

Scorton, Lime Tree Close, East Preston, BN16 1JA

Surface Water Drainage Details Document Ref: LTC.GW.002

Proposed redevelopment to provide seven new homes



Content:

Page 2: Drawing LTC.U/GSERVICES.002
Detailed drawing showing surface water drainage, soakaway positions and infiltration rates.

Appendix:

Page 4: Drawing LTC.INVEST.002
Shows location of boreholes & trail pits along with catchment area calculation

Page 6: Details of ground water level monitoring and soil samples

Page 8 to 24: Soakaway size calculation sheets

Page 26 & 27: TP1 test data at 1900mm & 2500mm

Page 28-29: TP2 & TP3 test data at 700mm

Page 30-36: BH6-12 test data

Page 38: Historic Boreholes

Page 40: Drainage and water enquiry from Southern Water

Page 64: Flood mapping

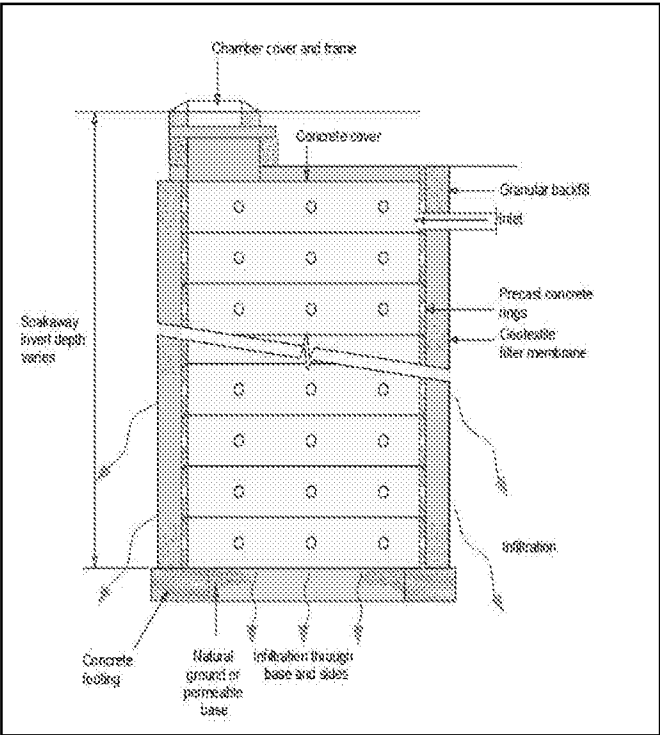
Page 66: Highways information

Page 68: Residential regulated local authority search

Page 86: Ground sure search

**GAS / WATER /
ELECTRIC / TELECOM**
Existing Service Route:
Assumed new service route

Soakaway Construction



Pits filled using course graded aggregate with a minimum porosity of 40%, pit fully lined with terram geotextile.

Bottle Gullies with built in silt trap to EN 1401-1 or BS4660 intercepts all rainwater downpipes before entering underground drainage / entering soakaway. All with rodding and clearing access

LEDGEND

SOAKAWAY INFORMATION

SA = Soakaway
BL = Base Level
CL = Cover Level
IL = Inlet Level
PIT = Pit Size
IC = Inspection Chamber

IC = Inspection Chamber

● = Bottle & Back Inlet Gully

— = 110mm Pipe set at minimum fall of 1:100

SA = Soakaway

FOUL DRAINAGE INFORMATION

IC = 600mm Dia Inspection Chamber
IV = Invert Level of Chamber

IC = Inspection Chamber

— = 110mm Pipe set at min fall of 1:60

SUGGESTED SERVICE ROUTES & METER POSITIONS

— = Proposed route to be confirmed with service provider

■ = Proposed Meter Box positions, gas & electric built into wall cold taken to kitchen sink. Telecom surface

SUD's DRAINAGE SURFACES

Sud's permeable surface comprising of free draining stone surface finish over 350mm course graded aggregate over a layer of Terram geotextile .

Cellular grass parking bays specified by manufacturers but generally 350mm of course grade aggregated sub base over a layer of Terram geotextile. Further layer of geotextile over the 350mm sub base. Bedding layer under Cellpave which is then filled in with blended loam and grass to provide a free draining SUD's surface. Products such as Ground Trax or Suregreen.

Paved terraced areas and paths finished with Sud's compliant Hydropave paving slabs from Tobermore, or similar performing product. Follow manufacturers instructions and install to BS 7533 to provide a permeable surface.

SURFACE WATER DRAINAGE

The Site:

Environmental searches show the area is free from flood risk and historical events that would alter ground conditions. The topography allows the site to sit higher than the surrounding areas which drops away gradually by approximately 1m over a 200m radius. The site sits between 8.00 to 8.35m above sea level.

The ground conditions and the wider area comprise of a layer of topsoil over silty sandy clay becoming sandier with depth. At a reasonably consistent depth across the site ranging from 1.9 to 2.1m below ground level (difference due to topography heights) the sandy clay is mixed with a considerable amount of small flint and stones with this layer being 300 to 450mm thick. Below this the ground returns to soft to firm clay mixed with sand and stone. Historic boreholes located 200m to the North and North West confirm chalk is found at depth with ground water resting levels of 4.4m above sea level / 4m below our sites ground level (TQ 00S E/3 and TQ 00E/45).

The existing site totals 1740m² and has a large house with outbuildings having a total of impervious area of 331m². It seems all the existing surface water discharges into soakaways built at the same time as the house, although these could not be located but no signs of surface water discharge into sewer. There is no evidence of any surface water drainage issues and throughout the monitoring and winter months the ground remained firm and free from water logging.

The proposal offers an increase of 169m² over the existing impervious areas.

Ground Water Monitoring Boreholes:

In November 2018 two boreholes were drilled (BH1 & BH2) to a depth of 3.1m. In order to give a wider coverage a further three were put in place in January 2019 (BH3, BH4 BH5) but as these hit hard ground only to a depth of 1.9 to 2.1m was achieved. From November till the end of March these boreholes were regularly checked for ground water and none found. Heavy duty boring equipment was used mid-March to drill to a depth of 4.2m when water was struck and rested at 3.5m. In East Preston historical data shows March generally sees the highest recorded resting ground water levels.

Percolation Tests:

Two 160mm Dia boreholes were drilled mid December 2018 to a depth of 1.92m (BH6 & BH7) and three consecutive percolation tests carried out with the lowest results for each being 'f' (m/s) = 4.04E-06 and 'f' (m/s) = 2.49E-06. A further two 160mm Dia boreholes were drilled mid-January BH8 at 1.92m and BH9 at 1.36m both were also tested with three consecutive percolation tests returning the lowest performing 'f' (m/s) = 3.64E-06 and 'f' (m/s) 4.02E-06 consecutively.

Trial pit TP1 was excavated to 450 x 2000 x 1900mm (deep) and tested over four consecutive days at the end of January / beginning of February 2019. The lowest performing result was 'f' (m/s) = 1.07E-06.

The filtration rate of the full-sized test was considerably lower than the earlier borehole tests. BH6 was re-drilled to a depth of 2.25m and tested (one fill only) and showed an improvement of the earlier and shallower test. An infiltration rate of 'f' (m/s) = 4.04E-06 was achieved.

TP1 was further excavated to a depth of 2.6m and tested mid-March over seven consecutive days achieving an infiltration result of 'f' (m/s) = 1.37E-06.

A further three 160mm dia shallow 1m deep boreholes (BH10,11 & 12) were drilled in the position of the new drive to check filtration rates under the proposed SUD's surface and tested mid-March 2019. Lowest test results for these are BH10 'f' (m/s) = 4.02E-06 BH11 'f' (m/s) = 2.34E-06 BH12 'f' (m/s) = 3.02E-06. Similar results for shallow TP2 & TP3 at 4.25E-06. All testing in accordance with CIRIA R156 and BRE 365 guidance.

Soakaway Design:

The percolation tests on TP1 show an improvement at depths over 2m which is in the layer of sandy clay mixed with flint & stone. To avoid any ambiguity the poorest filtration test result at the shallower depth of TP1 have been used by Civil Web to calculate the soakaway sizes 'f' (m/s) 1.07E-06 / 0.0039 m/hr.

The proposed soakaways are to be perforated concrete rings, located within large pits filled with course grade aggregate with a porosity of not less than 40%. Allowance has been made within the calculation by Civil Web for climate change (30%), no base filtration, a 100-year return period. The lowest part of the soakaways are at least 1m above the water table.

All design follows BRE 365 guidance.

Further Information:

Document LTC.GW.001 contains the site investigation work, borehole monitoring, photographic details, historic borehole details, environmental searches and spreadsheets used to design the soakaways.



Notes & Revisions

Submission for Planning Condition Approval.
Service position Provisional

The Pure Group

project
Limetree Close
East Preston

drawing
Surface Water Drainage
Foul Water Drainage
Provisional Service Routes

Drawing ref: LTC.U/GSERVICES. 002

Scaled at 1:100 on A1 - March 2019

Drawn by: AM The Pure Group

IMPERVIOUS CATCHMENT AREA:

EXISTING 331m2

PROPOSED

Plot 1:	67m2
Plot 2:	64m2
Plot 3:	87m2
Plot 4:	
Front	27m2
Rear	51m2
Plot 5:	
Front	27m2
Rear	41m2
Plot 6:	
Front	27m2
Rear	41m2
Plot 7:	
Front	27m2
Rear	41m2
TOTAL	500m2

Total site area 1740m2



LEGEND

-  Ground Water Monitoring Bore Holes
-  Percolation Test Bore Holes
-  Trial Pit for Full Scale Percolation Test

Drawing Reference: LTC.INVEST.002	THE PURE GROUP
	Location of Site Investigation Bore Holes & Trial Pits
	Scortan, Lime Tree Close East Preston, BN16 1JA
Scale: On A3 1:200 / as bar	
March 2019	

Ground Water Level Monitoring Boreholes

BH1:

70mm auger drilled to 3.1m mid November 2018
0-350mm Made ground/ organic containing topsoil
350-1200mm firm light brown sandy clay
1200-1800mm firm lighter brown clay with more sand content
1800-2200mm sandy clay mixed with stone / flint
2200-3000mm firm sandy clay
Bore hole was checked for ground water regularly between November and end of March 2019 with no water detected

BH2:

70mm auger drilled to 3.1m mid November 2018
0-400mm Made ground/ organic containing topsoil
400-1200mm firm light brown sandy clay
1200-1800mm firm lighter brown clay with more sand content
1800-2200mm sandy clay mixed with stone / flint
2400-3000mm firm sandy clay with decreasing stone/flint content
Bore hole was checked for ground water regularly between November and the end of March 2019 with no water detected

BH3:

70mm auger drilled to 2.1m mid January 2019
0-300mm Made ground/ organic containing topsoil
300-1200mm firm light brown sandy clay
1200-1800mm firm lighter brown clay with more sand content
1800-2100mm clay has small stone / flint mixed and becoming more sandy
Bore hole was checked for ground water regularly between January and the end of March 2019 with no water detected

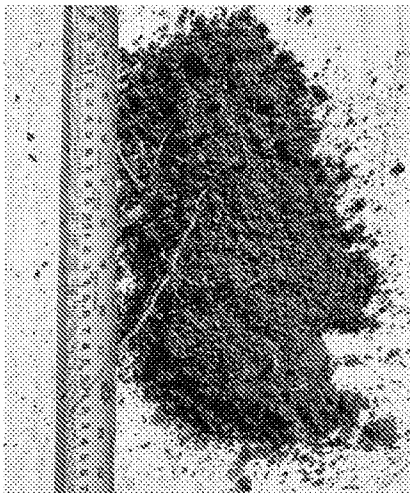
BH4:

70mm hand auger drilled to 2.1m mid/late March 2019
0-300mm Made ground/ organic containing topsoil
300-1200mm firm light brown sandy clay
1200-1600mm firm lighter brown clay with more sand content
1600-1800mm clay has small stone / flint mixed and becoming more sandy
1800-2100mm turns to high sand content

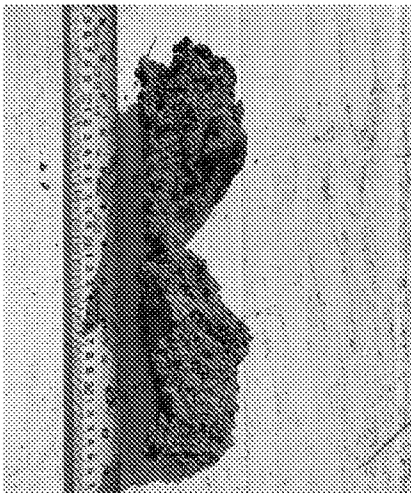
Bore hole was checked for ground water regularly with no water detected

BH5:

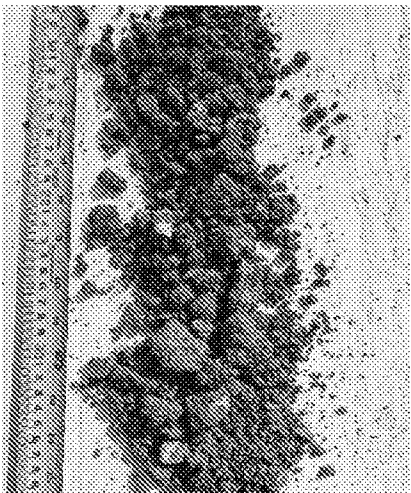
70mm hand auger drilled mid January 2019 to 1.9m. Re-drilled to 2.1m mid/late March 2019
0-300mm Made ground/ organic containing topsoil
300-1200mm firm light brown sandy clay
1200-1800mm firm lighter brown clay with more sand content
1800-2100mm clay has small stone / flint mixed and becoming more sandy
Bore hole was checked for ground water regularly between January and the end of March 2019 with no water detected



Made ground / topsoil: containing organic material roots etc. Typical across whole site 0 - 300 / 400mm



Firm light brown sandy clay. Typical across whole site to a depth between 300 and up to 1800mm. Sand content increases gradually as you travel downwards



Light brown sandy clay mixed with small flints / stones typical across site at a depth of 1.8 to 2m. BH's indicate this layer to be 250-450mm

Typical Soil Samples Found Across all Boreholes

	Project:	Lime Tree Close, BN16 1JA			By Civil Web	
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	SA. Plot 1	Date:	29.03.2019		

Catchment Details

Catchment Area / Front Elevation Roof			67	m ²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

