.700	4.87E-05				
* Trial Pit stable - gran	ular fill no	t required					

Departures from BRE365 test method: Test 3 not undertaken due to time taken for initial test runs. 1. Trial Pit dry during excavation and preparation of the Soakaway Test. Remarks: 2. Water level in trial pit raised rapidly to 0.35m bgl using water from towed bowser. 3. Water level recorded using tape measure (measured in m bgl). 4. Soakaway Test complete after 62mins. 5. Trial Pit backfilled with arisings upon completion. INFILTRATION TEST RESULTS Prepared MC Checked AEL AECOM St. Athan Northern Access Road Job No. 60509148 Welsh Government Date Jan-17

Project Name:	St. Athan Northern Access Road								
Site Location:	n: St. Athan								
Client:	Velsh Government								
Test Location ID:	SK503	Test No:	1 of 1						
Weather Conditions:	Dry	Test Date:	25-Nov-16						

TRIAL PIT DIMENSIONS:

Width (m):	0.70	Length (m):	1.40
Depth (m bgl):	1.30	Start level (m bgl):	0.50

SOAKAGE RESULTS:

		-							TIM	e elapsed	(mins)							
Depth to Water (m	Capacity (%)	Time elapsed (min)	100%	10	20	30	40	50	60	70	BO	90	100	110	120	130	140	1
bgl)			90% -	 														
0.500 0.500	100.00% 100.00%	0 1	80%															
0.500 0.500	0.500 100.00% 0.500 100.00% 0.500 100.00% 0.500 100.00% 0.500 100.00%	2 10 20 30 40 50 60	70% -														_	
0.500 0.500 0.500			60%															
0.500 0.500	100.00% 100.00%		, %05 pac fty (%)															
0.500	100.00%	120	5 40% -															
			30% -															
			20%															
			10%															
			0% -														_	
Test durati	on (mins):	120																

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	N/A	m ³ *	Soil Infiltration Rate, f =	Vp75-25
aP50	=	N/A	m²		aP50 x Tp75-25
Тр75-25	=	N/A	mins		
		I 			9

Test depth ra	inge (r	n bgl)	Soil Infiltration Rate, f (m/s) **
0.500	to	0.500	N/A
* Trial Pit stable - granu	lar fill no	t required	

** No infiltration recorded during test - possibly rising groundwater level

Departures	from BRE365 test method:	Only 1no. Test was undertaken due to negligible infiltration rate.	
Remarks:	 Ground water strike in trial pit a Water level brought to 0.50m b Water level recorded using tap Soakaway Test terminated after Trial Pit backfilled with arisings 	at 1.30m bgl, rising to 1.10m bgl after 30 mins. bgl using water from towed bowser. e measure (measured in m bgl). er 120 mins due to static water level. upon completion.	
Prepared Checked Job No. Date	MC AEL 60509148 Jan-17	INFILTRATION TEST RESULTS St. Athan Northern Access Road Welsh Government	AECOM

Project Name:	St. Athan Northern Access Road		
Site Location:	St. Athan		
Client:	Welsh Government		
Test Lessting ID:	SKE04	Test Ne	1 - 6 1
Test Location ID:	SK504	Test No:	
Weather Conditions:	Dry	Test Date:	25-Nov-16

TRIAL PIT DIMENSIONS:

Width (m):	0.70	Length (m):	1.50
Depth (m bgl):	0.80	Start level (m bgl):	0.70



INFILTRATION RATE CALCULATIONS:

Vp75-25	=	N/A	m ³ *	Soil Infiltration Rate, $f =$	Vp75-25
aP50	=	N/A	m²		aP50 x Tp75-25
Тр75-25	=	N/A	mins		

Т	est depth ra	inge (r	n bgl)	Soil Infiltration Rate, f (m/s)
	0.700	to	0.410	N/A**
* Trial Pi	t stable - oranu	lar fill no	t required	

** Ground water level rising - no infiltration

Departures from BRE365 test method: No infiltration test undertaken due to rising ground water level. 1. Ground water strike in trial pit at 0.80m bgl, steadily rising to 0.41m bgl after 165 mins. Remarks: 2. No water added to test pit as water level was rising. 3. Water level monitored using tape measure for 165mins (measured in m bgl). 4. Soakaway Test terminated due to rising ground water. 5. Trial Pit backfilled with arisings upon completion. INFILTRATION TEST RESULTS Prepared MC Checked AEL AECOM St. Athan Northern Access Road Job No. 60509148 Welsh Government Date Jan-17

Project Name:	St. Athan Northern Access Road		
Site Location:	St. Athan		
Client:	Welsh Government		
Test Location ID:	SK505	Test No:	1 of 1
Weather Conditions:	Dry	Test Date:	25-Nov-16

TRIAL PIT DIMENSIONS:

Width (m):	0.65	Length (m):	1.50
Depth (m bgl):	0.90	Start level (m bgl):	0.31

SOAKAGE RESULTS:

		- <u>-</u>								1	Time elaps	sed (mins	5)							
Depth to Water (m	Capacity (%)	Time elapsed (r	nin) 100%		2	20	30	40	50	60	70 8	80 9	90 1	00 1	110	120	130 1-	40 150	160	170
bgl)	(,-)																			
			90%		٠															
0.310	100.00%	2			•															
0.320	98.31%	4	80%			•	•	_										L		
0.340	94.92%	8																		
0.345	94.07%	10							T											
0.360	91.53%	15	70%							•										
0.390	86.44%	20									•									
0.410	83.05%	25	60%								-									
0.410	83.05%	30	(%)															L		
0.430	79.00%	40 50	acity																	
0.490	69.49%	60	Сар										· ·							
0.520	64.41%	70													•	•				
0.550	59.32%	80	40%																	
0.580	54.24%	90															*	<u> </u>		
0.610	49.15%	100	30%														•			
0.640	44.07%	110																•		
0.630	42.37%	120																	•	
0.710	32.20%	140	20%																	
0.740	27.12%	150																		
0.753	25.00%	153*	10%																	
*Extranolato	d 25% value																			
LAllapolate	u 2076 value		0%																	
Test durat	ion (mins):	150																		
INFILTRA [®] Vp75-25	TION RATI = -	E CALCULATI 0.287625	ONS: m ^{3 **}						Soil	Infil	tratic	on Ra	ate, <i>j</i>	-			-P50	Vp75	-25 Tp75	25
ar 30 T::: 35 05	=	2.2433	m 													•	ar Ju	^	i pr 3	-23
10/5-25	=	102.82	mins																	
		Test de	pth range (n bgl)		ę	Soil	nfilt	ratio	on Ra	ate,	f (m	/s) *	**	٦				
		0.	310 to	0.1	740					2.	08E-	-05								
		** Trial Pit stable	e - granular fill n	ot requ	iired											_				
		*** Indicative un	actored infiltration	on rate	(759	% - 2	5%).													
D		F (a a (a a a b)	1. Oak 1a	. .						C.1		t	4 - 4 4 -	- 1						
Departures	Depin to Calgacity initia elapsed (min) bg() 0.310 0.000% 2.325 0.345 0.4407% 10 0.380 0.4407% 10 0.380 0.4407% 10 0.380 0.4407% 10 0.380 0.4407% 10 0.4807 1.53% 0.4807 1.53% 0.4807 1.53% 1.50 0.4807 1.53% 1.50 0.4807 1.52% 1.50 0.680 0.770 0.782 2.20% 1.50 0.782 1.00 1																			
			2: 20/0 po.					9.00												
Remarks:	1. Trial Pit w	as dry during exca	avation and prep	aratior	n of t	he s	oakav	way te	est.											
	2. Water lev	el in trial pit raised	I rapidly to 0.31r	n bgl u	sing	wate	er fror	n bov	vser.											
	3. Water lev	el monitored using	tape measure	(meası	ured	in m	bgl).													
	4. Trial Pit ba	ackfilled with arisi	ngs upon comple	etion.																
Drenerad		MC							TEO	TP		те				1				
Checker							AI		153	IR	-301	_13				20			-	-
	^	AEL			St.	Atha	an N	orthe	ern A	Acce	ss Ro	bad						C	٦N	Λ
JOD NO.	6	00009148				,	Mal	L 0			-1					-				
Date	1	Jan-17	1				/veis	in (50	verr	umel	ΠŪ					1				

Project Name:	St. Athan Northern Access Road		
Site Location:	St. Athan		
Client:	Welsh Government		
Test Location ID:	SK506	Test No:	1 of 1
Weather Conditions:	Dry	Test Date:	24-Nov-16

TRIAL PIT DIMENSIONS:

Width (m):	0.76	Length (m):	1.60
Depth (m bgl):	1.20	Start level (m bgl):	0.64

SOAKAGE RESULTS:

Dopth to	Conocity	Time clansed (min)		0 10	20	20	40	50	60	70	00	00	100	110	120	mins)	140	150	160	170	100	100	200	210	220	220	240 /
	Capacity	Time elapsed (min)	100% <		20	30	40	50	00	70	00	90	100	110	120	130	140	150	100	170	100	190	200	210	220	230	240 2
vvater (m	(%)			•••	•																						
bgl)					`∳∙	♦⊥																					
			90%			Ť											-										
0.640	100.00%	0				_										-				_	_			_	_		
0.640	100.00%	1	80%					•																			
0.645	99.11%	2							Ť	•																	
0.650	98.21%	3									•																
0.650	98.21%	4	70%			-						Ť			_	-				-	-			-			
0.652	97.86%	5				_							1			_	_			_	_			_	_		
0.655	97.32%	7	60%											_													
0.660	96.43%	10	ৃ																								
0.665	95.54%	15	ity (s																								
0.675	93.75%	20	20% SO%										_			-				-	-			-			
0.680	92.86%	25	ö			_	_	_								_				_	_			_			
0.690	91.07%	30	40%																								
0.710	87.50%	40																									
0.750	80.36%	50																									
0.755	79.46%	60	30%		_	-					-		_			-	-		-	-	-			-	_		
0.760	78.57%	70				_	_	_												_							•
0.780	75.00%	80	20%																								
0.800	71.43%	90	2078																								
0.820	67.86%	100														-											
0.845	63.39%	110	10%			-		_				_			_	-	-		-		-			-			
1.060	25.00%	235*				_			_		_	_		_		_	_			_	_			_			
			00/																								
Test durati	on (mins):	110	0%	· · ·					1			1		1													

