

Appendix 3

[illegible]

Requested By:

Appendix 4

Surface Geology

- ☒ Superficial only
- ☐ Bedrock only
- ☐ Bedrock and Superficial

Visible geology:
1:50 000 scale

[Geology Key](#)

[More on digital geology](#)



[Go to Location](#)

[Switch Basemap](#)

100% 0%
Geology Transparency

Grid Ref: 465737, 101430

Superficial geology

1:50 000 scale superficial deposits description:
Storm Beach Deposits - Gravel. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by shorelines.

Setting: shorelines. These rocks were formed in shoreline environments with sediments deposited in beaches and barrier islands.

[Further details](#)

[What are Superficial Deposits?](#)

[To purchase detailed geological reports for this area, try our GeoReports service](#)

Surface Geology

☒ Superficial only
☐ Bedrock only
☐ Bedrock and Superficial

Visible geology:
1:50 000 scale

[Geology Key](#)

[More on digital geology](#)



[Go to Location](#)

[Switch Basemap](#)

100% 0%
Geology Transparency

Grid Ref: 465322, 101590

Superficial geology 

1:50 000 scale superficial deposits description:
River Terrace Deposits (undifferentiated) - Sand, Silt And Clay. Superficial Deposits formed up to 3 million years ago in the Quaternary Period. Local environment previously dominated by rivers.

Setting: rivers. These rocks were formed from rivers depositing mainly sand and gravel detrital material in channels to form river terrace deposits, with fine silt and clay from overbank floods forming floodplain alluvium, and some bogs depositing peat; includes estuarine and coastal plain deposits mapped as alluvium.

[Further details](#) [What are Superficial Deposits?](#)

[To purchase detailed geological reports for this area, try our GeoReports service](#)

 **Surface Geology**  **3D Models**  **Borehole Scans**  **Earthquake Timeline**

Surface Geology

- ☐ Superficial only
- ☒ Bedrock only
- ☐ Bedrock and Superficial

Visible geology:
1:50 000 scale

[Geology Key](#)

[More on digital geology](#)

 [Go to Location](#) [Switch Basemap](#)

100% 0%
Geology Transparency

Grid Ref: 465625, 101107

Bedrock geology

1:50 000 scale bedrock geology description: Portsmouth Sand Member And Whitecliff Sand Member (undifferentiated) - Sand. Sedimentary Bedrock formed approximately 23 to 66 million years ago in the Palaeogene Period. Local environment previously dominated by shallow seas.

Setting: shallow seas. These rocks were formed in shallow seas with mainly siliciclastic sediments (comprising of fragments or clasts of silicate minerals) deposited as mud, silt, sand and gravel.

[Further details](#)

[What is Bedrock Geology?](#)

[To purchase detailed geological reports for this area, try our GeoReports service](#)



Surface
Geology



3D
Models



Borehole
Scans



Earthquake
Timeline

Borehole Scans

Click on a borehole to view scan.

Borehole depth

-  0 - 10m
-  10 - 30m
-  30m+
-  Unknown
-  Confidential or Restricted

[More on boreholes](#)



Go to
Location

Switch
Basemap

100% 0%
Geology Transparency

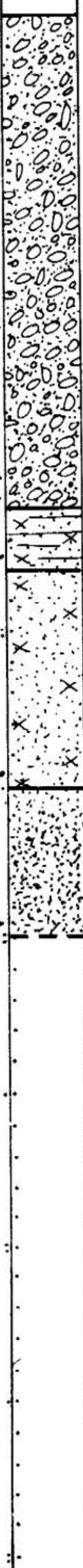
Grid Ref: 470207, 99335

LOCATION : Hayling Island
BOREHOLE DIA. : 6"
DATE (Start) : 5.6.62.

BOREHOLE No. : 109.
GROUND LEVEL :
WATER LEVEL : 5'-0".

7060 9912

331

Dates	Description	Thickness	Depth		Sample	Remarks
			0'-0"			
	Beach Gravel	16'-0"			+ 1	15 blows/ft.
					+ 2	50 blows/ft.
					4 bulk	
			16'-0"		+ 3	30 blows/ft.
	Firm grey silty sandy clay	2'-0"	18'-0"		5	
					6	
					+ 7	50+ blows/ft.
	Very compact grey silty sand	7'-0"				
S(LC) B.B. Whitcliffe Member			25'-0"		+ 8	50+ blows/ft.
					9	
	Very compact brown sand	5'-0"			11	
			30'-0"		+ 12	50+ blows/ft.
						End of borehole.

52 79 NW/36

FIG. 1h

7053 9914

British Geological Survey

SITE SOUTH HAYLING SURFACE WATER DRAINAGE SCHEME

British Geological Survey

BOREHOLE 8

DIAMETER 200 mm

DEPTH 5.20 m

DATE 5.4.72

British Geological Survey

British Geological Survey

British Geological Survey

Sandy FMC rounded flint GRAVEL with some organic inclusions.

0.00 (+3.77 m)