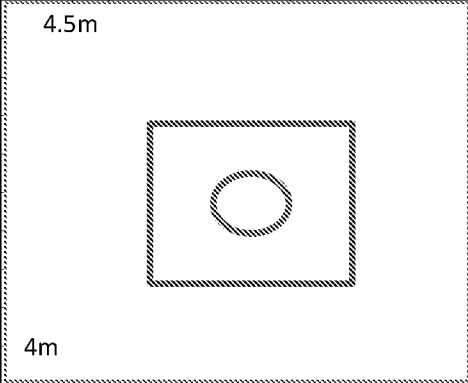
Ground Information

Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

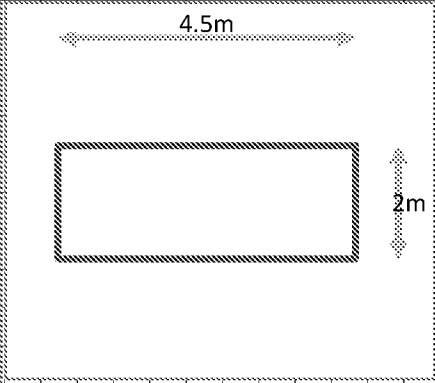
Soakaway Design

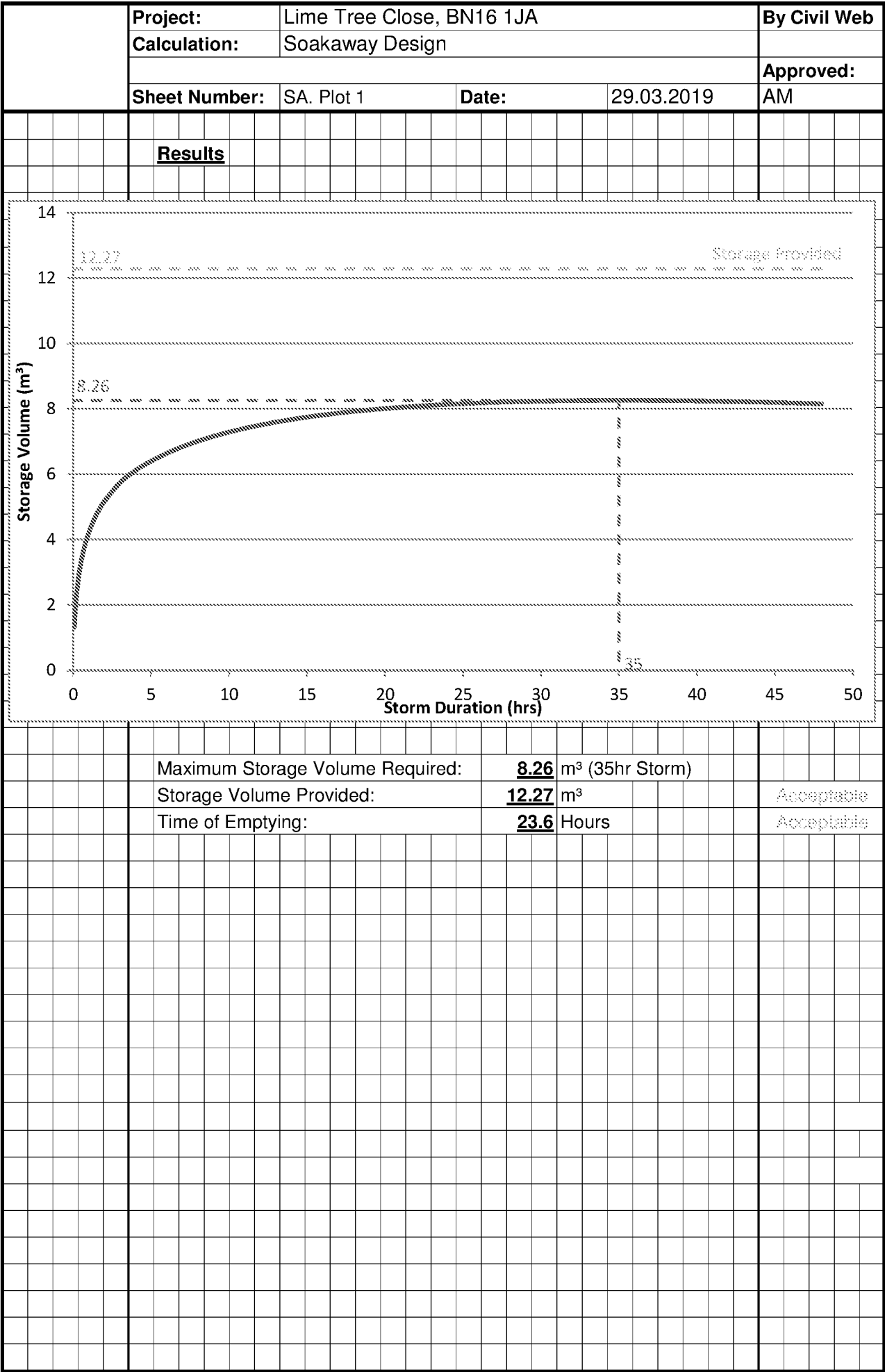
Soakaway Shape	Manhole Within Pit			
Number of Soakaways	1			
Length	4.00			
Width	4.50	m		
Effective Depth	2.00	m		
Backfill Porosity	30	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1200	mm		

Soakaway Plan



Soakaway Cross Section





	Project:	Lime Tree Close, BN16 1JA			By Civil Web	
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	SA. Plot 2	Date:	29.03.2019		

Located adjacent to parking bay for each house

Catchment Details

Catchment Area / Front Elevation Roof			64	m ²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

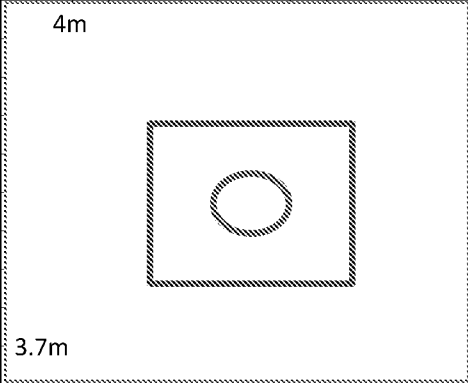
Ground Information

Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

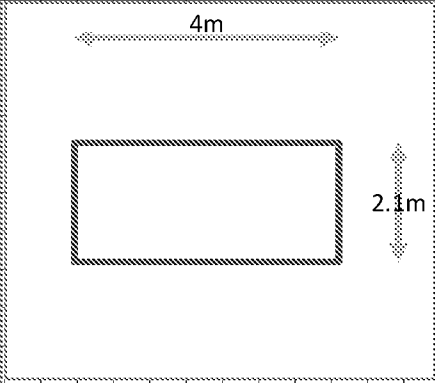
Soakaway Design

Soakaway Shape	Manhole Within Pit			
Number of Soakaways	1			
Length	3.70			
Width	4.00	m		
Effective Depth	2.10	m		
Backfill Porosity	30	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1050	mm		

Soakaway Plan



Soakaway Cross Section



ARUN DISTRICT COUNCIL EP/133/20/DOC

11

Project:		Lime Tree Close, BN16 1JA		By Civil Web
Calculation:		Soakaway Design		
Sheet Number:		SA. Plot 2	Date:	29.03.2019
				Approved: AM
Results				
Storage Volume (m³) 12 10 8 6 4 2 0 0 5 10 15 20 25 30 35 40 45 50 10.51 7.90 23.7 Storage Provided				
Maximum Storage Volume Required:		<u>7.90</u>	m³ (35hr Storm)	
Storage Volume Provided:		<u>10.51</u>	m³	Acceptable
Time of Emptying:		<u>23.7</u>	Hours	Acceptable

	Project:	Lime Tree Close, BN16 1JA			By Civil Web	
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	SA. Plot 3	Date:	29.03.2019		

Located adjacent to parking bay for each house

Catchment Details

Catchment Area / Front Elevation Roof			87	m²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

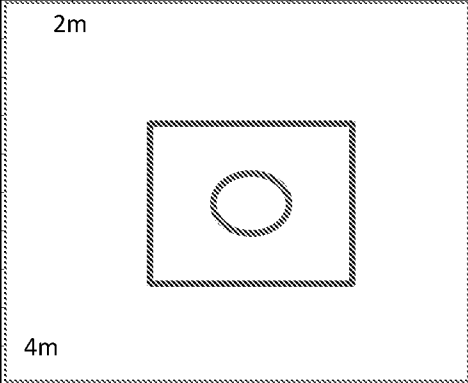
Ground Information

Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

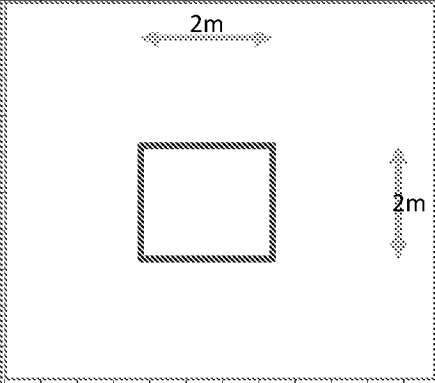
Soakaway Design

Soakaway Shape	Manhole Within Pit			
Number of Soakaways	2			
Length	4.00			
Width	2.00	m		
Effective Depth	2.00	m		
Backfill Porosity	30	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1050	mm		

Soakaway Plan

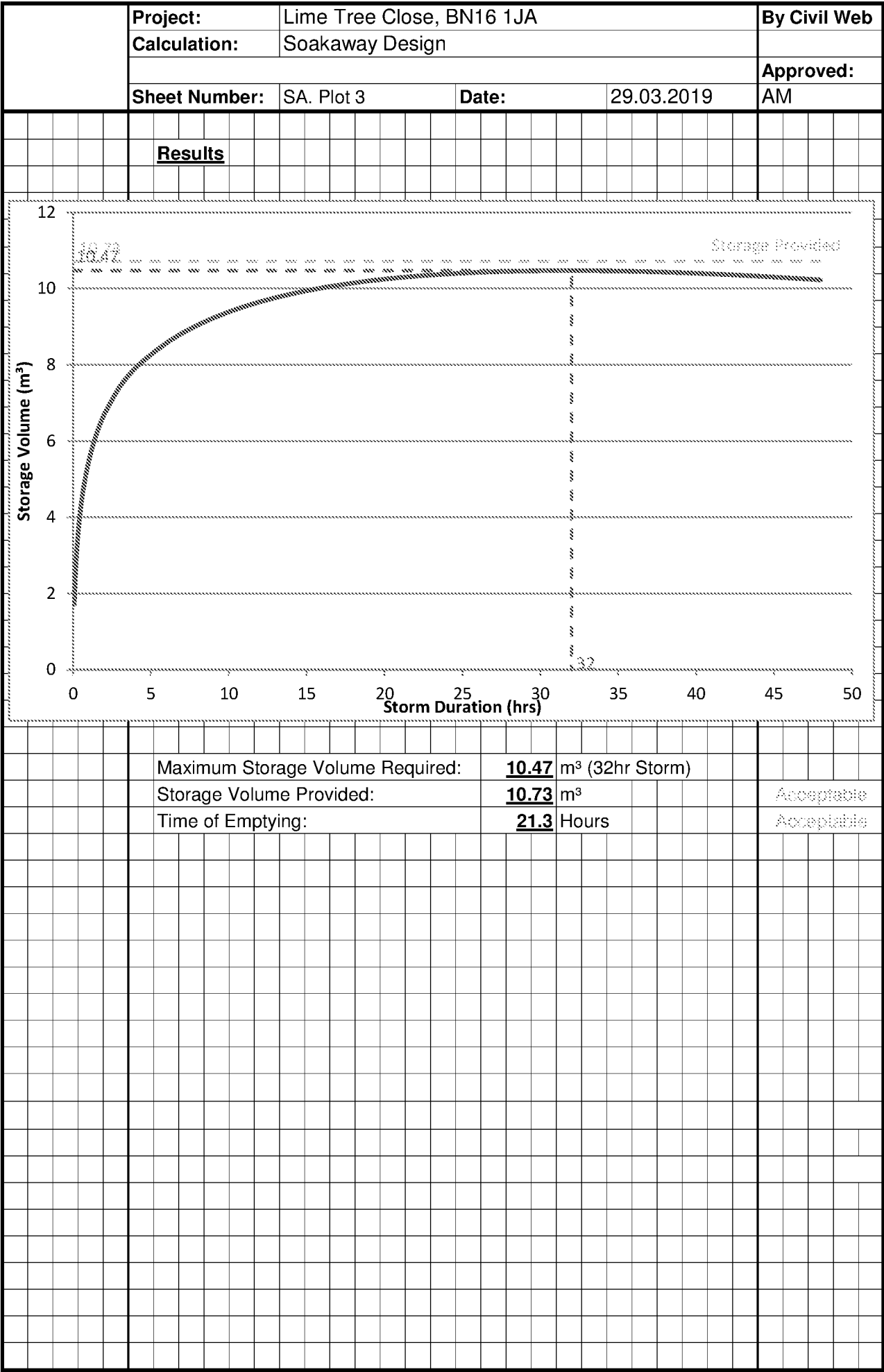


Soakaway Cross Section



ARUN DISTRICT COUNCIL EP/133/20/DOC

14



	Project:	Lime Tree Close, BN16 1JA			By Civil Web	
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	Plot 4,5,6,7 WEST S	Date:	29.03.2019		

Located adjacent to parking bay for each house

Catchment Details

Catchment Area / Front Elevation Roof			27	m²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

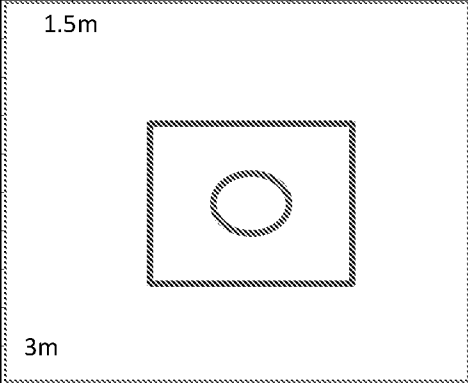
Ground Information

Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

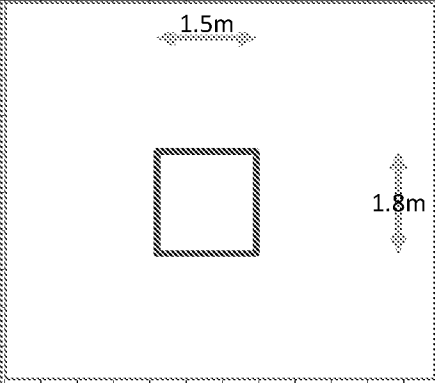
Soakaway Design

Soakaway Shape	Manhole Within Pit			
Number of Soakaways	1			
Length	3.00			
Width	1.50	m		
Effective Depth	1.80	m		
Backfill Porosity	40	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1050	mm		

Soakaway Plan



Soakaway Cross Section



ARUN DISTRICT COUNCIL EP/133/20/DOC

17

	Project:	Lime Tree Close, BN16 1JA				By Civil Web
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	Plot 4 East SA	Date:	29.03.2019		

Located rear garden of each house

Catchment Details

Catchment Area / Front Elevation Roof			51	m ²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

Ground Information

Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

Soakaway Design

Soakaway Shape	Manhole Within Pit			
Number of Soakaways	1			
Length	2.00			
Width	5.00	m		
Effective Depth	2.00	m		
Backfill Porosity	30	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1050	mm		