*Extrapolated 25% value

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	0.340480	m ³ **	Soil Infiltration Rate, $f =$	V	p75-25
aP50	=	2.5376	m ²	_	aP50	х Тр75-25
Тр75-25	=	155.00	mins			

Test depth range (m bgl)	Soil Infiltration Rate, f (m/s) ***
0.640 to 0.845	1.44E-05
** Trial Ditatable annual of fill a star suite a	

Trial Pit stable - granular fill not required

*** Indicative unfactored infiltration rate (75% - 25%).



Project Name:	St. Athan Northern Access Road						
Site Location:	. Athan						
Client:	/elsh Government						
Test Lessting ID:	0// 07	Test Ne.	1 - 6 1				
Test Location ID:	5K507	Test No:	1 01 1				
Weather Conditions:	Dry Test Date: 23-Nov-16						

TRIAL PIT DIMENSIONS:

Width (m):	0.60	Length (m):	2.10
Depth (m bgl):	0.90	Start level (m bgl):	0.85

SOAKAGE RESULTS:

Depth to Water (m	Capacity (%)	Time elapsed (min)	0	0		10	20	T 30	i me elapsed (mins)	40	50	60	70												
bgi)													_												
0.850 0.800 0.750 0.710	100.00% 200.00% 300.00%	0% 0 0% 1 0% 5 0% 10 0% 20 0% 30 0% 40 0% 50 0% 60	0 1 5	0 1 5	0 1 5	0 1 5	0 1 5	0 1 5 10	0 1 5 10	0 1 5 10	0 1 5	0 1 5	0 1 5	0 1 5 10	0.1										
0.660 0.600	480.00% 600.00%		0.3																						
0.580 0.530 0.490	640.00% 740.00% 820.00%		40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	40 50 60	0.4											
01100	02010070				0.5 Oepth (m t								•	•											
			9.0 Mater [•			_												
				0.7			•	•																	
			0.8	•	•																				
			0.9																						
Test durat	ion (mins):	60	1																						

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	N/A	m ³ *	Soil Infiltration Rate, f =	Vp75-25
aP50	=	N/A	m²		aP50 x Tp75-25
Тр75-25	=	N/A	mins		

Test depth range (m bgl)	Soil Infiltration Rate, f (m/s)			
0.850 to 0.490	N/A**			
* Trial Pit stable - granular fill not required				

** Ground water level rising - no infiltration

Departures from BRE365 test method: No infiltration test undertaken due to ground water level rising. 1. Ground water strike in trial pit at 0.85m bgl, rising to 0.49m bgl after 60 mins. Remarks: 2. No water added to test pit as water level was rising. 3. Water level monitored using tape measure for 60mins (measured in m bgl). 4. Soakaway Test terminated due to rising ground water. 5. Trial Pit backfilled with arisings upon completion. Prepared MC INFILTRATION TEST RESULTS AECOM Checked AEL St. Athan Northern Access Road 60509148 Job No. Welsh Government Jan-17 Date

Project Name:	St. Athan Northern Access Road						
Site Location:	. Athan						
Client:	/elsh Government						
Test Location ID:	SK508	Test No:	1 of 1				
Weather Conditions:	Dry Test Date: 23-Nov-16						

TRIAL PIT DIMENSIONS:

Width (m):	0.80	Length (m):	1.60
Depth (m bgl):	0.95	Start level (m bgl):	0.81

SOAKAGE RESULTS:

SOAKAGE		S:							Time el	apsed (r	nins)						
Depth to Water (m	Capacity (%)	Time elapsed (min)	0	0		100		200		300		400		500		_	600
bgl)			0.1								_					_	
0.810 0.800	100.00% 107.14%	0 1	0.2											•		_	
0.780 0.730 0.670	121.43% 157.14% 200.00%	3 5 10	0.3											_	+++	+	
0.520 0.430	307.14% 371.43%	30 60	0.4		•						-			_		_	
0.180	550.00%	480	6q m) qbda 0.5		•											_	
			^{9.0}													_	
			0.7	 												_	
			0.8								-					_	
			0.9													_	
											-		-			+	+

Test drainage time (mins): 480

INFILTRATION RATE CALCULATIONS:

Vp75-25	=	N/A	m ³ *	Soil Infiltration Rate, $f =$	Vp75-25
aP50	=	N/A	m²		aP50 x Tp75-25
Тр75-25	=	N/A	mins		
					

•	Test depth ra	inge (r	n bgl)	Soil Infiltration Rate, f (m/s)
	0.810	to	0.180	N/A
* Trial D	Pit stable - granu	lar fill no	t roquirod	

rial Pit sta granular fill not required ** Water level rising - no infiltration

Departures from BRE365 test method: No infiltration test undertaken due to ground water level rising.

Remarks: 1. Ground water strike in trial pit at 0.95m bgl, rising to 0.18m bgl after 480 mins. 2. No water added to test pit as water level was naturally rising steradily. 3. Water level monitored using tape measure for 60mins (measured in m bgl). 4. Soakaway Test terminated due to rising ground water. 5. Trial Pit backfilled with arisings upon completion.					
Prepared	MC	INFILTRATION TEST RESULTS			
Checked	AEL	St. Athan Northarn Assass Dood	ATCOM		
Job No.	60509148	SI. Alhan Northern Access Road	ALCOM		
Date	Jan-17	Welsh Government			

Project Name:	St. Athan Northern Access Road					
Site Location:	St. Athan					
Client:	Welsh Government					
	01/200	T (N)				
Test Location ID:	SK509	Test No:	1 of 1			
Weather Conditions:	Dry	Test Date:	23-Nov-16			

TRIAL PIT DIMENSIONS:

Width (m):	0.80	Length (m):	2.00
Depth (m bgl):	1.32	Start level (m bgl):	0.98

1200

SOAKAGE RESULTS: Time elapsed (mins) 500 600 700 1000 1100 Depth to Capacity Time elapsed (min) 100 200 300 400 800 900 0 Water (m (%) bgl) 0.1 0.980 100.00% 0 1 3 5 10 0.2 0.980 100.00% 0.970 102.94% 0.3 0.930 114.71% 0.880 129.41% 0.820 0.730 0.4 147.06% 30 173.53% 60 **Water Depth (m bgl)** 0.0 0.0 0.300 300.00% 1110 0.7 ٠ 0.8 ٠ 0.9 1.1 Test duration (mins): 1110 INFILTRATION RATE CALCULATIONS:

Vp75-25	=	N/A	m ³ *	Soil Infiltration Rate, $f =$	v	/p75-25	
aP50	=	N/A	m²		aP50	х Тр75-25	
Тр75-25	=	N/A	mins				
		Tee	denth renge (m.h.al)	Coll Infiltration Data f (m/a)	ก		

Test depth range (m bgl)		n bgl)	Soil Infiltration Rate, f (m/s)	
0.980	to	0.300	N/A**	
* Trial Pit stable - gran	ular fill no	t required		

** Ground water level rising - no infiltration

Departures from BRE365 test method: No infiltration test undertaken due to ground water level rising.

Prepared	MC	INFILTRATION TEST RESULTS			
5. Trial Pit backfilled with arisings upon completion.					
	4. Soakaway Test terminated due t	o rising ground water.			
	3. Water level monitored using tap	e measure for 60mins and after 1110 mins (measured in m bgl).			
	2. No water added to test pit as water level was naturally rising steradily.				
Remarks:	1. Ground water strike in trial pit at 1.20m bgl, rising to 1.10m bgl after 20 mins, and continuing to rise after 1110 mins.				
	1. One we down to a strike in this list it at	4 00m had alaine to 4 40m had after 00 mins, and continuing to size after 4	140		

Prepared	MC	INFILTRATION TEST RESULTS	
Checked	AEL	St. Athan Northarn Access Road	A=COM
Job No.	60509148	SI. AIIIdii Norineiti Access Rodu	
Date	Jan-17	Welsh Government	
INFILTRATION TEST RESULTS

Project Name:	St. Athan Northern Access Road				
Site Location:	St. Athan				
Client:	Welsh Government				
Test Location ID:	SK510	Test No:	1 of 3		
Weather Conditions:	Dry	Test Date:	22-Nov-16		

TRIAL PIT DIMENSIONS:

Width (m):	0.80	Length (m):	1.60
Depth (m bgl):	1.40	Water level (m bgl):	1.30

SOAKAGE RESULTS:

SOAKAGE	RESULTS	S:				Time elapsed (mins)		
Depth to Water (m	Capacity (%)	Time elapsed (min)	100%	0.	.1 (0.2	0.3 0	.4 0.5
bgl)		90%						
1.300 1.350 1.400	100.00% 50.00% 0.00%	0 0.16 0.33	80%					
1.400 0.0070		70%						
			60%					
			%) (%		•			
			ن 40%					
			30%					
			20%					
			10%					
Test drainage	time (mins):	0.33	0%				•	

INFILTRATION RATE CALCULATIONS:

=	0.064000	m ³ *	Soil Infiltration Rate, $f =$	Vp75-25
=	1.5200	m²		aP50 x Tp75-25
=	0.10	mins		
	= = =	= 0.064000 = 1.5200 = 0.10	= 0.064000 m ³ [*] = 1.5200 m ² = 0.10 mins	= 0.064000 m^3 Soil Infiltration Rate, $f =$ = 1.5200 m^2 = 0.10 mins

Test depth ran	ige (n	n bgl)	Soil Infiltration Rate, f (m/s) **
1.300	to	1.400	7.02E-03
* Trial Pit stable - granula	r fill no	t required	

Departures	from BRE365 test method:	None	
Remarks:	 Trial Pit dry during excavation ar Water level in trial pit raised rapi Water level recorded using tape Soakaway Test complete after 2 Trial Pit backfilled with arisings u 	nd preparation of the Soakaway Test. idly to 1.30m bgl using water from towed bowser. measure (measured in m bgl). 0 seconds - rapid infiltration rate observed. upon completion.	
Prepared Checked Job No. Date	MC AEL 60509148 Jan-17	INFILTRATION TEST RESULTS St. Athan Northern Access Road Welsh Government	AECOM

INFILTRATION TEST RESULTS

Project Name:	St. Athan Northern Access Road				
Site Location:	St. Athan				
Client:	Welsh Government				
Test Location ID:	SK510	Test No:	2 of 3		
Weather Conditions:	Dry	Test Date:	22-Nov-16		

TRIAL PIT DIMENSIONS:

Width (m):	0.80	Length (m):	1.60
Depth (m bgl):	1.40	Water level (m bgl):	1.30

SOAKAGE RESULTS:

