

**TP04** 





TP05







**TP06** 



TP06



**TP07** 



**TP08** 



TP08

# **APPENDIX 3** – Cable Percussion Records



Ground Investigations Ireland Ltd				Site Cartron Oranmore		Boreh Numbo BH0	ole er 1			
Machine : Da Method : Ca	ando 2000 able Percussion	Casing 20	<b>Diamete</b> Omm cas	r ed to 1.10m	Ground Level (mOD) 12.44		Client AKM Design		Job Numbe 12674-03	<b>er</b> 3-23
		Locatio	<b>n</b> 6254.6 E	725244.4 N	Dates 12	/05/2023	Engineer		Sheet 1/1	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.50	В				11.34		Brown grey slightly sandy slightly gravelly CLAY wti cobbles. Gravel is subangular to subrounded fine to Refusal at 1.10m	ih some o coarse.		
Remarks No groundwa Cable Percus Borehole bad	ater encountered du ssion refusal at 1.10 ckfilled on completio	ring drilling m BGL. n.	g.		1			Scale (approx)	Logge By	d
Chiselling fro	om 0.90m to 1.10m f	or 1 hour.						1:50 Figure N	NG	
								12674-03	ა-∠3.BH(	1.I

	Grou	Ground Investigations Ireland Ltd				Ltd	Site Cartron Oranmore	Borehole Number BH02	
Machine : D Method : C	Dando 2000 Cable Percussion	Casing 20	Diamete Omm cas	<b>r</b> ed to 1.50m	Ground Level (mOD) 7.33		l (mOD)	Client AKM Design	Job Number 12674-03-23
		Locatio	<b>n</b> 6402 E 7	25218.1 N	Dates 12	2/05/2	023	Engineer	<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	D (Thie	epth (m) ckness)	Description	Legend Star
0.50 1.00-1.45 1.00 2.00-2.45 2.00 3.00-3.45 3.00 4.00-4.45 4.00 5.00-5.03 5.00	B SPT(C) N=8 B SPT(C) N=12 B SPT(C) N=27 B SPT(C) N=36 B SPT(C) 25*/25 S0/0 B			1,1/2,2,2,2 2,2/3,2,3,4 3,4/5,5,7,10 3,3/3,8,11,14 25,0/50	6.83 4.88 3.88 2.33		(0.50) 0.50 (1.95) 2.45 (1.00) 3.45 (1.55) 5.00	TOPSOIL         Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine coarse.         Stiff brown grey slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is subangular to subrounded fine to coarse.         Very stiff greyish brown slightly sandy slightly gravelly CLAY with some cobbles. Gravel is subangular to subrounded fine to coarse.         Very stiff greyish brown slightly sandy slightly gravelly CLAY with some cobbles. Gravel is subangular to subrounded fine to coarse.         Refusal at 5.00m	
Remarks No groundw Cable Percu Borehole ba Chiselling fro	rater encountered du ission refusal at 5.00 ickfilled on completic om 4.70m to 5.00m f	ring drillin Im BGL. on. for 1 hour.	g.					(scale (approx) 1:50 Figure 12674-1	NG No. 03-23.BH02

	Ground Investigations Ireland Ltd			Site Cartron Oranmore		10le )er )3			
Machine : D	ando 2000	Casing	Diameter		Ground	Level (mOD)	Client	Job Numb	ber
Method : C	able Percussion	20	0mm case	ed to 1.00m		5.58	AKM Design	12674-0	3-23
		Locatio 53	<b>n</b> 6519.4 E	725281.8 N	Dates 12	2/05/2023	Engineer	Sheet 1/*	: 1
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					5.38	(0.20)	TOPSOIL		
0.50	В					(0.80)	Brown grey slightly sandy slightly gravelly CLAY with some cobbles. Gravel is subangular to subrounded fine to coarse.		•
1.00					4.58		Refusal at 1.00m		ed
No groundw Cable Percu Borehole ba	rater encountered du Ission refusal at 1.00 Ickfilled on completio	ring drillin Im BGL. In.	g.				(approx) 1:50	By <sup>39</sup> NG	
							Figure	No.	100

APPENDIX 4 – Soakaway Records





#### IT01A Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	4	-0.550
25/04/2023	10	-0.650
25/04/2023	25	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m 3.300	) Width of pit (m) 0.500			75-25Ht (m) 0.200	Vp75-25 (m3) 0.33
Tp75-25 (from graph) (s)		660		50% Eff Depth	ap50 (m2) 3 17
f =	1.577E-04	m/s		0.200	5.17



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#### IT01B

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	4	-0.550
25/04/2023	10	-0.600
25/04/2023	25	-0.700
25/04/2023	40	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m) 1.500	) Width of pit (m) 0.700			75-25Ht (m) 0.200	Vp75-25 (m3) 0.21
Tp75-25 (from graph) (s)		1320		50% Eff Depth	ap50 (m2) 1 93
f =	8.243E-05	m/s		0.200	1.00



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#### IT01A Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	18	-0.550
25/04/2023	34	-0.750
25/04/2023	51	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m) 3.300	) Width of pit (m) 0.500			75-25Ht (m) 0.200	Vp75-25 (m3) 0.33
Tp75-25 (from graph) (s)		900		50% Eff Depth	ap50 (m2) 3 17
f =	1.157E-04	m/s		0.200	0.17



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#### IT01B

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	18	-0.550
25/04/2023	34	-0.750
25/04/2023	62	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m) 1.500	) Width of pit (m) 0.700			75-25Ht (m) 0.200	Vp75-25 (m3) 0.21
Tp75-25 (from graph) (s)		1380		50% Eff Depth 0 200	ap50 (m2) 1 93
f =	7.885E-05	m/s		0.200	1.00



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#### IT01A Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	25	-0.600
25/04/2023	55	-0.800
25/04/2023	85	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m) 3.300	) Width of pit (m) 0.500			75-25Ht (m) 0.200	Vp75-25 (m3) 0.33
Tp75-25 (from g	raph) (s)	1800		50% Eff Depth	ap50 (m2)
f =	5.783E-05	m/s		0.200	5.17



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#### IT01B

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	25	-0.600
25/04/2023	55	-0.650
25/04/2023	85	-0.900

Start depth 0.50	Depth of Pit 0.900		Diff 0.400	75% full 0.6	25%full 0.8
Length of pit (m) 1.500	) Width of pit (m) 0.700			75-25Ht (m) 0.200	Vp75-25 (m3) 0.21
Tp75-25 (from g	raph) (s)	2940		50% Eff Depth	ap50 (m2) 1 93
f =	3.701E-05	m/s		0.200	1.00



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IT02A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	14	-0.600
25/04/2023	26	-0.600
25/04/2023	40	-0.650
25/04/2023	66	-0.725
25/04/2023	83	-0.800
25/04/2023	107	-0.850
25/04/2023	127	-0.925
25/04/2023	141	-1.000
25/04/2023	165	-1.000

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Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.500	1.000	0.75	1.25





IT02B

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 2.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	14	-0.500
25/04/2023	26	-0.600
25/04/2023	40	-0.700
25/04/2023	66	-0.800
25/04/2023	83	-0.900
25/04/2023	107	-0.950
25/04/2023	127	-1.000
25/04/2023	141	-1.050
25/04/2023	165	-1.100

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Start depth	Depth of Pit	Diff	75% full	25%full
0.50	2.000	1.500	0.875	1.625





#### IT02C

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.30m x 0.50m 1.10m (L x W x D)

Date	Time	Water level (m bgl)	
25/04/2023	0	-0.500	
25/04/2023	14	-0.500	
25/04/2023	26	-0.550	
25/04/2023	40	-0.600	
25/04/2023	66	-0.625	
25/04/2023	83	-0.700	
25/04/2023	107	-0.800	
25/04/2023	127	-0.850	
25/04/2023	141	-0.900	
25/04/2023	165	-0.950	

Start depth 0.50	Depth of Pit 1.100		Diff 0.600	75% full 0.65	25%full 0.95
Length of pit (m) 3.300	Width of pit (m) 0.500			75-25Ht (m) 0.300	Vp75-25 (m3) 0.50
Tp75-25 (from g	raph) (s)	5280		50% Eff Depth 0.300	ap50 (m2) 3.93



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# IT02A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	26	-0.600
25/04/2023	53	-0.700
25/04/2023	90	-0.800
25/04/2023	110	-0.850

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.500	1.000	0.75	1.25





IT02B

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 2.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	35	-0.600
25/04/2023	62	-0.750
25/04/2023	89	-0.850
25/04/2023	119	-0.900

#### \*Soakaway failed - Pit backfilled

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	2.000	1.500	0.875	1.625



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IT02C

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.10m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	33	-0.550
25/04/2023	62	-0.550
25/04/2023	89	-0.600
25/04/2023	119	-0.650

\*Soakaway failed - Pit backfilled

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.100	0.600	0.65	0.95



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## IT03A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 2.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	7	-0.650
25/04/2023	11	-0.800
25/04/2023	40	-0.975
25/04/2023	59	-1.100
25/04/2023	76	-1.150
25/04/2023	100	-1.180
25/04/2023	121	-1.220
25/04/2023	136	-1.250
25/04/2023	158	-1.280

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	2.000	1.500	0.875	1.625





#### IT03B

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.50m (L x W x D)

	Date	Time	Wate (m	er level bgl)		
25	/04/2023	0	-0.500			
25	/04/2023	7	-0.550			
25	/04/2023	11	-0.600			
25	/04/2023	40	-0.800	1		
25	/04/2023	59	-0.900	1		
25	/04/2023	76	-0.940	1		
25	/04/2023	100	-1.000	1		
25	/04/2023	121	-1.050	_		
25	/04/2023	136	-1.090			
25	/04/2023	158	-1.160			
25	/04/2023	190	-1.260			
Sta	art depth 0.50	Depth of Pit 1.500		Diff 1.000	75% full 0.75	25%full 1.25
Leng	th of pit (m) 3.000	Width of pit (m) 0.500			75-25Ht (m) 0.500	Vp75-25 (m3) 0.75
Tp75	-25 (from g	raph) (s)	9000		50% Eff Depth 0.500	ap50 (m2) 5
	f =	1.667E-05	m/s			
			IT03B F	irst		
100 0	20	40 60	80 10	00 120	140 160	180—200