Water encounter at 1.40 m

0.30

0.1

0.2

1.00 m

N=10

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1.0

1.1

1.2

1.3

1.4

1.5

1.6

1.7

1.8

1.9

2.0

2.1

2.2

2.3

2.4

2.5

2.6

2.7

2.8

2.9

3.0

3.1

3.2

3.3

3.4

3.5

3.6

3.7

3.8

3.9

2.00 m

N=15

3.00 m

N=38

4.00 m

5.00 m

N=26

6.00 m

7.00 m

Beach

Gravel

probably near base of Beach Gravel

R.T.W.
24.2.84

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

S2 79 NW / 35

FIG. 1g

7-39 9919

SITE SOUTH HAYLING SURFACE WATER DRAINAGE SCHEME

BOREHOLE 7

DIAMETER 200 mm

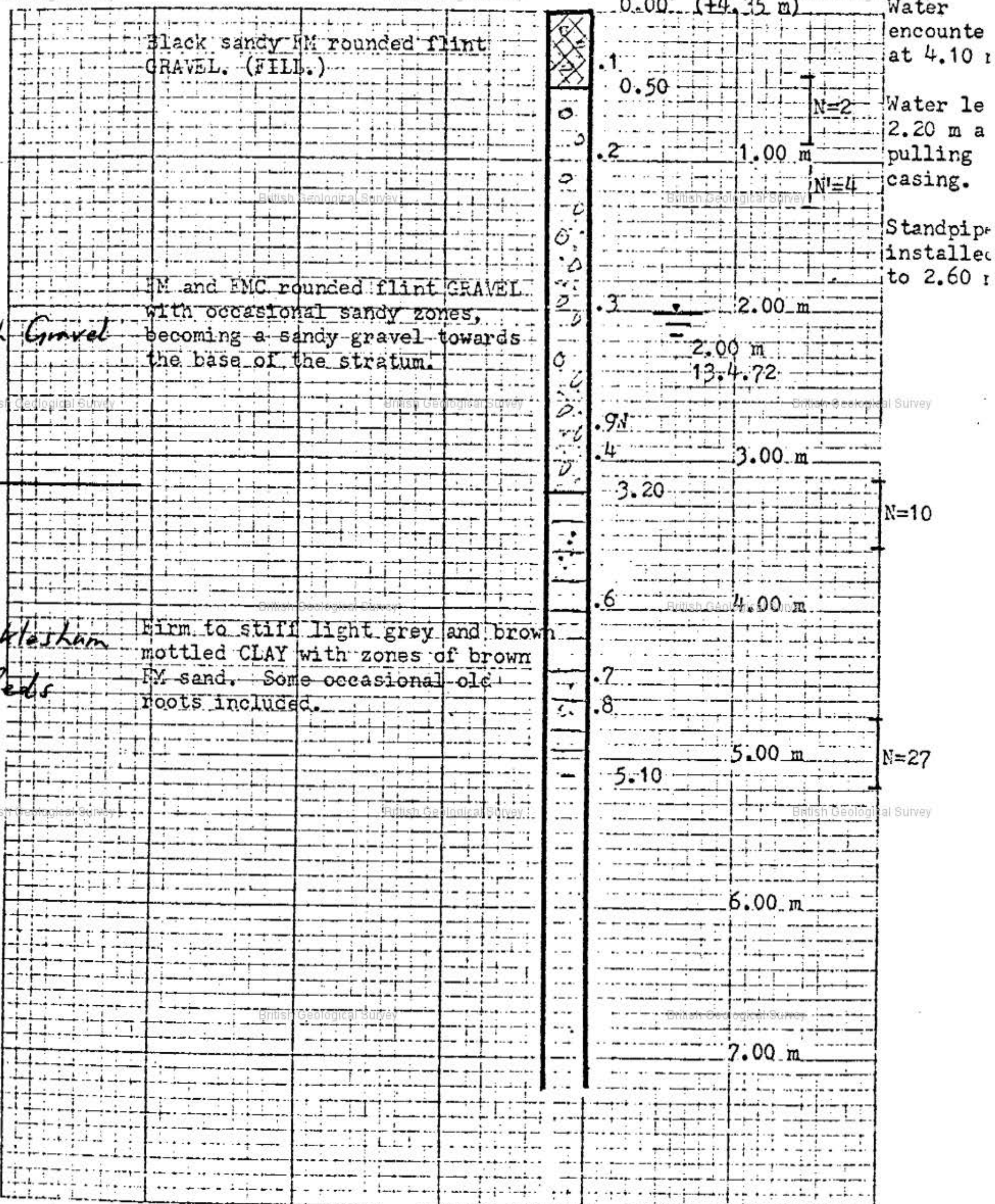
DEPTH 5.10 m

DATE 4-5.4.72

British Geological Survey

British Geological Survey

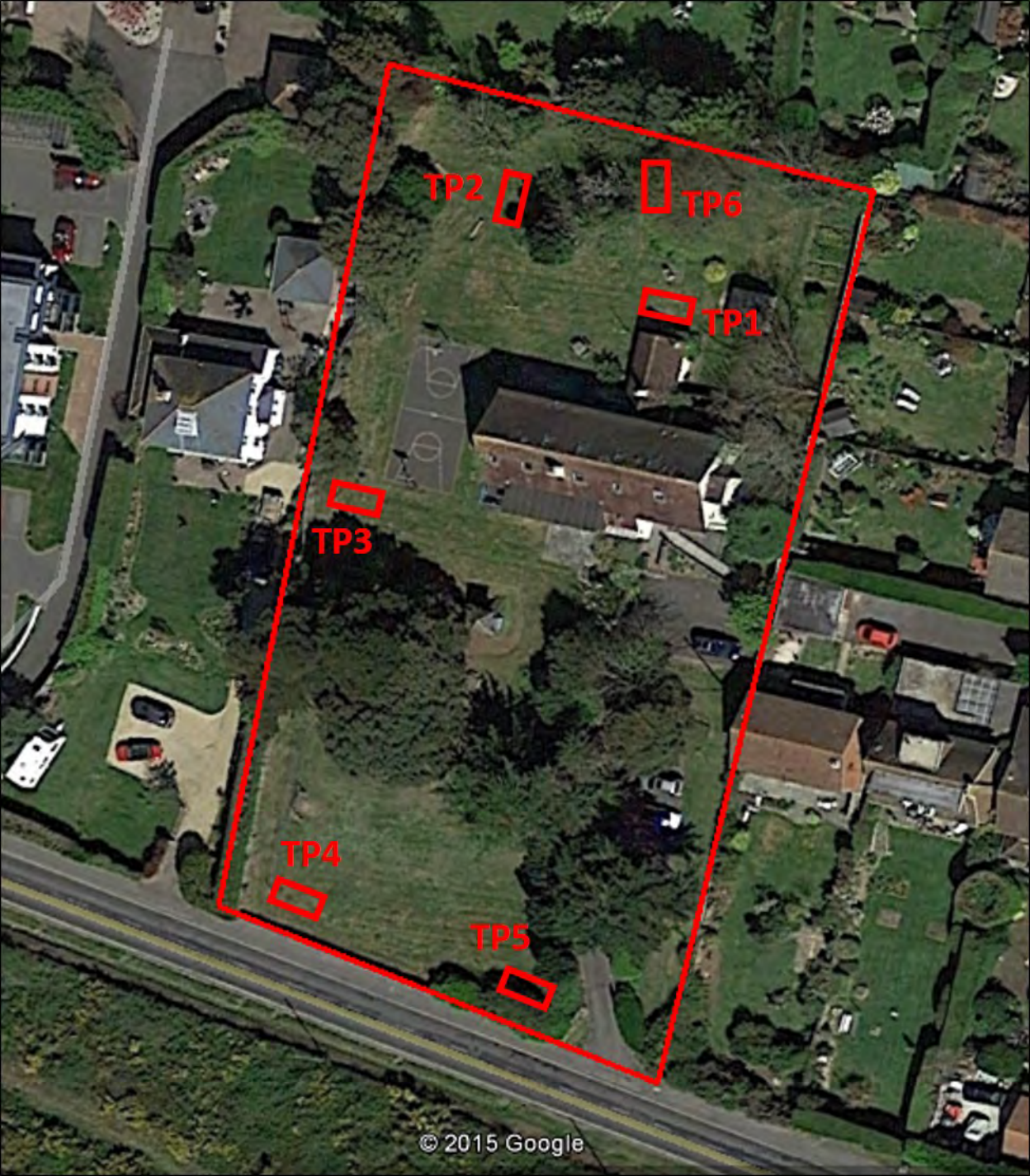
British Geological Survey



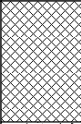
British Geological Survey

British Geological Survey

British Geological Survey



Project Name: Godbey House, Hayling Island	Project No. 5630	Co-ords: - Level:	Date 03/11/2015
Location: 380 Seafront, Hayling Island, PO11 0BD		Dimensions: 1.80 0.50	Scale 1:25
Client: Hampshire County Council		Depth 0.40	Logged JL

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.35	ES		0.40 0.45		 Grass on MADE GROUND Soft dark brown-grey slightly gravelly sandy CLAY. Gravels are fine to coarse subangular to subrounded of orange-grey flint, glass, clinker and pottery.		
						CONCRETE ----- End of Pit at 0.40m		
								1
								2
								3
								4
								5

Remarks: Shallow concrete encountered below surface. Pit terminated at top of concrete layer.

Stability: Good



Project Name: Godbey House, Hayling Island

Project No.
5630

Co-ords: -
Level:

Date
03/11/2015

Location: 380 Seafront, Hayling Island, PO11 0BD

Dimensions: 1.80

Depth
2.50

0.50

Scale
1:25

Logged
JL

Client: Hampshire County Council

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.35 0.35	ES ES		0.30			Grass on MADE GROUND Soft dark brown-grey slightly gravelly sandy CLAY. Gravels are fine to coarse subangular to subrounded of orange-grey flint, glass, clinker, plastics and wire. Thick roots are seen occasionally and fine roots are common. Firm orange very sandy CLAY.	
	0.70	B		0.65			Dense to very dense orange-brown slightly clayey sandy GRAVELS with rare cobbles. Gravels are orange-grey fine to coarse subangular to subrounded flint.	1
	1.10	B		1.05			Dense to very dense light orange coarse gravelly SAND. Gravels of fine to coarse subrounded to rounded orange-grey flint. Occasional zones of high clay content are seen.	
							<i>The ground becomes very difficult to excavate due to density.</i>	
	1.90	B		1.80			Medium dense grey-beige clayey SAND. Sand is fine to coarse and subrounded.	2
				2.50			End of Pit at 2.50m	3
								4
								5

Remarks:

Stability: Good

Project Name: Godbey House, Hayling Island

Project No.
5630

Co-ords: -
Level:

Date
03/11/2015

Location: 380 Seafront, Hayling Island, PO11 0BD

Dimensions: 1.90

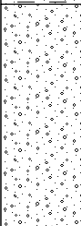
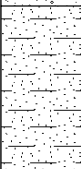
Depth
2.20

0.50

Scale
1:25

Logged
JL

Client: Hampshire County Council

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
▼	0.25	ES		0.20			Grass on MADE GROUND Soft dark brown-grey slightly gravelly sandy CLAY. Gravels are fine to coarse subangular to subrounded of orange-grey flint, glass, clinker and plastic. Soft light brown slightly gravelly slightly sandy CLAY. Gravels are fine to coarse subangular to rounded orange-grey flint.	
	0.95	B		0.90			Dense to very dense orange-brown slightly clayey sandy GRAVELS with rare cobbles, grading towards a very gravelly SAND. Gravels and cobbles are fine to coarse subangular to rounded orange-grey flint.	1
	1.81	B		1.65			Medium dense grey-beige clayey SAND/sandy CLAY. Occasional patches of clean sand are seen.	2
				2.20			End of Pit at 2.20m	3
								4
								5

Remarks:

Stability: Good

Project Name: Godbey House, Hayling Island

Project No.
5630

Co-ords: -
Level:

Date
03/11/2015

Location: 380 Seafront, Hayling Island, PO11 0BD

Dimensions: 1.80

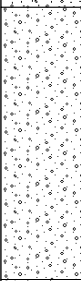
Depth
1.70

0.50

Scale
1:25

Logged
JL

Client: Hampshire County Council

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.40	ES		0.20			Grass on TOPSOIL. Soft dark brown gravelly sandy CLAY. Gravels of fine to coarse subangular to subrounded orange-grey flint.	
				0.50			Medium dense light brown gravelly clayey SAND. Gravels of fine to coarse subangular to subrounded orange-grey flint. <i>Coarse gravel band. Dark brown well rounded coarse flint pebbles.</i>	
	1.10	B		1.40			Medium dense light brown sandy GRAVEL. Gravels of fine to medium subrounded to rounded orange-grey flint. Sand is coarse grained.	1
				1.70			Medium dense light beige-grey SAND. Sand is medium to coarse grained predominately of broken shell fragments. Grains are of multiple colours. <i>Pit wall collapses are very common.</i>	
							End of Pit at 1.70m	2
								3
								4
								5

Remarks: Granular material lead to repetitive pit wall collapse. Pit terminated at 1.70m due to instability.

Stability: Very poor

Project Name: Godbey House, Hayling Island

Project No.
5630

Co-ords: -
Level:

Date
03/11/2015

Location: 380 Seafront, Hayling Island, PO11 0BD

Dimensions: 2.00

Depth
1.70

0.50

Scale
1:25

Logged
JL

Client: Hampshire County Council

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.10			Grass on TOPSOIL	
							Soft dark brown gravelly sandy CLAY. Gravels of fine to coarse subangular to subrounded orange-grey flint.	
				0.40			Firm brown gravelly sandy CLAY. Gravels of fine to coarse subangular to rounded orange-grey flint.	
	0.65	B					Medium dense brown clayey sandy GRAVELS with rare cobbles. Gravels and cobbles of fine to coarse subangular to rounded orange-black flint.	
	1.00	B		0.95			Dense orange-brown gravelly SAND/sandy GRAVEL. Gravels of subangular to rounded orange-grey flint. Sand is coarse and subangular of shell fragments.	1
				1.70			End of Pit at 1.70m	2
								3
								4
								5

Remarks:

Stability: Poor



Project Name: Godbey House, Hayling Island

Project No.
5630

Co-ords: -
Level:

Date
03/11/2015

Location: 380 Seafront, Hayling Island, PO11 0BD

Dimensions: 2.00

Depth
2.50

0.60

Scale
1:25

Logged
JL

Client: Hampshire County Council

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.60	ES		0.10			Grass on MADE GROUND Soft grey-brown slightly gravelly sandy CLAY. Common fine roots and occasional thick roots. Gravels are fine to coarse subangular to subrounded of orange-grey flint, pottery, clinker and brick. <i>The ground is very dry. Several large trees are planted near the pit location.</i>	
							Firm light brown sandy CLAY.	
	1.05	B		0.80			Dense to very dense orange-grey clayey, very sandy GRAVELS of fine to coarse subangular to subrounded orange-grey flint.	1
	2.30	B		2.50			<i>Strong orange staining is common.</i> <i>Gravels generally become coarser with depth.</i> <i>Note, clay content appears reduced as wet arisings are removed from below groundwater level. Clay content is lost as groundwater washes over materials.</i>	2
							End of Pit at 2.50m	3
								4
								5

Remarks:

Stability: Good

TERRAFIRMA (SOUTH)

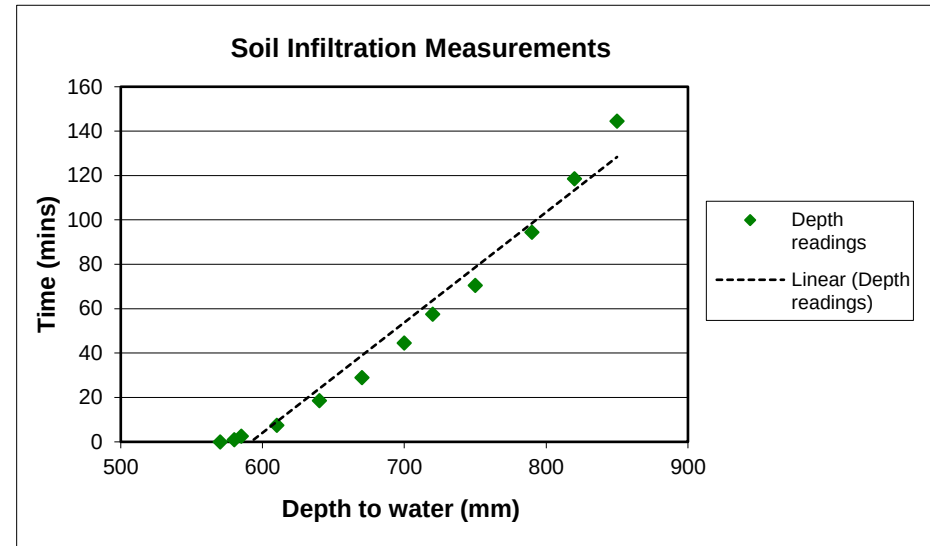
Site Name: 5630 - Godbey House, Hayling Island

Date Undertaken: 03/10/2015

Trial Pit No.: TP2

	Depth to Water (mm)	Time (Mins)
(effective depth - 100%)	570	0
	580	1
	585	2.5
	610	7.5
	640	18.5
	670	29
	700	44.5
	720	57.5
	750	70.5
	790	94.5
	820	118.5
(effective depth - 0%)	850	144.5

Length of Trial Pit (m)	1.8
Width of Trial Pit (m)	0.50
Depth of Trial Pit (m)	2.5
Effective Storage Depth (m)	0.28
75% Effective Depth (V _{p75})	0.64
25% Effective Depth (V _{p25})	0.78
Volume of Water Outflowing (m ³)	0.126
Assumed 50% effective depth (a _{p50})	1.79
Mean Surface Area of outflow	9.134
Time for 25% Outflow (t _{p25})	23.98332097
Time for 75% Outflow (t _{p75})	93.56682637
Soil Infiltration Rate (m/s)	3.30E-06



NB. tp25 and tp75 were calculated through a linear trend by fitting a straight line using the least squares method to the known values

Soil Infiltration Worksheet: This worksheet has been produced in combination with the document 'BRE Digest 365- September 1991'

This worksheet can be used to determine soil infiltration rates from trial pit field measurements

Worksheet options are identified by a green background

TERRAFIRMA (SOUTH)

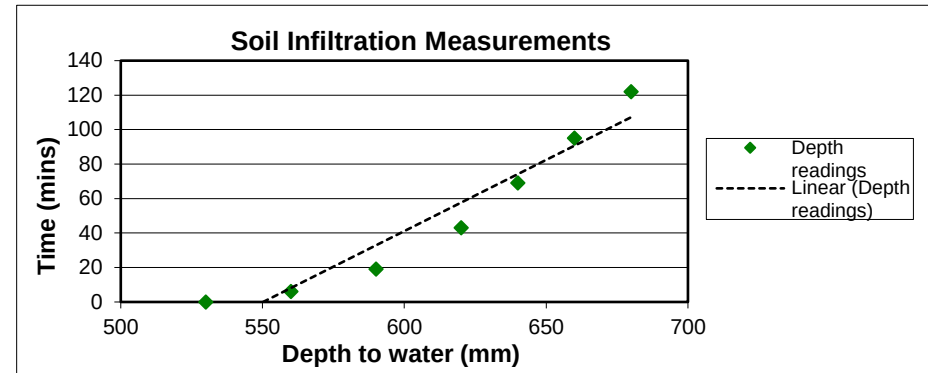
Site Name: 5630 - Godbey House, Hayling Island

Date Undertaken: 03/10/2015

Trial Pit No.: TP3

	Depth to Water (mm)	Time (Mins)
(effective depth - 100%)	530	0
	560	6
	590	19
	620	43
	640	69
	660	95
(effective depth - 0%)	680	122

Length of Trial Pit (m)	1.9
Width of Trial Pit (m)	0.50
Depth of Trial Pit (m)	2.2
Effective Storage Depth (m)	0.15
75% Effective Depth (V _{p75})	0.5675
25% Effective Depth (V _{p25})	0.6425
Volume of Water Outflowing (m ³)	0.07125
Assumed 50% effective depth (a _{p50})	1.595
Mean Surface Area of outflow	8.606
Time for 25% Outflow (tp ₂₅)	14.29664782
Time for 75% Outflow (tp ₇₅)	76.22920032
Soil Infiltration Rate (m/s)	2.23E-06



NB. tp₂₅ and tp₇₅ were calculated through a linear trend by fitting a straight line using the least squares method to the known values

Soil Infiltration Worksheet: This worksheet has been produced in combination with the document 'BRE Digest 365- September 1991'

This worksheet can be used to determine soil infiltration rates from trial pit field measurements

Worksheet options are identified by a green background

TERRAFIRMA (SOUTH)

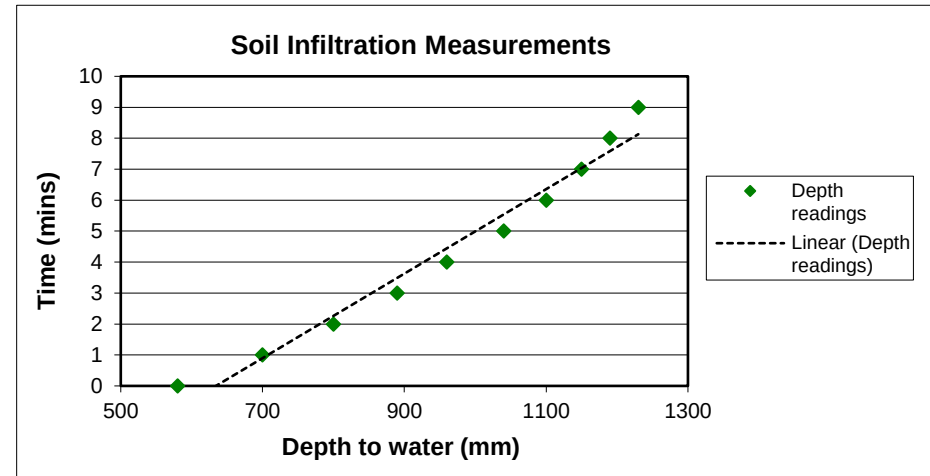
Site Name: 5630 - Godbey House, Hayling Island

Date Undertaken: 03/10/2015

Trial Pit No.: TP5 Fill 1

	Depth to Water (mm)	Time (Mins)
(effective depth - 100%)	580	0
	700	1
	800	2
	890	3
	960	4
	1040	5
	1100	6
	1150	7
	1190	8
(effective depth - 0%)	1230	9

Length of Trial Pit (m)	1.7
Width of Trial Pit (m)	0.50
Depth of Trial Pit (m)	2
Effective Storage Depth (m)	0.65
75% Effective Depth (V_{p75})	0.7425
25% Effective Depth (V_{p25})	1.0675
Volume of Water Outflowing (m^3)	0.27625
Assumed 50% effective depth (a_{p50})	1.095
Mean Surface Area of outflow	5.668
Time for 25% Outflow (t_{p25})	1.477954165
Time for 75% Outflow (t_{p75})	5.912107196
Soil Infiltration Rate (m/s)	1.83E-04



NB. t_{p25} and t_{p75} were calculated through a linear trend by fitting a straight line using the least squares method to the known values

Soil Infiltration Worksheet: This worksheet has been produced in combination with the document 'BRE Digest 365- September 1991'
 This worksheet can be used to determine soil infiltration rates from trial pit field measurements
 Worksheet options are identified by a green background

TERRAFIRMA (SOUTH)

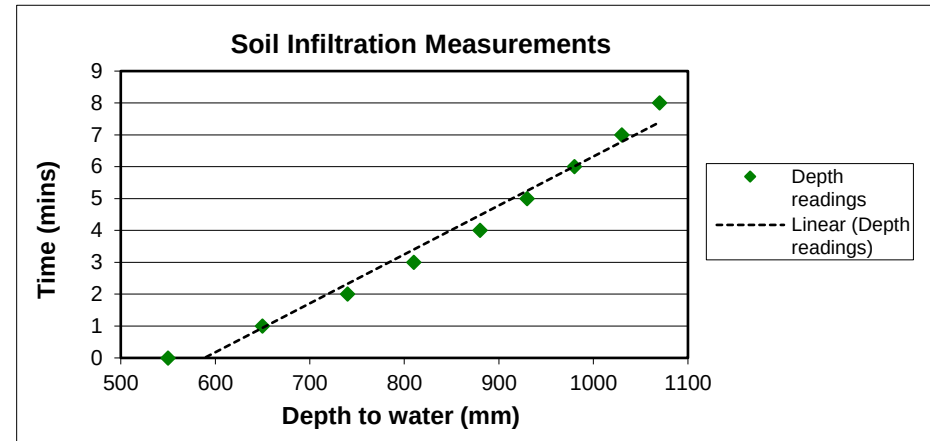
Site Name: 5630 - Godbey House, Hayling Island

Date Undertaken: 03/10/2015

Trial Pit No.: TP5 Fill 2

	Depth to Water (mm)	Time (Mins)
(effective depth - 100%)	550	0
	650	1
	740	2
	810	3
	880	4
	930	5
	980	6
	1030	7
(effective depth - 0%)	1070	8

Length of Trial Pit (m)	1.7
Width of Trial Pit (m)	0.50
Depth of Trial Pit (m)	2
Effective Storage Depth (m)	0.52
75% Effective Depth (Vp75)	0.68
25% Effective Depth (Vp25)	0.94
Volume of Water Outflowing (m3)	0.221
Assumed 50% effective depth (ap50)	1.19
Mean Surface Area of outflow	6.086
Time for 25% Outflow (tp25)	1.405772496
Time for 75% Outflow (tp75)	5.399517469
Soil Infiltration Rate (m/s)	1.52E-04



NB. tp25 and tp75 were calculated through a linear trend by fitting a straight line using the least squares method to the known values

Soil Infiltration Worksheet: This worksheet has been produced in combination with the document 'BRE Digest 365- September 1991'
This worksheet can be used to determine soil infiltration rates from trial pit field measurements
Worksheet options are identified by a green background

TERRAFIRMA (SOUTH)

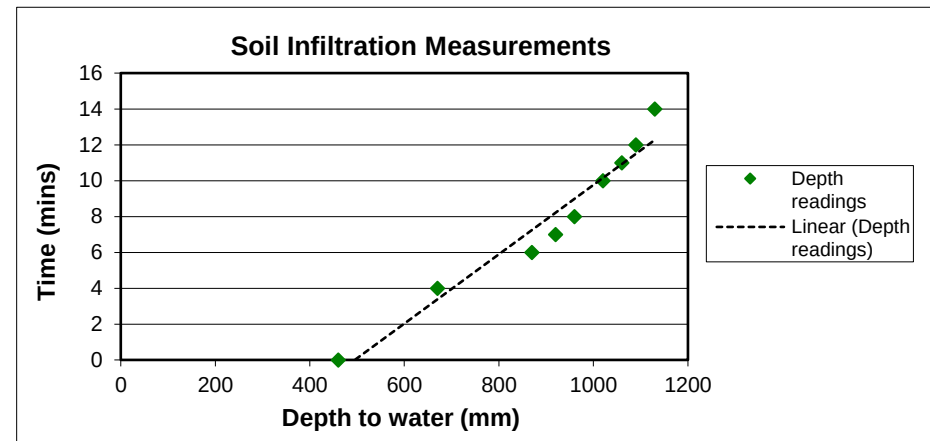
Site Name: 5630 - Godbey House, Hayling Island

Date Undertaken: 03/10/2015

Trial Pit No.: TP5 Fill 3

	Depth to Water (mm)	Time (Mins)
(effective depth - 100%)	460	0
	670	4
	870	6
	920	7
	960	8
	1020	10
	1060	11
	1090	12
(effective depth - 0%)	1130	14

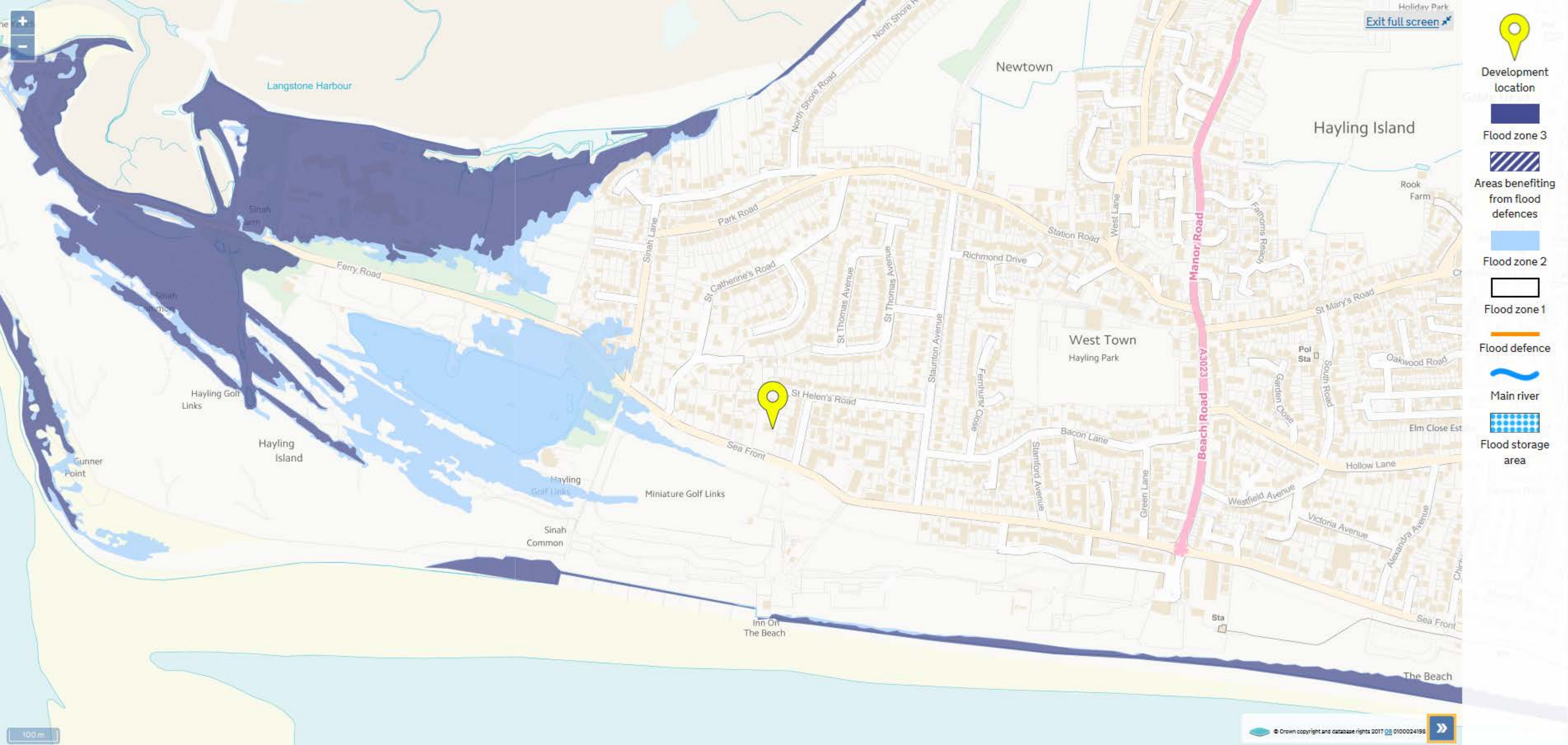
Length of Trial Pit (m)	1.7
Width of Trial Pit (m)	0.50
Depth of Trial Pit (m)	2
Effective Storage Depth (m)	0.67
75% Effective Depth (V_{p75})	0.6275
25% Effective Depth (V_{p25})	0.9625
Volume of Water Outflowing (m^3)	0.28475
Assumed 50% effective depth (a_{p50})	1.205
Mean Surface Area of outflow	6.152
Time for 25% Outflow (tp_{25})	2.560297905
Time for 75% Outflow (tp_{75})	9.036389442
Soil Infiltration Rate (m/s)	1.19E-04



NB. tp_{25} and tp_{75} were calculated through a linear trend by fitting a straight line using the least squares method to the known values

Soil Infiltration Worksheet: This worksheet has been produced in combination with the document 'BRE Digest 365- September 1991'
 This worksheet can be used to determine soil infiltration rates from trial pit field measurements
 Worksheet options are identified by a green background

Appendix 5



 Flood risk from rivers or the sea

☒ Extent of flooding

☐ Depth and flow estimates at monitoring stations

 Flood risk from surface water

☐ Extent of flooding

☐ High risk: depth

☐ High risk: velocity

☐ Medium risk: depth

☐ Medium risk: velocity

☐ Low risk: depth

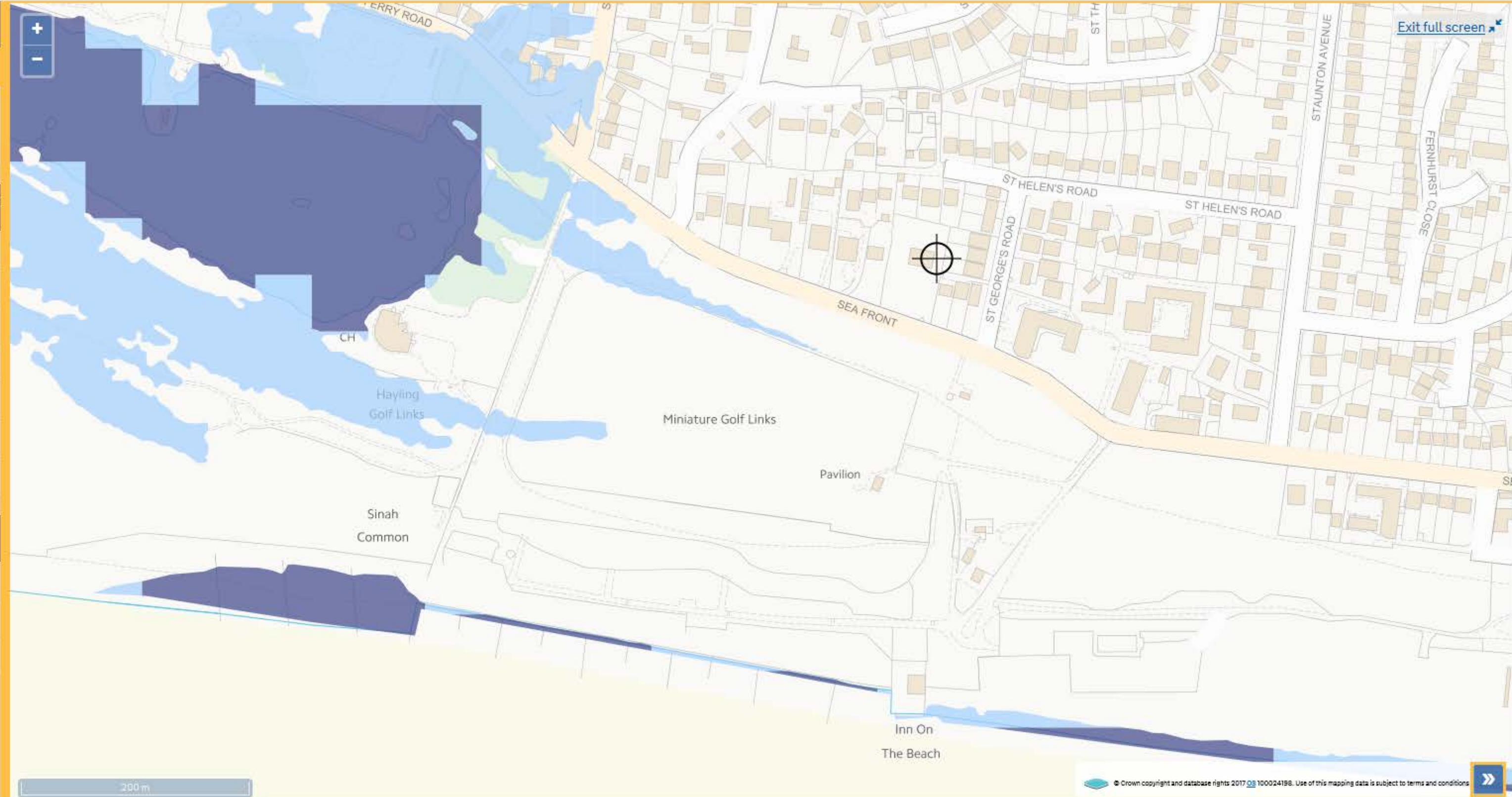
☐ Low risk: velocity

 Flood risk from reservoirs

☐ Extent of flooding

☐ Flood depth

☐ Flood speed



Flood risk

 High

 Medium

 Low

 Very low

 Location you selected



Flood risk from rivers or the sea

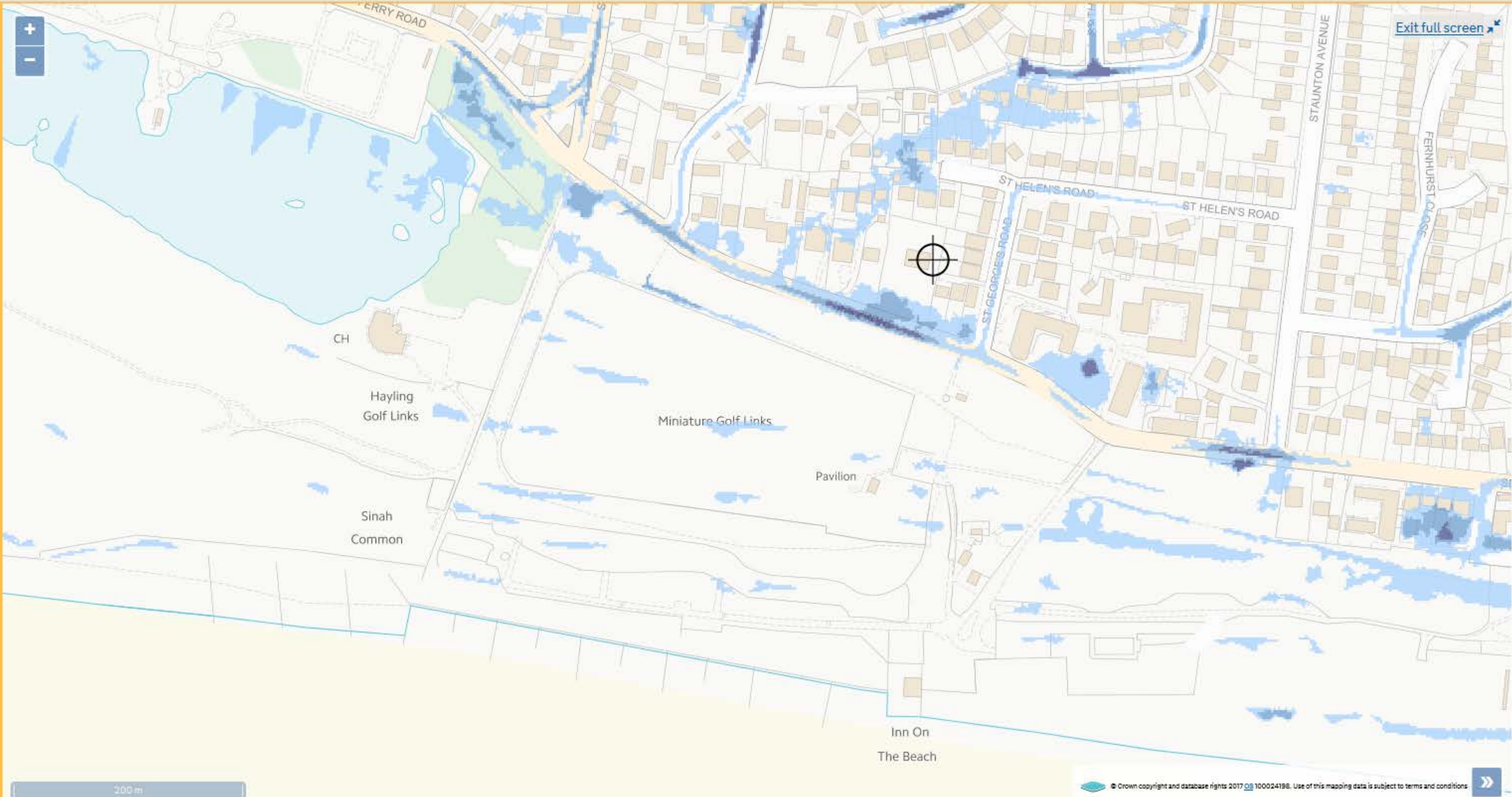
- ☐ Extent of flooding
- ☐ Depth and flow estimates at monitoring stations

Flood risk from surface water

- ☒ Extent of flooding
- ☐ High risk: depth
- ☐ High risk: velocity
- ☐ Medium risk: depth
- ☐ Medium risk: velocity
- ☐ Low risk: depth
- ☐ Low risk: velocity

Flood risk from reservoirs

- ☐ Extent of flooding
- ☐ Flood depth
- ☐ Flood speed



Flood risk

- High
- Medium
- Low
- Very low
- Location you selected

Appendix 6

Determination of Peak Discharge from Catchment



COLE EASDON
CONSULTANTS

Existing Site

The Rational Formula

$$Q_p = CiA/0.36$$

Q_{100yr}	23.8l/s	Peak discharge from catchment
A	0.10ha	Catchment area
i	91.6mm/hr	Average rainfall intensity
C	1.0mm/hr	Dimensionless coefficient

Determination of C

Value of C_V		
C_V	0.75	Volumetric runoff coefficient
Value of C_R		
C_R	1.3	Routing coefficient

Determination of i

Determination of M5-60 min and r

M5-60min	19mm	5 year - 60 minute rainfall depth
r	0.35	Ratio of the 5 year - 60 minute rainfall depth to the 5 year - 2 day rainfall depth
D	15min	Rainfall duration
T	100year	Return period

Determination of M5-D

Z_1	0.62	
M5-D	11.8mm	rainfall depth of 5 year return period for required duration

Determination of MT-D

Z_2	1.94	
MT-D	22.89mm	rainfall depth of the required return period

Determination of point rainfall intensities

i	91.6mm/hr
---	-----------

Application of areal reduction factor

A	0.0010km ²
ARF	1
i	91.6mm/hr

Determination of Peak Discharge from Catchment

Proposed Site Potential Runoff



The Rational Formula

$$Q_p = CiA/0.36$$

$Q_{P(100yr)}$	41l/s	Peak discharge from catchment	$Q_{P(100yr+40\%)}$	57l/s
A	0.1460ha	Catchment area		
i	91.6mm/hr	Average rainfall intensity		
C	1.092	Dimensionless coefficient		

Determination of C

Value of C_V		
C_V	0.84	Volumetric runoff coefficient
Value of C_R		
C_R	1.3	Routing coefficient

Determination of i

Determination of M5-60 min and r

M5-60min	19.0mm	5 year - 60 minute rainfall depth
r	0.35	Ratio of the 5 year - 60 minute rainfall depth to the 5 year - 2 day rainfall depth
D	15min	Rainfall duration
T	100year	Return period

Determination of M5-D

Z_1	0.62	
M5-D	11.8mm	rainfall depth of 5 year return period for required duration

Determination of MT-D

Z_2	1.94	
MT-D	22.89mm	rainfall depth of the required return period

Determination of point rainfall intensities

i	91.6mm/hr
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Application of areal reduction factor

A	0.0015km ²
ARF	1
i	91.6mm/hr

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York House, Edison Park Dorcan Way Swindon, SN3 3RB		Godbey House, Hayling Island Soakaway 1																																																																																																																																																																																																																					
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K</td></tr><tr><td>600 min Summer</td><td>4.578</td><td>0.278</td><td>0.1</td><td>13.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>4.581</td><td>0.281</td><td>0.1</td><td>13.9</td><td>O K</td></tr><tr><td>960 min Summer</td><td>4.582</td><td>0.282</td><td>0.1</td><td>13.9</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>4.578</td><td>0.278</td><td>0.1</td><td>13.7</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>4.568</td><td>0.268</td><td>0.1</td><td>13.2</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>4.557</td><td>0.257</td><td>0.1</td><td>12.7</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>4.533</td><td>0.233</td><td>0.1</td><td>11.5</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>4.509</td><td>0.209</td><td>0.1</td><td>10.3</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>4.488</td><td>0.188</td><td>0.1</td><td>9.3</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>4.468</td><td>0.168</td><td>0.1</td><td>8.3</td><td>O K</td></tr><tr><td>10080 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Summer</td><td>8.665</td><td>0.0</td><td>720</td></tr><tr><td>960 min Summer</td><td>6.943</td><td>0.0</td><td>960</td></tr><tr><td>1440 min Summer</td><td>5.071</td><td>0.0</td><td>1186</td></tr><tr><td>2160 min Summer</td><td>3.696</td><td>0.0</td><td>1560</td></tr><tr><td>2880 min Summer</td><td>2.949</td><td>0.0</td><td>1964</td></tr><tr><td>4320 min Summer</td><td>2.142</td><td>0.0</td><td>2772</td></tr><tr><td>5760 min Summer</td><td>1.705</td><td>0.0</td><td>3584</td></tr><tr><td>7200 min Summer</td><td>1.427</td><td>0.0</td><td>4392</td></tr><tr><td>8640 min Summer</td><td>1.235</td><td>0.0</td><td>5184</td></tr><tr><td>10080 min Summer</td><td>1.093</td><td>0.0</td><td>5944</td></tr><tr><td>15 min Winter</td><td>124.633</td><td>0.0</td><td>19</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	4.403	0.103	0.1	5.1	O K	30 min Summer	4.437	0.137	0.1	6.8	O K	60 min Summer	4.475	0.175	0.1	8.6	O K	120 min 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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
30 min Winter	4.454	0.154	0.1	7.6	O K
60 min Winter	4.496	0.196	0.1	9.7	O K
120 min Winter	4.539	0.239	0.1	11.8	O K
180 min Winter	4.562	0.262	0.1	13.0	O K
240 min Winter	4.577	0.277	0.1	13.7	O K
360 min Winter	4.597	0.297	0.1	14.7	O K
480 min Winter	4.609	0.309	0.1	15.3	O K
600 min Winter	4.617	0.317	0.1	15.6	O K
720 min Winter	4.622	0.322	0.1	15.9	O K
960 min Winter	4.626	0.326	0.1	16.1	O K
1440 min Winter	4.622	0.322	0.1	15.9	O K
2160 min Winter	4.608	0.308	0.1	15.2	O K
2880 min Winter	4.592	0.292	0.1	14.4	O K
4320 min Winter	4.557	0.257	0.1	12.7	O K
5760 min Winter	4.522	0.222	0.1	11.0	O K
7200 min Winter	4.489	0.189	0.1	9.3	O K
8640 min Winter	4.459	0.159	0.1	7.9	O K
10080 min Winter	4.433	0.133	0.1	6.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
30 min Winter	83.789	0.0	33
60 min Winter	53.779	0.0	62
120 min Winter	33.337	0.0	122
180 min Winter	24.832	0.0	180
240 min Winter	20.006	0.0	240
360 min Winter	14.706	0.0	356
480 min Winter	11.818	0.0	472
600 min Winter	9.966	0.0	588
720 min Winter	8.665	0.0	702
960 min Winter	6.943	0.0	924
1440 min Winter	5.071	0.0	1352
2160 min Winter	3.696	0.0	1684
2880 min Winter	2.949	0.0	2136
4320 min Winter	2.142	0.0	3028
5760 min Winter	1.705	0.0	3912
7200 min Winter	1.427	0.0	4688
8640 min Winter	1.235	0.0	5456
10080 min Winter	1.093	0.0	6248

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Source Control 2015.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.022

Time (mins) Area
From: To: (ha)

0 4 0.022

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Model Details

Storage is Online Cover Level (m) 5.500

Cellular Storage Structure

Invert Level (m) 4.300 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.01200 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.01200

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	52.0	52.0	0.400	52.0	63.5

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Summary of Results for 100 year Return Period (+40%) Half Drain Time : 25 minutes. <table><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr><tr><td>15 min Summer</td><td>3.322</td><td>0.322</td><td>10.2</td><td>16.8</td><td>O K</td></tr><tr><td>30 min Summer</td><td>3.366</td><td>0.366</td><td>11.6</td><td>21.7</td><td>O K</td></tr><tr><td>60 min Summer</td><td>3.385</td><td>0.385</td><td>12.2</td><td>24.0</td><td>O K</td></tr><tr><td>120 min Summer</td><td>3.377</td><td>0.377</td><td>12.0</td><td>23.0</td><td>O K</td></tr><tr><td>180 min Summer</td><td>3.356</td><td>0.356</td><td>11.3</td><td>20.5</td><td>O K</td></tr><tr><td>240 min Summer</td><td>3.334</td><td>0.334</td><td>10.6</td><td>18.0</td><td>O K</td></tr><tr><td>360 min Summer</td><td>3.296</td><td>0.296</td><td>9.4</td><td>14.2</td><td>O K</td></tr><tr><td>480 min Summer</td><td>3.266</td><td>0.266</td><td>8.5</td><td>11.4</td><td>O K</td></tr><tr><td>600 min Summer</td><td>3.241</td><td>0.241</td><td>7.7</td><td>9.4</td><td>O K</td></tr><tr><td>720 min Summer</td><td>3.221</td><td>0.221</td><td>7.0</td><td>7.9</td><td>O K</td></tr><tr><td>960 min Summer</td><td>3.189</td><td>0.189</td><td>6.0</td><td>5.8</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>3.147</td><td>0.147</td><td>4.7</td><td>3.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>3.111</td><td>0.111</td><td>3.5</td><td>2.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>3.090</td><td>0.090</td><td>2.9</td><td>1.3</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>3.065</td><td>0.065</td><td>2.1</td><td>0.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>3.052</td><td>0.052</td><td>1.6</td><td>0.4</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>3.047</td><td>0.047</td><td>1.4</td><td>0.4</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>3.043</td><td>0.043</td><td>1.2</td><td>0.3</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>3.041</td><td>0.041</td><td>1.1</td><td>0.3</td><td>O K</td></tr><tr><td>15 min Winter</td><td>3.346</td><td>0.346</td><td>11.0</td><td>19.4</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>124.633</td><td>0.0</td><td>21</td></tr><tr><td>30 min Summer</td><td>83.789</td><td>0.0</td><td>30</td></tr><tr><td>60 min Summer</td><td>53.779</td><td>0.0</td><td>46</td></tr><tr><td>120 min Summer</td><td>33.337</td><td>0.0</td><td>80</td></tr><tr><td>180 min Summer</td><td>24.832</td><td>0.0</td><td>112</td></tr><tr><td>240 min Summer</td><td>20.006</td><td>0.0</td><td>144</td></tr><tr><td>360 min Summer</td><td>14.706</td><td>0.0</td><td>204</td></tr><tr><td>480 min Summer</td><td>11.818</td><td>0.0</td><td>266</td></tr><tr><td>600 min Summer</td><td>9.966</td><td>0.0</td><td>326</td></tr><tr><td>720 min Summer</td><td>8.665</td><td>0.0</td><td>384</td></tr><tr><td>960 min Summer</td><td>6.943</td><td>0.0</td><td>504</td></tr><tr><td>1440 min Summer</td><td>5.071</td><td>0.0</td><td>742</td></tr><tr><td>2160 min Summer</td><td>3.696</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>2.949</td><td>0.0</td><td>1468</td></tr><tr><td>4320 min Summer</td><td>2.142</td><td>0.0</td><td>2200</td></tr><tr><td>5760 min Summer</td><td>1.705</td><td>0.0</td><td>2880</td></tr><tr><td>7200 min Summer</td><td>1.427</td><td>0.0</td><td>3632</td></tr><tr><td>8640 min Summer</td><td>1.235</td><td>0.0</td><td>4328</td></tr><tr><td>10080 min Summer</td><td>1.093</td><td>0.0</td><td>5056</td></tr><tr><td>15 min Winter</td><td>124.633</td><td>0.0</td><td>21</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	3.322	0.322	10.2	16.8	O K	30 min Summer	3.366	0.366	11.6	21.7	O K	60 min Summer	3.385	0.385	12.2	24.0	O K	120 min Summer	3.377	0.377	12.0	23.0	O K	180 min Summer	3.356	0.356	11.3	20.5	O K	240 min Summer	3.334	0.334	10.6	18.0	O K	360 min Summer	3.296	0.296	9.4	14.2	O K	480 min Summer	3.266	0.266	8.5	11.4	O K	600 min Summer	3.241	0.241	7.7	9.4	O K	720 min Summer	3.221	0.221	7.0	7.9	O K	960 min Summer	3.189	0.189	6.0	5.8	O K	1440 min Summer	3.147	0.147	4.7	3.5	O K	2160 min Summer	3.111	0.111	3.5	2.0	O K	2880 min Summer	3.090	0.090	2.9	1.3	O K	4320 min Summer	3.065	0.065	2.1	0.7	O K	5760 min Summer	3.052	0.052	1.6	0.4	O K	7200 min Summer	3.047	0.047	1.4	0.4	O K	8640 min Summer	3.043	0.043	1.2	0.3	O K	10080 min Summer	3.041	0.041	1.1	0.3	O K	15 min Winter	3.346	0.346	11.0	19.4	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	124.633	0.0	21	30 min Summer	83.789	0.0	30	60 min Summer	53.779	0.0	46	120 min Summer	33.337	0.0	80	180 min Summer	24.832	0.0	112	240 min Summer	20.006	0.0	144	360 min Summer	14.706	0.0	204	480 min Summer	11.818	0.0	266	600 min Summer	9.966	0.0	326	720 min Summer	8.665	0.0	384	960 min Summer	6.943	0.0	504	1440 min Summer	5.071	0.0	742	2160 min Summer	3.696	0.0	1104	2880 min Summer	2.949	0.0	1468	4320 min Summer	2.142	0.0	2200	5760 min Summer	1.705	0.0	2880	7200 min Summer	1.427	0.0	3632	8640 min Summer	1.235	0.0	4328	10080 min Summer	1.093	0.0	5056	15 min Winter	124.633	0.0	21
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2160 min Summer	3.111	0.111	3.5	2.0	O K																																																																																																																																																																																																																		
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York House, Edison Park Dorcan Way Swindon, SN3 3RB		Godbey House, Hayling Island Permeable Paving			
Date July 2017 File 5550 Permeable		Designed by NP Checked by RB			
Elstree Computing Ltd		Source Control 2015.1			
<u>Summary of Results for 100 year Return Period (+40%)</u>					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	3.392	0.392	12.5	24.9	O K
60 min Winter	3.406	0.406	12.9	26.7	O K
120 min Winter	3.386	0.386	12.3	24.1	O K
180 min Winter	3.354	0.354	11.2	20.3	O K
240 min Winter	3.323	0.323	10.3	16.9	O K
360 min Winter	3.272	0.272	8.6	12.0	O K
480 min Winter	3.234	0.234	7.4	8.9	O K
600 min Winter	3.205	0.205	6.5	6.8	O K
720 min Winter	3.183	0.183	5.8	5.4	O K
960 min Winter	3.150	0.150	4.8	3.6	O K
1440 min Winter	3.111	0.111	3.5	2.0	O K
2160 min Winter	3.081	0.081	2.6	1.1	O K
2880 min Winter	3.065	0.065	2.1	0.7	O K
4320 min Winter	3.049	0.049	1.5	0.4	O K
5760 min Winter	3.043	0.043	1.2	0.3	O K
7200 min Winter	3.039	0.039	1.0	0.2	O K
8640 min Winter	3.037	0.037	0.9	0.2	O K
10080 min Winter	3.034	0.034	0.7	0.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.789	0.0	31		
60 min Winter	53.779	0.0	50		
120 min Winter	33.337	0.0	84		
180 min Winter	24.832	0.0	118		
240 min Winter	20.006	0.0	150		
360 min Winter	14.706	0.0	212		
480 min Winter	11.818	0.0	272		
600 min Winter	9.966	0.0	330		
720 min Winter	8.665	0.0	388		
960 min Winter	6.943	0.0	506		
1440 min Winter	5.071	0.0	740		
2160 min Winter	3.696	0.0	1100		
2880 min Winter	2.949	0.0	1448		
4320 min Winter	2.142	0.0	2176		
5760 min Winter	1.705	0.0	2864		
7200 min Winter	1.427	0.0	3536		
8640 min Winter	1.235	0.0	4256		
10080 min Winter	1.093	0.0	5088		
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Date July 2017	Designed by NP	
File 5550 Permeable	Checked by RB	
Elstree Computing Ltd	Source Control 2015.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.120

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4	0.040	4	8	0.040
				8	12
					0.040

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Model Details

Storage is Online Cover Level (m) 3.800

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	0.21200	Width (m)	18.0
Membrane Percolation (mm/hr)	1000	Length (m)	50.0
Max Percolation (l/s)	250.0	Slope (1:X)	60.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	3.000	Cap Volume Depth (m)	0.000