SOAKAGE	RESULTS	S:				Time elapsed (mins)		
Depth to Water (m	Capacity (%)	Time elapsed (min)	0 100% •	.0 0.	.1 0	2	0.3 (0.4 0.5
bgl)		90%						
1.300 1.350 1.400	100.00% 50.00%	0 0.16 0.33	80%					
1.400 0.0078	0.00	70%						
			60%					
			bacity (%)		•			
			<u>छ</u> 40%					
			30%					
			20%					
			10%					
Toot drainage	time (mine):	0.22	0%				•	
i est utalitage		0.55						

INFILTRATION RATE CALCULATIONS:

=	0.064000	m ³ *	Soil Infiltration Rate, $f =$	Vp75-25
=	1.5200	m²		aP50 x Tp75-25
=	0.10	mins		
	= = =	= 0.064000 = 1.5200 = 0.10	= 0.064000 m ³ [*] = 1.5200 m ² = 0.10 mins	= 0.064000 m^3 Soil Infiltration Rate, $f =$ = 1.5200 m^2 = 0.10 mins

Test depth ran	ige (n	n bgl)	Soil Infiltration Rate, f (m/s) **
1.300	to	1.400	7.02E-03
* Trial Pit stable - granula	r fill no	t required	

Departures	from BRE365 test method:	None	
Remarks:	 Trial Pit dry during excavation ar Water level in trial pit raised rapi Water level recorded using tape Soakaway Test complete after 2 Trial Pit backfilled with arisings u 	nd preparation of the Soakaway Test. idly to 1.30m bgl using water from towed bowser. measure (measured in m bgl). 0 seconds - rapid infiltration rate observed. upon completion.	
Prepared Checked Job No. Date	MC AEL 60509148 Jan-17	INFILTRATION TEST RESULTS St. Athan Northern Access Road Welsh Government	AECOM

INFILTRATION TEST RESULTS

Project Name:	St. Athan Northern Access Road	a. Athan Northern Access Road									
Site Location:	St. Athan	Athan									
Client:	Welsh Government	Ish Government									
Test Location ID:	Test Location ID: SK510 Test No: 3 of 3										
Weather Conditions:	Dry	Test Date:	22-Nov-16								

TRIAL PIT DIMENSIONS:

Width (m):	0.80	Length (m):	1.60
Depth (m bgl):	1.40	Water level (m bgl):	1.30

SOAKAGE RESULTS:

SOAKAGE	RESULTS	S:				Time elapsed (mins)		
Depth to Water (m	Capacity (%)	Time elapsed (min)	0. 100% 4	0 0.	1 0	2 (0.3 0	.4 0.5
bgl)	(70)		90% -					
1.300 1.350 1.400	100.00% 50.00% 0.00%	0 0.16 0.33	80% -					
1.100	0.0070	0.00	70% -					
			60%					
			%) (%) 50% -		•			
			5 40% -					
			30% -					
			00,0					
			20% -					
			10% -					
Test drainage	time (mins):	0.33	0% -				•	

INFILTRATION RATE CALCULATIONS:

=	0.064000	m ³ *	Soil Infiltration Rate, $f =$	Vp75-25
=	1.5200	m²		aP50 x Tp75-25
=	0.10	mins		
	= = =	= 0.064000 = 1.5200 = 0.10	= 0.064000 m ³ [*] = 1.5200 m ² = 0.10 mins	= 0.064000 m^3 Soil Infiltration Rate, $f =$ = 1.5200 m^2 = 0.10 mins

Test depth ran	ige (n	n bgl)	Soil Infiltration Rate, f (m/s) **
1.300	to	1.400	7.02E-03
* Trial Pit stable - granula	r fill no	t required	

Departures	from BRE365 test method:	None	
Remarks:	 Trial Pit dry during excavation ar Water level in trial pit raised rapi Water level recorded using tape Soakaway Test complete after 2 Trial Pit backfilled with arisings u 	nd preparation of the Soakaway Test. idly to 1.30m bgl using water from towed bowser. measure (measured in m bgl). 0 seconds - rapid infiltration rate observed. upon completion.	
Prepared Checked Job No. Date	MC AEL 60509148 Jan-17	INFILTRATION TEST RESULTS St. Athan Northern Access Road Welsh Government	AECOM

Appendix D Borehole Logs

KEY TO BOREHOLE, TRIAL PIT AND WINDOW SAMPLE LOGS

SOIL STRATA

SAMPLES

Grietblikey to soll BH/TP/WS RECORDS NOTTS 26/02/2015 11:00:22

J100 JT100 J38 D BLK C G J TUB ES W SS SS CSS -	Open Drive Tube Sample (100mm nominal diameter) - UNR denotes 'no recovery'. Open Drive Thin Wall Tube Sample (100mm nominal diameter) - UNR denotes 'no recovery'. Open Drive Tube Sample (38mm nominal diameter) Piston Sample (100mm nominal diameter unless noted otherwise) - PNR denotes 'no recovery'. Small Distrubed Sample Bulk Disturbed Sample Block Sample Rotary Core Sample (taken for laboratory testing) Gas Sample Jar Sample Tub Sample Environmental Sample Environmental Sample Split Spoon Sample Cutting Shoe Sample Liner Sample
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IN SITU TESTING

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C	Standard Penetration Test using the Split Spoon Sampler. Standard Penetration Test using a solid cone.
	Where a test has been completed the type of test and the N-value will

Where a test has been completed the type of test and the N-value will be reported. Where the full 300mm penetration of the main drive has not been completed, the number of blows (not an N-value) will be reported. The Field Records column on the log will show each set of blow counts per 75mm of penetration including seating blows and will also indicate the partial penetration achieved (mm) for incomplete tests.

V	Field vane test, vane shear strength quoted for neak (P) and remoulded (R) tests in kPa
PP	Pocket Penetrometer measurements (kN/m2).
k	Field Permeability Test, R denotes Rising Head, F denotes Falling Head, C Constant Head.
So	Field Soakage Test in a borehole.
PID	Photo lonisation Detector (PID) readings for volatile hydrocarbon screening (ppm).
CU	Undrained shear strength triaxial test result (kN/m2)

cu Undrained shear strength triaxial test result (kN/m2)

STRATA		BACKFILL / IN	STALLATIONS	WATER				
	Made Ground / Fill		Тор Сар	Į Ţ	Initial Level of Water Strike			
$\frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}} \frac{\sqrt{1}}{\sqrt{1}}$	Topsoil		Backfill With Arisings	Ţ	Level of Water Strike Rise After 20 Mins			
	Cobbles and Boulders		Bentonite Seal					
	Gravel		Cement					
	Sand		Filter					
$\begin{array}{ccccc} \times & \times & \times \\ & \times & \times \\ \times & \times & \times \\ & \times & \times$	Silt		Grout					
	Clay		Slotted Pipe					
	Peat		Piezo Tip					
Composite so	il types shown by combined symbols							

Composite soil types shown by combined symbols (primary + secondary constituents)

AECOM

AECOM

12 Regan Way Chetwynd Business Park, Chilwell Nottingham, NG9 6RZ Tel: 0115 9077000 Fax: 0115 9077001 www.aecom.com

Λ					AECO	М	т	el: 01793 50	08500		Bore	ehole	eNo. B⊦	1501	
					Newbridge Swindon, S	Square SN1 1BY	F	ax: 01793 5 ww.aecom.c	08501 com		Sheet:	1 of 2			
Equipmen	t & Me	thods:			Project	Name: St. Ath	an Northe	rn Access	Road				Job	No:	
0.00 - 8.5	0 Ha 20	nd Tools - Com 5	acchio		Project	Location: St. A	than						6	0509148	
					Client:	Welsh Governr	ment		Ground	level (m):			Date Started:	30/11/201	6
					E: 298	644.305			Cround	Lever (III).	43.01 AOD		Date Complete	ed: 30/11/2	2016
In Situ T	Festing		Cori	ng Info	rmation	0054.476						Reduced		Depth	Back
Depth (m)	Туре	Result	TCR SCR	FI	Core Run		DES	SCRIPTION	N	(m)	Legend	(THICK) (m)	Instrum		
			RQD			TOPSOIL: G	Grass Ov	er: Soft s	lightly red	dish brov	wn slightly		$\frac{\overline{z_{f}}}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}} \frac{1}{\overline{z_{f}}}$		
).00- 0.35	В					gravelly san subangular t	dy CLAY to rounde	with abu ed fine of ed fine fine ed fine ed fine ed	Indant ro	ots. Grave e and rar	el is e brick. Sand		$\frac{1}{1} \underline{\sqrt{1}} \underline{\sqrt{1}} \underline{\sqrt{1}} \underline{\sqrt{1}}$	(0.35)	
).30	ES					is fine to me	dium				,	42.66		0.35	
).50	ES					Soft locally f	irm sligh	tly reddis	sh brown	silty CLA	Y with		<u> </u>	- (0 35)	
0.35- 0.70	B					subangular o	oots and	one	ble conte	nt. Coddie	es are		××××	+ (0.00)	
0.70	SPT (C)	N>50 8,17				(PROBABLE Strong arev	E ALLUV	IUM) weathere	ed mediu	n bedded	, I	42.31		0.70	
		40mm/35,15 for 40mm					E with oc	casional	shell frag	ments an	d two sets of			Į –	
					1.00	Subhorizont	al, close	ly spaced	d, planar i	ough, op	en infilled			┡	00
						Subvertical ((~50°), c	losely sp	aced, pla	nar rough	, tight with				
							WEATH	HERED P	ORTHKE	RRY MEN	IBER)				↓ °
														1	
														1	
.00- 2.50	с		93 57	0										ŧ –	
			57	ю										Ţ	
														₽-	
						At 2.00m bg	gl: Soft o	rangish b	prown cla	y fracture	infill (~6cm				000
														4- 1∟	
					2.50	At 2 50m bo	ul [.] Soft o	rangish h	prown cla	v fracture	infill (~4cm			┣-	
						thick) preser	nt.			,	(ł	
						At 2.60m bg	gl: Assun	ned clay	fracture in	nfill washe	ed out			Ţ	
							x).							┣	
50 4 00			86			At 3.00m bg	gl: Assun k).	ned clay	fracture in	nfill washe	ed out			ŀ	
2.50- 4.00			65 65	7		(1	
														1- 1-	
														ŀ	
														ŧ.	
														Ę	
			-		4.00									 -	0
						At 4.00m bg	gl: Infill o thick) pr	f soft to f resent.	irm green	ish greyis	sh brown				
						From 4 00m	ı bal: Su	bvertical	(~80°) ca	lcite vein	s present				
						(~2mm thin)					- p. 00011				
														(7.80)	
.00- 5.50	с		100 93	5										ŧ	
			00	5										1	
Wa	ter Str	kes		Hole	e Diamete	er <u> </u>	Progre	ess				Rema	rks		
rike Flo epth	w Ren	narks		Hole [(mm)	Dia Depth Hole (of Date m)	Time	Hole Depth (m	Casing Depth (m	Water) Depth (m)	1. Borehole locate 2. Buried services	d in third pa inspection	arty field north of the pit excavated by har	Eglwys Brew nd refused at	vis Road. t 0.70m bgl
30 Stan	ding			300 140	0.70 1.00	30-11-2016 01-12-2016	14:30 15:30	8.50 8.50	1.00	1.30 1.37	3. Borehole advan 8.50m bgl.	ced by Rot	ary Coring with wate	r recirculation	n: 0.70m -
											4. Borehole compl 5. Topography: Ge	eted to 8.50 ently sloping	Um bgl. g. vd at 1 30m bol		
											7. No visual or olfa 8. 50mm standnin	encountere actory evide e installed to	ence of contamination of 4.00m bol and bac	n. ckfilled with h	entonite fro
											4.00m to 8.50m bo	gl upon com	npletion, as instructe	d by the eng	ineer.
lotes: For	explan	ation of symbol	s and a	abbrevi	iations, se	e Key Sheet.	Sc	cale: 1:25		L	ogged By: MC		Checked	By: MB	