Soakaway Plan

5m

2m

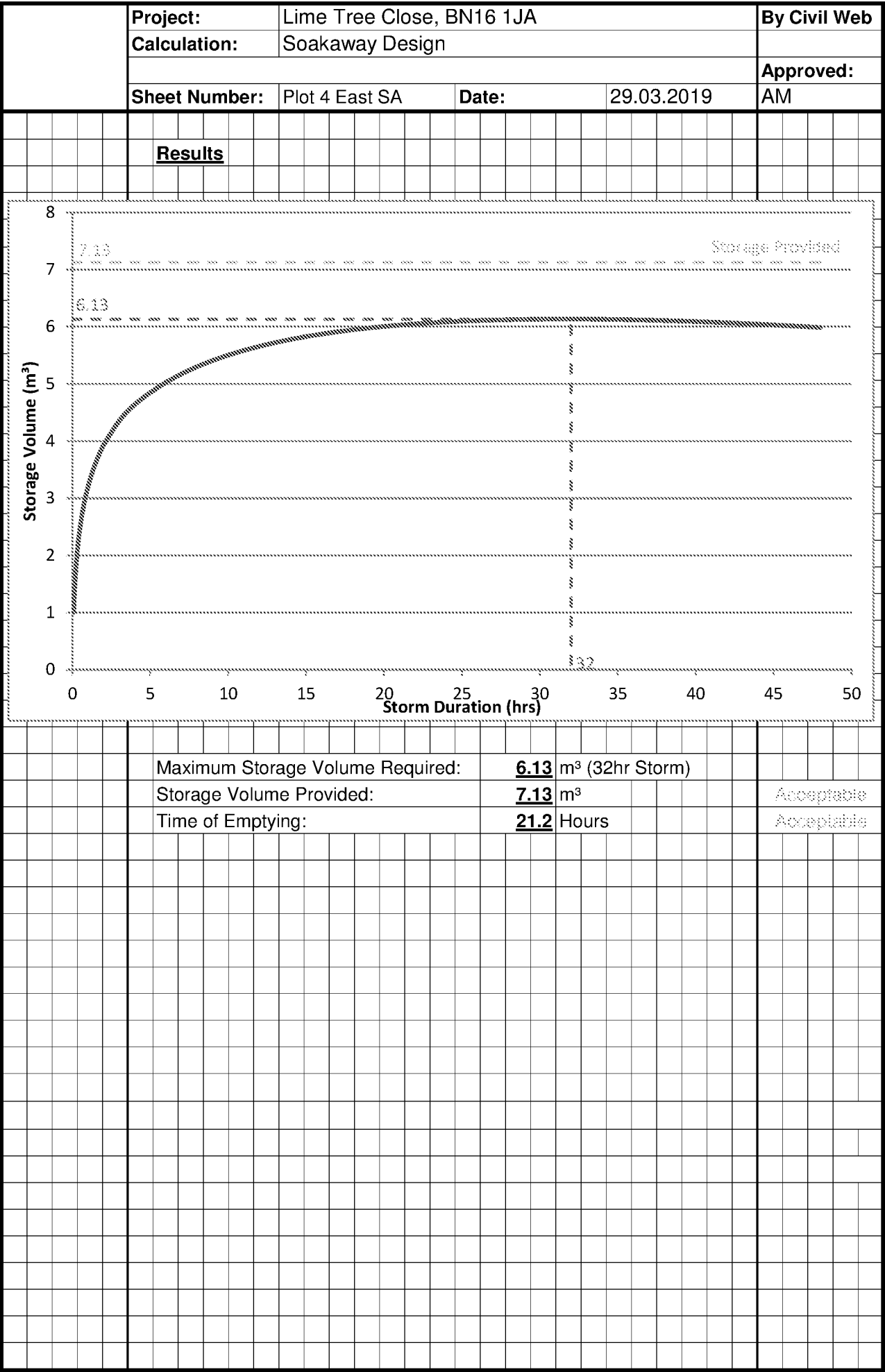
Soakaway Cross Section

5m

2m

ARUN DISTRICT COUNCIL EP/133/20/DOC

20



	Project:	Lime Tree Close, BN16 1JA			By Civil Web	
	Calculation:	Soakaway Design				
	Wallingford Procedure Rainfall					Approved: AM
	Sheet Number:	Plot 5,6,7 EAST SA	Date:	29.03.2019		

Located rear garden of each house

Catchment Details

Catchment Area / Front Elevation Roof			41	m²
Location			England & Wales	
City/Town			Littlehampton	
M5-60	18.7	Override-		
r Ratio	0.35	Override-		
Runoff Coefficient			100	%

Design Storm Details

Return Period	100	years
Climate Change Allowance	1.3	

Ground Information

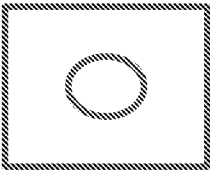
Infiltration Rate	0.0039	m/hr
Factor of Safety	1	

Soakaway Design

Soakaway Shape	Manhole Within Pit			
Number of Soakaways	1			
Length	3.50			
Width	1.80	m		
Effective Depth	2.00	m		
Backfill Porosity	40	%		
Additional Outflow (If Any)	0	l/s		
Base Infiltration Factor	0			
Manhole Diameter	1050	mm		

Soakaway Plan

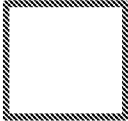
1.8m



3.5m

Soakaway Cross Section

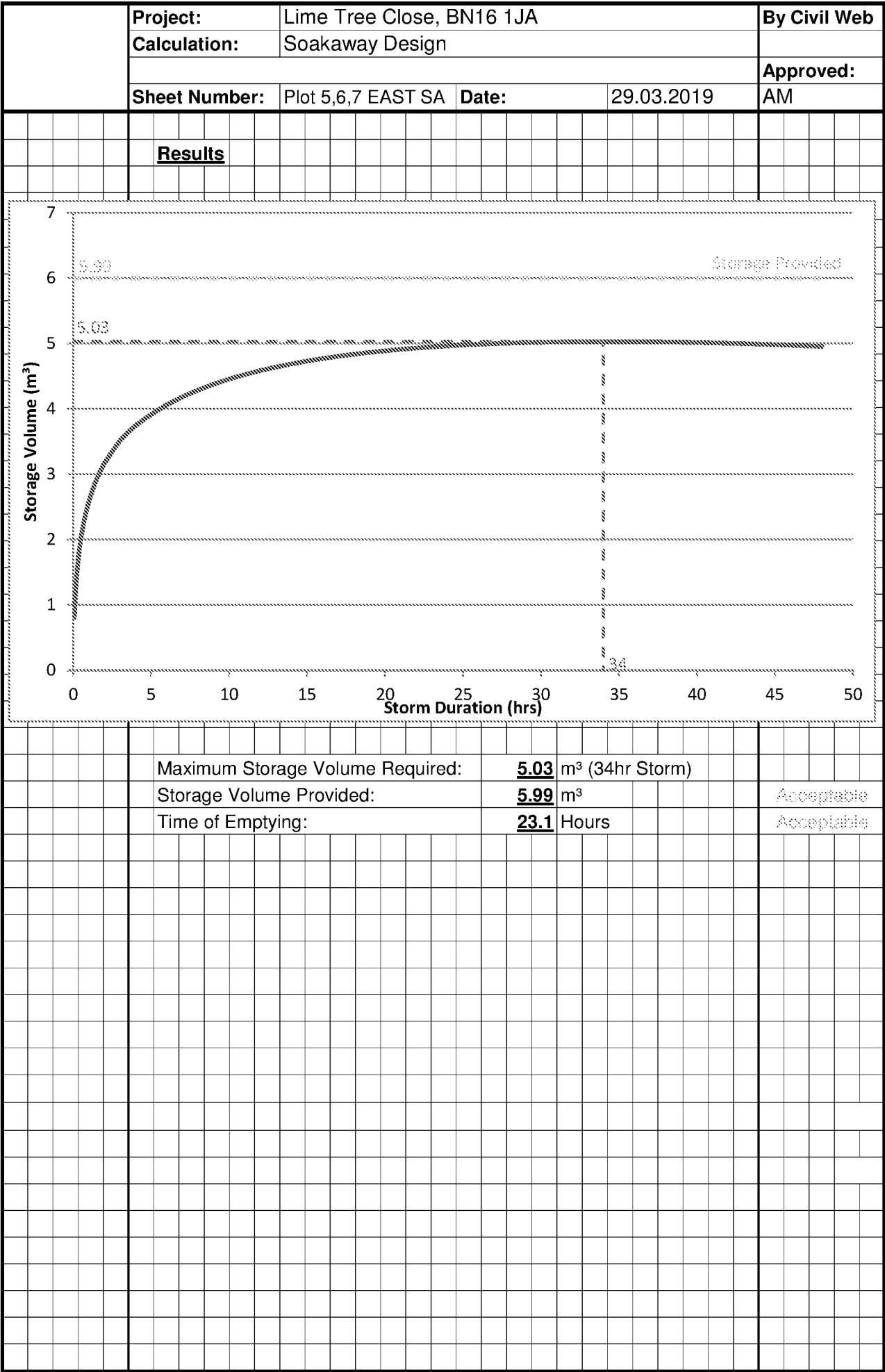
1.8m



2m

ARUN DISTRICT COUNCIL EP/133/20/DOC

23

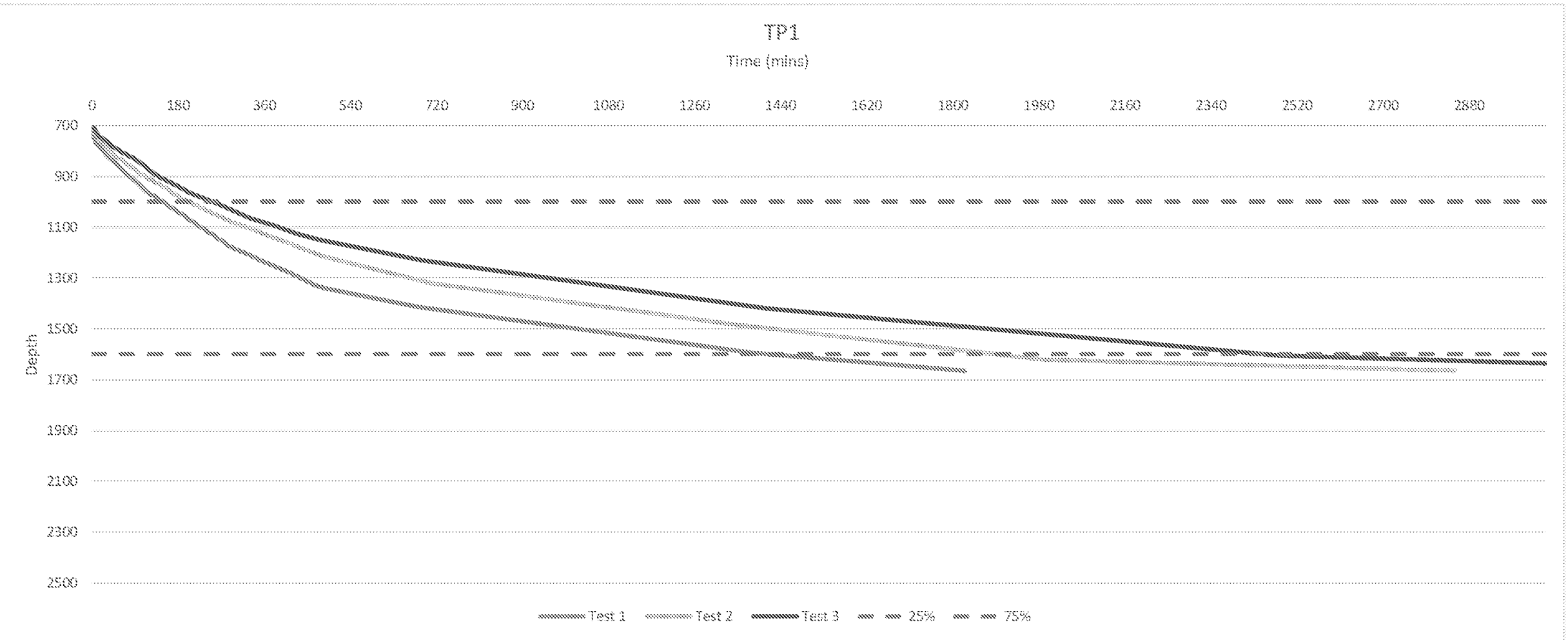


TP1 1900mm: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1		Test 2		Test 3	
450 x 2000 1900 mm deep		450 x 2000 1900 mm deep		450 x 2000 1900 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	700	0	700	0	700
2	740	5	720	8	725
6	760	8	735	12	735
9	770	15	750	16	745
15	780	20	765	21	750
22	800	25	775	29	760
31	820	30	790	41	780
40	835	40	805	50	790
49	850	50	820	62	805
60	870	60	835	78	820
86	910	76	855	92	835
113	960	82	865	134	895
136	985	90	875	150	910
159	1015	120	910	180	940
184	1045	148	940	205	965
215	1085	162	955	265	1010
243	1120	176	975	330	1065
291	1180	190	990	382	1095
329	1210	212	1010	425	1125
352	1230	292	1080	474	1150
414	1280	332	1105	690	1230
468	1330	370	1135	1410	1420
485	1340	415	1165	2480	1605
682	1415	482	1215	3315	1650
1380	1595	710	1320	END	
1825	1665	1350	1485		
END		1990	1620		
		2850	1665		
		END			
Test over consecutive days from 29th January to the 2nd February 2019					
f'(m/s)=1.79E-06		f'(m/s)=1.39E-06		f'(m/s)=1.07E-06	



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

f' (m/s) = 1.07E-06 or 0.003852 m/hr

TEST 1

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{ss} ' [m ²] =	3.84
storage volume between 75-25% 'V _s ' [m ³] =	0.54
time for water to fall from 75-25% 't _p ' [min] =	1264.29
soil infiltration rate 'f' [m/s] =	1.85E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{to} ' [m] =	1.90
depth to pipe invert level 'D _{pi} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.20
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	2	9	22	40	60	136	159	215	291	352	414	468	485	682	1380	1825		
	depth to water [m] =	0.70	0.74	0.77	0.80	0.84	0.87	0.89	1.02	1.09	1.18	1.23	1.28	1.33	1.34	1.42	1.60	1.67		
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

Spreadsheet provided by: www.YourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 2

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{ss} ' [m ²] =	3.84
storage volume between 75-25% 'V _s ' [m ³] =	0.54
time for water to fall from 75-25% 't _p ' [min] =	1691.57
soil infiltration rate 'f' [m/s] =	1.39E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{to} ' [m] =	1.90
depth to pipe invert level 'D _{pi} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.20
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =																			
	depth to water [m] =																			
Soakage Trial 2	time [min] =	0	5	15	25	40	60	90	148	176	292	370	482	710	1350	1990	2850			
	depth to water [m] =	0.70	0.72	0.75	0.78	0.81	0.84	0.88	0.94	0.98	1.08	1.14	1.22	1.32	1.49	1.62	1.67			
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

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calculations are based on BRE Guidelines (Digest 365)

TEST 3

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{ss} ' [m ²] =	3.84
storage volume between 75-25% 'V _s ' [m ³] =	0.54
time for water to fall from 75-25% 't _p ' [min] =	2198.22
soil infiltration rate 'f' [m/s] =	1.07E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{to} ' [m] =	1.90
depth to pipe invert level 'D _{pi} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.20
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =																			
	depth to water [m] =																			
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =	0	8	16	29	62	92	134	150	180	265	330	382	425	474	690	1410	2480	3315	
	depth to water [m] =	0.70	0.73	0.75	0.76	0.81	0.84	0.90	0.91	0.94	1.01	1.07	1.10	1.13	1.15	1.23	1.42	1.61	1.67	

Spreadsheet provided by: www.YourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

Combined Tests

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{ss} ' [m ²] =	3.84
storage volume between 75-25% 'V _s ' [m ³] =	0.54
time for water to fall from 75-25% 't _p ' [min] =	2198.22
soil infiltration rate 'f' [m/s] =	1.07E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{to} ' [m] =	1.90
depth to pipe invert level 'D _{pi} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.20
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement h^N		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]	0	2	9	22	40	60	136	159	215	291	352	414	468	485	682	1380	1825		
	depth to water [m]	0.70	0.74	0.77	0.80	0.84	0.87	0.99	1.02	1.09	1.18	1.23	1.28	1.33	1.34	1.42	1.60	1.67		
Soakage Trial 2	time [min]	0	5	15	25	40	60	90	148	176	292	370	482	710	1350	1990	2850			
	depth to water [m]	0.70	0.72	0.75	0.78	0.81	0.84	0.88	0.94	0.98	1.08	1.14	1.22	1.32	1.49	1.62	1.67			
Soakage Trial 3	time [min]	0	8	16	29	62	92	134	150	180	265	330	382	425	474	690	1410	2480	3315	
	depth to water [m]	0.70	0.73	0.75	0.76	0.81	0.84	0.90	0.91	0.94	1.01	1.07	1.10	1.13	1.15	1.23	1.42	1.61	1.67	

