

Our Ref: 11116/LO.002/GD

Mr. C. Jones David Wilson Homes (Mercia) Building 2020 Meriden Business Park Copse Drive Meriden COVENTRY CV5 9RG

30 August 2011

By e-mail

Dear Chris

KM8 AND KM12 KINGSMERE, BICESTER SOAKAWAY TEST RESULTS

Further to your e-mail of 17 August 2011 we have attended the above sites and have undertaken infiltration testing in trial pits across the two areas.

Please find attached the logs of 6 No trial pits annotated TP1 to TP6. Trial Pits 1 to 4 were located in Zone KM 12 whilst Trial Pits 5 and 6 were located within Zone KM 8. You will note from the trial pit logs that the ground generally comprised topsoil over stiff clays which in turn lay over limestone at varying depth. The limestone was generally located between 1.4 and 2.1m below ground level in Zone KM12 and at 2.6 to 2.7m below ground level in KM8.

The clays encountered across the site at shallow depth (which were in general stiff) made the use of soakaways in these strata problematic however the existence of the limestone did provide some possibility that the use of soakaways in the development may be feasible. Consequently each pit was excavated so as to penetrate the clay and expose the limestone at the base of each pit. Significantly deepening the pits in the limestone proved beyond the capability of the JCB 3CX as the limestone is strong and intact and consequently very difficult to excavate.

Water was added to each pit and the soakage rate through the top of the limestone noted in accordance with BRE Digest 365:2007. Please find attached the soakaway test results.

You will note that the soakaway tests conducted in Zone KM12 provided a range of results from 5.81×10^{-6} m/s to 9.9×10^{-7} m/s: however the water in those tests conducted in KM 8 failed to soak away sufficiently for a permeability to be calculated.

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We trust that the above and attached is self explanatory however should you have any queries please do not hesitate to contact us

Yours sincerely

1 Donier

Geoff Davies Director

mobile: 07814 127780 geoff.davies@georisk-uk.com

deo	risk			Georisk Manage Tel: 0121 553 40 email: enquiries@	ment Ltd)44 @georisk-uk.com		Trialpit No TP1)
	EMENT			www.georisk-uk.	com		Sheet 1 of	1
Project Name	;		F	Project No.	Co-ords: -		Date	
Kingsmere, E				11116	Level: -		24/08/201	1
Equipment: J	CB 3CX				Dimensions:	1.70m	Scale 1:25	
					Depth 5 1.90m 7			
	avid Wilson Ho				1.90m 0		Logged By GD	/
Samples & InDepth (m)Type	Results	Depth (m) (Level (m AOD) Lege	end	Stratum I	Description		
		0.20		Stiff orange-bro limestone.	own and grey CLAY with oc	DPSOIL with many rootlets.		-
		1.40		Orange-brown		ry clayey gravelly SAND. Gravel	is	- 1 - -
		1.70	1	Very closely fra	actured light grey LIMESTC	NE; strong. Recovered as angul obble of limestone with occasion	ar	
		1.90	1	sandy matrix.			ai 	-
								-
								-
Remarks: Groundwater:	Pit sides stable. Groundwater not	t encou	ntered durir	ng excavation.			AGS	5

	با م ا			G	Georisk Manageme	nt Ltd		Trialpit No)
deo	risk			е	el: 0121 553 4044 mail: enquiries@ge	eorisk-uk.com		TP2	
MANA	GEMENT			W	ww.georisk-uk.con	1		Sheet 1 of	1
Project Nar	me			Proj	ect No.	Co-ords: -		Date	
Kingsmere	, Bicester			111	16	Level: -		24/08/201	1
Equipment	JCB 3CX					Dimensions:	2.10m	Scale	
						Depth LS 2.20m O		1:25	
Client:	David Wilson Ho	mes N	/lercia			2.20m 0		Logged By GD	/
Samples & Depth (m) Type	In Situ Testing e Results	Depth (m)	Level (m AOD)	Legend		Stratum [Description		
		0.20			to medium limesto	ne. y locally orange-brown	with rare gravel of subrounded slightly gravelly CLAY. Gravel is		-
									1
		2.00 2.10			Orange-brown clay angular fine to mee	vey gravelly SAND with dium limestone	occasional cobble. Gravel/cobb	le is	-2
		2.20			Recovered as ang	ght grey locally yellow-t ular to subangular fine t asional sandy matrix. Trialpit Compl	orown LIMESTONE; strong. o coarse gravel and cobble of ete at 2.20 m	; ; ; ;	-
									- 3
									- - - - - -
Remarks:	Pit sides stable.								-
Groundwater:			untered of	during e	excavation.			AGS	5