	A		CO	V		AECOI Tricentre 3 Newbridge Swindon, S United King	Square N1 1BY gdom		Tel: 01793 50 Fax: 01793 50 www.aecom.c	8500)8501 om			Bore Sheet:	ehole	No.	BH	501		
	Equipmen 0.00 - 8.5	t & Me 0 Ha 20	thods: nd Tools - Coma 5	acchio	1	Project Project Client:	Name: St. Ath Location: St. A Welsh Govern	an Northe Athan ment	ern Access F	Road						Job N 60	lo:)509148		
						E: 298	644.305			Ground	Level (m):	: 43.01	AOD		Date S	Completed: 30/11/2016			
-	In Situ	Testinc	1	Cori	na Info	N: 169 Remation	054.476							Reduced	Date e	ompicie	Depth	Backfill/	
	Depth (m)	Туре	Result	TCR SCR RQD	FI	Core Run		DE	SCRIPTION	I				Level (m)	Leç	gend	(Thick) (m)	Instrument	
						5.50											-		
0 January 2017	- 5.50- 7.00	С		100 93 87	5												-		
GS 4_0 LIBRARY V6_25102016.GLB Date: 1	-			87		7.00													
7 MC.GPJ Library: AECOM A	-			87 76	6		At 8.10m bg	gl: Assu gl: Assu	med clay f med clay f	racture ir	nfill wash	ned out	t.				- - - - - -		
Project: S1. ATHAN ACCESS RUAD 10.01.201	8.50	\$EJ	N>50 25 for 25mm/50 for 5mm					En (Th	d of Boreł ickness of not pro	nole 8.50 basal la ivven)	m yer			_ 34.51			L 8.50		
REHOLE LOG - SWINDON	Wa Strike Flc Depth	ter Str	ikes narks		Hole I (mm)	e Diamete Dia Depth Hole (1	r of Date m) 30-11-2016	Prog Time	ress Hole Depth (m)	Casing Depth (m)	Water Depth (m	1. Bore 1) 2. Burie natural	hole locate ed services rock.	Remain Re	rks rty field nor pit excavate	th of the E	Eglwys Brewi	s Road. 0.70m bgl on	
sport ID: STANDARD CC					.20		01-12-2016	15:30	8.50 8.50		1.37	3. Bore 8.50m 4. Bore 5. Topo 6. Stan 7. No v 8. 50m 4.00m	enore advar bgl. chole comp ography: G iding water risual or olf m standpip to 8.50m b By: MC	leted to 8.50 ently sloping encountere actory evide be installed to gl upon com	ary Coring V Dm bgl. I. d at 1.30m nce of cont o 4.00m bg upletion, as	bgl. amination I and back instructed	(filled with be I by the engin By: MB	to.rum -	
шL		Subial	saon or symbols		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		e noy oncer.												

A		CO	V		AECOI Tricentre 3 Newbridge Swindon, S	Square N1 1BY	T F V	el: 01793 50 ax: 01793 50 ww.aecom.c	8500 08501 com		Boi	rehole	e No.	BH	502		
Equipmen 0.00 - 8.0	it & Me 0 Ha	thods: nd Tools - Com	acchio	205	Project Project Client:	Name: St. Ath: Location: St. A Welsh Governr	an Northe Athan ment	rn Access I	Road					Job N 60	lo: 509148		
					Co-ordi E: 299	nates: 568.328			Ground	Level (m):	41.80 AOI	 ר	Date St	tarted: 2	23/11/201	6	
					N: 169	207.301					41.09 AOL		Date C	omplete	d: 01/12	/2016	
Depth (m)	Testing	Result	TCR SCR	ng Info FI	rmation Core Run		DES	SCRIPTION	1			Reduced Level (m)	Leg	end	Depth (Thick) (m)	Ins	ackfill/ strumen
	ES					TOPSOIL: G gravelly CLA medium of li (TOPSOIL)	Grass Ov AY with fi mestone	rer: Soft to requent ro e	o firm dar oots. Gra	k brown s vel is sub	slightly bangular	41.69		$\frac{\sqrt{I_{z}}}{\sqrt{I_{z}}} \frac{\sqrt{I_{z}}}{\sqrt{I_{z}}}$	_ (0.20) _ 0.20 _		
_ 0.50 _	ES					Firm brown s to rounded f medium	slightly g ine to m E ALLUV	ravelly sa edium of 'IUM)	andy CLA limestone	Y. Grave a. Sand is	I is angular fine to	41.29			_ (0.40) 0.60		
- 0.75 - 0.60- 0.95	ES B					Firm light gro (PROBABLE	ey mottle E ALLUV	ed yellowi 'IUM)	sh orang	e silty CL	AY				-	1 L	
0.95- 1.20	D SPT (C)	N=10 2,2/ 2,3,2,3				At 1.00m bg	gl: Becor	nes stiff.							 - -		
 1.40- 2.00	D					From 1.50m	n bgl: Be	comes ve	ery stiff.						- (1.80) - - -		
 2.00- 2.40 	D													× × · · × · · · × · · · · · · · · · · ·			
- 2.40 - -	SET (C)	N>50 16,9/50 for 35mm			2.50	Strong dark calcite veins rough, partly Interbedded fragments an (PORTHKER	grey me and sul open w with har nd Grypl RRY MEN	dium bec bvertical (ith orange d very da haea foss //BER)	Ided shel (~45°) clc e surface ark grey C sil (~30mr	ly LIMES sely spa stained f LAY with n)	TONE with ced, planar fractures. n shell	39.49			_ 2.40 - -		
 2.50- 4.00 	С		100 56 56	6											- - - -		
- - -				8													
					4.00	From 4.00m	n to 4.20	m bgl: Cla	ay washe	d out (co	re loss).						
4.00- 5.50 	С		87 50 44	6		From 4.65m Recovered a	n to 4.77 as angul	m bgl: Fra ar mediur	actured z n to coar	one pres se gravel	ent. I.				- - -		
Strike Fig	ater Stri	ikes narks		Hole F	e Diamete Dia Denth	r of Date	Progr	ess Hole	Casing	Water	1. Borehole loc	Rema	rks arty field nort	h of the F	alwvs Bro	vis Roa	d.
0.70 Fallir mins	ng to 1	.20m bgl after 2	0	(mm) 300 140	Hole (r 0.95 2.50	23-11-2016 01-12-2016	16:00 16:00	Depth (m 0.95 8.00	2.50	0.70	 Buried servici Borehole advisit Borehole advisit Borehole cor Topography: Groundwater No visual or (Somm stand) Somm stand) 	vanced by dyn culation: 2.40r mpleted at 8.00 Level ground encountered olfactory evide pipe installed t i bgl upon con	pit excavate amic sampli n-8.00m bgl. 0m bgl. at 0.70m bg ence of conta to 2.30m bgl npletion, as i	I falling to amination. and back	1.20m bg	after 20 pentonite	Dmins.
Notes: For	explan	ation of symbol	s and	abbrevi	iations, se	e Key Sheet.	So	cale: 1:25			Logged By: M	с U	C	necked B	y: MB		

A		CO /	V		AECOI Tricentre 3 Newbridge Swindon, S	M Square N1 1BY	T F W	ēl: 01793 508 āx: 01793 50 ww.aecom.co	8500 18501 om		Bor	ehole	No.	BH	502	
Equipment 0.00 - 8.00	& Met) Har	hods: nd Tools - Coma	acchio	205	United King Project Project Client:	^{Idom} Name: St. Atha Location: St. A Welsh Governn	an Northei than nent	rn Access F	Road					Job N 60	o: 509148	
					Co-ordi	nates:			Ground	Level (m):	41.00 400		Date St	arted: 2	3/11/2016	6
					N: 169	207.301					41.69 AOD	Deduced	Date Co	ompleted	d: 01/12/2	016
Depth (m)	esting Type	Result	TCR SCR RQD	ng Info FI	rmation Core Run		DES	SCRIPTION	I			Level (m)	Leg	end	Depth (Thick) (m)	Backfill/ Instrument
- - -					5.50										- _ (5.60) - -	
Date: 10 January 2017	с		100 100 100	2	5.50	From 5.50m with extreme	bgl: Be ly weak	comes thi black thir	ickly bedo ily lamina	led inter ted mud	bedded Istone.				-	
X: AECOM AGS 4_0 LIBRARY V6_25102016.GLB III 00.2 00.8 00.8 00.8	C	N>50 25 for	100 73 56	3	7.00	At 7.20m bg present.	I: Veine	d/fracture	d zone (~	100mm	thick)	_ 33.89			- - - - - - - - - - - - - - - - - - -	
SWINDON Project: ST. ATHAN ACCESS ROAD 10.01.2017 MC GPJ Libra	(C)	25mm/50 for 5mm					End (Thie	d of Boreh ckness of not pro	tole 8.00 basal lay oven)	m rer						
9-90																
U Wa	ter Stri	kes		Hole Hole F	e Diamete	r of Date	Progre	ess Hole	Casing	Water	1 Boreholo loost	Remar	ks	h of the F	alwaye Provid	s Road
point Department ID: STANDARD COREHC				120	Hole (r 8.00	23-11-2016 01-12-2016	16:00 16:00	Depth (m) 0.95 8.00	2.50	0.70	2. Buried service: natural rock. 3. Borehole adva with water recircu 4. Borehole comp 5. Topography: L 6. Groundwater e 7. No visual or of 8. 50mm standpi 2.30m to 8.00m t	s inspection p nced by dyna lation: 2.40m evel ground. .nccuntered a factory eviden- be installed to ogl upon com	amic samplii amic samplii I-8.00m bgl. Im bgl. at 0.70m bgl nce of conta o 2.30m bgl pletion, as in	I falling to mination. and back	1.20m bgl a filled with be by the engin	0.95m bgl on Rotary Coring Infer 20mins. entonite from heer.
⊮ Notes: For	explan	ation of symbols	and a	abbrevi	iations, se	e Key Sheet.	30	Jano. 1.20						D	J	