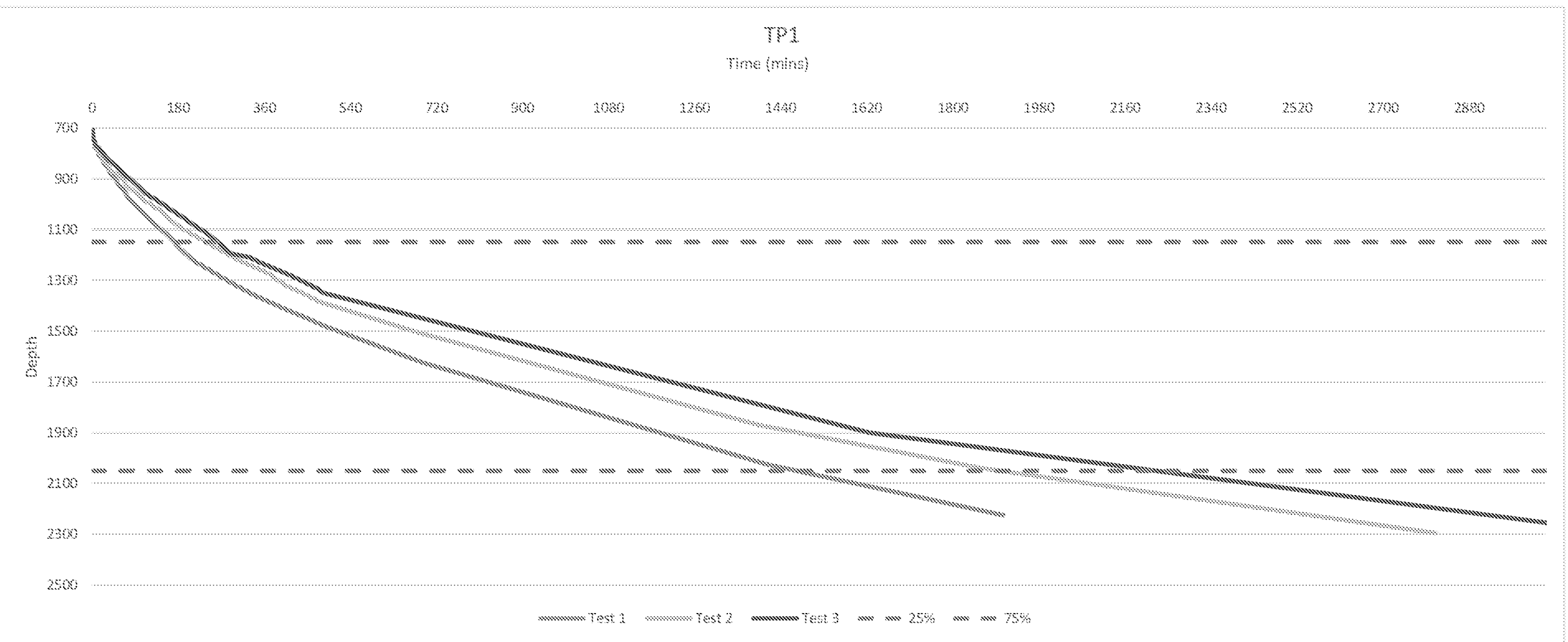
Spreadsheet provided by: www.YourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

TP1 2600mm : Field Test Data Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1 450 x 2000 2500 mm deep		Test 2 450 x 2000 2500 mm deep		Test 3 450 x 2000 5600 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	700	0	700	0	700
2	750	5	780	2	740
4	755	10	790	6	760
8	785	18	810	9	770
22	830	26	830	15	780
28	845	33	850	22	800
40	880	42	870	31	820
55	920	58	890	40	835
78	980	72	925	49	850
98	1020	105	980	60	870
130	1075	138	1020	86	910
162	1130	180	1085	113	960
184	1175	210	1120	136	985
210	1220	305	1220	159	1015
296	1315	365	1270	184	1045
340	1360	405	1320	215	1085
405	1415	440	1350	243	1120
450	1450	475	1385	291	1195
485	1480	680	1505	329	1210
692	1625	1395	1870	352	1230
1412	2025	1860	2040	414	1280
1905	2225	2810	2295	468	1330
END		END		485	1350
				1625	1900
				3225	2300
				END	
Tested over consecutive days 18th to 24th March 2019					
f'(m/s) =1.79E-06		f'(m/s) =3.25E-06		f'(m/s) =1.37E-06	



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

f' (m/s) = 1.37E-06 or 0.004932 m/hr

TEST 1

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{50%} ' [m ²] =	5.31
storage volume between 75-25% 'V _{5%} ' [m ³] =	0.81
time for water to fall from 75-25% 't _{5%} ' [min] =	1301.85
soil infiltration rate 'f' [m/s] =	1.95E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{IG} ' [m] =	2.50
depth to pipe invert level 'D _{IP} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.80
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	2	4	22	40	78	130	162	184	210	296	340	405	450	485	692	1412	1905	
	depth to water [m] =	0.70	0.75	0.76	0.83	0.88	0.98	1.08	1.13	1.18	1.22	1.32	1.36	1.42	1.45	1.48	1.63	2.03	2.23	
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

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calculations are based on BRE Guidelines (Digest 365)

TEST 2

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{50%} ' [m ²] =	5.31
storage volume between 75-25% 'V _{5%} ' [m ³] =	0.81
time for water to fall from 75-25% 't _{5%} ' [min] =	1674.88
soil infiltration rate 'f' [m/s] =	1.52E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{IG} ' [m] =	2.50
depth to pipe invert level 'D _{IP} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.80
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =																			
	depth to water [m] =																			
Soakage Trial 2	time [min] =	0	5	10	18	33	58	105	138	180	210	305	405	475	680	1395	1860	2810		
	depth to water [m] =	0.70	0.78	0.79	0.81	0.85	0.89	0.98	1.02	1.09	1.12	1.26	1.32	1.39	1.51	1.87	2.04	2.25		
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

Spreadsheet provided by: www.YourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 3

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{50%} ' [m ²] =	5.31
storage volume between 75-25% 'V _{5%} ' [m ³] =	0.81
time for water to fall from 75-25% 't _{5%} ' [min] =	1965.09
soil infiltration rate 'f' [m/s] =	1.29E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{IG} ' [m] =	2.50
depth to pipe invert level 'D _{IP} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.80
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =																			
	depth to water [m] =																			
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =	0	2	6	15	22	40	60	113	159	215	291	329	414	468	485	1625	3225		
	depth to water [m] =	0.70	0.74	0.76	0.78	0.80	0.84	0.87	0.96	1.02	1.09	1.20	1.21	1.28	1.33	1.35	1.90	2.30		

Spreadsheet provided by: www.YourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

Combined Tests

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	Yes No
use soakage trial pit table below	
internal surface area of trial pit 'a _{50%} ' [m ²] =	5.31
storage volume between 75-25% 'V _{5%} ' [m ³] =	0.81
time for water to fall from 75-25% 't _{5%} ' [min] =	1965.09
soil infiltration rate 'f' [m/s] =	1.29E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] =	0.45
soakage trial pit length 'L _i ' [m] =	2.00
total depth from ground level 'D _{IG} ' [m] =	2.50
depth to pipe invert level 'D _{IP} ' [m] =	0.70
soakage trial pit effective depth 'D _{eff} ' [m] =	1.80
free volume in infill aggregate [%] =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	2	4	22	40	78	130	162	184	210	296	340	405	450	485	692	1412	1905	
	depth to water [m] =	0.70	0.75	0.76	0.83	0.88	0.98	1.08	1.13	1.18	1.22	1.32	1.36	1.42	1.45	1.48	1.63	2.03	2.23	
Soakage Trial 2	time [min] =	0	5	10	18	33	58	105	138	180	210	305	405	475	680	1395	1860	2810		
	depth to water [m] =	0.70	0.78	0.79	0.81	0.85	0.89	0.98	1.02	1.09	1.12	1.26	1.32	1.39	1.51	1.87	2.04	2.25		
Soakage Trial 3	time [min] =	0	2	6	15	22	40	60	113	159	215	291	329	414	468	485	1625	3225		
	depth to water [m] =	0.70	0.74	0.76	0.78	0.80	0.84	0.87	0.96	1.02	1.09	1.20	1.21	1.28	1.33	1.35	1.90	2.30		

Spreadsheet provided by: www.YourSpreadsheets.co.uk

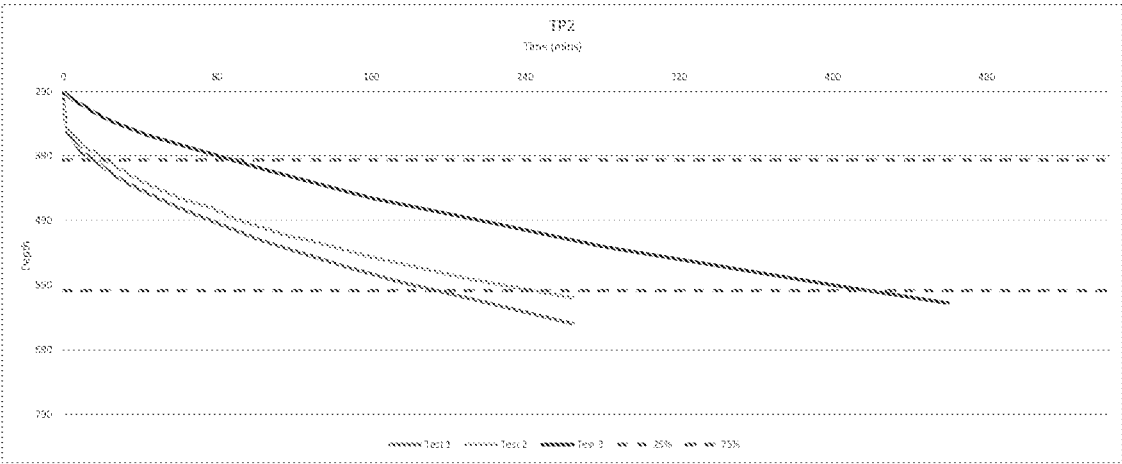
calculations are based on BRE Guidelines (Digest 365)

TP2: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1 450x1000 700 mm deep		Test 2 450 x 1000 700 mm deep		Test 3 450 x 1000 700 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	295	0	310	0	290
2	352	1	336	2	295
4	362	2	347	6	305
10	385	3	351	10	311
16	395	7	362	16	322
22	410	10	375	23	333
32	430	16	383	30	342
42	445	24	400	44	358
60	470	34	418	106	412
82	496	42	431	160	455
102	520	62	457	220	492
145	560	77	470	280	530
175	585	88	486	342	561
210	610	97	495	400	590
265	650	107	504	460	618
END		117	514	END	
		122	517		
		127	520		
		158	545		
		210	580		
		265	610		
		END			
Test one first day, Test two & three second day starting 29th January 2019					
f(m/s) =8.27E-06		f(m/s) =6.46E-06		f(m/s) =4.21E-06	



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

T' (m/s) = 4.21E-06 or 0.0151 m/hr

TEST 1

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit 'A _{tp} ' (m ²) =	1.04
storage volume between 75-25% V ₂ (m ³) =	0.09
time for water to fall from 75-25% V ₂ (mins) =	175.60
soil infiltration rate 'f' (m/s) =	8.27E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W' (m) =	0.45
soakage trial pit length 'L' (m) =	1.09
total depth from ground level 'D _g ' (m) =	0.70
depth to pipe invert level 'D _p ' (m) =	0.29
soakage trial pit effective depth 'D _{eff} ' (m) =	0.41
free volume in infiltr aggregate (%) =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																			
water level measurement (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time (min) =	2	4	10	19	22	32	42	60	82	103	145	179	210	265				
	depth to water (m) =	0.25	0.36	0.39	0.40	0.41	0.43	0.45	0.47	0.50	0.52	0.55	0.59	0.61	0.65				
Soakage Trial 2	time (min) =																		
	depth to water (m) =																		
Soakage Trial 3	time (min) =																		
	depth to water (m) =																		

Spreadsheet provided by: www.YourSpreadsheet.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 2

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit 'A _{tp} ' (m ²) =	1.02
storage volume between 75-25% V ₂ (m ³) =	0.09
time for water to fall from 75-25% V ₂ (mins) =	223.06
soil infiltration rate 'f' (m/s) =	6.46E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W' (m) =	0.45
soakage trial pit length 'L' (m) =	1.09
total depth from ground level 'D _g ' (m) =	0.70
depth to pipe invert level 'D _p ' (m) =	0.29
soakage trial pit effective depth 'D _{eff} ' (m) =	0.39
free volume in infiltr aggregate (%) =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																			
water level measurement (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time (min) =																		
	depth to water (m) =																		
Soakage Trial 2	time (min) =	1	2	3	7	10	19	28	39	48	77	97	107	112	122	127	160	210	266
	depth to water (m) =	0.34	0.36	0.35	0.28	0.28	0.28	0.28	0.40	0.42	0.40	0.47	0.50	0.50	0.51	0.52	0.55	0.59	0.61
Soakage Trial 3	time (min) =																		
	depth to water (m) =																		

Spreadsheet provided by: www.YourSpreadsheet.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 3

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit 'A _{tp} ' (m ²) =	1.04
storage volume between 75-25% V ₂ (m ³) =	0.09
time for water to fall from 75-25% V ₂ (mins) =	350.02
soil infiltration rate 'f' (m/s) =	4.21E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W' (m) =	0.45
soakage trial pit length 'L' (m) =	1.09
total depth from ground level 'D _g ' (m) =	0.70
depth to pipe invert level 'D _p ' (m) =	0.29
soakage trial pit effective depth 'D _{eff} ' (m) =	0.41
free volume in infiltr aggregate (%) =	100
NOTE: faces of excavation assumed to be vertical	

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																			
water level measurement (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time (min) =																		
	depth to water (m) =																		
Soakage Trial 2	time (min) =																		
	depth to water (m) =																		
Soakage Trial 3	time (min) =	8	2	9	10	19	22	26	44	103	160	229	269	342	400	460			
	depth to water (m) =	0.25	0.36	0.34	0.34	0.32	0.32	0.34	0.38	0.48	0.48	0.53	0.55	0.56	0.59	0.62			

Spreadsheet provided by: www.YourSpreadsheet.co.uk

calculations are based on BRE Guidelines (Digest 365)



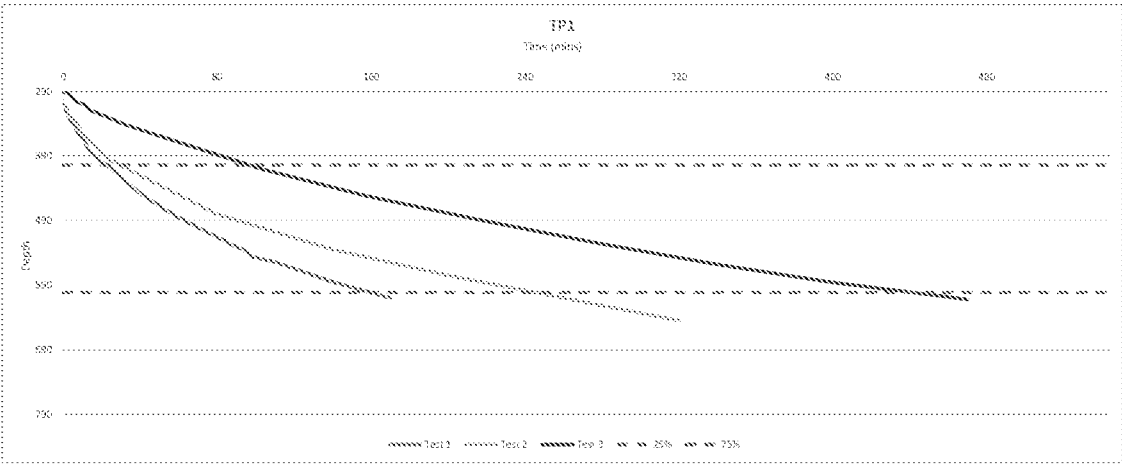
The Pure Group

TP3: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1		Test 2		Test 3	
450x1000		450 x 1000		450 x 1000	
700 mm deep		700 mm deep		700 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	305	0	305	0	290
1	315	1	312	3	295
2	325	4	330	7	305
3	330	8	345	11	311
4	335	16	375	15	320
5	340	24	395	23	330
8	355	40	420	31	340
11	368	80	480	43	352
15	387	140	535	103	410
23	405	200	575	158	452
27	415	260	610	218	490
31	425	320	645	278	525
41	450	END		338	557
58	482			398	585
74	507			470	612
83	520			END	
88	528				
93	534				
98	546				
110	554				
140	585				
170	610				
END					
Test one first day, Test two & three second day starting 30th January 2019					
f'(m/s)=1.05E-05		f'(m/s)=1.06E-05		f'(m/s)=4.25E-06	