georisk			Georisk Managem Tel: 0121 553 404 email: enquiries@g www.georisk-uk.co	4 georisk-uk.com		Trialpit No TP3	
MANAGEMENT Project Name			ject No.	Co-ords: -		Sheet 1 of 1 Date	_
Kingsmere, Bicester			116	Level: -		24/08/2011	
Equipment: JCB 3CX						Scale	_
				Depth		1:25	
Client: David Wilson Ho			1	Depth 5 1.80m 6 0		Logged By GD	
Samples & In Situ Testing epth (m) Type Results	Depth (m) (i	Level m AOD) Legend		Stratum Descr	iption		
ptn (m) Type Results	0.20 0.50 1.60 1.70 1.80		Rough grass ove Stiff brown mottle Stiff grey locally r medium limeston Gravel is angular Orange-brown sa coarse limestone Closely fractured	r brown clayey TOPSOIL. ed grey CLAY. nottled brown CLAY with rare g e.Occasional pocket of orange fine to medium limestone. andy gravelly CLAY. Gravel is a	ravel of angular fine to -brown sandy gravelly cl ngular to subangular fin ed as angular to subang th occasional sandy mat	le to	2
						- - - - - - - - - - - - - - - - - - -	3
							Standard Traipt Log v2 dated 27th Nov 03
Remarks: Pit sides stable Groundwater: Groundwater no		I	1			AGS	E 3.1 (Bkd 422.20) (

deo	risk		T	Georisk Managen Fel: 0121 553 404 email: enquiries@	4 georisk-uk.com		Trialpit No TP4
	GEMENT		W	ww.georisk-uk.c	om		Sheet 1 of 1
Project Nam	ne		Proj	ect No.	Co-ords: -		Date
Kingsmere,	Bicester		111	16	Level: -		24/08/2011
Equipment:	JCB 3CX				Dimensions:	2.20m	Scale
					Depth န္ဟြ		1:25
	David Wilson Ho	omes M	ercia		Depth		Logged By GD
Samples & I Depth (m) Type	n Situ Testing Results	Depth (m) (Level m AOD) Legend		Stratum Descrip	otion	
	roound			Grass over stiff	prown clayey TOPSOIL.		-
		0.25		Stiff to very stiff	brown and orange-brown locally s	sandy CLAY.	
		0.60		Stiff to very stiff	grey and orange-brown locally slig	ghtly gravelly CLAY.	
				Gravel is suban	gular fine limestone.		
		1.00		Firm to stiff orar coarse limeston	ge-brown sandy gravelly CLAY. C e.	Gravel is angular fine to	
		1.40 1.50		Extremely close angular to suba	y fractured light grey LIMESTON ngular fine to coarse gravel and c	IE; strong. Recovered as obble of limestone with	
				` <u>occasional sand</u>	y matrix Trialpit Complete at 1.		'
							- 2
							-
							-
							-
							- 3
							-
							-
							- 4
							-
							-
							-
Remarks:	Pit sides stable.						
Groundwater:	Groundwater no	ot encour	ntered during e	excavation.			AGS

ge	0	risk			T e	Georisk Management Ltd iel: 0121 553 4044 mail: enquiries@georisk-uk.com ww.georisk-uk.com	Trialpit N TP5	
M A	NAG	EMENT				-	Sheet 1 o	f 1
Project Kingsm					Proj	ect No. Co-ords: - 16 Level: -	Date 24/08/201	11
Equipm						Dimensions: 2.10m	Scale	
Equipm	0111. 0						1:25	
Client:	D	avid Wilson Ho	mes N	lercia		Depth 5 2.80m 6	Logged B GD	Зу
	es & In : Type	Situ Testing Results	Depth (m)	Level (m AOD)	Legend	Stratum Description		
Dopar(iii)	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	roouko	0.40			Brown clayey TOPSOIL with rare angular fine gravel of limestone. Stiff orange-brown locally gravelly CLAY and clayey gravel. Gravel is angular fine to medium limestone.		
			2.60			Stiff blue-grey locally sandy CLAY. Occasional pockets of orange-brow sandy gravelly clay. Gravel is angular fine to medium limestone.	igular to	-1
			2.80			subangular fine to coarse gravel and cobble of limestone with occasior sandy matrix. Trialpit Complete at 2.80 m	iai	-3
Remarks:		Pit sides stable.		 			AG	S
Groundwa	ater:	Groundwater no	t encou	untered o	during e	xcavation.		- -

noorie		Tel:	orisk Managem 0121 553 4044	1		Trialpit No
CONSK email: enquiries@georisk-uk.com MANAGEMENT www.georisk-uk.com						TP6
	NT			1		Sheet 1 of 1
roject Name		Projec 11116		Co-ords: - Level: -		Date 24/08/2011
ingsmere, Bicester quipment: JCB 3C>)	Dimensions:	2.10m	Scale
					2.1011	1:25
lient: David W	ilson Homes Mero	cia		Depth 57 2.80m 0		Logged By GD
Samples & In Situ Testi		vel (OD) Legend		Stratum De	aarintian	
oth (m) Type Res	ults (m) (m A		Stiff brown clayey		sciption	
	0.25		Firm to stiff sandy limestone.	y gravelly CLAY. Gravel is a		
	0.90		Stiff blue-grey CL Gravel is angular	AY. Rare pockets of orang fine limestone.	e-brown sandy gravelly clay	-1
	2.70 2.80		Closely fractured subangular fine to sandy matrix.	pale grey LIMESTONE; str	ong. Recovered as angula of limestone with occasion	r to al
				Trialpit Complete	at 2.80 m	
						- 4 4
emarks: Pit side	es stable.					
						AGS

Trial Pit No.	TP1
Test No.	1

Time	Elapsed Time	Depth to water from ground level			
	(min)	(m)	(mm)		
	0	1.400	1400		
	2	1.42	1420		
	4	1.440	1440		
	15	1.490	1490		
	67	1.580	1580		
	119	1.63	1630		
	277	1.69	1690		
	297	1.70	1700		

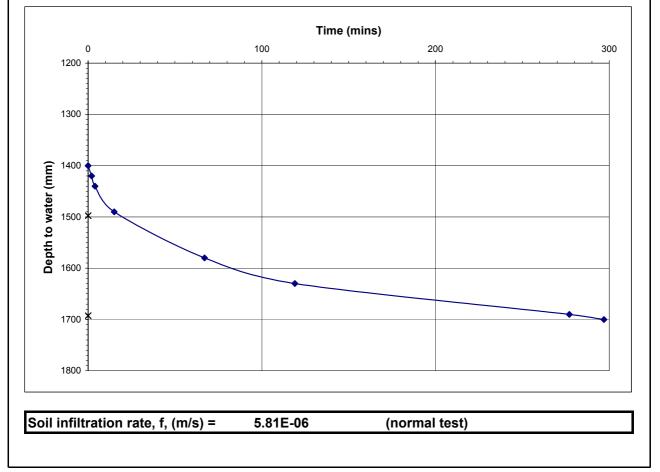
Soakaway Dimensions	(m)	(mm)
Length =	1.70	1700
Width =	0.45	450
Depth =	1.79	1790

Effective de	oth (empty)	mm	m
75%	=	1692.5	1.69
50%	=	1595.0	1.60
25%	=	1497.5	1.50

Depth at start of test (mm)	=	1400
Depth at end of test (mm)	=	1700

Base area of pit	=	0.765
$\mathbf{a_{p50}}$ - 50% internal surface area inc. base	=	1.604
V_{p75-25} - Volume 75 - 25%	=	0.149175

Read from the graph:			
t _{p 75} (min)	=	19	
t _{p 25} (min)	=	286	



Trial Pit No.	TP2
Test No.	1

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
	0	1.890	1890
	7	1.90	1900
	22	1.950	1950
	53	2.000	2000
	112	2.040	2040
	200	2.06	2060
	295	2.08	2080

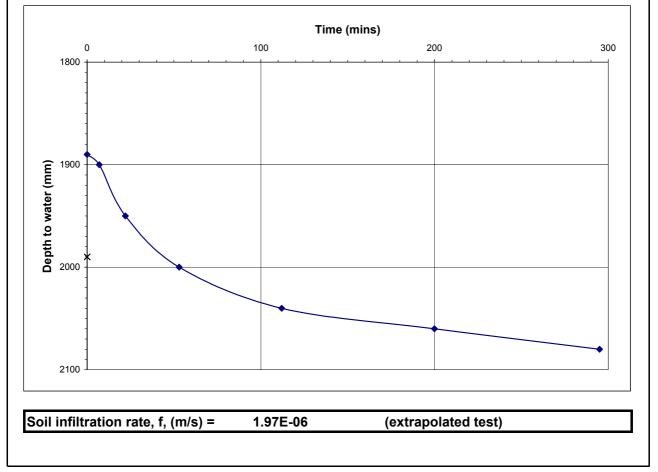
Soakaway Dimensions	(m)	(mm)
Length =	2.10	2100
Width =	0.45	450
Depth =	2.29	2290

Effective depth (empty)		mm	m
75%	=	2190.0	2.19
50%	=	2090.0	2.09
25%	=	1990.0	1.99

Depth at start of test (mm)	=	1890
Depth at end of test (mm)	=	2080

Base area of pit	=	0.945
$\mathbf{a_{p50}}$ - 50% internal surface area inc. base	=	1.965
V_{p75-25} - Volume 75 - 25%	=	0.189

Read from the gra		
t _{p 75} (min) =	45	
t _{p 25} (min) =	860	extrapolated



Trial Pit No.	TP3
Test No.	1

Time	Elapsed	Depth to water from ground level	
	Time		
	(min)	(m)	(mm)
	0	1.580	1580
	10	1.59	1585
	20	1.590	1590
	45	1.640	1640
	90	1.700	1700
	120	1.72	1720
	163	1.73	1730
	205	1.74	1735
	272	1.740	1740

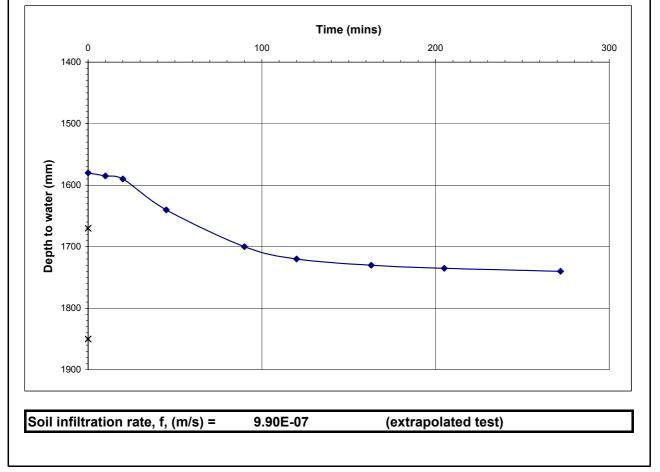
Soakaway Dimensions	(m)	(mm)
Length =	2.00	2000
Width =	0.45	450
Depth =	1.94	1940

Effective depth (empty)		mm	m
75%	=	1850.0	1.85
50%	=	1760.0	1.76
25%	=	1670.0	1.67

Depth at start of test (mm)	=	1580
Depth at end of test (mm)	=	1740

Base area of pit	=	0.9
a_{p50} - 50% internal surface area inc. base	=	1.782
V_{p75-25} - Volume 75 - 25%	=	0.162

Read from the graph:		
t _{p 75} (min) =	60	
t _{p 25} (min) =	1590	extrapolated



Trial Pit No.	TP4
Test No.	1

Time	Elapsed Time	Depth to water from ground level	
	1		
	(min)	(m)	(mm)
	0	1.340	1340
	15	1.36	1360
	35	1.380	1380
	74	1.400	1400
	124	1.420	1420
	184	1.44	1440
	269	1.45	1450

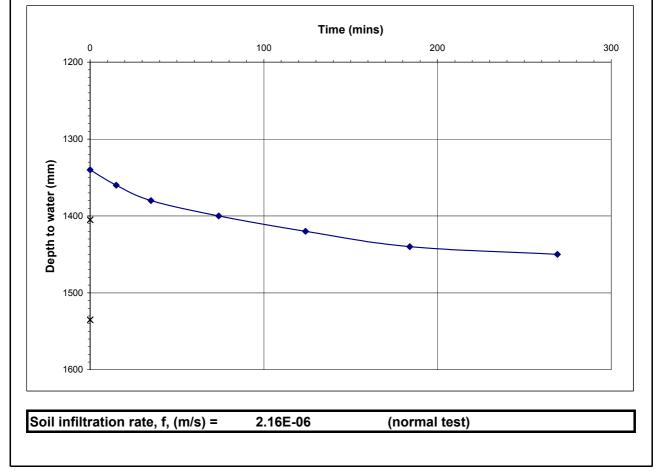
Soakaway Dimensions	(m)	(mm)
Length =	2.20	2200
Width =	0.45	450
Depth =	1.60	1600

Effective dep	th (empty)	mm	m
75%	=	1535.0	1.54
50%	=	1470.0	1.47
25%	=	1405.0	1.41

Depth at start of test (mm)	=	1340
Depth at end of test (mm)	=	1450

Base area of pit	=	0.99
a_{p50} - 50% internal surface area inc. base	=	1.679
V_{p75-25} - Volume 75 - 25%	=	0.1287

Read from the graph:		
t _{p 75} (min) =	88	
t _{p 25} (min) =	680	extrapolated



Client: David Wilson Homes Mercia Job Name: Kingsmere, Bicester Job No.: 11116

Trial Pit No.	TP5
Test No.	1

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
	0	2.410	2410
	10	2.41	2410
	18	2.420	2420
	40	2.420	2420
	85	2.420	2420
-	126	2.43	2425
	206	2.44	2440
	302	2.44	2440

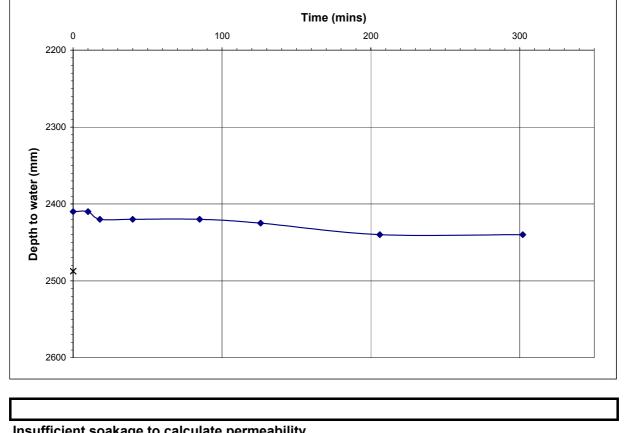
Soakaway Dimensions	(m)	(mm)
Length =	2.10	2100
Width =	0.45	450
Depth =	2.72	2720

Effective depth (empty)		mm	m
75%	=	2642.5	2.64
50%	=	2565.0	2.57
25%	=	2487.5	2.49

Depth at start of test (mm)	=	2410
Depth at end of test (mm)	=	2440

Base area of pit	=	0.945
a_{p50} - 50% internal surface area inc. base	=	1.736
V _{p75-25} - Volume 75 - 25%	=	0.146475

Read from the gra		
t _{p 75} (min) =	0	
t _{p 25} (min) =	0	extrapolated



Insufficient soakage to calculate permeability

Trial Pit No.	TP6
Test No.	1

Time	Elapsed Time	Depth to water from ground level	
	(min)	(m)	(mm)
	0	2.510	2510
	15	2.51	2510
	35	2.510	2510
	74	2.510	2510
	127	2.520	2520
	184	2.52	2520
	269	2.53	2530
	306	2.53	2530

Soakaway Dimensions	(m)	(mm)
Length =	2.00	2000
Width =	0.45	450
Depth =	2.85	2850

Effective depth (empty)		mm	m
75%	=	2765.0	2.77
50%	=	2680.0	2.68
25%	=	2595.0	2.60

Depth at start of test (mm)	=	2510
Depth at end of test (mm)	=	2530

Base area of pit	=	0.9
a_{p50} - 50% internal surface area inc. base	=	1.733
V_{p75-25} - Volume 75 - 25%	=	0.153

Read from the gra		
t _{p 75} (min) =	0	
t _{p 25} (min) =	0	extrapolated