A		CO	M		AECO Tricentre 3 Newbridge	Square	T F	el: 01793 50 ax: 01793 5	8500 08501		Bor	ehole	No. BH	1503	
Equipmen 0.00 - 0.8	it & Me 0 Ha	thods: and Tools			Project	Name: St. Ath Location: St. J	w nan Norther Athan	mw.aecom.c	Road		Sheet:	1 of 2	Job 1 60	No:)509148	
					Client: Co-ordi	Welsh Govern inates:	ment		Ground	Level (m)	:		Date Started:	21/11/201	6
					E: 299 N: 169	985.073 259.091					41.83 AOD		Date Complete	ed: 29/11/	2016
In Situ ⁻ Depth	Testing	Result	Corii	ng Info FI	rmation Core		DES	SCRIPTION	1			Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrumen
(m) 0.00- 0.35	D		RQD		Run	TOPSOIL: (gravelly CL/ medium of l	Grass Ov AY with fr	er: Soft to	o firm dai oots. Gra	rk brown avel is sul	slightly bangular		$\frac{\sqrt{2}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$	(0.35)	
_ 0.30	ES					(TOPSOIL) Soft becom	ina firm li	aht vellov	vish brov	vn sliahtl	v gravelly	41.48		0.35	
0.50 0.35- 0.80	ES D					CLAY. Grav (PROBABL	vel is suba E ALLUV	angular fi IUM)	ne of lim	estone	, g ,			(0.45)	
- 0.80 - 0.80- 1.00	SPT (C) D	N>50 25 for 40mm/50 for 10mm				Medium stro bedded LIM	ong local IESTONE	ly weak li E with oco	ght grey casional	weathere	ed medium placed shell	41.03		0.80	
					1.00	fragments, set: Subver with orange Horizontal,	calcite ve tical (~45 surface s closelv to	eins and t i ^o), closel straining. o verv close	wo fractu y spaced Second selv spac	ire sets. I I, planar i fracture ced. plana	First fracture rough, open set: ar rough.			-	
-						open with fi (PARTIALL)	rm dark g Y WEATH	reenish I HERED P	orown cla ORTHKE	ay infill RRY ME	MBER)			-	
-			91			At 1.20m b clay (~10cm	gl: Layer n thick) pr	of weath resent.	ered stiff	dark gre	enish brown				
1.00- 2.50 - -	C		59 49	11		From 1.45r greenish bro	n to 1.65 own clay	m bgl: La present.	yer of we	eathered	stiff dark			-	
- - -														-	
-														-	
-					2.50										
-														-	
- 2.50- 4.00	с		87 79			From 2.96r greenish bro	n to 3.04 own clay	m bgl: La present.	yer of we	eathered	stiff dark			-	
-			67	6										F - 	
-														-	
-														-	
-					4.00										
- -															
- 4.00- 5.50	с		100 90	6										(7.70)	
		ikaa				-	D.							-	
Strike Flo	w Rer	narks		Hole [Diamete	of Date	Time	Hole	Casing	Water	1. Borehole loca	ted in the St.	Athan Ministry of Def	ence (MoD)	base north of
Depth 1.20 Stan	ding			(mm) 300 140	Hole (1 0.80 1.00	m) 21-11-2010 29-11-2010 30-11-2010	6 13:00 6 16:00 6 14:45	Depth (m 0.80 8.50 8.50) Depth (m 1.00	1) Depth (m 1.20 1.35	 the Eglwys Brew 2. Buried service natural rock. 3. Borehole adva 8.50m bgl. 4. Borehole com 5. Topography: I 6. Standing wate 7. No visual or o visual or o	is Road. is inspection anced by Rota pleted at 8.50 evel ground. ir encountere factory evide	pit excavated by han ary Coring with water)m bgl. d at 1.20m bgl. nce of contamination	d refused at recirculatio	: 0.80m bgl on n: 0.80m -
				- 1- 1			Sc	ale: 1:25			8. 50mm standp 3.80m to 8.50m Logged By: MC	ipe installed t bgl upon com	o 3.80m and backfille pletion, as instructed Checked F	ed with bent by the eng by: MB	onite from ineer.
INOTES: FOR	explar	iation of symbols	s and a	aporev	iations, se	e key Sneet.					00			-	

	A		CO /	V		AECO Tricentre 3 Newbridge Swindon, S	M Tel: 01793 500 Square Fax: 01793 50 SN1 1BY www.aecom.cr	3500 8501 om	Borehole	e No. BH	1503	
	Equipme 0.00 - 0.	nt & Me 80 Ha	thods: nd Tools			United King Project Project	gdom Name: St. Athan Northern Access F Location: St. Athan Welsh Government	Road		1 dol 60	No: 0509148	
						Co-ord	inates:	Ground Level (m):	00 AOD	Date Started:	21/11/2016	
	la Oita	Testin		Qui		N: 169	0259.091	41.3	83 AUD	Date Complete	ed: 29/11/20)16
	Depth (m)	Testing	Result	TCR SCR RQD	ng Into	Core Run	DESCRIPTION		Level (m)	Legend	Deptn (Thick) (m)	Instrument
							At 5.10m bgl: Layer of weather clay (~5cm thick) present.	ered stiff dark greenisl	h brown		-	
016.GLB Date: 10 January 2017	- - - - - - - - - - - - - - -	c c		100 82 65	6	5.50	At 5.45m bgl: Layer of very st thick) present.	iff dark grey clay (~10	cm			
2017 MC.GPJ Library: AECOM AGS 4_0 LIBRARY V6_25102(7.00- 8.50) C	N>50 25 for	100 95 95	4				33.33		- - - - - - - - - - - - - - - - - - -	
LOG - SWINDON Project: ST. ATHAN ACCESS ROAD 10.01.		(C)	25mm/50 for 15mm		Hol	Piamete	End of Boreh (Thickness of not pro	iole 8.50 m basal layer ven)	Rema	rks		
Report ID: STANDARD COREHOLE	W Strike F Depth	ater Sti low Rer	ixes narks	s and a	Hole I (mm) 120 abbrev	e Diamete Dia Depth Hole (8.50	Progress of Date Time Hole 21-11-2016 13:00 0.80 29-11-2016 16:00 8.50 30-11-2016 14:45 8.50	Casing Water Depth (m) Depth (m) the f 2. Bi 1.00 1.20 3. Bi 1.35 8.50 6. Si 7. N 8. 50 3.80 4. Bi 3.80 4. Bi 4. Bi 5. To 6. Si 7. N 8. Si 8. Si 7. N 8. Si 8. Si 7. N 8. Si 8. Si 7. N 8. Si 8. Si	Rema orehole located in the St. Eglwys Brewis Road. uried services inspection ral rock. orehole advanced by Rol orehole completed at 8.5 opography: Level ground tanding water encountere o visual or olfactory evide Dmm standpipe installed Im to 8.50m bgl upon cor ad By: MC	rks Athan Ministry of De pit excavated by han ary Coring with water Om bgl. d at 1.20m bgl. ance of contaminatior to 3.80m and backfill npletion, as instructed Checked f	fence (MoD) b Id refused at C r recirculation: n. ed with bentor d by the engin By: MB	base north of 0.80m bgl on 0.80m - 0.80m - itie from eer.