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

T^* (m/s) = 4.25E-06 or 0.0153 m/hr

TEST 1

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit A_{int} [m ²]	1.02
storage volume between 75-25% V_{75-25} [m ³]	0.09
time for water to fall from 75-25% t_{75-25} (min)	137.32
soil infiltration rate f [m/s]	1.05E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width W_1 [m]	0.45
soakage trial pit length L_1 [m]	1.00
total depth from ground level D_{GL} [m]	0.70
depth to pipe invert level D_{PI} [m]	0.31
soakage trial pit effective depth D_{eff} [m]	0.40
free volume in in-fill aggregate (%)	100
NOTE: bases of soakaways assumed to be vertical	

		SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																		
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]	9	1	2	3	4	5	9	0	19	27	58	08	30	38	119	160	179		
	depth to water [m]	0.34	0.52	0.32	0.23	0.34	0.34	0.59	0.30	0.42	0.48	0.53	0.53	0.55	0.55	0.61				
Soakage Trial 2	time [min]																			
	depth to water [m]																			
Soakage Trial 3	time [min]																			
	depth to water [m]																			

Spreadsheet provided by: www.FourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 3

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit A_{int} [m ²]	1.64
storage volume between 75-25% V_{75-25} [m ³]	0.09
time for water to fall from 75-25% t_{75-25} (min)	346.44
soil infiltration rate f [m/s]	4.25E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width W_1 [m]	0.45
soakage trial pit length L_1 [m]	1.00
total depth from ground level D_{GL} [m]	0.70
depth to pipe invert level D_{PI} [m]	0.28
soakage trial pit effective depth D_{eff} [m]	0.41
free volume in in-fill aggregate (%)	100
NOTE: bases of soakaways assumed to be vertical	

		SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																		
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]																			
	depth to water [m]																			
Soakage Trial 2	time [min]																			
	depth to water [m]																			
Soakage Trial 3	time [min]	0	3	7	11	16	23	31	45	105	158	218	279	320	396	478				
	depth to water [m]	0.28	0.26	0.31	0.34	0.32	0.23	0.34	0.35	0.44	0.45	0.45	0.53	0.58	0.58	0.61				

Spreadsheet provided by: www.FourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)

TEST 2

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit A_{int} [m ²]	1.02
storage volume between 75-25% V_{75-25} [m ³]	0.09
time for water to fall from 75-25% t_{75-25} (min)	215.40
soil infiltration rate f [m/s]	6.72E-06

SOAKAGE TRIAL PIT DATA	
soakage trial pit width W_1 [m]	0.45
soakage trial pit length L_1 [m]	1.00
total depth from ground level D_{GL} [m]	0.70
depth to pipe invert level D_{PI} [m]	0.31
soakage trial pit effective depth D_{eff} [m]	0.40
free volume in in-fill aggregate (%)	100
NOTE: bases of soakaways assumed to be vertical	

		SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																		
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]																			
	depth to water [m]																			
Soakage Trial 2	time [min]	0	1	4	6	10	25	40	58	148	209	269	320							
	depth to water [m]	0.31	0.34	0.33	0.26	0.28	0.40	0.42	0.48	0.54	0.58	0.61	0.65							
Soakage Trial 3	time [min]																			
	depth to water [m]																			

Spreadsheet provided by: www.FourSpreadsheets.co.uk

calculations are based on BRE Guidelines (Digest 365)



The Pure Group

BH6: Field Test Data Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1 160mm dia x 1920 mm deep		Test 2 160mm dia x 1920 mm deep		Test 3 160mm dia x 1920 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	650	0	650	0	650
2	760	5	830	1	700
4	820	10	910	2	750
8	920	15	960	10	900
13	1010	20	1015	15	970
17	1040	25	1060	20	1005
22	1090	30	1100	25	1050
26	1130	35	1130	30	1080
31	1165	40	1160	35	1110
40	1225	45	1185	40	1140
48	1270	50	1210	45	1170
56	1305	55	1235	50	1195
64	1350	60	1252	55	1220
72	1380	65	1280	60	1245
80	1420	70	1305	65	1270
88	1450	80	1350	75	1310
96	1480	90	1390	85	1350
104	1500	100	1430	95	1400
112	1535	110	1460	105	1430
120	1550	120	1490	115	1450
144	1600	130	1522	125	1470
152	1630	140	1550	135	1500
160	1665	150	1580	145	1540
168	1685	160	1610	155	1570
176	1705	170	1640	165	1600
184	1735	180	1665	175	1625
200	1760	190	1700	185	1655
208	1780	200	1720	195	1675
237	1840	210	1740	205	1700
257	1875	220	1765	215	1720
		230	1790	225	1740
		240	1805	235	1760
		250	1825	245	1770
		265	1845		
tested 14th to 16th January 2019					
.f'(m/s) = 5.06E-06		.f'(m/s) = 4.35E-06		f'(m/s) = 4.04E-06	

Test 4 160mm dia x 2250 mm deep	
Time (mins)	Depth to water surface
0	650
1	705
2	780
10	940
14	1000
30	1220
47	1380
67	1540
89	1690
113	1850
137	1960
176	2075
196	2100
244	2180
282	2200
tested 22nd February 2019	
f'(m/s) = 5.68E-06	

SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

f' (m/s) = 4.04E-06 or 0.014544 m/hr



The Pure Group: Site: Lime Tree Close, East Preston, BN16 1JA		BH6: Bore Hole 6		Revision: 1.00
		Job No: LTC01	Page: C/01	
Section: Infiltration test & Indicative Soakaway Design		Prepared By: AAM	Date: Test mid Jan 2019	
ALTERNATIVE SOAKAWAY SIZES		SUMMARY OF CALCULATIONS		
width of trench [mm]: required trench length [m]:		critical design rainfall duration t_{cd} = 600 min required storage volume V_{req} = 5.60 m ³ provided storage volume V_{prov} = 7.30 m ³ utilisation factor = 0.77 .OK required time to discharge 50% t_{50} = 16.35 hours utilisation factor = 0.68 .OK		
diameter of ring [mm]: required pit side length [m]:				
		NOTE: based on effective depth and number of pits as in Soakaway Data table		
GENERAL DATA		SOAKAWAY DATA		
site location: England and Wales soakaway type: perforated concrete ring pit shape: square pit around ring impermeable area drained to soakaway 'A' [m ²] = 87 60 min rainfall depth of 5 year return period 'R' [mm] = 19 M5-60 to M5-2d rainfall ratio 'Y' = 0.35 allowance for climate change: 30%		number of ring soakaways: 2 square pit side length 'L' [m] = 2.40 soakaway ring internal diameter 'D _{in} ' [mm] = 1050 total depth from ground level 'D _g ' [m] = 2.00 depth to drain invert level 'D _i ' [m] = 0.40 soakaway effective depth 'D _{eff} ' [m] = 1.60 free volume in infill aggregate [%] = 30		
SOIL INFILTRATION DATA		SOAKAGE TRIAL PIT DATA		
allowance for infiltration through soakaway base: No available on-site infiltration test results: ☒ Yes ☐ No use soakage trial pit table below internal surface area of trial pit 'A _{trial} ' [m ²] = 0.46 storage volume between 75-25% 'V _s ' [m ³] = 0.02 time for water to fall from 75-25% 't _f ' [min] = 133.23 soil infiltration rate 'f' [m/s] = 4.04E-06		soakage trial pit width 'W _i ' [m] = 0.14 soakage trial pit length 'L _i ' [m] = 0.14 total depth from ground level 'D _g ' [m] = 1.92 depth to pipe invert level 'D _i ' [m] = 0.35 soakage trial pit effective depth 'D _{eff} ' [m] = 1.57 free volume in infill aggregate [%] = 100 NOTE: slope of excavation assumed to be vertical		
REQUIRED STORAGE CAPACITY PER RAINFALL DURATION		SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS		
rainfall duration [mins] rainfall factor Z1		water level measurement h ₁ [m] Soakage Trial 1 Soakage Trial 2 Soakage Trial 3		
		calculations are based on BRE Guidelines (Digest 365)		

The Pure Group: Site: Lime Tree Close, East Preston, BN16 1JA		BH6: Bore Hole 6 DEEPER		Revision: 1.00
		Job No: LTC01	Page: C/01	
Section: Infiltration Test & Indicative Soakaway Design		Prepared By: AAM	Date: Test March 2019	
ALTERNATIVE SOAKAWAY SIZES		SUMMARY OF CALCULATIONS		
width of trench [mm]: required trench length [m]:		critical design rainfall duration t_{cd} = 360 min required storage volume V_{req} = 3.97 m ³ provided storage volume V_{prov} = 5.61 m ³ utilisation factor = 0.71 .OK required time to discharge 50% t_{50} = 10.72 hours utilisation factor = 0.45 .OK		
diameter of ring [mm]: required pit side length [m]:		NOTE: based on effective depth and number of pits as in Soakaway Data table		
GENERAL DATA		SOAKAWAY DATA		
site location: England and Wales soakaway type: perforated concrete ring pit shape: square pit around ring impermeable area drained to soakaway 'A' [m ²] = 65 60 min rainfall depth of 5 year return period 'R' [mm] = 20 M5-60 to M5-2d rainfall ratio 'Y' = 0.35 allowance for climate change: 30%		number of ring soakaways: 2 square pit side length 'L' [m] = 2.00 soakaway ring internal diameter 'D _{in} ' [mm] = 1050 total depth from ground level 'D _g ' [m] = 2.00 depth to drain invert level 'D _i ' [m] = 0.40 soakaway effective depth 'D _{eff} ' [m] = 1.60 free volume in infill aggregate [%] = 30		
SOIL INFILTRATION DATA		SOAKAGE TRIAL PIT DATA		
allowance for infiltration through soakaway base: No available on-site infiltration test results: ☒ Yes ☐ No use soakage trial pit table below internal surface area of trial pit 'A _{trial} ' [m ²] = 0.47 storage volume between 75-25% 'V _s ' [m ³] = 0.02 time for water to fall from 75-25% 't _f ' [min] = 59.00 soil infiltration rate 'f' [m/s] = 5.68E-06		soakage trial pit width 'W _i ' [m] = 0.14 soakage trial pit length 'L _i ' [m] = 0.14 total depth from ground level 'D _g ' [m] = 2.25 depth to pipe invert level 'D _i ' [m] = 0.65 soakage trial pit effective depth 'D _{eff} ' [m] = 1.60 free volume in infill aggregate [%] = 100 NOTE: slope of excavation assumed to be vertical		
REQUIRED STORAGE CAPACITY PER RAINFALL DURATION		SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS		
rainfall duration [mins] rainfall factor Z1		water level measurement h ₁ [m] Soakage Trial 1 Soakage Trial 2 Soakage Trial 3		
		calculations are based on BRE Guidelines (Digest 365)		

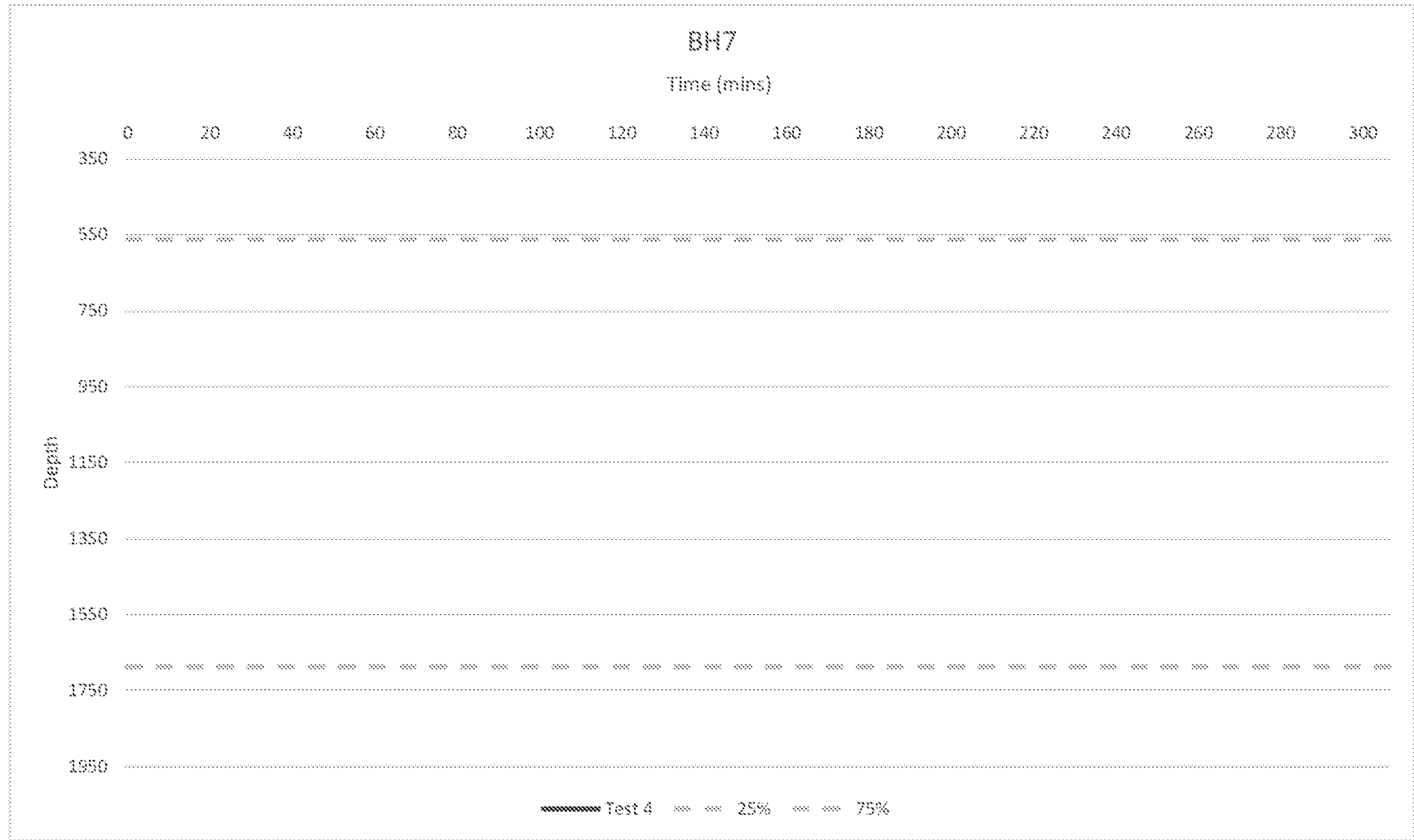
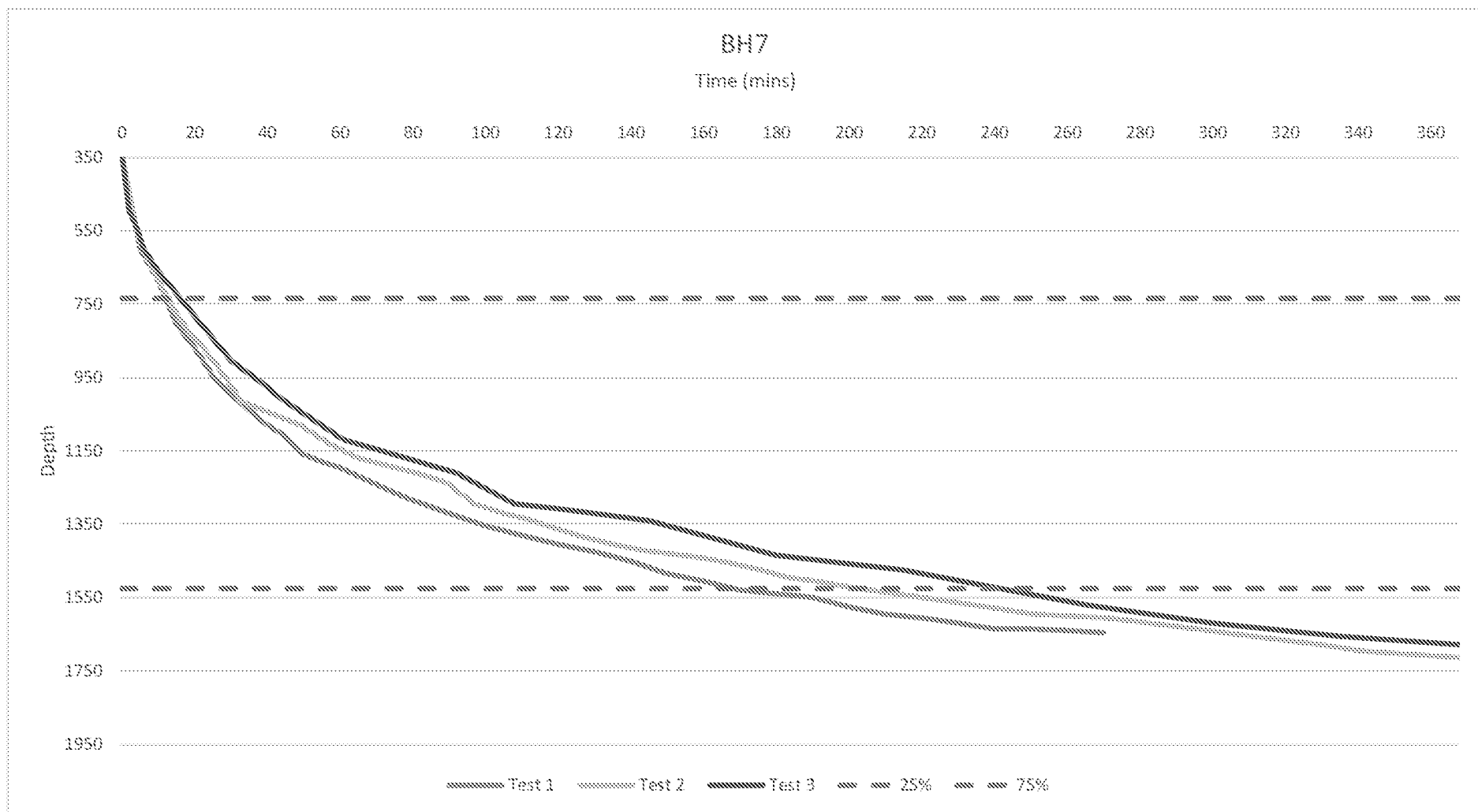
BH7: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