-0.100 0 20 40 60 80 100 120 140 160 180 200 -0.300 -0.500 -0.700 -0.700 -1.100 -1.300

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## IT03A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	35	-0.600
25/04/2023	62	-0.750
25/04/2023	91	-0.850
25/04/2023	121	-0.900

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.500	1.000	0.75	1.25





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#### IT03C Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 3.00m x 0.50m 1.20m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.400
25/04/2023	7	-0.450
25/04/2023	11	-0.500
25/04/2023	40	-0.550
25/04/2023	59	-0.600
25/04/2023	76	-0.650
25/04/2023	100	-0.750
25/04/2023	121	-0.800
25/04/2023	136	-0.850
25/04/2023	158	-0.850

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.200	0.700	0.675	1.025





# IT04A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.30m x 0.50m 1.90m (L x W x D)

Date	Time	Water level (m bgl)	
25/04/2023	0	-0.500	
25/04/2023	14	-0.600	
25/04/2023	35	-0.750	
25/04/2023	53	-0.900	
25/04/2023	71	-1.000	
25/04/2023	95	-1.100	
25/04/2023	116	-1.150	
25/04/2023	131	-1.200	
25/04/2023	158	-1.300	
25/04/2023	210	-1.550	

Start depth 0.50	Depth of Pit 1.900		Diff 1.400	75% full 0.85	25%full 1.55
Length of pit (m) 2.300	Width of pit (m) 0.500			75-25Ht (m) 0.700	Vp75-25 (m3) 0.81
Tp75-25 (from g	raph) (s)	9900		50% Eff Depth 0.700	ap50 (m2) 5.07



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#### IT04B

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.30m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	14	-0.650
25/04/2023	35	-0.700
25/04/2023	53	-0.800
25/04/2023	71	-0.900
25/04/2023	95	-0.950
25/04/2023	116	-1.000
25/04/2023	131	-1.100
25/04/2023	158	-1.150
25/04/2023	198	-1.250

Start depth 0.50	Depth of Pit 1.500		Diff 1.000	75% full 0.75	25%full 1.25
Length of pit (m) 2.300	Width of pit (m) 0.500			75-25Ht (m) 0.500	Vp75-25 (m3) 0.58
Tp75-25 (from g	raph) (s)	9300		50% Eff Depth 0.500	ap50 (m2) 3.95



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#### IT04C Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.00m x 0.50m 1.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	14	-0.650
25/04/2023	35	-0.650
25/04/2023	53	-0.650
25/04/2023	71	-0.650
25/04/2023	95	-0.700
25/04/2023	116	-0.700
25/04/2023	131	-0.700
25/04/2023	158	-0.750
25/04/2023	205	-0.780

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.000	0.500	0.625	0.875





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# IT04A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.30m x 0.50m 1.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	36	-0.750
25/04/2023	72	-1.000
25/04/2023	109	-1.130
25/04/2023	131	-1.200
25/04/2023	152	-1.220

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.900	1.400	0.85	1.55





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# IT04B

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.30m x 0.50m 1.50m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	36	-0.700
25/04/2023	72	-0.800
25/04/2023	109	-0.900
25/04/2023	131	-0.950
25/04/2023	152	-1.000

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	1.500	1.000	0.75	1.25





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#### IT04C

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.00m x 0.50m 1.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.300
25/04/2023	36	-0.400
25/04/2023	72	-0.450
25/04/2023	109	-0.510
25/04/2023	131	-0.550
25/04/2023	155	-0.600

Start depth	Depth of Pit	Diff	75% full	25%full
0.30	1.000	0.700	0.475	0.825





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#### IT05A

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.80m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2023	0	-0.500
25/04/2023	22	-0.500
25/04/2023	58	-0.500
25/04/2023	100	-0.500
25/04/2023	127	-0.500
25/04/2023	140	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	0.900	0.400	0.6	0.8





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# IT05B

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 2.20m x 0.50m 0.90m (L x W x D)

Date	Time	Water level (m bgl)	
25/04/2023	0	-0.500	
25/04/2023	22	-0.500	
25/04/2023	58	-0.500	
25/04/2023	100	-0.500	
25/04/2023	127	-0.500	
25/04/2023	140	-0.510	

Start depth	Depth of Pit	Diff	75% full	25%full
0.50	0.900	0.400	0.6	0.8


# **APPENDIX 5** – Insitu Plate Bearing Test Records



Applied Load	Gauge settlement
0	0.000
34.5	-3.3115
69	-4.815
138	-7.6895
0	-7.196
69	-7.6395
138	-8.354
0	-7.884

12674-03-23

27/04/2023

CBR-01

AKM Design

LOCATION

DATE

CLIENT

TEST NO.

CONTRACT NO.

PLATE DIAMETER 457mm



Brownish grey clayey sandy GRAVEL with many cobbles.

500mm



MATERIAL

DEPTH

NOTES

SAMPLES

Modulus of subgrade reaction, K (Initial) =	9.68 MN/m2/m
Modulus of subgrade reaction, K (Reload) =	105.13 MN/m2/m
Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	= 0.49 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2	= 30.76 %

Applied Load	Gauge settlement
0	0.000
34.5	-2.958
69	-4.0605
138	-5.838
0	-5.6175
69	-5.8265
138	-6.0425
0	-5.841

12674-03-23 27/04/2023

AKM Design

LOCATION

DATE CLIENT

CONTRACT NO.

PLATE DIAMETER 457mm



Geotechnical & Environmental

Grey clayey sandy GRAVEL with cobbles.

500mm



MATERIAL

DEPTH

NOTES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 11.48 MN/m2/m 223.08 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	0.66 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 =	113.29 %

Applied Load	Gauge settlement
0	0.000
34.5	-0.7445
69	-2.3495
138	-7.1045
0	-3.968
69	-6.036
138	-8.143
0	-4.9325

12674-03-23 26/04/2023

AKM Design

LOCATION

DATE CLIENT

CONTRACT NO.

PLATE DIAMETER 457mm



Brown slightly sandy slighty gravelly CLAY.

450mm



MATERIAL

DEPTH

NOTES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 19.84 MN/m2/m 22.55 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	1.71 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 =	2.13 %

Applied Load	Gauge settlement
0	0.000
34.5	-2.876
69	-4.5935
138	-7.991
0	-5.945
69	-7.497
138	-8.8225
0	-6.919

12674-03-2023

26/05/2023

CBR-04

AKM Design

LOCATION

DATE

CLIENT

TEST NO.

CONTRACT NO.

PLATE DIAMETER 457mm



GROUND INVESTIGATIONS IRELAND Geotechnical & Environmental

Brown slightly sandy slightly gravelly CLAY

500mm



MATERIAL

DEPTH

NOTES SAMPLES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 10.15 MN/m2/m 30.04 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/	94 volume7 section2 =	0.54 %
Equivalent CBR(reload)in accordance with HD25	5/94 volume7 section2 =	3.51 %

Applied Load	Gauge settlement
0	0.000
34.5	-5.971
69	-8.162
138	-12.4305
0	-10.6225
69	-12.073
138	-13.593
0	-11.9025

12674-03-2023

26/04/2023 AKM Design

457mm

LOCATION

DATE

CLIENT

CONTRACT NO.

PLATE DIAMETER



Geotechnical & Environmental

Brown slightly sandy slightly gravelly CLAY with some cobbles.

0.45m



MATERIAL

DEPTH

NOTES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 5.71 MN/m2/m 32.14 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	0.20 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 =	3.95 %

Applied Load	Gauge settlement
0	0.000
34.5	-0.795
69	-1.071
138	-1.902
0	-1.519
69	-1.8255
138	-2.082
0	-1.6395

12674-03-23

26/04/2023

Akm Design

457mm

LOCATION

DATE

CLIENT

CONTRACT NO.

PLATE DIAMETER



Geotechnical & Environmental

Grey slightly sandy slightly gravelly CLAY with many cobbles.

0.55m



MATERIAL

DEPTH

NOTES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 43.53 MN/m2/m 152.12 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	6.67 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 =	58.35 %

Applied Load	Gauge settlement
0	0.000
34.5	-3.783
69	-5.813
138	-10.958
0	-4.704
69	-9.298
138	-12.016
0	-6.0045

12674/03/23 26/04/2023

AKM Design

LOCATION

DATE CLIENT

CONTRACT NO.

PLATE DIAMETER 457mm



Brown slightly sandy slightly gravelly CLAY.

0.60m



MATERIAL

DEPTH

NOTES

Modulus of subgrade reaction, K (Initial) = Modulus of subgrade reaction, K (Reload) = 8.02 MN/m2/m 10.15 MN/m2/m

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 =	0.36 %
Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 =	0.54 %

**APPENDIX 6** – Laboratory Testing





Element Materials Technology Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA P: +44 (0) 1244 833780 F: +44 (0) 1244 833781

W: www.element.com

Ground Investigations Ireland Catherinestown House Hazelhatch Road Newcastle Co. Dublin Ireland D22 K5P8		BC-MRA	UKAS TESTING 4225
Attention :	Eoin Bryne		
Date :	1st June, 2023		
Your reference :	12674-03-23		
Our reference :	Test Report 23/7911 Batch 1		
Location :	Cartron Cranmore		
Date samples received :	18th May, 2023		
Status :	Final Report		
Issue :	1		

Nine samples were received for analysis on 18th May, 2023 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Ly Kn

Liza Klebe Project Co-ordinator

Please include all sections of this report if it is reproduced



Ground Investigations Ireland 12674-03-23 Cartron Cranmore Eoin Bryne 23/7911

### Report : Solid

ENT SOD NO.	20//011											
EMT Sample No.	1-4	5-8	9-12	13-16	17-18	19-20	21-24	25-28	29-32			
Sample ID	IT02A	IT03C	IT04B	TP02	TP04	TP05	TP06	TP07	TP08			
Depth	1.00	1.00	0.50	1.00	1.50	1.50	0.50	0.50	0.50	 Diagona	o ottoobod r	atao far all
COC No / misc										 abbrevi	ations and a	cronyms
Containara	VIT	VIT	VIT	VIT	- T	- T	VIT	VIT	VIT			
Containers	VJI	VJI	VJI	VJI		'	VJI	VJI	VJI			
Sample Date	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023			
Sample Type	Soil			1								
Batch Number	1	1	1	1	1	1	1	1	1		Linite	Method
Date of Receipt	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	LODIEOIR	Onito	No.
Antimony	<1	<1	<1	<1	-	-	<1	1	2	<1	mg/kg	TM30/PM15
Arsenic <sup>#</sup>	5.5	3.7	8.6	3.5	-	-	3.1	15.0	10.5	<0.5	mg/kg	TM30/PM15
Barium <sup>#</sup>	23	19	32	10	-	-	20	51	69	<1	mg/kg	TM30/PM15
Cadmium <sup>#</sup>	0.7	0.6	0.9	0.4	-	-	0.8	1.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	19.8	26.2	42.5	13.0	-	-	27.5	84.9	81.7	<0.5	mg/kg	TM30/PM15
Copper <sup>#</sup>	8	6	7	5	-	-	5	11	14	<1	mg/kg	TM30/PM15
Lead <sup>#</sup>	25	14	40	20	-	-	7	89	54	<5	mg/kg	TM30/PM15
Mercury <sup>#</sup>	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum <sup>#</sup>	1.0	1.3	2.3	0.8	-	-	1.4	4.5	4.1	<0.1	mg/kg	TM30/PM15
Nickel <sup>#</sup>	10.2	8.5	16.5	7.1	-	-	9.8	28.1	24.4	<0.7	mg/kg	TM30/PM15
Selenium <sup>#</sup>	<1	<1	<1	<1	-	-	<1	<1	1	<1	mg/kg	TM30/PM15
Zinc <sup>#</sup>	27	21	39	20	-	-	15	78	64	<5	mg/kg	TM30/PM15
PAH MS												
Naphthalene <sup>#</sup>	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene <sup>#</sup>	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	-	-	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	-	-	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene <sup>#</sup>	<0.02	<0.02	<0.02	<0.02	-	-	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene <sup>#</sup>	<0.07	<0.07	<0.07	<0.07	-	-	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene <sup>#</sup>	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene#	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene <sup>#</sup>	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	-	-	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total <sup>#</sup>	<0.22	<0.22	<0.22	<0.22	-	-	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	-	-	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	-	-	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	-	-	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	77	97	94	-	-	94	97	94	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	<30	<30	-	-	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16
												-
												-
												-



Ground Investigations Ireland 12674-03-23 Cartron Cranmore Eoin Bryne 23/7911

### Report : Solid

EMT Sample No.	1-4	5-8	9-12	13-16	17-18	19-20	21-24	25-28	29-32			
Sample ID	IT02A	IT03C	IT04B	TP02	TP04	TP05	TP06	TP07	TP08			
Depth	1.00	1.00	0.50	1.00	1.50	1.50	0.50	0.50	0.50	 Please se	e attached n	otes for all
COC No / misc										 abbrevi	ations and a	cronyms
Containers	VJT	VJT	VJT	VJT	т	т	VJT	VJT	VJT			
Sample Date	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023			
Sample Tune	0-1	0.04/2020	0.04/2020	0.04/2020	0.04/2020	0.04/2020	0.04/2020	0.04/2020	0.04/2020			
Sample Type	501	Soli	Soli	Soli	501	Soli	Soli	Soll	Soli	 		
Batch Number	1	1	1	1	1	1	1	1	1	 LOD/LOR	Units	Method
Date of Receipt	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023			NO.
TPH CWG												
Aliphatics												
>C5-C6 (HS_1D_AL)*	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	 <0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)*	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	 <0.2	mg/kg	TM5/PM0/PM10
>C12-C16 (EH_CU_1D_AL)	<7	<7	<7	<7	-	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C21 (EH_CU_1D_AL)#	<7	<7	<7	<7	_	_	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_1D_AL)	<7	<7	<7	<7	-	-	<7	<7	<7	 <7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH+HS 1D AL)	<26	<26	<26	<26	-	-	<26	<26	<26	<26	ma/ka	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS 1D AL)	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	<10	<10	<10	<10	-	-	<10	<10	<10	 <10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	<10	<10	<10	<10	-	-	<10	<10	<10	 <10	mg/kg	TM5/PM8/PM16
Aromatics												
>C5-EC7 (HS_1D_AR) <sup>#</sup>	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) <sup>#</sup>	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4	-	-	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) <sup>#</sup>	<7	<7	<7	<7	-	-	<7	<7	<7	 <7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	<7	<7	-	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_1D_AR)	<7	<7	<7	<7	-	-	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH+HS_1D_AR)	<26	<26	<26	<26	-	-	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	<52	<52	<52	<52	-	-	<52	<52	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)*	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	 <0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	<10	<10	<10	<10	-	-	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	<10	<10	<10	<10	-	-	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTRE #	<5	<5	<5	<5	_	_	<5	<5	<5	<5	ua/ka	TM36/DM12
Benzene <sup>#</sup>	<5	<5	<5	<5	_	-	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	 <5	ug/kg	TM36/PM12
Ethylbenzene <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xvlene <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	 <5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 <sup>#</sup>	<5	<5	<5	<5	-	-	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs <sup>#</sup>	<35	<35	<35	<35	-	-	<35	<35	<35	<35	ug/kg	TM17/PM8



Ground Investigations Ireland 12674-03-23 Cartron Cranmore Eoin Bryne 23/7911

### Report : Solid

EMT 300 NO.	20/1011											
EMT Sample No.	1-4	5-8	9-12	13-16	17-18	19-20	21-24	25-28	29-32			
Sample ID	IT02A	IT03C	IT04B	TP02	TP04	TP05	TP06	TP07	TP08			
Depth	1.00	1.00	0.50	1.00	1.50	1.50	0.50	0.50	0.50	Please se	e attached n	otes for all
COC No / misc										abbrevi	ations and ac	cronyms
Containers	VJT	VJT	VJT	VJT	т	т	VJT	VJT	VJT	 ĺ		
Sample Date	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	1		
Sample Type	Soil	 1										
Batch Number	1	1	1	1	1	1	1	1	1			
Date of Receipt	19/05/2022	19/05/2022	19/05/2022	19/05/2022	19/05/2022	19/05/2022	19/05/2022	19/05/2022	19/05/2022	 LOD/LOR	Units	Method No.
Natural Moisture Content	11 5	10/03/2023	12 /	6.5	10/03/2023	16/05/2025	0 1	16/03/2023	26.0	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	10.3	9.8	12.4	6.1	-	-	8.3	14.1	20.0	<0.1	%	PM4/PM0
Hexavalent Chromium <sup>#</sup>	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) <sup>#</sup>	0.0050	-	-	0.0037	0.0043	0.0035	-	-	-	<0.0015	g/l	TM38/PM20
Chromium III	19.8	26.2	42.5	13.0	-	-	27.5	84.9	81.7	<0.5	mg/kg	NONE/NONE
Total Organic Carbon <sup>#</sup>	0.40	0.17	0.29	0.15	-	-	0.17	0.70	1.03	<0.02	%	TM21/PM24
pH <sup>#</sup>	8.59	8.79	8.51	8.68	8.80	8.90	8.75	8.49	7.94	<0.01	pH units	TM73/PM11
Asbestos Type*	NAD	NAD	NAD	NAD	-	-	NAD	NAD	NAD		None	Subcontracted
Mass of raw test portion	0.0999	0.1063	0.1016	0.0994	-	-	0.102	0.1029	0.1188		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	-	-	0.09	0.09	0.09		кg	NONE/PM17



Ground Investigations Ireland 12674-03-23 Cartron Cranmore Eoin Bryne 23/7911

### Report : CEN 10:1 1 Batch

											-		
EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32						
Sample ID	IT02A	IT03C	IT04B	TP02	TP06	TP07	TP08						
Depth	1.00	1.00	0.50	1.00	0.50	0.50	0.50				Please se	e attached n	otes for all
COC No / misc											abbrevi	ations and a	cronyms
Containers	VJT												
Sample Date	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023						
Comple Date	0.1	0.1	0.1	0.1	0.1	0.1	0.1						
Sample Type	Soli	Soli	Soli	Soli	501	Soli	Soli						1
Batch Number	1	1	1	1	1	1	1				LOD/LOR	Units	Method
Date of Receipt	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023						NO.
Dissolved Antimony#	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10)#	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				<0.02	mg/kg	TM30/PM17
Dissolved Arsenic <sup>#</sup>	<0.0025	<0.0025	0.0036	<0.0025	<0.0025	<0.0025	0.0027				<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10)#	<0.025	<0.025	0.036	<0.025	<0.025	<0.025	0.027				<0.025	mg/kg	TM30/PM17
Dissolved Barium#	<0.003	< 0.003	<0.003	<0.003	<0.003	<0.003	0.009				<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.09				<0.03	mg/kg	TM30/PM17
Dissolved Cadmium <sup>#</sup>	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) <sup>#</sup>	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				<0.005	mg/kg	TM30/PM17
Dissolved Chromium <sup>#</sup>	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0015				<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) <sup>#</sup>	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015				<0.015	mg/kg	TM30/PM17
Dissolved Copper <sup>#</sup>	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007				<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) <sup>#</sup>	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07				<0.07	mg/kg	TM30/PM17
Dissolved Lead <sup>#</sup>	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) <sup>#</sup>	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum <sup>#</sup>	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004				<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.04				<0.02	mg/kg	TM30/PM17
Dissolved Nickel <sup>#</sup>	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10)#	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				<0.02	mg/kg	TM30/PM17
Dissolved Selenium <sup>#</sup>	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM30/PM17
Dissolved Zinc <sup>#</sup>	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.004				<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) <sup>#</sup>	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04				<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	<0.00001				<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001				<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM26/PM0
Fluoride	0.7	0.4	0.5	< 0.3	0.7	0.6	1.1				<0.3	ma/l	TM173/PM0
Fluoride	7	4	5	<3	7	6	11				<3	ma/ka	TM173/PM0
		-	-	-							-		
Sulphate as SO4 #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7				<0.5	mg/l	TM38/PM0
Sulphate as SO4 <sup>#</sup>	<5	<5	<5	<5	<5	<5	7				<5	ma/ka	TM38/PM0
Chloride <sup>#</sup>	< 0.3	< 0.3	<0.3	<0.3	<0.3	< 0.3	0.4				<0.3	ma/l	TM38/PM0
Chloride <sup>#</sup>	<3	<3	<3	<3	<3	<3	4				<3	ma/ka	TM38/PM0
	-	-	-	-	-	-	-				-		
Dissolved Organic Carbon	3	2	3	<2	<2	4	6				<2	ma/l	TM60/PM0
Dissolved Organic Carbon	30	<20	30	<20	<20	40	60				<20	ma/ka	TM60/PM0
pH	7.70	8.19	8.31	8.16	8.17	8.21	8.28				<0.01	pH units	TM73/PM0
Total Dissolved Solids #	51	36	65	36	<35	56	100				<35	ma/l	TM20/PM0
Total Dissolved Solids	510	360	650	360	<350	560	1000				<350	ma/ka	TM20/PM0
I Star Dissonred Guilds	010	000	000		-000		1000				-000	maring	
													-
	1	1	1	1	1	1	1	1	1	1	(	1	1

Client Name:Ground InvegeeReference:12674-03-2Location:Cartron CratContact:Eoin Bryne

Ground Investigations Ireland 12674-03-23 Cartron Cranmore

#### Report : EN12457\_2

EMI JOB NO:	23/7911									_					
EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32								
Sample ID	IT02A	IT03C	IT04B	TP02	TP06	TP07	TP08								
Depth	1.00	1.00	0.50	1.00	0.50	0.50	0.50						Please se	e attached n	otes for all
COC No / misc													abbrevi	ations and a	cronyms
Containers	VJT														
Sample Date	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023	16/04/2023								
Sample Type	Soil														
Batch Number	1	1	1	1	1	1	1								
Date of Receipt	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023	18/05/2023			Inert	Stable Non- reactive	Hazardous	LOD LOR	Units	Nethod No.
Solid Waste Analysis	10/00/2020	10/00/2020	10/00/2020	10/03/2020	10/03/2020	10/03/2020	10/03/2020								
Total Organic Carbon <sup>#</sup>	0.40	0.17	0.29	0.15	0.17	0.70	1.03			3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025			6	-	-	<0.025	ma/ka	TM36/PM12
oun of Brex	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025			1	-	-	<0.025	mg/kg	TM30/FW12
Sum of 7 PCBs"	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035			1	-	-	<0.035	mg/kg	110117/P108
Mineral Oli	<30	<30	<30	<30	<30	<30	<30			500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 "	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22			-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64			100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate															
Arconic #	<0.025	<0.025	0.036	<0.025	<0.025	<0.025	0.027			0.5	2	25	<0.025	ma/ka	TM30/PM17
Porium #	<0.020	<0.020	<0.03	<0.020	<0.020	<0.020	0.00			20	100	300	<0.020	ma/ka	TM30/PM17
Dallulli O. L. : #	<0.00F	<0.00	<0.00F	<0.005	<0.00F	<0.005	<0.005			0.04	100	5000	<0.005	malka	TM30/DM417
Cadmium	~0.005	~0.005	-0.005	-0.005	~0.005	~0.005	~0.005			0.04	10	70	-0.005	iiig/kg	TM30/FM17
Chromium "	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015			0.5	10	70	<0.015	mg/kg	TN/50/PM17
Copper"	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07			2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001			0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.04			0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel <sup>#</sup>	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony <sup>#</sup>	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.04			4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids#	510	360	650	360	<350	560	1000			4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	30	<20	<20	40	60			500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	90.2	84.4	88.3	90.6	88.0	87.1	75.7			-	-	-	<0.1	%	NONE/PM4
Mojetura Content 105C (% Dry Weight)	10.0	19.5	13.2	10.3	13.7	14.9	32.1						<0.1	9/	DM4/DM0
Molatore Content 1000 (76 bity Weight)	10.5	10.5	13.2	10.5	13.7	14.0	52.1			-	-	-	~0.1	70	F 1014/F 1010
рН #	8.59	8.79	8.51	8.68	8.75	8.49	7.94			-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	7	4	5	<3	7	6	11			10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	<5	<5	<5	<5	<5	<5	7			1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	<3	<3	<3	<3	<3	<3	4			800	15000	25000	<3	mg/kg	TM38/PM0
			1	1				1	1				1		

	-	<b>n</b> - 1	
Matrix	-	SO	
<b>WAUIN</b>		00	IIЧ

Client Name:	Ground Investigations Ireland
Reference:	12674-03-23
Location:	Cartron Cranmore
Contact:	Eoin Bryne

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/7911	1	IT02A	1.00	1-4	No Interpretation Possible
23/7911	1	IT03C	1.00	5-8	No Interpretation Possible
23/7911	1	IT04B	0.50	9-12	No Interpretation Possible
23/7911	1	TP02	1.00	13-16	No Interpretation Possible
23/7911	1	TP06	0.50	21-24	No Interpretation Possible
23/7911	1	TP07	0.50	25-28	No Interpretation Possible
23/7911	1	TP08	0.50	29-32	No Interpretation Possible

Client Name:Ground Investigations IrelandReference:12674-03-23Location:Cartron Cranmore

Contact: Eoin Bryne

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/7911	1	IT02A	1.00	1-4	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
23/7911	1	IT03C	1.00	5-8	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, TOC	Sample holding time exceeded prior to receipt
23/7911	1	IT04B	0.50	9-12	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, TOC	Sample holding time exceeded prior to receipt
23/7911	1	TP02	1.00	13-16	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
23/7911	1	TP04	1.50	17-18	pH, Sulphate	Sample holding time exceeded prior to receipt
23/7911	1	TP05	1.50	19-20	pH, Sulphate	Sample holding time exceeded prior to receipt
23/7911	1	TP06	0.50	21-24	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, TOC	Sample holding time exceeded prior to receipt
23/7911	1	TP07	0.50	25-28	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, TOC	Sample holding time exceeded prior to receipt
23/7911	1	TP08	0.50	29-32	Cr VI, EPH, GRO, Metals, PAH, PCB, pH, TOC	Sample holding time exceeded prior to receipt

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

Matrix : Solid

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

**EMT Job No.:** 23/7911

### SOILS and ASH

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at  $35^{\circ}C \pm 5^{\circ}C$  unless otherwise stated. Moisture content for CEN Leachate tests are dried at  $105^{\circ}C \pm 5^{\circ}C$ . Ash samples are dried at  $37^{\circ}C \pm 5^{\circ}C$ .

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

### WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

### STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

### **DEVIATING SAMPLES**

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

### SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

### DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

# BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

### NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a requirement of our Accreditation Body for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation. Laboratory records are kept for a period of no less than 6 years.

### **REPORTS FROM THE SOUTH AFRICA LABORATORY**

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

### **Measurement Uncertainty**

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

### **Customer Provided Information**

Sample ID and depth is information provided by the customer.

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
w	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
со	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ОС	Outside Calibration Range

### HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/7911

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes

Method Code Appendix

EMT Job No: 23/7911

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co- elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co- elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes

EMT Job No: 23/7911

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377- 3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377- 3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AR	

Method Code Appendix



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# **Ground Investigations Ireland**

# **Cartron Galway Phase 2**

AKM Design

**Ground Investigation Report** 

December 2023

Directors: Fergal McNamara (MD), Conor Finnerty, Aisling McDonnell, Barry Sexton & Stephen Kealy Ground Investigations Ireland Limited | Registered in Ireland Company Registration No.: 405726





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# DOCUMENT CONTROL SHEET

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Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.





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# **GROUND INVESTIGATIONS IRELAND**

**Geotechnical & Environmental** 

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Appendix 2	Infiltration Test Records
Appendix 3	Dynamic Probe Records



### 1.0 Preamble

On the instructions of AKM Design, a site investigation was carried out by Ground Investigations Ireland Ltd., during October 2023 at the site of the proposed residential development on the Coast Road, Oranmore, Co. Galway.

### 2.0 . Overview

### 2.1. Background

It is proposed to construct a new residential development with associated services, access roads and car parking at the proposed site. The site is currently greenfield. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

### 2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 25 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 29 No. Dynamic Probes to determine soil strength/density characteristics
- Report with recommendations

# 3.0 Subsurface Exploration

# 3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and insitu testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling. The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

# 3.2. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level

was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 2 of this Report.

# 3.3. Dynamic Probing (DPH)

The dynamic probe tests (DPH) were carried out at the locations shown in the location plan in Appendix 1 in accordance with B.S. 1377: Part 9 1990. The test consists of mechanically driving a cone with a 50kg weight in 100mm intervals and monitoring the number of blows required. An equivalent Standard Penetration Test (SPT) 'N' value may be calculated by dividing the total number of blows over a 300mm drive length by 1.5. The dynamic probe logs are provided in Appendix 3 of this Report.

### 3.4. Surveying

The exploratory hole locations have been recorded using a KQ GEO Technologies KQ-M8 System which records the coordinates and elevation of the locations to ITM as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

### 4.0 Ground Conditions

### 4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were consistent across the site and generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits

TOPSOIL: Topsoil was encountered in IT25 and was present to a depth of 0.20m BGL.

**MADE GROUND:** Made Ground deposits were encountered beneath the Topsoil in IT25 and were present to a depth of between 0.90m BGL. These deposits were described as *grey sandy gravelly Clay fragments of concrete.* 

**COHESIVE DEPOSITS:** Cohesive deposits were encountered from the surface and were described typically as *brown sandy gravelly CLAY with occasional cobbles and boulders* overlying a *grey sandy gravelly CLAY with occasional cobbles and boulders*. The secondary sand and gravel constituents varied

across the site and with depth, with granular lenses occasionally present in the glacial till matrix. These deposits had some, occasional or frequent cobble and boulder content, where noted on the exploratory hole logs.

# 4.2. Insitu Strength Testing

The correlated DPH blow counts indicate that the overburden deposits are soft or soft to firm to depth of 0.90m to 1.60m BGL and become firm or firm to stiff with depth.

# 4.3. Groundwater

No groundwater was noted during the investigation however we would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall, nearby construction and other factors.

### 5.0 Recommendations & Conclusions

### 5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records and the report of Cartron Oranmore 12674-03-23. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

### 5.2. Foundations

An allowable bearing capacity of 200 kN/m<sup>2</sup> is recommended for conventional strip or pad foundations on the very stiff cohesive deposits at a depth of 3.45m BGL at the location of BH02. At the locations of BH01 and BH03 where shallow rock was encountered, an allowable bearing capacity of 500 kN/m<sup>2</sup> is recommended on the competent Limestone encountered. Further site investigation would be required to determine the rock mass quality or for founding at other locations.

At the location of the proposed structure an allowable bearing capacity of 150 kN/m<sup>2</sup> is recommended for conventional strip or pad foundations on the deposits at the depths outlined in the table below.

The possibility for variation in the depth of the made ground in the vicinity of these foundations should be considered and foundation inspections should be carried out. Any soft spots encountered at the proposed foundation depths should be excavated and replaced with lean mix concrete.

Trial Pit	ABC	Depth	Comment	Trial Pit	ABC	Depth	Comment
No.	kN/m²	m BGL		No.	kN/m²	m BGL	
DP01	150	1.20	Cohesive	DP16	150	1.90	Granular
DP02	150	0.50	Cohesive	DP17	125	1.40	Cohesive
DP03	150	0.30	Granular	DP18	150	1.00	Cohesive
DP04	150	0.60	Cohesive	DP19	150	1.40	Cohesive
DP05	150	0.50	Cohesive	DP20	150	0.50	Granular
DP06A	150	0.60	Cohesive	DP21	150	0.50	Granular
DP07	150	0.80	Cohesive	DP22	150	0.50	Granular
DP08A	150	0.50	Granular	DP23	150	1.30	Cohesive
DP09	150	1.20	Cohesive	DP24	150	1.20	Cohesive
DP10	150	0.50	Granular	DP25	150	1.00	Granular
DP11	150	0.90	Cohesive	DP26	150	1.30	Cohesive

DP12	150	1.50	Cohesive	DP27	150	0.90	Granular
DP13	150	1.60	Cohesive	DP28	150	1.00	Granular
DP14A	150	1.80	Granular	DP29A	150	1.00	Cohesive
DP15A	150	1.70	Granular				

In any part of the site, should part of the foundation be on rock we would recommend that all the foundations of the unit in question be lowered to the competent rock stratum to avoid differential settlement.

The pH and sulphate testing completed on samples recovered from the exploratory holes indicates the pH results are near neutral and the sulphate results are low, when compared to the guideline values from BRE Special Digest 1:2005. No special precautions are required for concrete foundations to prevent sulphate attack.

# 5.3. Excavations

Excavations in the Made Ground or soft Cohesive Deposits will require to be appropriately battered or the sides supported due to the low strength of these deposits.

Excavations in the upper cohesive and weathered rock deposits are expected to be excavatable with conventional excavation equipment, with zones of more intact bedrock below this depth requiring rock breaking techniques.

Any waste material to be removed off site should be disposed of to a suitably licenced landfill. The environmental testing completed during the ground investigation is reported under the cover of a separate GII Waste Classification/Subsoil Assessment Report.

# 5.4. Soakaway Design

Infiltration rates of between f=1.728 x 10<sup>-5</sup> m/s and 4.317 x 10<sup>-5</sup> m/s respectively were calculated for the soakaway locations. At the locations of IT10, IT12, IT13, IT15, IT16, IT17, IT19, IT20 and IT21 the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

**APPENDIX 1** - Site Location Plan





536400E

536550E



# **APPENDIX 2** – Infiltration Test Records



Ground Investigations Ireland Ltd						Site Trial F Oranmore ITO		Trial Pit Number IT01
Excavation Method Trial Pit		Dimensions 1.40 x 0.80 x 0.90m		Ground	Level (mOD) 11.86	Client Marshall Yards Company Ltd		Job Number 13188-09-23
		Location 536248.2 E 725198.4 N		Dates 26/10/2023		Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Kater Kater
				10.96	0.90	Firm brown sandy slightly boulders	gravelly CLAY with cobbles	and Control of Control
Plan .		·			'	Remarks		
· ·		·		·	•••			
· ·				•	•••			
				·	•••			
· ·				·		Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT01

Produced by the GEOtechnical DAtabase SYstem (GEODASY) © all rights reserved
	Ground Investigations Ireland Ltd					Site Oranmore		Trial Pit Number IT02
Excavation Trial Pit	Method	<b>Dimensio</b> 1.70 x 0.8	<b>ns</b> 80 x 0.80m	Ground	Level (mOD) 13.63	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5362	224.8 E 725251 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Blac				12.83		Soft brown sandy slightly s boulders	gravelly CLAY with cobbles	and
: ···· .				·	· · ·   ·			
				·	•••			
		·		·	•••			
	· ·							
					<mark>.</mark>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT02

	Grou	ind Inv	estigations www.gii.ie	Site Oranmore	Trial Pit Number IT03			
Excavation Trial Pit	Method	<b>Dimensio</b> 1.60 x 0.8	<b>ns</b> 80 x 0.80m	Ground	Level (mOD) 12.75	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5362	245.4 E 725279.3 N	Dates 20	6/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Plan				11.95		Stiff brown sandy gravelly Complete at 0.80m	CLAY with cobbles and bou	
		•			- s	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT03

	Grou	ind Inv	estigations I www.gii.ie	Site Oranmore	Trial Pit Number IT04			
Excavation Trial Pit	Method	<b>Dimensio</b> 1.40 x 0.8	ns 80 x 0.80m	Ground	Level (mOD) 11.92	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5362	271.3 E 725257.2 N	Dates 20	6/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Plan				11.12		Firm brown sandy gravelly Complete at 0.80m	CLAY with cobbles and bou	
: •••• .		·		•				
		·		·				
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT04

S	Ground Investigations Irela					Site Oranmore		r M	Trial Pit Number IT05
Excavation Trial Pit	Method	<b>Dimensi</b> 1.70 x 0	<b>ons</b> .90 x 0.40m	Ground	Level (mOD) 11.38	Client Marshall Yards Company I	_td	13	<b>Job Number</b> 3188-09-23
		Location 536	1 279.6 E 725221.8 N	Dates 20	6/10/2023	Engineer AKM Design		5	Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Le	Agend Safe
					 (0.40)	Soft brown sandy gravelly	CLAY with cobbles and bou	ılders	
Plan .	· · ·				I	Complete at 0.40m			
					s	Scale (approx) 1:25	Logged By	Figure N	<b>lo.</b> 9-23.IT05

	Ground Investigations Ireland Ltd					Site Oranmore	Trial Pit Number IT06	
Excavation Trial Pit	Method	Dimensio 1.5 x 0.9	<b>ns</b> x 0.8m	Ground	Level (mOD) 10.57	Client Marshall Yards Company I	Ltd	Job Number 13188-09-23
		Location 5363	314.3 E 725195.5 N	Dates 26	6/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				9.77		Firm brown sandy gravelly Complete at 0.80m	CLAY with cobbles and bot	
				·		Remarks		
· ·		•	· · ·	•				
				•				
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT06

	Grou	ind Inv	vestigations www.gii.ie	Ltd	Site Trial F Oranmore ITO			
Excavation Trial Pit	Method	Dimensio 1.5 x 1.0	ons x 0.8m	Ground	Level (mOD) 12.79	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5363	309.8 E 725288.7 N	Dates 26	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Plan				11.99		Soft to firm brown sandy g boulders	ravelly CLAY with cobbles a	and
:		·		·	•••			
				•				
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT07

	Ground Investigations Ireland Ltd							Site Oranmore			Trial Pit Number IT08	
Excavation Trial Pit	Method	<b>Dimens</b> 1.4 x 0.9	i <b>ons</b> 9 x 0.8m		Ground	<b>Level (m</b> 12.69	ıOD)	Client Marshall Yards Company I	_td		Job Number 13188-09-23	23
		Location 536	n 6343.6 E 725280.	4 N	Dates 26	6/10/2023	3	Engineer AKM Design			<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Rec	cords	Level (mOD)	Dept (m) (Thickn	th less)	D	escription		Legend Safe	AVALU
					12.09		.60) ).60	Soft brown sandy gravelly	CLAY with cobbles and bou	Ilders		
					11.89	- (0 - C	.20) ).80	Complete at 0.80m			• <u>• • • • •</u> • •	
Plan .					-		. F	Remarks				
					-		•					
					-							
				•	-							
			· ·		-		. s	cale (approx)	Logged By	Figure	No.	
								1:25	LB	13188	-09-23.IT08	8

S	Grou	Ground Investigations Ireland Ltd www.gii.ie				Site Oranmore	Site Oranmore		
Excavation Trial Pit	Method	<b>Dimensio</b> 1.9 x 0.8	ons s x 0.9m	Ground	Level (mOD) 10.51	Client Marshall Yards Company I	_td	Job Number 13188-09-23	
		Location 536	346.3 E 725253.8 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Xater	
Plan				9.61	0.90	Soft brown sandy gravelly Complete at 0.90m	CLAY with cobbles and bou		
: •••• .		·		·					
					· ·				
		·							
					<mark> </mark>	Scale (approx)	Logged By	Figure No.	
						1:25	LB	13188-09-23.IT09	

	Ground Investigations Ire www.gii.ie				Ltd	Site Oranmore		Trial Pit Number IT10
Excavation Trial Pit	Method	Dimension 1.8 x 0.9	ons 0 x 0.9m	Groun	d Level (mOD) 8.78	Client Marshall Yards Company	Ltd	Job Number 13188-09-23
		Location 536	354.8 E 725217.9	N Dates	26/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Reco	rds Level (mOD	Depth (m) (Thickness)	D	escription	Legend Sate
(m)	Sample / Tests	- Depth (m)	Field Reco	rds (mOD 8.1 7.8	(Thickness)          (Thickness)         -	Soft brown sandy gravelly Firm grey sandy gravelly ( Complete at 0.90m Remarks	CLAY with cobbles and bound	Legend     s       iders     Iders       Iders <td< th=""></td<>
			· ·			Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT10

	Grou	ind Inv	estigations www.gii.ie	s Ireland	Site Trial F Oranmore IT1			
Excavation Trial Pit	Method	<b>Dimensio</b> 1.7 x 0.8	ons x 0.8m	Ground	Level (mOD) 6.77	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5363	376.8 E 725190.9 N	Dates 26	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Record	s Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
					(0.30)	Soft brown sandy gravelly	CLAY with cobbles and bou	Iders
				6.47	0.30	Firm grey sandy gravelly C	CLAY with cobbles and bould	lers
					(0.50)			
				5.97	0.80	Complete at 0.80m		*: •: • •
					- 			
					- - - -			
					 -  			
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					-     			
Plan .					<u> </u>  '	Remarks		
				. <u>.</u>				
				. <u>.</u>				
				. <b>.</b>				
						Scale (approx)	Logged By	Figure No.
						1:25	LB	- 13188-09-23.IT11

	Ground Investigations Ireland Ltd					Site Oranmore	Trial Pit Number IT12	
Excavation Trial Pit	Method	<b>Dimensio</b> 1.4 x 0.8	ns x 0.8m	Ground	Level (mOD) 6.70	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5364	404.1 E 725204.3 N	Dates 20	6/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
					 (0.40)	Soft brown sandy gravelly	CLAY with cobbles and bou	lders
				6.30	0.40	Firm grey sandy gravelly C	CLAY with cobbles and bould	ders
				5.00	(0.40)			
				5.90		Complete at 0.80m		
					- - -			
					- - - -			
					-			
Plan .						Remarks		
		·						
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT12

	Ground Investigations Ireland Lto www.gii.ie						Site Oranmore			Trial Pit Number IT13
Excavation Trial Pit	Method	<b>Dimensi</b> 1.5 x 0.8	i <b>ons</b> 8 x 0.8m	G	Ground	Level (mOD 7.52	Client Marshall Yards Company	Ltd	1:	<b>Job Number</b> 3188-09-23
		Location 536	n 6407.3 E 725231.1		Dates 26	/10/2023	Engineer AKM Design			Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Reco	ords (	Level (mOD)	Depth (m) (Thickness	D	escription	L	A kater Kater
Depth (m)	Sample / Tests	Water Depth (m)	Field Reco	ords	7.12 6.72	Depth (Thickness (0.40) (0.4	Soft brown sandy gravelly Firm grey sandy gravelly O Complete at 0.80m	escription CLAY with cobbles and bould CLAY with cobbles and bould	Ilders	
Plan						<u> </u>	 Remarks			
						.	Scale (approx)	Logged By	Figure N	No.
							1:25	LB	13188-0	9-23.IT13

	Ground Investigations Irel						Site Oranmore		Trial Pit Number IT14
Excavation Trial Pit	Method	<b>Dimens</b> 1.9 x 0.	<b>ions</b> 8 x 0.9m	-	Ground	Level (mOD) 10.35	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Locatio	<b>n</b> 6404 E 725302	2.8 N	Dates 26	/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field I	Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
(m)	Sample / lests				(mOD) 9.75 9.45	(Thickness)	Soft brown sandy gravelly Soft grey sandy gravelly C Complete at 0.90m Remarks	escription CLAY with cobbles and bould LAY with cobbles and bould	Legend     s       Iders     Iders       Iders <td< th=""></td<>
					· ·				
					· ·	•			
							Scale (approx) 1:25	Logged By	Figure No. 13188-09-23.IT14

	Grou	ind Inv	vestigation www.gii.ie	s Ireland	Ltd	<b>Site</b> Oranmore	Trial Pit Number IT15	
Excavation Trial Pit	Method	<b>Dimensio</b> 1.7 x 0.8	ons 5 x 0.9m	Ground	Level (mOD) 10.36	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location	418.6 E 725316.1 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Record	ls Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Xater
(m)	Sample / Tests	Depth (m)		Is (mOD) 9.76 9.46	(Thickness)	Soft brown sandy gravelly Firm grey sandy gravelly C Complete at 0.90m	CLAY with cobbles and bound	Iders
					<u> </u>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT15

	Grou	ind Inv	estigations www.gii.ie	Site Oranmore	Site Oranmore			
Excavation Trial Pit	Method	Dimensio 1.6 x 0.9	<b>ns</b> x 0.9m	Ground	Level (mOD) 8.61	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5364	143.6 E 725292 N	Dates 26	6/10/2023	Engineer AKM Design		Sheet 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				8.31	(0.30) 0.30 (0.60)	Soft brown sandy gravelly Soft grey sandy gravelly C	CLAY with cobbles and bou	Iders
				7.71		Complete at 0.90m		
Plan .		•			'	Remarks		
					•••			
		•						
					•••			
					•••			
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT16

	Grou	ind Inv	vestigations www.gii.ie	s Ireland	Ltd	Site Oranmore		Trial Pit Number IT17
Excavation Trial Pit	Method	<b>Dimensio</b> 1.4 x 0.8	ons x 0.9m	Ground	Level (mOD) 6.40	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5364	451.6 E 725237.7 N	Dates 26	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	s Level (mOD)	Depth (m) (Thickness)	D	escription	Kater Kater
				5.80	(Thičkříess)	Soft brown sandy slightly g boulders Soft grey sandy slightly gra boulders Complete at 0.90m	avelly CLAY with cobbles ar	and ************************************
Plan						Remarks		
		·						
		·						
		·		•	•••			
		·			•••			
		·			<mark>.</mark>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT17

	Grou	ind Inv	vestigations www.gii.ie	Ireland	Ltd	Site Oranmore		Trial Pit Number IT18
Excavation Trial Pit	Method	Dimension 1.6 x 0.8	ons x 0.9m	Ground	Level (mOD) 5.04	Client Marshall Yards Company	Ltd	Job Number 13188-09-23
		Location 5364	443.1 E 725192.9 N	Dates 2	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				4.44	(Thickness) (Thick	Soft brown sandy slightly good boulders	gravelly CLAY with cobbles an	Legend         3           and
Plan .					· · · · ·	Remarks		
					<mark> </mark>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT18

	Ground Investigations Irelar						Site Oranmore		Trial Pit Number IT19
Excavation Trial Pit	Method	<b>Dimensi</b> 1.5 x 0.8	ions 8 x 0.9m		Ground	Level (mOD) 4.59	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 536	n 6479.5 E 72519	94.1 N	Dates 26	/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field R	ecords	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Sate
(m)					(MOD) 3.99 3.69	(Thickness) (Thick	Soft brown sandy gravelly Soft grey sandy gravelly C Complete at 0.90m Remarks	EAY with cobbles and bould	Legend     s       Iders     Iders       Iders <td< th=""></td<>
		·					Scale (approx) 1:25	Logged By	Figure No. 13188-09-23.IT19

	Grou	ind Inv	estigations www.gii.ie	Site Oranmore		Trial Pit Number IT20		
Excavation Trial Pit	Method	Dimensio 1.9 x 0.8	<b>ns</b> x 0.9m	Ground	Level (mOD) 5.00	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 5364	184.8 E 725219.4 N	Dates 26	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Plan				4.30		Soft brown sandy gravelly Firm grey sandy gravelly Complete at 0.90m	CLAY with cobbles and bound	Ilders
: •••• .		·		·				
		·		·	•••			
		·		·	•••			
				·		Scale (approx)	Logged By	Figure No.
						1:25	LB	- 13188-09-23.IT20

Excavation Method Dimensions Ground Level (mOD) Client Ja	b.
Trial Pit         1.7 x 0.8 x 0.8m         7.72         Marshall Yards Company Ltd         Ni           131	u <b>mber</b> 88-09-23
Location         Dates         Engineer         SI           536472.2 E 725284.6 N         26/10/2023         AKM Design         SI	n <b>eet</b> 1/1
Depth (m)         Sample / Tests         Water Depth (m)         Field Records         Level (mOD)         Depth (m)         Depth (m)         Description         Level Level	Kater Vater
Soft brown sandy gravelly CLAY with cobbles and boulders	· · · · · · · · · · · · · · · · · · ·
7.32 - 0.40 - (0.40) - (0.40)	· · · · · · · · · · · · · · · · · · ·
6.92 0.80 Complete at 0.80m	· · · · · · · · · · · · · · · · · · ·
Plan         .	
.     . <td>). 22 IT24</td>	). 22 IT24

	Grou	ind In	vestigation www.gii.ie	s Ireland	Site     Trial Pit       Oranmore     IT22			
Excavation Trial Pit	Method	Dimensi 1.5 x 0.9	<b>ons</b> 9 x 0.9m	Ground	Level (mOD) 8.29	Client Marshall Yards Company I	Ltd	Job Number 13188-09-23
		Location 536	n 6468.1 E 725326.4 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Record	ds Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				8.09	(0.20) 0.20 (0.70)	Soft brown slightly sandy g boulders Firm grey slightly sandy gr boulders	ravelly CLAY with cobbles a	and
				7.39		Complete at 0.90m		
Plan .						Remarks		
· ·		•			•••			
					•••			
· ·		•	· ·		· · ·			
		·			· · ·	Scale (approx)	Logged By	Figure No.
1						1:25	LD	13100-09-23.1122

	Grou	ind Inv	vestigations www.gii.ie	Site Oranmore		Trial Pit Number IT23		
Excavation Trial Pit	Method	Dimension 1.6 x 0.9	x 0.8m	Ground	Level (mOD) 5.42	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 536	540.1 E 725288.6 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				4.62		Soft to firm brown slightly s frequent cobbles and boul Complete at 0.80m	sandy gravelly CLAY with ders	
Plan .					'	Remarks		
· ·		·		•	•••			
· ·	· ·	•		•	· · ·			
					<mark> </mark>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT23

	Grou	ind Inv	vestigations www.gii.ie	Site Oranmore		Trial Pit Number IT24		
Excavation Trial Pit	Method	Dimensio 1.9 x 1.0	ns x 0.8m	Ground	Level (mOD) 5.31	Client Marshall Yards Company	_td	Job Number 13188-09-23
		Location 5365	520.3 E 725259.9 N	Dates 20	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
Blas				4.51		Soft to firm brown sandy g boulders and rubbish	ravelly CLAY with cobbles a	and
					'	Remarks		
					•••			
		·			•••			
· ·	· ·		· · ·		· · ·			
						Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT24

S	Grou	nd Inv	/estigations Ir www.gii.ie	Site Oranmore		Trial Pit Number IT25		
Excavation Trial Pit	Method	Dimensi 1.4 x 0.9	ons 9 x 0.9m	Ground	Level (mOD) 4.77	Client Marshall Yards Company I	_td	Job Number 13188-09-23
		Location 536	1 523.6 E 725222.6 N	Dates 26	6/10/2023	Engineer AKM Design		<b>Sheet</b> 1/1
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	D	escription	Legend Safe
				4.57 3.87	(0.20) 0.20 (0.70) 0.90	TOPSOIL MADE GROUND: Grey sa and boulders and concrete Complete at 0.90m	ndy gravelly Clay with cobb	les
Plan .					'	Remarks		
				· ·				
			· · ·					
					<u>-</u>	Scale (approx)	Logged By	Figure No.
						1:25	LB	13188-09-23.IT25



IT01

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	3	-0.300
17/10/2023	13	-0.400
17/10/2023	23	-0.675

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.50
Tp75-25 (from g	ıraph) (s)	1260		50% Eff Depth 0 450	ap50 (m2) 3 1
f =	1.290E-04	m/s			5.1



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IT01

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	6	-0.300
17/10/2023	11	-0.400
17/10/2023	18	-0.400
17/10/2023	28	-0.500
17/10/2023	36	-0.675

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.50
Tp75-25 (from g	ıraph) (s)	2100		50% Eff Depth	ap50 (m2) 3 1
f =	7.742E-05	m/s		0.430	5.1



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IT01

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	9	-0.300
17/10/2023	18	-0.400
17/10/2023	26	-0.500
17/10/2023	49	-0.675

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.50
Tp75-25 (from g	ıraph) (s)	2880		50% Eff Depth 0.450	ap50 (m2) 3.1
f =	5.645E-05	m/s			2



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### IT02

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	3	-0.400
17/10/2023	5	-0.500
17/10/2023	7	-0.660

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.700	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.54
Tp75-25 (from g	ıraph) (s)	375		50% Eff Depth 0.400	ap50 (m2) 3.36
f =	4.317E-04	m/s			



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### IT02

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	3	-0.400
17/10/2023	5	-0.500
17/10/2023	7	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m) 1.700	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.54
Tp75-25 (from g	ıraph) (s)	420		50% Eff Depth 0.400	ap50 (m2) 3.36
f =	3.855E-04	m/s			



Catherinestown House, Hazelhatch Road, Newcastle, Co. Dublin. D22 YD52



### IT02

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	3	-0.300
17/10/2023	7	-0.400
17/10/2023	12	-0.630

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.700	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.54
Tp75-25 (from g	ıraph) (s)	675		50% Eff Depth 0.400	ap50 (m2) 3.36
f =	2.399E-04	m/s			



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### IT03

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	3	-0.300
17/10/2023	6	-0.450
17/10/2023	12	-0.700

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.51
Tp75-25 (from g	ıraph) (s)	570		50% Eff Depth	ap50 (m2) 3 2
f =	2.807E-04	m/s		0.400	0.2



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### IT03

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	15	-0.400
17/10/2023	25	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.51
Tp75-25 (from g	ıraph) (s)	1500		50% Eff Depth 0.400	ap50 (m2) 3.2
f =	1.067E-04	m/s			



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### IT03

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	5	-0.300
17/10/2023	15	-0.400
17/10/2023	23	-0.500
17/10/2023	35	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.51
Tp75-25 (from g	ıraph) (s)	2100		50% Eff Depth	ap50 (m2)
f =	7.619E-05	m/s		0.400	0.2



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### IT04

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	4	-0.300
17/10/2023	10	-0.400
17/10/2023	25	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.45
Tp75-25 (from g	ıraph) (s)	1500		50% Eff Depth	ap50 (m2) 2 88
f =	1.037E-04	m/s		0.400	2.00



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### IT04

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	15	-0.300
17/10/2023	29	-0.500
17/10/2023	34	-0.550
17/10/2023	49	-0.650

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.45
Tp75-25 (from g	ıraph) (s)	2490		50% Eff Depth	ap50 (m2)
f =	6.247E-05	m/s		0.400	2.00



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### IT04

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	6	-0.300
17/10/2023	13	-0.350
17/10/2023	23	-0.400
17/10/2023	38	-0.420
17/10/2023	52	-0.500
17/10/2023	65	-0.500
17/10/2023	73	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m) 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.45
Tp75-25 (from g	ıraph) (s)	4380		50% Eff Depth	ap50 (m2) 2 88
f =	3.551E-05	m/s		0.400	2.00



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#### IT05

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.90m x 0.40m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	0.000
17/10/2023	6	-0.200
17/10/2023	10	-0.320

Start depth 0.00	Depth of Pit 0.400		Diff 0.400	75% full 0.1	25%full 0.3
Length of pit (m 1.700	) Width of pit (m) 0.900			75-25Ht (m) 0.200	Vp75-25 (m3) 0.31
Tp75-25 (from g	ıraph) (s)	375		50% Eff Depth 0.200	ap50 (m2) 2.57
f =	3.175E-04	m/s			-



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#### IT05

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.90m x 0.40m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	0.000
17/10/2023	4	-0.200
17/10/2023	15	-0.300
17/10/2023	31	-0.400

Start depth 0.00	Depth of Pit 0.400		Diff 0.400	75% full 0.1	25%full 0.3
Length of pit (m 1.700	) Width of pit (m) 0.900			75-25Ht (m) 0.200	Vp75-25 (m3) 0.31
Tp75-25 (from g	ıraph) (s)	810		50% Eff Depth 0 200	ap50 (m2) 2 57
f =	1.470E-04	m/s		0.200	2.01



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### IT05

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.90m x 0.40m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	0.000
17/10/2023	7	-0.100
17/10/2023	26	-0.250
17/10/2023	44	-0.400

Start depth 0.00	Depth of Pit 0.400		Diff 0.400	75% full 0.1	25%full 0.3
Length of pit (m 1.700	) Width of pit (m) 0.900			75-25Ht (m) 0.200	Vp75-25 (m3) 0.31
Tp75-25 (from g	ıraph) (s)	1500		50% Eff Depth 0.200	ap50 (m2) 2.57
f =	7.938E-05	m/s			-



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### IT06

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	5	-0.300
17/10/2023	29	-0.400
17/10/2023	43	-0.500
17/10/2023	62	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.500	) Width of pit (m) 0.900			75-25Ht (m) 0.400	Vp75-25 (m3) 0.54
Tp75-25 (from g	ıraph) (s)	3720		50% Eff Depth 0 400	ap50 (m2) 3 27
f =	4.439E-05	m/s		0.400	0.21



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### IT06

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	19	-0.300
18/10/2023	52	-0.300
18/10/2023	104	-0.300
18/10/2023	159	-0.300

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





IT07

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	10	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m) 1.500	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.60
Tp75-25 (from g	ıraph) (s)	600		50% Eff Depth	ap50 (m2) 3 5
f =	2.857E-04	m/s		0.400	0.0



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#### IT07

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	16	-0.300
17/10/2023	34	-0.800

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.500	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.60
Tp75-25 (from g	ıraph) (s)	1650		50% Eff Depth	ap50 (m2) 3 5
f =	1.039E-04	m/s		0.400	0.0



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### IT07

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
17/10/2023	0	-0.200
17/10/2023	7	-0.400
17/10/2023	13	-0.500
17/10/2023	22	-0.620

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m) 1.500	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.60
Tp75-25 (from g	ıraph) (s)	1230		50% Eff Depth 0.400	ap50 (m2) 3.5
f =	1.394E-04	m/s		0.100	5.0



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### IT08

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	18	-0.350
18/10/2023	52	-0.400
18/10/2023	104	-0.500
18/10/2023	164	-0.800

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m) 1.400	) Width of pit (m) 0.900			75-25Ht (m) 0.400	Vp75-25 (m3) 0.50
Tp75-25 (from g	ıraph) (s)	7560		50% Eff Depth	ap50 (m2) 3 1
f =	2.151E-05	m/s		0.400	0.1



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### IT08

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	48	-0.300
19/10/2023	108	-0.400
19/10/2023	187	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





#### IT09

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	17	-0.500
18/10/2023	51	-0.800

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m) 1.900	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.68
Tp75-25 (from g	ıraph) (s)	2100		50% Eff Depth 0.450	ap50 (m2) 3.95
f =	8.246E-05	m/s			



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### IT09

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	50	-0.620

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.900	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.68
Tp75-25 (from g	ıraph) (s)	3180		50% Eff Depth	ap50 (m2)
f =	5.445E-05	m/s		0.430	0.90



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#### IT09

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	43	-0.450
19/10/2023	113	-0.800

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.900	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.68
Tp75-25 (from g	ıraph) (s)	4620		50% Eff Depth 0.450	ap50 (m2) 3.95
f =	3.748E-05	m/s			2100



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### IT10

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.80m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	48	-0.300
18/10/2023	101	-0.300
18/10/2023	162	-0.300

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





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### IT11

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)	
18/10/2023	0	-0.200	
18/10/2023	57	-0.200	
18/10/2023	119	-0.300	
18/10/2023	168	-0.400	

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





IT12

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	12	-0.300
18/10/2023	50	-0.400
18/10/2023	113	-0.600
18/10/2023	162	-0.700

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.45
Tp75-25 (from g	ıraph) (s)	6780		50% Eff Depth 0 400	ap50 (m2) 2 88
f =	2.294E-05	m/s		01100	2.00



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IT12

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	52	-0.350
19/10/2023	103	-0.500
19/10/2023	129	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.400	) Width of pit (m) 0.800			75-25Ht (m) 0.400	Vp75-25 (m3) 0.45
Tp75-25 (from g	ıraph) (s)	7740		50% Eff Depth 0 400	ap50 (m2) 2 88
f =	2.010E-05	m/s		0.100	2.00



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#### IT12

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.80m (L x W x D)



Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





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### IT13

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	10	-0.250
18/10/2023	64	-0.320
18/10/2023	112	-0.500
18/10/2023	158	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





IT14

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	13	-0.300
18/10/2023	62	-0.400
18/10/2023	98	-0.500
18/10/2023	119	-0.600

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.900	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.68
Tp75-25 (from g	ıraph) (s)	7680		50% Eff Depth 0.450	ap50 (m2) 3.95
f =	2.255E-05	m/s			



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IT14

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	34	-0.370
19/10/2023	73	-0.400
19/10/2023	96	-0.500
19/10/2023	153	-0.620

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m) 1.900	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.68
Tp75-25 (from g	ıraph) (s)	10020		50% Eff Depth 0.450	ap50 (m2) 3.95
f =	1.728E-05	m/s		0.100	0.00



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### IT15

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	11	-0.400
18/10/2023	55	-0.450
18/10/2023	95	-0.500
18/10/2023	114	-0.610

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.700	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.61
Tp75-25 (from g	graph) (s)	7200		50% Eff Depth 0 450	ap50 (m2) 3 61
f =	2.355E-05	m/s		0.400	0.01



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#### IT15

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	46	-0.300
19/10/2023	86	-0.320
19/10/2023	108	-0.390
19/10/2023	165	-0.460

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





### IT16

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)	
18/10/2023	0	-0.200	
18/10/2023	44	-0.400	
18/10/2023	138	-0.650	

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.600	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.65
Tp75-25 (from g	ıraph) (s)	8280		50% Eff Depth 0.450	ap50 (m2) 3.69
f =	2.121E-05	m/s			



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### IT16

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	45	-0.270
19/10/2023	78	-0.340
19/10/2023	104	-0.400
19/10/2023	161	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





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#### IT17

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.80m x 0.90m (L x W x D)



Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





IT18

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	23	-0.300
18/10/2023	97	-0.500
18/10/2023	135	-0.630

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.600	) Width of pit (m) 0.800			75-25Ht (m) 0.450	Vp75-25 (m3) 0.58
Tp75-25 (from graph) (s)		8700		50% Eff Depth	ap50 (m2)
f =	1.925E-05	m/s		0.430	5.44



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#### IT18

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	52	-0.300
19/10/2023	102	-0.400
19/10/2023	123	-0.400
19/10/2023	183	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





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### IT19

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	25	-0.300
18/10/2023	96	-0.500
18/10/2023	134	-0.500

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





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### IT20

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 0.80m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	25	-0.320
18/10/2023	94	-0.390
18/10/2023	132	-0.400

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.900	0.900	0.225	0.675





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#### IT21

Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.70m x 0.80m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	52	-0.350
19/10/2023	93	-0.500
19/10/2023	115	-0.510
19/10/2023	169	-0.550

Start depth	Depth of Pit	Diff	75% full	25%full
0.00	0.800	0.800	0.2	0.6





#### IT22

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
18/10/2023	0	-0.200
18/10/2023	42	-0.500
18/10/2023	100	-0.800

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.500	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.61
Tp75-25 (from g	ıraph) (s)	4260		50% Eff Depth 0.450	ap50 (m2) 3.51
f =	4.063E-05	m/s			



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#### IT22

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	48	-0.350
19/10/2023	86	-0.700

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.500	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.61
Tp75-25 (from g	ıraph) (s)	4560		50% Eff Depth 0.450	ap50 (m2) 3.51
f =	3.796E-05	m/s			



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### IT22

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.50m x 0.90m x 0.90m (L x W x D)

Date	Time	Wate (m	r level bgl)		
19/10/2023 19/10/2023	0 62	-0.200 -0.600			
Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m) 1.500	Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.61
Tp75_25 (from ar	anh) (s)	1200		50% Eff Denth	2n50 (m2)

	epth ap50 (m2)
0.450	) 3.51

f = 4.121E-05 m/s IT22 (3) 0.000 Mater Level Relative to Ground Level (m) -0.200 -0.300 -0.400 -0.500 -0.500 -0.600 -0.700 -0.800 -0.900 -1.000 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 Time Elapsed (mins)

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#### IT23

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	64	-0.800

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.900			75-25Ht (m) 0.400	Vp75-25 (m3) 0.58
Tp75-25 (from g	ıraph) (s)	2520		50% Eff Depth	ap50 (m2)
f =	6.645E-05	m/s		0.400	5.44



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### IT23

# Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	16	-0.400
19/10/2023	35	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.900			75-25Ht (m) 0.400	Vp75-25 (m3) 0.58
Tp75-25 (from g	ıraph) (s)	2100		50% Eff Depth 0.400	ap50 (m2) 3.44
f =	7.973E-05	m/s		01100	••••



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#### IT23

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.60m x 0.90m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	15	-0.400
19/10/2023	39	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.600	) Width of pit (m) 0.900			75-25Ht (m) 0.400	Vp75-25 (m3) 0.58
Tp75-25 (from g	ıraph) (s)	2340		50% Eff Depth 0.400	ap50 (m2) 3.44
f =	7.156E-05	m/s			••••



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#### IT24

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	64	-0.800

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.900	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.76
Tp75-25 (from g	ıraph) (s)	2520		50% Eff Depth 0.400	ap50 (m2) 4.22
f =	7.147E-05	m/s			



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#### IT24

## Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)		
19/10/2023 19/10/2023	0 27	-0.200 -0.600		
Start depth	Depth of Pit		Diff	75% full

0.00	0.800		0.800	0.2	0.6
Length of pit (m 1.900	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.76
Tp75-25 (from g	graph) (s)	1620		50% Eff Depth	ap50 (m2) 4 22
f =	1.112E-04	m/s		0.400	7.22



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25%full



#### IT24

### Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.90m x 1.00m x 0.80m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	15	-0.500
19/10/2023	42	-0.600

Start depth 0.00	Depth of Pit 0.800		Diff 0.800	75% full 0.2	25%full 0.6
Length of pit (m 1.900	) Width of pit (m) 1.000			75-25Ht (m) 0.400	Vp75-25 (m3) 0.76
Tp75-25 (from graph) (s)		2520		50% Eff Depth	ap50 (m2) 4 22
f =	7.147E-05	m/s		0.400	ד.22



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#### IT25

### Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	63	-0.500
19/10/2023	95	-0.620

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.57
Tp75-25 (from g	ıraph) (s)	6300		50% Eff Depth 0.450	ap50 (m2) 3.33
f =	2.703E-05	m/s			



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#### IT25

### Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)
19/10/2023	0	-0.200
19/10/2023	6	-0.400
19/10/2023	14	-0.500
19/10/2023	34	-0.600

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.57
Tp75-25 (from graph) (s)		2700		50% Eff Depth 0 450	ap50 (m2) 3 33
f =	6.306E-05	m/s		0.400	0.00



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#### IT25

### Soakaway Test to BRE Digest 365 Trial Pit Dimensions: 1.40m x 0.90m x 0.90m (L x W x D)

Date	Time	Water level (m bgl)	
19/10/2023	0	-0.200	
19/10/2023	14	-0.350	
19/10/2023	59	-0.700	

Start depth 0.00	Depth of Pit 0.900		Diff 0.900	75% full 0.225	25%full 0.675
Length of pit (m 1.400	) Width of pit (m) 0.900			75-25Ht (m) 0.450	Vp75-25 (m3) 0.57
Tp75-25 (from g	ıraph) (s)	3180		50% Eff Depth 0 450	ap50 (m2) 3 33
f =	5.354E-05	m/s		0.100	0.00



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# Cartron Oranmore Phase 2 Soakaway Photographs







IT03





IT06









IT10



IT11