A _		JU	V		Tricentre 3 Newbridge Swindon, S	Square N1 1BY	-	Tel: 01793 50 Fax: 01793 50 www.aecom.c	8500 18501 om		Sheet:	1 of 2			
Equipment 0.00 - 8.30	& Meti Han 205	nods: Id Tools - Con	nacchio		Project	Name: St. Ath Location: St. A	an Northe	ern Access F	Road				J	lob No: 60509148	
					Client: Co-ordi	nates:	ment		Ground	Level (m):			Date Starte	ed: 21/11/20	16
					E: 3000 N: 1693	052.146 282.685					41.91 AOD		Date Com	pleted: 28/11	/2016
In Situ T Depth	esting Type	Result	Cori TCR SCR	ng Info FI	rmation Core		DE	SCRIPTION				Reduced Level (m)	Legeno	j Depth (Thick) (m)	Bao Instru
(m)			RQD		Run	TOPSOIL: 0	Grass Ov	ver: Soft to	firm dar	k brown s	slightly		$\left[\frac{\overline{z_{f}}}{\overline{z_{f}}}\right]^{N} = \frac{\overline{z_{f}}}{\overline{z_{f}}}\left[\frac{1}{\overline{z_{f}}}\right]^{N} = \frac{\overline{z_{f}}}{\overline{z_{f}}}$	<u>z: x.</u>	
).00- 0.45).30	D ES					gravelly CLA medium of li (TOPSOIL)	imeston	e e	ots. Gra	vel is sub	angular		<u>17 111 117</u> <u>17 117 117</u>	<u>(0.45)</u> (0.45)	
0.50	FS					Coft boomi	na firm	arangiah h		abtly area		41.46	$\frac{I_{2}}{2} \xrightarrow{\langle V I_{2}} \xrightarrow{\langle V I_{2}}$	0.45	
.45- 0.80	D					Gravel is su	bangula	orangish b ar fine of lir /IUM)	nestone	gnuy grav	elly CLAY.			(0.35)	
					-	Medium stro	na to w	, eak arev v	veathere	d thinly to	thickly	41.11		0.80	1 ₽
					1.00	laminated L closely space	IMESTC ced, plar	ONE with on ar rough,	rangish l	brown sta h orange	ining and surface				
				15	1.00	stained fract	tures Y WEA1	THERED P	ORTHKE	RRY MEI	MBER)				
															1 ⊑
				0											
00- 2.50	с		100 73											(1.70)	
			49												
				8											
				Ū											
												39.41		2.50	
					2.50	Strong loca	Ily med	lium stron occasiona	g grey I shell f	partially v ragments	weathered and two				00
						spaced, plai Second frac	ar roug	h, open w subvertic	ith orang al (~85°)	e surface . undulati	straining.				00
						tight with ora	ange su / WEAT	rface stain HERED PO	ing DRTHKE	RRY MEN	IBER)				00
.50- 4.00	с		100	06											00
			62	00											00
															00
					4.00	From 4.00n	n bgl: Be	ecomes da	ırk grey l	ess weath	nered with				
						very low per become ver	sistant o y close,	calcite veir rough ste	ns and su oped, pa	ibvertical rtly open	fractures with pyrite				
						and calcite i	meralls	5au011.							
.00- 5.30	с		100 55	10											
Wat	er Strik	æs		Hole	e Diamete	r	Proa	ress				Remar	ks		0
ike Flov	w Rem	arks		Hole [(mm)	Dia Depth Hole (r	of Date n)	Time	Hole Depth (m)	Casing Depth (m	Water) Depth (m)	1. Borehole locate the Eglwys Brewis 2. Buried services	d in the St. A Road. inspection pi	than Ministry of I t excavated by h	Defence (MoD) I nand refused at (base north o 0.80m bgl o
0 Fallin mins	g to 1.3	35m bgl after 2	20	300 140	0.80 1.00	21-11-2016 28-11-2016 29-11-2016	6 15:00 6 16:00 6 15:30	0.80 8.30 8.30	1.00	1.30 1.47	natural rock. 3. Borehole advan bgl.	ced by Rotar	y Coring with wa	ater recirculation	0.80m-8.30
						20-11-2010		0.00			 Borehole compl Topography: Le Surface water a 1.35m bgl after 20 No visual or olfa 	eted at 8.30n vel ground. t location. Gr mins. actory eviden	n bgl. oundwater enco ce of contaminat	untered at 0.80r tion.	n bgl falling
											8. 50mm standpip	e installed to	8.30m bgl upon	completion as ir	nstructed by

Λ =	-				AECO	M	-				Bo	rehole	No	. BH	504	
A.					Newbridge Swindon, S	Square N1 1BY	I F W	el: 01793 50 ax: 01793 50 ww.aecom.c	8500)8501 om		Shoot	2 of 2				
Equipment	& Met	hods:			United King Project	dom Name: St. Atha	an Northei	rn Access F	Road		Sileet	2 01 2		Job N	lo:	
0.00 - 8.30) Hai	nd Tools - C	omacchio		Project	Location: St. A	than							60	509148	
	205)			Client:	Welsh Governn	nent									
					Co-ordi E: 300	nates: 052.146			Ground	Level (m):	: 41.91 AOI)	Date	Started: 2	21/11/2016	6
In City T	ootina		Cari	a a lafa	N: 169	282.685						Boducod	Date	Complete	d: 28/11/2	2016
Denth	esung -		TCR		Core		DES	SCRIPTION	l			Level (m)	Le	egend	(Thick)	Instrumer
(m)	туре	Result	SCR RQD	FI	Run										(11)	
-															-	
-															-	
-					5.30										_ (5.80)	
-															-	
-															-	
-																
-															-	
5.30- 6.80	с		90 72	7											_	
-			68			From 6.00m	bgl: Fra	actures (~	70°) are	very clos	sely and					
-						planal shoo		sange su	nace sia	ning.					_	
															-	
-															_	
					6.80										-	
					0.00	From 6.80m	to 6.87	m bgl: Ve	ry weak t	hinly lam	ninated				-	
-						black weathe	ered ora	nge muds	stone pre	sent.						
															-	
															-	
_			100												-	
6.80- 8.30	С		100 91	6		At 7.45m to	7.52m b	ogl: Very v	veak thin	ly lamina	ated black				-	
						weathered o	range m	luastone	present.						-	
_															_	
															-	
												33.61			8.30	
							End	d of Boreh	nole 8.30	m						
							(1110	not pro	ven)	yer						
Wat Strike Flor	er Stri	kes arks		Hole I	e Diamete	r of Date	Progre	ess Hole	Casing	Water	1. Borehole loca	Remain the St A	rks than Minis	try of Defen	ce (MoD) ba	se north of
Depth		ano		(mm)	Hole (r	n)	15.00	Depth (m)	Depth (m)	Depth (m	the Eglwys Brew 2. Buried service	is Road. is inspection pi	it excavate	ed by hand r	efused at 0.8	0m bgl on
				120	8.30	21-11-2016 28-11-2016	15:00	0.80 8.30	1.00	1.30	atural rock. 3. Borehole adva bgl.	anced by Rotar	ry Coring w	vith water re	circulation: 0	.80m-8.30m
						29-11-2016	10.30	0.30		1.47	4. Borehole com 5. Topography: I	pleted at 8.30r .evel ground.	n bgl.			
											6. Surface water 1.35m bgl after 2	at location. Gr 0 mins.	oundwater	r encountere	ed at 0.80m b	ogl falling to
											 No visual or o 8. 50mm standp engineer 	inactory eviden ipe installed to	e or conta 8.30m bgl	amination. Upon comp	letion as inst	ructed by the
Notes: For e	explan	ation of sym	bols and a	abbrev	riations, se	e Key Sheet.	Sc	cale: 1:25	I		Logged By: M	2		Checked E	By: MB	

Appendix E Geotechnical Laboratory Results





Contract Number: 33562

Client's Reference: 60509148

Laboratory Report

Report Date: 24-01-2017

Client AECOM 12 Regan Way Chetwynd Business Park NG9 6RZ

Contract Title: St Athan Northern Access Road GI For the attention of: Michael Corlett

Date Received: **19-12-2016** Date Commenced: **19-12-2016** Date Completed: **12-01-2017**

Test Description Qty **Moisture Content** 7 1377 : 1990 Part 2 : 3.2 - * UKAS 7 4 Point Liquid & Plastic Limit (LL/PL) 1377 : 1990 Part 2 : 4.3 & 5.3 - * UKAS **PSD Wet Sieve method** 5 1377 : 1990 Part 2 : 9.2 - * UKAS BRE Suite D Ph Total Sulphate, Aqueous Sulphate, Total Sulphur, Aqueous Nitrate, Aqueous Mag, 4 Chloride, - @ Non Accredited Test Dry Den/MC (2.5kg Rammer Method 1 Litre Mould) 2 1377 : 1990 Part 4 : 3.3 - * UKAS **CBR Remoulded** 5 BS1377 Part 4 - * UKAS Natural Shear Strength by Hand Vane (3 measurements) 3 - @ Non Accredited Test Notes: Observations and Interpretations are outside the UKAS Accreditation * - denotes test included in laboratory scope of accreditation # - denotes test carried out by approved contractor

@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager) Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

GEO Site & Testing Services Ltd Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk







Contract Number: 33562

Test Description	Qty
Point load strength index test 10 Determinations. ISRM / BS 1377/2/3.3 Brock & Franklin 1972 * UKAS	4
Part 1 - SM for Determination of the Uniaxial Compressive Strength of Rock Materials - @ Non Accredited Test	2
Determination of the slake durability index, two cycles. ISRM / BS 1377/2/3.3 2/2 - @ Non Accredited Test	4
Extra Over Items - Specimen Preparation. - @ Non Accredited Test	2
Disposal of Samples on Project	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- * denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Alex Wynn (Associate Director) - Benjamin Sharp (Contracts Manager) - Emma Sharp (Office Manager) Paul Evans (Quality/Technical Manager) - Vaughan Edwards (Managing Director)

Client ref:

60509148 - M001.002.003

Location: Contract Number: St Athan Northern Access Road GI

33562-

Hole	Sample			
Number	Number	Туре	Depth (m)	Description of Sample*
SK503		В	0.30 - 0.70	Brown fine to coarse gravelly silty CLAY.
SK504		В	0.50 - 0.75	Brown fine to coarse gravelly clayey SILT.
SK507		В	0.30 - 0.55	Brown fine to coarse gravelly silty CLAY.
SK508		В	0.50 - 0.95	Brown fine to coarse gravelly clayey SILT.
BH501		В	0.35 - 0.70	Brown fine to coarse gravelly clayey SILT.
BH502		D	2.00 - 2.40	Brown fine to coarse gravelly silty CLAY.
BH503		D	0.35 - 0.80	Brown fine to coarse gravelly silty CLAY.

Note: Results on this table are in summary format and may not meet the requirements of the relevant standards, additional information is held by the laboratory



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager) Date: 11.1.17



Test Report: Method of the Determination of the plastic limit and plasticity index BS 1377 : Part 2 : 1990 Method 5

33562-

St Athan Northern Access Road GI

Contract Number:

Location:

Hole/			Moisture	Liquid	Plastic	Plasticity	%	
Sample	Sample	Depth	Content	Limit	Limit	Index	Passing	Remarks
Number	Туре	m	%	%	%	%	.425mm	
			Cl. 3.2	Cl. 4.3/4.4	Cl. 5.	Cl. 6.		
SK503	В	0.30 - 0.70	31	56	29	27	80	CH High Plasticity
SK504	В	0.50 - 0.75	33	61	32	29	70	MH High Plasticity
SK507	в	0.30 - 0.55	30	54	26	28	78	CH High Plasticity
SK508	В	0.50 - 0.95	39	62	34	28	70	MH High Plasticity
BH501	в	0.35 - 0.70	33	57	31	26	75	MH High Plasticity
BH502	D	2.00 - 2.40	19	46	23	23	100	CI Intermediate Plasticity
BH503	D	0.35 - 0.80	36	60	30	30	100	CH High Plasticity
		1						
		1		ľ				
		1						
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	!	1		ľ				

Symbols:

NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

BS 5930:1999+A2:2010





For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager) Date: 11.1.1





Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve, Clause 9.2

Client ref:	60509418	Sample Number:	N/A
Contract Number:	33562-	Depth from (m):	0.65
Hole Number:	SK501	Depth to (m):	1.40
		Sample Type:	В
Location:	St Athan Northern Access Road GI		

Description:

Brown fine to coarse sandy silty clayey GRAVEL with many cobbles.