[illegible]

Test 4	
160mm dia x 2250 mm deep	
Time (mins)	Depth to water surface
Bored deeper but not tested	
Not tested	





The Pure Group

Site: Lime Tree Close, East Preston, BN16 1JA

BHT: Bore Hole 7

Revision

1.00

Job No:

LTC01

Page:

C 01

Prepared By:

AAM

Date:

Test mid Jan 2019

Section:

Infiltration test & Indicative Soakaway Design

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench [mm]	1500	2000	3000
required trench length [m]	5.48	4.22	N/A
	ring soakaways		
diameter of ring [mm]	900	1200	1350
required pit side length [m]	1.68	N/A	N/A

SUMMARY OF CALCULATIONS

critical design rainfall duration t_{cr}	600	min
required storage volume V_{req}	3.91	m^3
provided storage volume V_{prov}	4.88	m^3
utilisation factor	0.80	.OK
required time to discharge 50% t_{50}	23.60	hours
utilisation factor	0.98	.OK

* Based on effective depth and number of pits as in Soakaway Data table

GENERAL DATA

site location: England and Wales	
soakaway type: perforated concrete ring	
pit shape: square pit around ring	
impermeable area drained to soakaway A [m^2]	65
60 min rainfall depth of 5 year return period P [mm]	19
M5-60 to M5-3d rainfall ratio γ	0.35
allowance for climate change:	10%

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base:	No
available on-site infiltration test results:	☒ Yes ☐ No
use soakage trial pit table below	
internal surface area of trial pit A_{int} [m^2]	0.07
storage volume between 75-25% V_{75} [m^3]	0.42
time for water to fall from 75-25% t_{75} [min]	225.44
soil infiltration rate S [m/s]	2.49E-06

SOAKAWAY DATA

number of ring soakaways:	2
square pit side length L [m]	1.80
soakaway ring internal diameter D_{in} [mm]	1050
total depth from ground level D_g [mm]	2.00
depth to drain invert level D_d [mm]	0.40
soakaway effective depth D_{eff} [mm]	1.60
free volume in infill aggregate [%]	30

SOAKAGE TRIAL PIT DATA

soakage trial pit width W [mm]	0.14
soakage trial pit length L [mm]	0.14
total depth from ground level D_g [mm]	1.92
depth to pipe invert level D_{in} [mm]	0.34
soakage trial pit effective depth D_{eff} [mm]	1.58
free volume in infill aggregate [%]	100

NOTE: lines of excavation assumed to be vertical

SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

'F' (m/s) = 2.49E-06 or 0.010044 m/hr

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION													
rainfall duration (mm)	rainfall factor Z1	M5-D rainfalls (mm)	M5-D			M30-D			M100-D			outflow from soakaway (m³)	required storage (m³)
			Z2	rainfalls (mm)	inflow (m³)	Z2	rainfalls (mm)	inflow (m³)	Z2	rainfalls (mm)	inflow (m³)		
5	0.36	6.60	1.02	7.43	0.48	1.45	10.50	0.68	1.83	13.27	0.86	0.01	0.85
10	0.51	9.37	1.03	10.61	0.69	1.48	15.28	0.99	1.89	19.54	1.27	0.02	1.25
15	0.62	11.41	1.03	12.93	0.84	1.56	18.83	1.22	1.93	24.25	1.58	0.03	1.55
30	0.79	14.55	1.03	16.49	1.07	1.52	24.39	1.59	1.58	31.74	2.06	0.05	2.51
60	1.00	18.50	1.03	20.96	1.36	1.54	31.31	2.03	2.02	41.07	2.67	0.10	2.97
120	1.22	22.63	1.03	25.64	1.67	1.54	38.29	2.49	2.02	50.27	3.27	0.21	3.90
240	1.50	27.69	1.03	31.37	2.04	1.52	46.37	3.01	1.99	60.56	3.94	0.41	3.52
360	1.69	31.27	1.03	35.38	2.30	1.51	51.84	3.37	1.96	67.40	4.38	0.62	3.76
600	1.95	36.01	1.02	40.56	2.64	1.49	58.84	3.82	1.92	76.14	4.95	1.03	3.91
1440	2.48	45.88	1.02	51.48	3.35	1.44	72.63	4.72	1.84	93.01	6.05	2.48	3.56

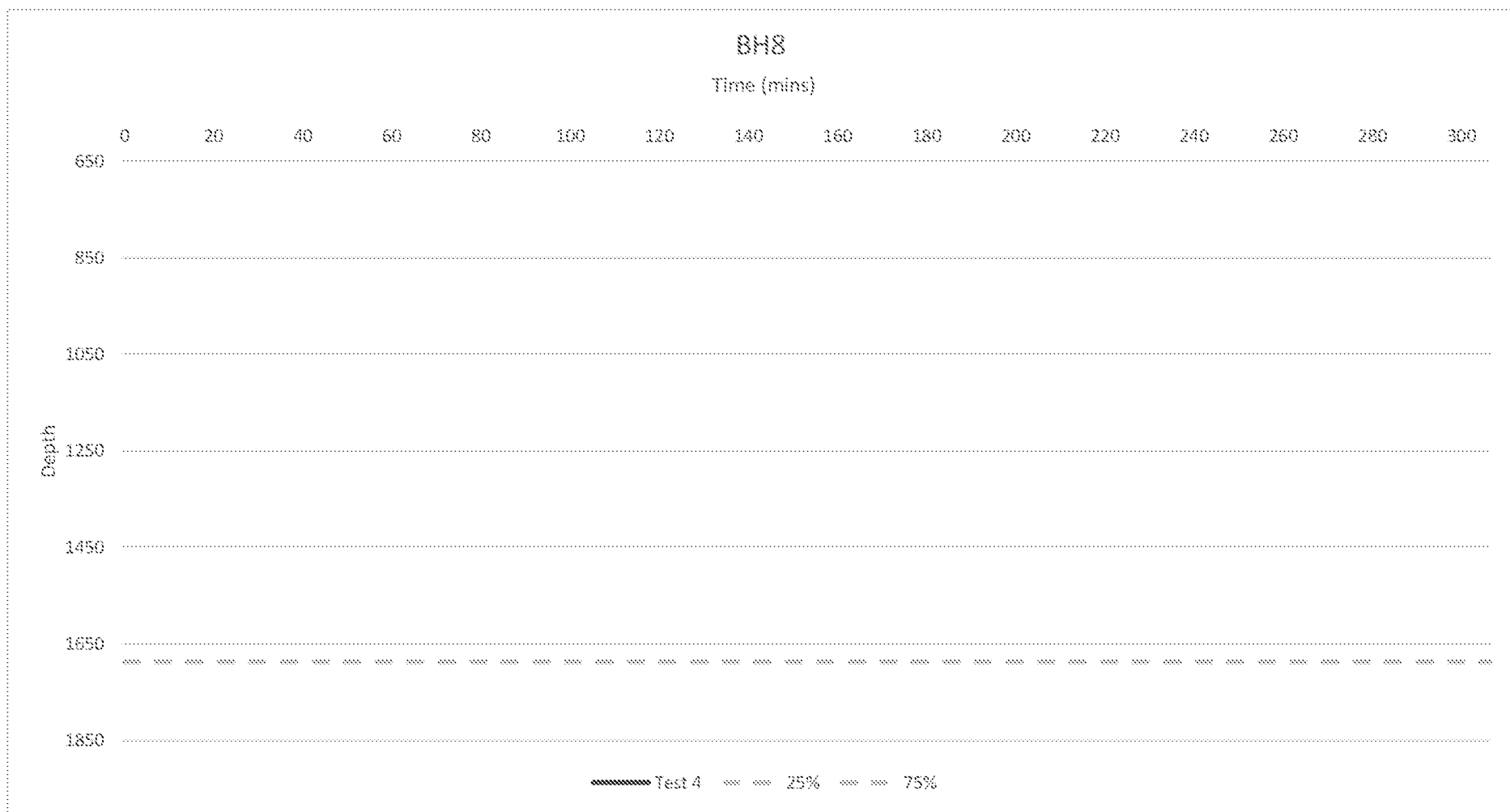
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]	0	5	10	15	30	45	60	75	90	100	130	150	170	210	230	250	265	280	
	depth to water [m]	0.34	0.50	0.69	0.81	1.00	1.06	1.16	1.20	1.27	1.32	1.38	1.43	1.49	1.53	1.60	1.62	1.64	1.64	1.65
Soakage Trial 2	time [min]	0	4	14	26	32	57	81	97	117	127	159	174	201	221	271	311	321	341	371
	depth to water [m]	0.34	0.56	0.76	0.82	1.02	1.13	1.21	1.30	1.34	1.39	1.44	1.46	1.51	1.57	1.61	1.63	1.68	1.70	1.72
Soakage Trial 3	time [min]	0	2	4	6	10	38	44	61	70	92	108	120	133	145	155	265	335	370	
	depth to water [m]	0.34	0.50	0.64	0.66	0.66	0.91	0.96	1.01	1.12	1.15	1.21	1.26	1.31	1.34	1.44	1.47	1.57	1.66	1.68

Project: Lime Tree Close, East Preston, BN16 1JA

Test 1		Test 2		Test 3	
160mm dia x 1920 mm deep		160mm dia x 1920 mm deep		160mm dia x 1920 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	350	0	340	0	340
4	600	2	565	2	500
8	720	4	610	6	680
13	820	6	660	16	800
18	900	10	720	26	930
22	970	20	870	36	1020
30	1040	28	960	46	1100
34	1100	44	1115	56	1170
42	1180	61	1205	66	1220
50	1250	70	1270	76	1270
58	1300	92	1375	86	1320
66	1365	108	1480	96	1360
74	1405	122	1505	106	1410
82	1445	145	1545	116	1440
90	1470	180	1595	126	1465
98	1495	215	1640	136	1485
114	1535	265	1690	146	1500
122	1565			156	1515
130	1590			166	1530
138	1605			176	1542
146	1625			186	1555
154	1640			196	1575
162	1655			206	1585
170	1680			236	1620
178	1695			266	1650
186	1710				

tested 10th to the 12th December 2018

$f'(m/s) = 5.63E-06$	$f'(m/s) = 4.55E-06$	$f'(m/s) = 3.64E-06$
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File Name: 2. Lime Free Bone Hole Test.docx

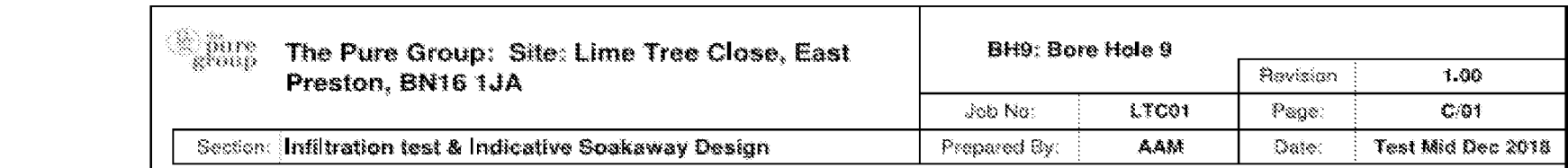
The Infiltration rate of 3.64E-06 (0.013104 m/hr)

The Pure Group

Percolation Test:

Percolation Test:

$f'(m/s) = 6.73E-06$	$f'(m/s) = 5.85E-06$	$f'(m/s) = 4.02E-06$
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Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

The Infiltration rate of 4.02E-06 (0.014472 m/hr)

'f' (m/s) = 4.02E-06 or 0.014472 m/hr

Spreadsheet provided by: www.YourSpreadsheets.co.uk calculations are based on BRE Guidelines (Digest 365)

BH10: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1		Test 2		Test 3	
160mm dia x 800 mm deep		160mm dia x 800 mm deep		160mm dia x 800 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	180	0	180	0	180
2	250	2	220	2	210
4	285	4	245	4	235
7	340	6	270	8	275
9	355	16	355	12	300
11	370	42	490	18	340
15	405	64	540	24	370
17	410	80	560	30	405
19	430	94	590	40	465
23	460	123	635	50	490
31	490	158	685	60	520
35	515	193	760	80	550
43	535			100	580
50	560			140	630
60	575			180	700
65	585			200	720
75	605				
77	610				
90	630				
106	655				
112	665				
118	675				
124	685				
130	690				
136	700				
142	710				
148	715				
154	725				
166	740				
172	745				
178	750				
196	770				
202	775				
208	780				
Tested 25th to the 27th March 2019					
f'(m/s) = 5.41E-06		f'(m/s) = 4.53E-06		f'(m/s) = 4.02E-06	

Test 4	
160mm dia x 800 mm deep	
Time (mins)	Depth to water surface
Not Tested	

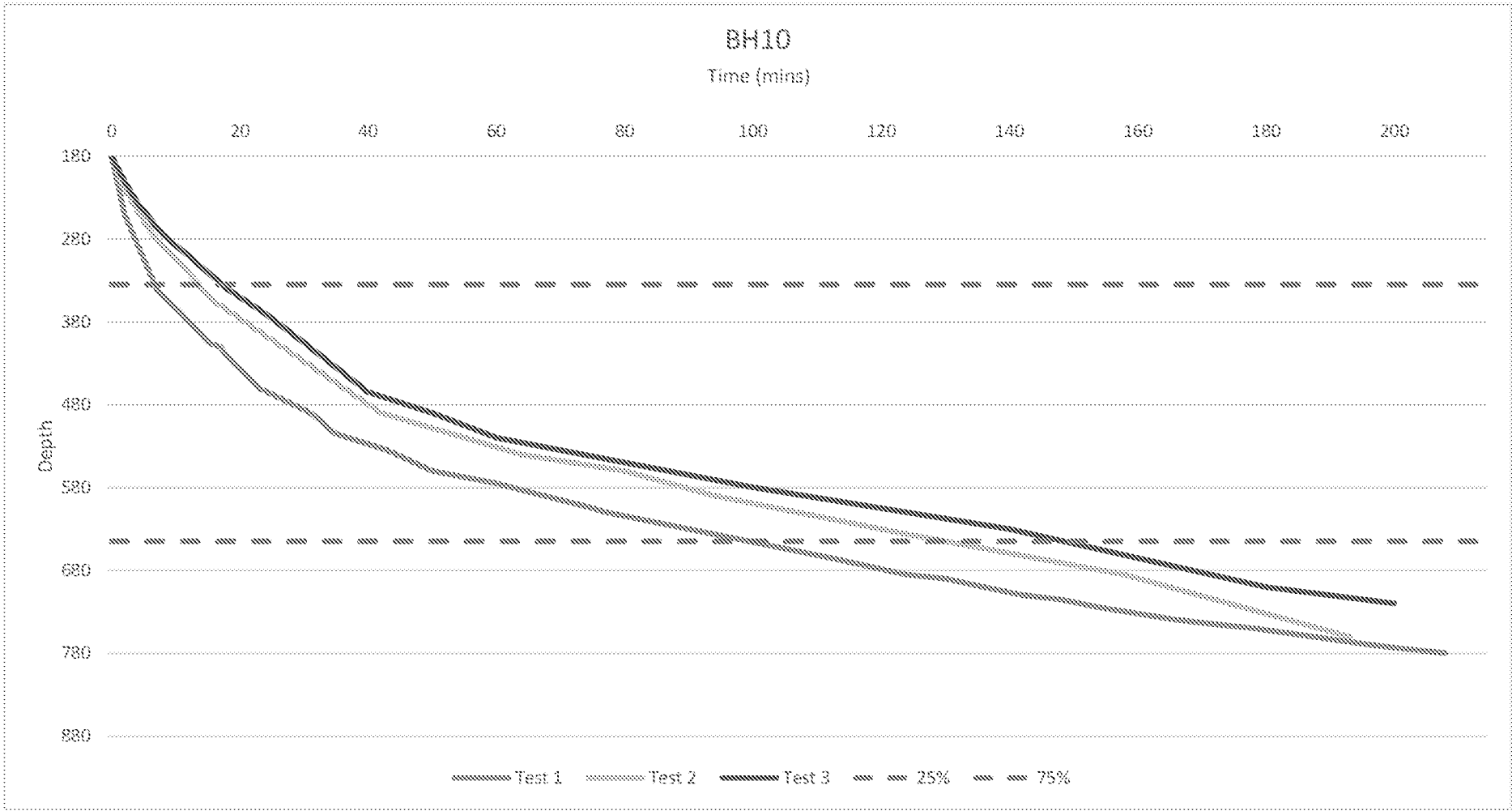
SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365)

The infiltration rate of 2.02E-06 (0.014472 m/hr)

f' (m/s) = 4.02E-06 or 0.014472 m/hr



 The Pure Group: Site: Lime Tree Close, East Preston, BN16 1JA	BH10: Bore Hole 10	Revision	1.00
Section: Infiltration test & Indicative Soakaway Design	Job No: LTC01	Page:	C 01
	Prepared By: AAM	Date:	Test mid Mar 2019

ALTERNATIVE SOAKAWAY SIZES			
trench soakaways			
width of trench [mm]	1500	2000	3000
required trench length [m]	2.64	2.00	1.30
ring soakaways			
diameter of ring [mm]	1050	1200	1350
required pit side length [m]	0.65	4.02	3.81

* Based on effective depth and number of pits as in Soakaway Data table

GENERAL DATA	
site location: England and Wales	
soak-away type: perforated concrete ring	
pit shape: square pit around ring	
impermeable area drained to soakaway 'A' [m ²] = 15	
60 min rainfall depth of 5 year return period 'R' [mm] = 20	
M5-60 to M5-2d rainfall ratio 'r' = 0.35	
allowance for climate change: 10%	

SOAKAWAY DATA	
number of ring soakaways: 2	
square pit side length 'L' [m] = 1.00	
soakaway ring internal diameter 'D _r ' [mm] = 900	
total depth from ground level 'D _g ' [m] = 0.80	
depth to drain invert level 'D _i ' [m] = 0.10	
soakaway effective depth 'D _e ' [m] = 0.70	
free volume in infill aggregate [%] = 30	

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base: ☒ Yes ☐ No	
available on-site infiltration test results: ☒ Yes ☐ No	
use soakage trial pit table below	
internal surface area of trial pit 'A _{int} ' [m ²] = 0.19	
storage volume between 75-25% 'V _s ' [m ³] = 0.01	
time for water to fall from 75-25% 't _s ' [min] = 131.32	
soil infiltration rate 'f' [m/s] = 4.02E-06	

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W _i ' [m] = 0.14	
soakage trial pit length 'L _i ' [m] = 0.14	
total depth from ground level 'D _g ' [m] = 0.80	
depth to pipe invert level 'D _i ' [m] = 0.18	
soakage trial pit effective depth 'D _e ' [m] = 0.62	
free volume in infill aggregate [%] = 100	
NOTE: Rates of excavation assumed to be vertical	

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION													
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M5-D		M30-D		M100-D		outflow from soakaway [m³/s]	required storage [m³/s]			
			Z2	rainfalls [mm]	Z2	rainfalls [mm]	Z2	rainfalls [mm]					
5	0.36	7.19	1.02	8.04	0.12	1.45	11.41	0.17	1.84	14.45	0.22	0.00	0.21
10	0.51	10.13	1.03	11.48	0.17	1.49	16.62	0.25	1.91	21.31	0.32	0.01	0.31
15	0.62	12.93	1.03	13.97	0.21	1.51	20.45	0.31	1.85	26.42	0.40	0.01	0.39
30	0.79	15.73	1.03	17.93	0.27	1.53	26.46	0.40	2.00	34.54	0.52	0.02	0.50
60	1.00	20.00	1.03	22.66	0.34	1.54	33.95	0.51	2.03	44.66	0.67	0.04	0.63
120	1.22	24.47	1.03	27.72	0.42	1.53	41.30	0.62	2.01	54.15	0.81	0.08	0.73
240	1.50	29.93	1.03	33.91	0.51	1.51	49.84	0.75	1.97	64.98	0.97	0.16	0.81
360	1.69	33.80	1.03	38.15	0.57	1.50	55.61	0.83	1.94	72.11	1.06	0.24	0.84
600	1.95	38.90	1.02	43.73	0.66	1.47	63.03	0.95	1.90	81.31	1.22	0.40	0.81
1440	2.48	49.60	1.02	55.65	0.83	1.42	77.56	1.16	1.81	98.93	1.46	0.97	0.51

* Z2 is a growth factor from M5 rainfalls

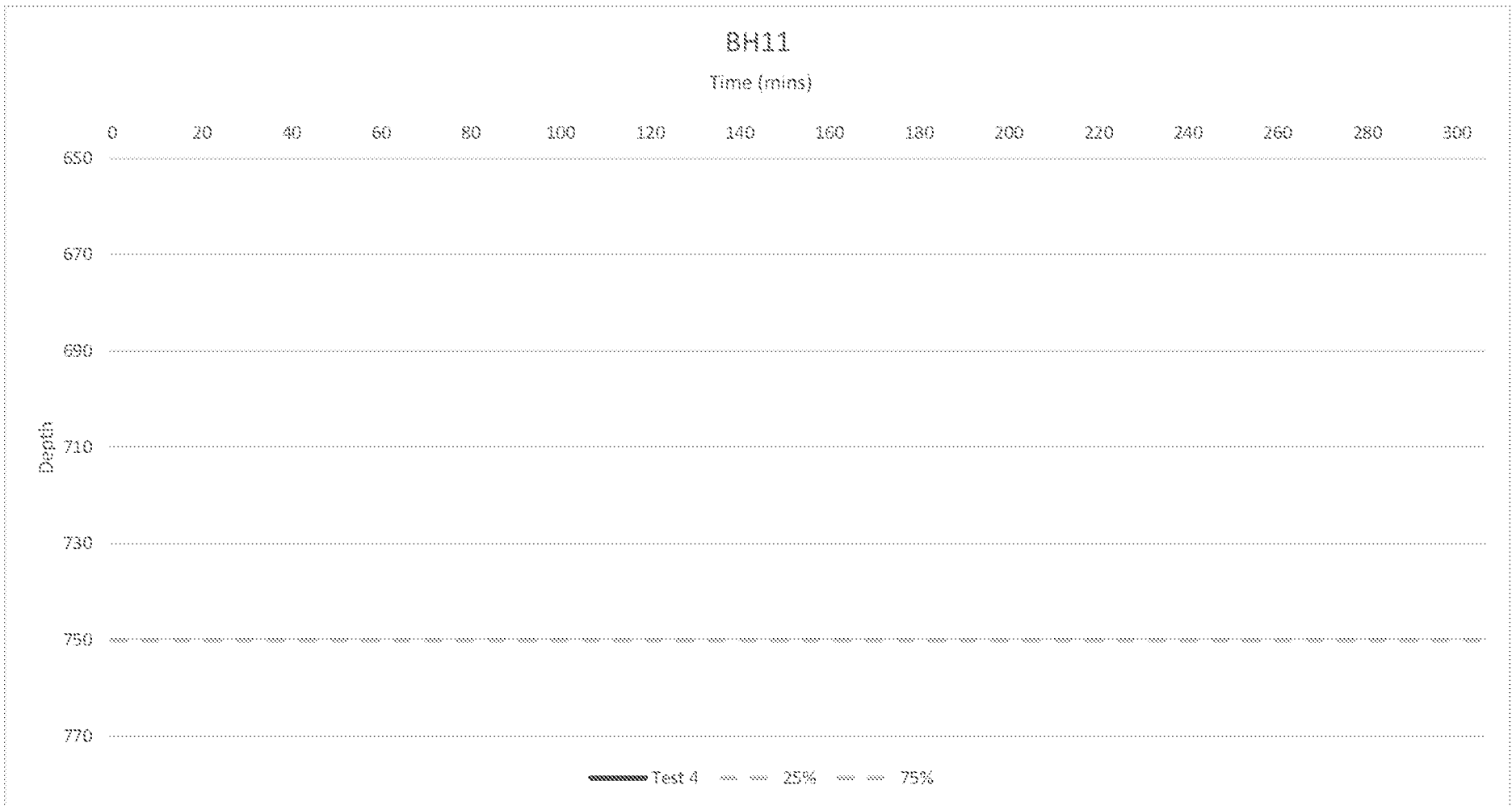
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurements N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min]	0	2	4	9	15	31	35	50	75	90	106	124	136	166	178	202			
	depth to water [m]	0.18	0.25	2.85	3.95	0.41	0.49	0.52	0.56	0.61	0.63	0.66	0.68	0.70	0.74	0.75	0.78			
Soakage Trial 2	time [min]	0	2	4	8	16	42	64	80	94	123	156	193							
	depth to water [m]	0.18	0.22	0.25	0.27	0.36	0.49	0.54	0.56	0.59	0.64	0.69	0.76							
Soakage Trial 3	time [min]	0	2	4	8	12	18	24	30	40	50	80	100	140	180	200				
	depth to water [m]	0.18	0.21	0.25	0.28	0.30	0.34	0.37	0.41	0.47	0.49	0.55	0.58	0.63	0.70	0.72				

Spreadsheet provided by: www.YourSpeedHeats.co.uk

calculations are based on BRE Guidelines (Digest 365)

Project: Lime Tree Close, East Preston, BN16 1JA

Test 1		Test 2		Test 3	
160mm dia x 1000 mm deep		160mm dia x 1000 mm deep		160mm dia x 1000 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	280	0	280	0	280
1	330	2	315	2	310
3	360	4	335	4	325
5	390	6	345	8	340
12	450	14	385	12	360
20	490	26	435	18	385
28	535	50	510	24	410
38	580	64	545	30	450
48	605	78	575	40	465
58	635	110	655	50	495
72	670	145	710	60	530
78	685	180	755	80	565
94	720	230	855	100	620
100	735	265	890	140	685
106	745	335	915	180	730
136	795	405	940	200	760
142	805	475	965	220	810
148	815	545	990	240	830
154	825			260	855
208	895			280	865
214	900			300	875
220	905			320	880
244	925				
250	930				
256	935				
262	940				
268	945				
274	950				
280	955				
286	960				
292	965				
298	970				



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 3.

Calculations are based on BRE Guidelines (Digest 365).

The Infiltration rate of 2.34E-06 (0.008424 m/hr)

'f' (m/s) = 2.34E-06 or 0.008424 m/hr

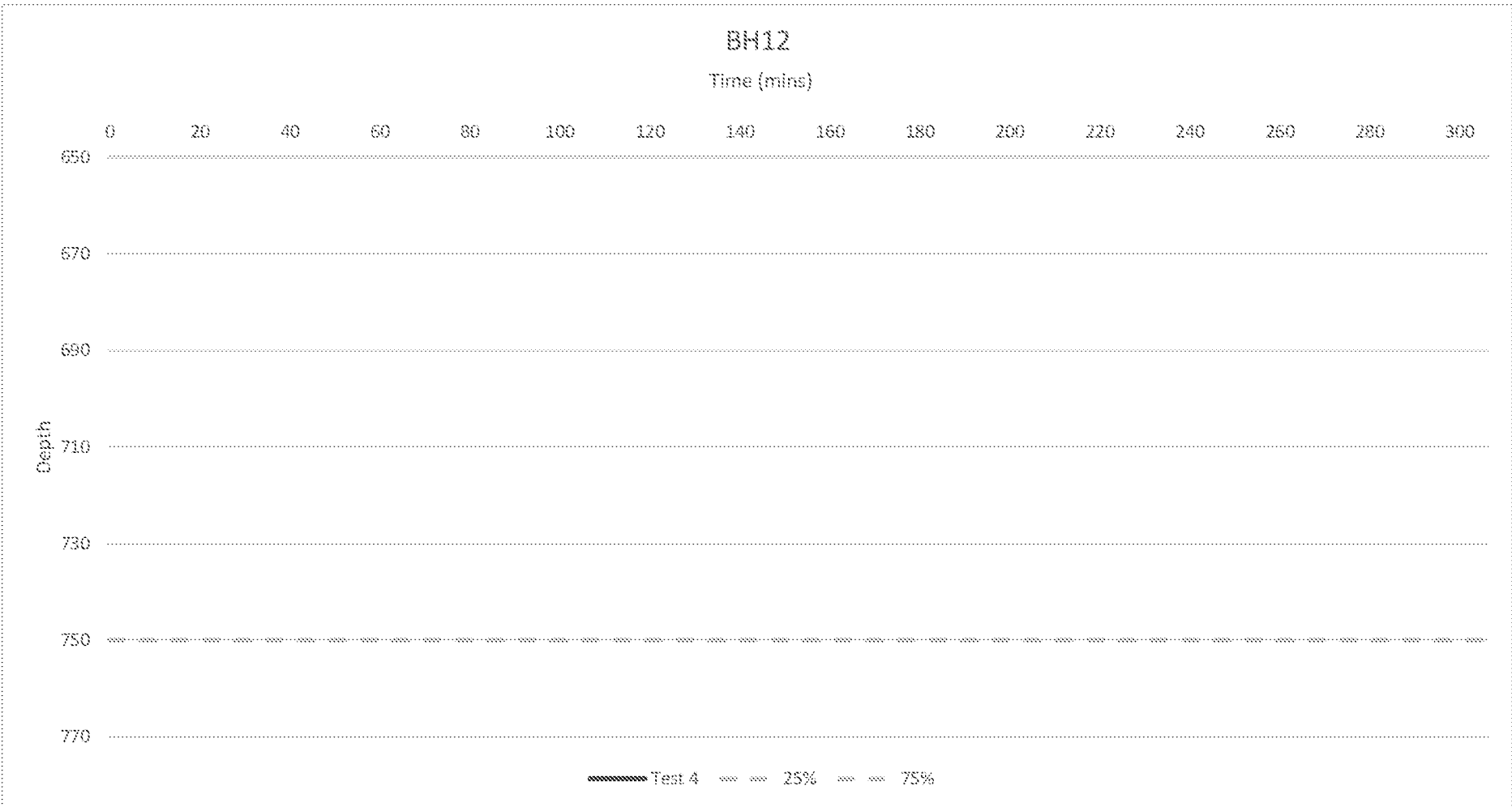
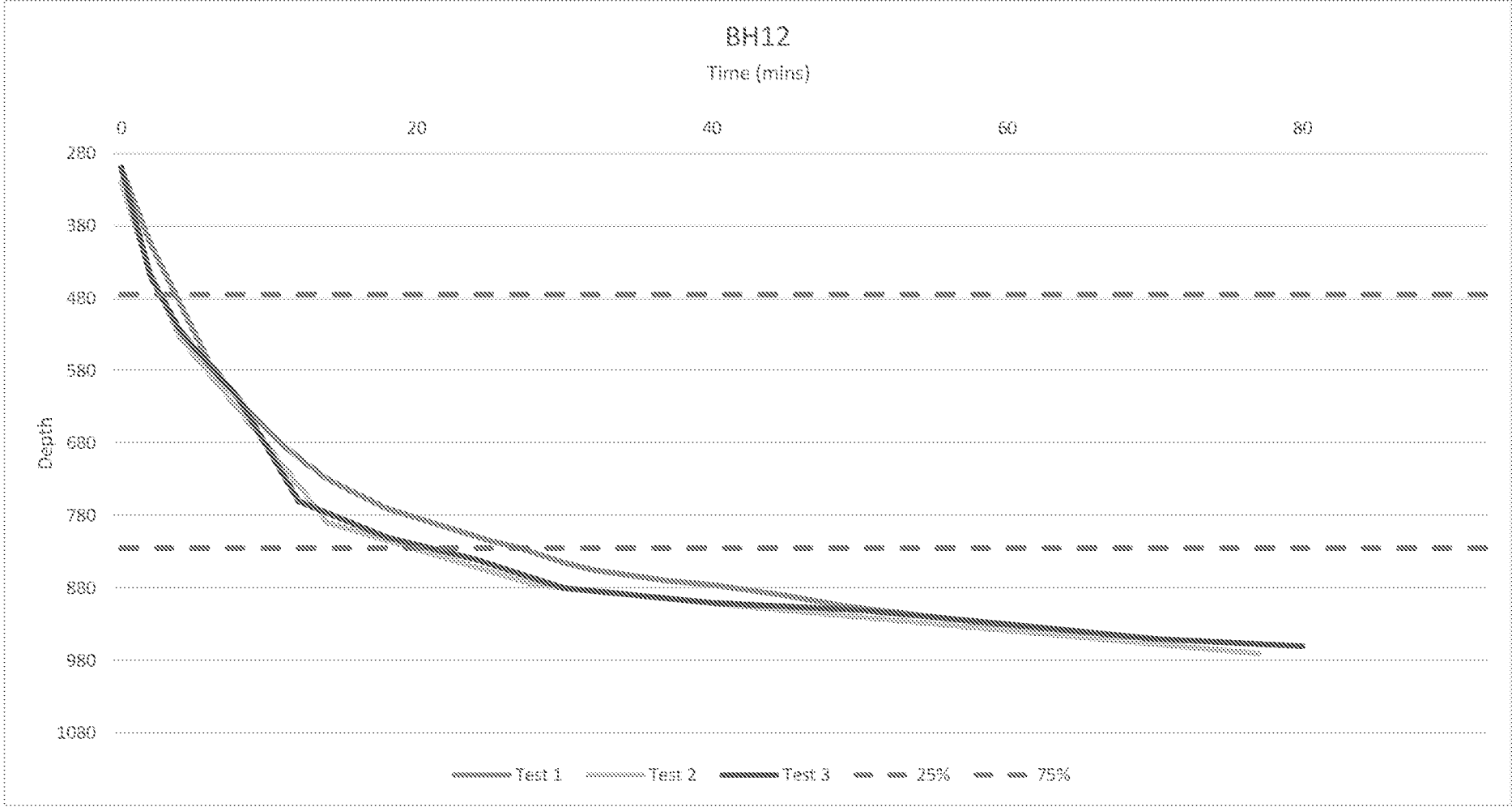
BH12: Field Test Data

Project: Lime Tree Close, East Preston, BN16 1JA

Percolation Test:

Test 1		Test 2		Test 3	
160mm dia x 1000 mm deep		160mm dia x 1000 mm deep		160mm dia x 1000 mm deep	
Time (mins)	Depth to water surface	Time (mins)	Depth to water surface	Time (mins)	Depth to water surface
0	300	0	320	0	300
2	405	2	445	2	450
2	500	4	535	4	525
6	570	8	635	8	620
8	620	14	790	12	760
10	665	28	875	18	810
12	700	42	905	24	840
14	730	77	970	30	880
16	750			40	900
18	770			50	910
25	815			60	930
27	825			70	950
30	845			80	960
32	855				
37	870				
40	875				
45	890				
49	905				
55	920				
61	935				
69	950				
Tested 25th to the 27th March 2019					
f'(m/s) = 2.34E-06		f'(m/s) = 3.22E-06		f'(m/s) = 3.02E-06	

Test 4	
160mm dia x 1000 mm deep	
Time (mins)	Depth to water surface
Not Tested	



SOIL INFILTRATION CALCULATIONS

Soil infiltration data calculated from the lowest performing test result, being test 1.

Calculations are based on BRE Guidelines (Digest 365)

f' (m/s) = 2.34E-06 or 0.008424 m/hr

The Pure Group: Site: Lime Tree Close, East Preston, BN16 1JA		BH12: Bore Hole 12																			
Section: Infiltration Test & Indicative Soakaway Design		Job No: LTC01	Revision: 1.00																		
Prepared By: AAM		Page: C-01	Date: Test Mar 2019																		
ALTERNATIVE SOAKAWAY SIZES		SUMMARY OF CALCULATIONS																			
trench soakaways		critical design rainfall duration t_{cd} = 5 min																			
width of trench [mm]: 1500 2000 3000		required storage volume V_{req} = 0.07 m ³																			
required trench length [m]: 0.29 0.19 0.10		provided storage volume V_{prov} = 3.93 m ³																			
ring soakaways		utilisation factor = 0.02 .OK																			
diameter of ring [mm]: 800 1200 1350		required time to discharge 50% t_{d50} = 2.43 hours																			
required pit side length [m]: N/A N/A N/A		utilisation factor = 0.10 .OK																			
GENERAL DATA		SOAKAWAY DATA																			
site location: England and Wales		number of ring soakaways: 2																			
soakaway type: perforated concrete ring		square pit side length L_p [m] = 1.50																			
pit shape: square pit around ring		soakaway ring internal diameter D_{in} [mm] = 1050																			
impermeable area drained to soakaway A [m ²] = 8		total depth from ground level D_g [m] = 2.00																			
60 min rainfall depth of 5 year return period R_5 [mm] = 28		depth to drain invert level D_i [m] = 0.40																			
M5-60 to M5-2d rainfall ratio r = 0.95		soakaway effective depth D_{eff} [m] = 1.60																			
allowance for climate change: 30%		free volume in infil aggregate V_f = 90																			
SOIL INFILTRATION DATA		SOAKAGE TRIAL PIT DATA																			
allowance for infiltration through soakaway base: No		soakage trial pit width W_p [m] = 0.14																			
available on-site infiltration test results: ☒ Yes ☐ No		soakage trial pit length L_p [m] = 0.14																			
use soakage trial pit table below		total depth from ground level D_g [m] = 1.00																			
internal surface area of trial pit A_{int} [m ²] = 0.22		depth to pipe invert level D_{pi} [m] = 0.28																			
storage volume between 75-25% V_{75-25} [m ³] = 0.61		soakage trial pit effective depth D_{eff} [m] = 0.72																			
time for water to fall from 75-25% t_{75-25} [min] = 22.64		free volume in infil aggregate V_f = 100																			
soil infiltration rate f [m/s] = 2.34E-06		NOTE: Rates of infiltration assumed to be verified																			
REQUIRED STORAGE CAPACITY PER RAINFALL DURATION																					
rainfall duration [min]	rainfall factor Z1	M5-D rainfall [mm]	M5-D		M30-D		M100-D		outflow from soakaway [m ³ /h]	required storage [m ³ /h]											
			Z2	rainfalls [mm]	inflow [m ³ /h]	Z2	rainfalls [mm]	inflow [m ³ /h]													
5	0.36	7.13	1.02	9.50	0.08	1.45	13.45	0.11	1.84	17.07	0.14										
10	0.51	10.13	1.03	13.57	0.11	1.49	19.64	0.16	1.91	25.19	0.20										
15	0.62	12.33	1.03	16.51	0.13	1.51	24.16	0.19	1.95	31.22	0.25										
30	0.79	15.79	1.03	21.07	0.17	1.53	31.28	0.25	2.00	40.82	0.33										
60	1.00	20.00	1.03	26.78	0.21	1.54	40.13	0.32	2.03	52.78	0.42										
120	1.22	24.47	1.03	32.76	0.26	1.53	46.80	0.39	2.01	64.00	0.51										
240	1.50	29.53	1.03	40.58	0.32	1.51	58.90	0.47	1.97	76.68	0.61										
360	1.69	33.80	1.03	45.09	0.36	1.50	65.72	0.53	1.94	85.23	0.68										
600	1.95	38.93	1.02	51.68	0.41	1.47	74.46	0.60	1.90	96.09	0.77										
1440	2.48	49.60	1.02	65.77	0.53	1.42	91.68	0.73	1.81	116.92	0.94										
* Z2 is a growth factor from M5 rainfall																					
SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																					
water level measurement N°		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
Soakage Trial 1	time [min]	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	depth to water [m]	0.36	0.41	0.50	0.57	0.62	0.67	0.70	0.73	0.75	0.77	0.82	0.83	0.86	0.88	0.91	0.92	0.94	0.95		
Soakage Trial 2	time [min]	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	depth to water [m]	0.38	0.45	0.64	0.64	0.79	0.88	0.91	0.97												
Soakage Trial 3	time [min]	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	
	depth to water [m]	0.30	0.45	0.53	0.62	0.76	0.81	0.84	0.88	0.90	0.91	0.93	0.95	0.96							
Sponsored and provided by: www.YourPrestonHeats.co.uk												calculations are based on BRE Guidelines (Digest 365)									

Historic Bore Holes Near Proposed Site: 200m to North & 230m to North West

TQ 00 SE 13
0707 0273

GEORGE STOW CO. LTD.
Waterworks Engineers

READING ROAD - HENLEY-ON-THAMES, OXON.

RECORD OF WELL (SHAFT OR BOREHOLE)

DATE COMPLETED 10.8.79

NAR. TQ 00 SE. (0707 0273)

All depths to be measured below Ground Level

Work carried out for Southern Water Authority, Sussex River & Water Division

Locality (Exact Site) East Preston No. 97 Borehole GRID REF: TQ 070027

Level of Ground Surface above Sea Level (O.D.) m.

Depth of Shaft m. Diameter mm. (548 ft) (8 in)

Depth of Bore 157 m. Diameter: At Top 200 mm. At Bottom 200 mm.

Details of Permanent Lining Tubes

Diameter	Length Inserted	Top At	Ground Level
200 mm	6m at top	12.55 m	Slotted between plain tubes
"	1.79m at bottom	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"

Water Struck at depth of (in m.)

Rest Level of Water below Ground Level 3 m.

Yield on Hours test Pumping NO TEST litres per sec. Date

Pump Water level m. below Ground Level.

Time of Recovery

Remarks

See back for Strata Record.

TQ 00 SE 145

L. BORING at East Preston

Geol. map 3" 1 in. map New Series 332

Made by Duke & Ockenden

Communicated by Duke & Ockenden

Height above Ordnance Datum

Yield At 1080 gph. level depresses to 25' 0"

Quality (with copy of analysis on separate sheet)

Rest level of water 8' 0"

29

TQ 0677 0276

GEOLOGICAL FORMATION	NATURE OF STRATA	THICKNESS		DEPTH	
		Feet	Inches	Feet	Inches
Drift	Yellow clay	4	—	4	— 1.2
	Coarse yellow sand	10	—	14	—
	Gravel	2	—	16	—
	Beach	2	—	18	— 55
Upper Chalk	Hard chalk	132	—	150	— 45.7

R.L.W. 1080 gph. level depresses to 25' 0" down

lined 4 1/2 tubes to 68'

Information for Messrs. Duke and Ockenden Ltd.

At East Preston Bore

East Preston—Map N.S.G. 332.

152. PRESTON PLACE, 1/4 mile S.E. of Angmering station. 1943.

Ht. above O.D. 30 ft. Map 63 S.E.

Drift	Thickness Ft.	Depth Ft.
Yellow clay	4	4
Coarse yellow sand	10	14
Gravel	2	16
Beach	2	18
Upper Chalk	132	150

R.L.W. 1080 gph. level depresses to 25' 0" down. Lined 4 1/2 in. tubes to 68 ft. Information from Messrs. Duke and Ockenden, Ltd.

Well still in use. No knowledge of yield or water levels. Dated 17/2/41 S.H.S.

Visited. Now Preston Hall. Divided into flats. Houses built on site of bore.

18-10-57 Ash.

DATA Bank

GEOLOGICAL SURVEY AND MUSEUM.

JERMYN STREET, LONDON, S.W. 1.

(S. 10.10) Wt. 5621/60. 2000. 589. Ph. & Ty. Ltd.