Remarks:

#- not determined



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager)





Date: 12.1.17

Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve, Clause 9.2

Client ref:	60509418	Sample Number:	N/A
Contract Number:	33562-	Depth from (m):	0.30
Hole Number:	SK503	Depth to (m):	0.70
		Sample Type:	В
Location:	St Athan Northern Access Road GI		
Description:	Brown fine to medium gravelly sandy silt	y CLAY.	



Remarks:

#- not determined



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager)





Date: 1

12.1.17

Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve, Clause 9.2

Client ref:	60509418	Sample Number:	N/A
Contract Number:	33562-	Depth from (m):	0.50
Hole Number:	SK504	Depth to (m):	0.75
		Sample Type:	В
Location:	St Athan Northern Access Road GI		

Description:

Brown fine to coarse sandy silty clayey GRAVEL with many cobbles.



Remarks:

#- not determined



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager)





Date: 12.1.17

Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve, Clause 9.2

Client ref:	60509418	Sample Number:	N/A		
Contract Number:	33562-	Depth from (m):	0.80		
Hole Number:	SK509	Depth to (m):	1.30		
		Sample Type:	В		
Location:	St Athan Northern Access Road GI				
Description: Brown fine to coarse sandy silty clayey GRAVEL.					



Remarks:

#- not determined



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager)





Particle Size Distribution Test BS 1377 Part 2:1990.

Wet Sieve, Clause 9.2

Client ref:	60509418	Sample Number:	N/A
Contract Number:	33562-	Depth from (m):	0.35
Hole Number:	SK510	Depth to (m):	0.60
		Sample Type:	В
Location:	St Athan Northern Access Road GI		

Description:

Brown fine to coarse sandy silty clayey GRAVEL with many cobbles.



Remarks:

#- not determined



For and behalf of GEO Site & Testing Services Ltd

Authorised By: Emma Sharp (Office Manager)





Date: 12.1.17



Unit 4 Heol Aur Dafen Ind EstateDafen Carmarthenshire SA14 8QN Tel: 01554 784040 01554 750752 Fax: 01554 770529 01554 784041 Web: www.geo.uk.com

Certificate of Analysis

Date:	06-01-17
Client:	Aecom
Our Reference:	33562
Client Reference:	
Contract Title:	ST.Athan
Description: (Total Samples)	4
Date Received:	
Date Started:	04-01-17
Date Completed:	06-01-17
Test Procedures:	(BRE BR 279)
Notes:	

Solid samples will be disposed 1 month and liquids 2 weeks after the date of issue of this test certificate

Approved By:

Authorised Signatories:

Emma Sharp Laboratory Office Manager Ben Sharp Contracts Manager

DP Grans

Paul Evans Quality Manager **Contract No:** 33562

Client Ref: Location: ST.Athan Date: 06-01-2017

Summary of Chemical Analysis (BRE BR 279)

				Sulp	hate Content as SO	4	Chloride	Content				
				Acid	Aqueous	Ground-	Semi		pH	Total	Magnesium	Nitrate
Hole	Sample	Sample	Depth	Soluble	Extract	water	Quantative	Quantative	Value	Sulphur	2	NO ₂
Number	Number	Type	m	Sulnhate	Sulphate		Tost Strin	-	@ 25°C	0/6 S	a/I	ma/l
Number	Number	Type				~//		~//	@ 25 C	/0 3	9/1	ilig/i
				as % 304	as 9/1 504	g/i	mg Ci/i	g/1				
01/503		_		BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279	BR 279
SK507		В	0.3-0.55	0.24	0.04		NCP		/.66	0.08	<1	10
SK508		В	0.50-0.95	0.14	0.03		NCP		7.91	0.06	<1	10-25
BH502		В	1.4-2.0	0.17	0.02		NCP		7.33	0.06	<1	10-25
BHE04		D	0.45.0.9	0.1/	0.02		NCD		9.05	0.06	<1	10 20
ылоч		U	0.15-0.0	0.14	0.02		NCF		0.05	0.00	<1	10
<u> </u>												
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			L	L								
L												
			L	L								
							1					

NCP - No Chloride present

Test Report: Point Load Test

Int. J. Rock Mech. Sci. & Geomech. Abstr. Vol. 22, No. 2, pp. 51 - 60, 1985.

Client:	Aecom
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Contract Number:	33562
Borehole Number:	As stated below
Core Box Number:	N/A
Depth (m):	As stated below
Date Tested:	07-12-16

Borehole	Sample	Depth	Type	of Test	Width	Platen	Failure	Equivalent	Point	Size	Point	Moisture	Description	Angle between	Type of
Number	Number		d	I		Separation	Load	Diameter	Load	Factor	Load Index	Content		plane of	anisotropy
			а	//	(W)	(D)	(P)	(D _e)	(I _s)	(F)	(I ₅₍₅₀₎)	(MC)	(SC)	anisotropy	(Bedding or
		(m)	b/i		(mm)	(mm)	(kN)	(mm)	(MPa)		(MPa)	(%)		& core axis.	Cleavage).
BH501		1.00 - 2.50	i		79.8	76.5	33.29	88	4.28	1.29	5.53				
			i		75.8	48.7	15.02	69	3.20	1.15	3.68				
			i		82.1	65.1	21.68	82	3.19	1.25	3.99	1			
			i		66.7	46.2	19.23	63	4.90	1.11	5.43				
			i		78.8	44.2	11.85	67	2.67	1.14	3.04				
			d			82.2	30.06		4.45	1.25	5.56	1			
			i		70.4	63.8	18.32	76	3.20	1.20	3.86				
			i		78.2	68.4	24.02	83	3.53	1.25	4.42				
			i		62.9	47.7	19.57	62	5.12	1.10	5.63				
			i		64.5	58	15.39	69	3.23	1.16	3.74				
		4.00 - 5.50	а		85.7	68.2	30.76	86	4.13	1.28	5.28				
			а		86.4	72.2	28.44	89	3.58	1.30	4.64				
			d			86.7	30.49		4.06	1.28	5.20				
			d			86.7	27.01		3.59	1.28	4.60				
			а		85.5	55.6	18.82	78	3.11	1.22	3.79				
			а		85.6	53.8	23.81	77	4.06	1.21	4.92				
			i		67.6	53.2	24.97	68	5.45	1.15	6.25				
			i		63.4	36.6	20.26	54	6.86	1.04	7.12				
			i		55.8	51.1	20.83	60	5.74	1.09	6.24				
			i		49.9	42.8	21.66	52	7.97	1.02	8.12				
L							L			L					
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L							L			L					
<u> </u>															
		1		1	1	I	1	I		1		1			

Key: d = diametral; a = axial; b = block; i = irregular lump test; I = perpendicular; // = parallel to planes of weakness.

Remarks:



Checked By Emma Sharp Office Manager 12-01-17

Date

DP Gang Approved By

Approved By Date Paul Evans Quality/Technical Manager

12-01-17



GEO/008

June-04 Issue No.1

Unit 4, Heol Aur, Dafen, Llanelli SA14 8QN

Test Report: Point Load Test

Int. J. Rock Mech. Sci. & Geomech. Abstr. Vol. 22, No. 2, pp. 51 - 60, 1985.

Client:	Aecom
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Contract Number:	33562
Borehole Number:	As stated below
Core Box Number:	N/A
Depth (m):	As stated below
Date Tested:	07-12-16

Borehole	Sample	Depth	Туре	of Test	Width	Platen	Failure	Equivalent	Point	Size	Point	Moisture	Description	Angle between	Type of
Number	Number		d	Ι		Separation	Load	Diameter	Load	Factor	Load Index	Content		plane of	anisotropy
			а	//	(W)	(D)	(P)	(D _e)	(I _s)	(F)	(I _{s(50)})	(MC)	(SC)	anisotropy	(Bedding or
		(m)	b/i		(mm)	(mm)	(kN)	(mm)	(MPa)		(MPa)	(%)		& core axis	Cleavage)
BH502		700 - 800	d.		()	86	19.56	()	2.64	1 28	3 38	(,0)		a core axisi	cicuruge).
011302		7.00 0.00	u a			00	21.20		2.01	1.20	3.50	-			
			u		00	30	21.20	01	2.88	1.28	3.67				
			a		86	/5.1	14.15	91	1.72	1.31	2.25				
			d			85.9	12.06		1.63	1.28	2.08	-			
			а		85.9	53.4	29.89	76	5.12	1.21	6.19				
			а		85.8	56.2	22.74	78	3.70	1.22	4.53				
			а		86	44.5	15.06	70	3.09	1.16	3.59				
			i		71	68.6	13.00	79	2.10	1.23	2.57				
			i		73.6	42.4	16.71	63	4.20	1.11	4.67				
			i		55.7	38.5	13.94	52	5.11	1.02	5.21				
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1		1	1	1	1	1	1	I	I	1	1	1	I	1	1

Key: d = diametral; a = axial; b = block; i = irregular lump test; I = perpendicular; // = parallel to planes of weakness.

Remarks:





Checked By Emma Sharp Office Manager 12-01-17

Date

DP Glang

Approved By Date Paul Evans Quality/Technical Manager



GEO/008

June-04 Issue No.1

Unit 4, Heol Aur, Dafen, Llanelli SA14 8QN

12-01-17

Test Report: Point Load Test

Int. J. Rock Mech. Sci. & Geomech. Abstr. Vol. 22, No. 2, pp. 51 - 60, 1985.

Aecom
St Athan Northern Access Road GI
60509148
33562
As stated below
N/A
As stated below
07-12-16

Borehole	Sample	Denth	Type	of Test	Width	Platen	Failure	Equivalent	Point	Size	Point	Moisture	Description	Angle between	Type of
Number	Number	Depai	d	T	Widen	Senaration	Load	Diameter	Load	Factor	Load Index	Content	Description	plane of	anisotrony
Humber	Humber		a	11	(W)	(D)	(P)	(D _a)	(L)	(F)	(L.(50))	(MC)	(SC)	anisotropy	(Bedding or
		(m)	b/i	,,	(mm)	(mm)	(kN)	(mm)	(MPa)		(MPa)	(96)	()	8. coro avic	(Logyage)
BH503		2 40 - 4 00	i		69.2	62.3	11 70	74	2 13	1 10	2 54	(70)		a core axis.	cleavage).
DIIJOJ		2.10 1.00			50	33	40.54	50	16.35	1.15	16.32				
					69.9	57.6	9.95	71	1 75	1.00	2.05				
					60.0	20.7	4.04	71 52	1.75	1.17	1.52				
			l d		00.7	30.7 9E 1	10.62	52	2.71	1.02	2.44				
			u d			05.1 9E 1	19.03		2.71	1.27	2.44				
			u		05	46.2	10.15	71	2.23	1.27	2.65				
			a ;		000	40.2	0.62	67	2.75	1.17	3.22				
			:		03.2	42.7	12.07	07	1.90	1.14	2.10				
					02.3	50.0	12.97	77	2.19	1.21	2.00				
			-		/4.4	01.8	0.01	//	1.47	1.21	1.78				
L															

Key: d = diametral; a = axial; b = block; i = irregular lump test; I = perpendicular; // = parallel to planes of weakness.

Remarks:





Checked By Emma Sharp Office Manager 12-01-17

Date

DP Glang

Approved By Date Paul Evans Quality/Technical Manager



GEO/008

June-04 Issue No.1

Unit 4, Heol Aur, Dafen, Llanelli SA14 8QN

12-01-17

Determination of Unconfined Compressive Strength. ISRM Suggested Methods Vol 16, No. 2, pp. 135-140 1979..

Date:	12-Jan-17
Contract Number:	33562-
Client reference:	N/A
Location:	St Athan Northern Access Road GI
Sample Type:	Core
Sample Preparation:	Sawing and Grinding
Operator:	Jason Dawney

Borehole Number	Depth (m) from	Depth (m) to	Diameter (mm)	Length (mm)	Initial Mass (g)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Moisture Content (%)	Load Failure (kn)	Maximum Compressive Strength (mpa)	Date Tested
BH501	2.50	4.00	86.00	212.50	3286.7	2.66	2.64	0.90	889.2	153.1	11-Jan-17
BH504	6.80	8.30	86.10	212.50	3258.2	2.63	2.61	0.70	446.2	76.6	11-Jan-17



For and behalf of GEO Site & Testing Services Limited

Paul Evans - Technical/Quality Manager Emma Sharp - Office Manager Ben Sharp - Contracts Manager Wayne Honey - Quality/Office Assistant



12.1.17

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23-08-12

Unit 4, Heol Aur, Dafen, Llanelli SA14 8QN

GEO-RCK01



Date:	12-Jan-17
Contract Number:	33562-
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Hole Number:	BH501
Sample Number:	
Depth from (m):	1.00
Depth to (m):	2.50
Sample Type :	В
Nature of slaking Fluid:	Water
Temperature (⁰ C):	20
Rock type:	Light brown SILTSTONE
Date Tested:	20-10-15
Operator:	Wayne Honey

Slake-Durability index (first cycle) %	98.67

Slake-Durability index (second cycle) % 98.11

Appearance of fragments retained in drum:

10 pieces of sub-angualr to well-rounded rock core with many pieces with ground corners and edges

Appearance of material passing through the drum:

Sub-angular to well rounded of <2mm fragments to a silty CLAY

If there is any remaining samples it shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Paul Evans - Quailty Manager	\bigcirc	DP Glans
Emma Williams - Office Manager	\bigcirc	
Date Approved: 12.1.17		



Date:	12-Jan-17
Contract Number:	33562-
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Hole Number:	BH502
Sample Number:	
Depth from (m):	2.50
Depth to (m):	4.00
Sample Type :	В
Nature of slaking Fluid:	Water
Temperature (⁰ C):	20
Rock type:	Light brown SILTSTONE
Date Tested:	20-10-15
Operator:	Wayne Honey

Slake-Durability index (first cycle) %	98.93
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Slake-Durability index (second cycle) % 98.55

Appearance of fragments retained in drum:

10 pieces of sub-angualr to well-rounded rock core with many pieces with ground corners and edges

Appearance of material passing through the drum:

Sub-angular to well rounded of <2mm fragments to a silty CLAY

If there is any remaining samples it shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Paul Evans - Quailty Manager	\bigcirc	DP Glans
Emma Williams - Office Manager	\bigcirc	
Date Approved: 12.1.17		



Date:	12-Jan-17
Contract Number:	33562-
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Hole Number:	BH503
Sample Number:	
Depth from (m):	0.80
Depth to (m):	1.00
Sample Type :	В
Nature of slaking Fluid:	Water
Temperature (⁰ C):	20
Rock type:	Light brown SILTSTONE
Date Tested:	20-10-15
Operator:	Wayne Honey

Slake-Durability index (first cycle) %	98.09

Slake-Durability index (second cycle) % 97.39

Appearance of fragments retained in drum:

10 pieces of sub-angualr to well-rounded rock core with many pieces with ground corners and edges

Appearance of material passing through the drum:

Sub-angular to well rounded of <2mm fragments to a silty CLAY

If there is any remaining samples it shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Paul Evans - Quailty Manager	\bigcirc	DP Gions
Emma Williams - Office Manager	\bigcirc	
Date Approved: 12.1.17		



Date:	12-Jan-17
Contract Number:	33562-
Location:	St Athan Northern Access Road GI
Client Ref:	60509148
Hole Number:	BH504
Sample Number:	
Depth from (m):	1.00
Depth to (m):	2.50
Sample Type :	В
Nature of slaking Fluid:	Water
Temperature (⁰ C):	20
Rock type:	Light brown SILTSTONE
Date Tested:	20-10-15
Operator:	Wayne Honey

Slake-Durability index (first cycle) %	98.28

Slake-Durability index (second cycle) % 97.23

Appearance of fragments retained in drum:

10 pieces of sub-angualr to well-rounded rock core with many pieces with ground corners and edges

Appearance of material passing through the drum:

Sub-angular to well rounded of <2mm fragments to a silty CLAY

If there is any remaining samples it shall be retained for a period of one month from the above date, after which time all samples shall be disposed of.

Paul Evans - Quailty Manager	\bigcirc	DP Gions
Emma Williams - Office Manager	\bigcirc	
Date Approved: 12.1.17		

Determination of the California Bearing Ratio Test Report: BS 1377: Part 4: 1990 Clause 7

Client ref:	60509148		
Location:	St Athan Northern Access Road GI		
Contract Number:	33562-		
Sample Type:	В		
Hole Number:	SK502		
Sample Number:	N/A		
Depth (m):	0.35 - 0.70		
Description:	Brown silty CLAY containing organic material.		



Checked By: Emma Sharp (Office Manager)

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Approved By: Paul Evans (Quality Manager





Date Approved:

icaling Services

Test Report: Determination of the California Bearing Ratio BS 1377: Part 4: 1990 Clause 7

Client ref:	60509148
Location:	St Athan Northern Access Road GI
Contract Number:	33562-
Sample Type:	В
Hole Number:	SK503
Sample Number:	N/A
Depth (m):	0.30 - 0.70
Description:	Brown silty CLAY.



Checked By: Emma Sharp (Office Manager)

Euch

Approved By: Paul Evans (Quality Manager





Date Approved:

11.1.17

GEO Sile & Tecling Service

GEO/016

Test Report: Determination of the California Bearing Ratio BS 1377: Part 4: 1990 Clause 7

Client ref:	60509148
Location:	St Athan Northern Access Road GI
Contract Number:	33562-
Sample Type:	В
Hole Number:	SK504
Sample Number:	N/A
Depth (m):	0.50 - 0.75
Description:	Brown silty CLAY.



Checked By: Emma Sharp (Office Manager)

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Approved By: Paul Evans (Quality Manager





Date Approved:

16.1.17

delo sito & Tecting Services Limited
Test Report: Determination of the California Bearing Ratio BS 1377: Part 4: 1990 Clause 7

Client ref:	60509148					
Location:	St Athan Northern Access Road G					
Contract Number:	33562-					
Sample Type:	В					
Hole Number:	SK508					
Sample Number:	N/A					
Depth (m):	0.50 - 0.95					
Description:	Brown silty CLAY.					



Checked By: Emma Sharp (Office Manager)

Euch

Approved By: Paul Evans (Quality Manager





iceding Service

Date Approved:





GEO/016

Test Report: Determination of the California Bearing Ratio BS 1377: Part 4: 1990 Clause 7

Client ref:	60509148				
Location:	St Athan Northern Access Road GI				
Contract Number:	33562-				
Sample Type:	В				
Hole Number:	SK509				
Sample Number:	N/A				
Depth (m):	0.80 - 1.30				
Description:	Brown silty CLAY.				







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Approved By: Paul Evans (Quality Manager





Date Approved:

16.1.17

Dry Density/Moisture Content Relationship BS 1377:Part 4:1990

Client ref:	60509148					
Location:	St Athan Northern Access Road G					
Contract Number:	33562-					
Hole Number:	SK502					
Sample Number:	N/A					
Depth (m):	0.35 - 0.70					
Sample Type:	В					
Description	Brown silty organic CLAY.					



Remarks:



Checked By: Emma Sharp

e R

Approved By: Paul Evans





Date Approved:

16.1.17

Dry Density/Moisture Content Relationship BS 1377:Part 4:1990

Client ref:	60509148					
Location:	St Athan Northern Access Road G					
Contract Number:	33562-					
Hole Number:	SK509					
Sample Number:	N/A					
Depth (m):	0.35 - 0.80					
Sample Type:	В					
Description:	Brown gravelly silty CLAY.					



Remarks:



Checked By: Emma Sharp

und 2

Approved By: Paul Evans





Date Approved:

16.1.17

SUMMARY OF SHEAR STRENGTH TESTS (TOTAL STRESS)

(BS 1377 : PART 7 : 3 : 1990)

Client ref: Location: **Contract Number:**

60509148 St Athan Northern Access Road GI 33562-

								Undrained Triaxial Compession Tests (Total Stress)							
Borhole	Sample	Sample	Sample	Sample	Moisture	Bulk	Dry	Size	Lateral	Cohesion	Average	Failure	Type	Hand Vane	
Number	Number	Depth	Depth	Type	Content	Density	, Density		Pressure	1/2(s1-s2)	Cohesion	Strain	of	kPa	
		from	to						S 3				Failure		
		m	m		%	Mg/m ³	Mg/m ³	mm	kPa	kPa	kPa	%		Peak	Residual
SK504		0.50	0.75	В										47	18
SK507		0.30	0.55	В										56	23
SK509		0.35	0.80	В										62	32

SYMBOLS: RM: Remoulded MS: Multistage B: Brittle P: Plastic C: Compound Vane Size : 19mm/33



BBR DPGIONS

24/01/17

Checked by:

Approved by:

Date of approval: