

Land at Caldyne Park, Turners Hill Rd, RH10 4NB

Reference: 0228 - DD- 001

May-24

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Purpose of this report

- 1.1 The purpose of this statement is to accompany the technical drawings and details showing the proposed Sustainable Drainage System and foul sewer design.



Existing and Proposed Site

- 2.1 The estimated lifetime of this development is: 100 years
- 2.2 The distribution of catchment areas for existing and proposed site is as per table 1 below. See appendix A for details

Table 1 : Existing and Proposed catchment areas in hectares

Description	Existing Site	Proposed Site
Area draining away from development	2.100	2.050
Area positively drained*	0.000	0.050
Total Development Area	2.100	2.100

*Positively drained areas do not include permeable areas that discharge directly into the ground

- 2.3 There is an increase on the impermeable areas due to the new buildings. It has been assumed that the positively drained areas will have different runoff coefficients depending on the type of surface as follow:

Impermeable Surface	1.0
Permeable Surfaces	0.5
Grass Areas	0.3

- 2.4 The distribution of surfaces within the positively drained areas can be seen in appendix A and are summarised in table 2 below.

Table 2 : Surface Type distribution for positively drained areas in hectares

Description	Existing Site	Proposed Site
Impermeable Surface	0.000	0.050
Permeable Surface	0.000	0.000
Total Area positively drained	0.000	0.050



Site Characteristics

2.5 The site background is clearly identified through answers to the questions below

TOPIC	QUESTION	ANSWER
Protected species or habitat	Is the site near to designated sites and priority habitats?	No
Flood Plain	Is the site located in the flood plain?	No
Soils and Geology	Soil permeability? - See appendix B for BGS records	Yes
Space constraints	Space for SuDS components?	Yes
Topography	Sited on a flat site?	Yes
	Sited on a steep slope (5-15%)	No
	Sited on a very steep slope (>15%)	No
Groundwater	Is ground Water less that 3m bgl?	Ukn
Contaminated land	Are there contaminated soils on site?	No
Existing Infrastructure	Are there underground utilities in the SuDS area?	No
Runoff characteristics	Is the development in a high risk flooding area?	No
Green Roofs	Are green roofs a requirement for the development?	No
Water Harvesting	Is water harvesting a requirement for the development?	Yes

Evaluation of Discharge Point

2.6 The SuDS design takes into account Building Regulations Section H3. Rainwater from roofs and paved areas is carried away from the surface to discharge to one of the following in order of priority:

Discharge to:	Site Assessment
Adequate infiltration system	The site has potential for infiltration. An infiltration rate of 1.0×10^{-5} m/s has been assumed for this site. Trial pits are required to confirm this assumed rate
a watercourse	There are not watercourses in the proximity to the site
a surface water sewer	There are not public drains in the proximity to the site
a combined sewer system	There are not public drains in the proximity to the site



Peak Run-off Rate

- 3.1 The peak runoff rate for the existing site was calculated as per table 3. Calculation results are in table 5 and appendix C.

Table 3: Peak run-off rate calculation method for existing site

Method Used	Calculation Method
	This is a greenfield site, as the proposed development area is less than 50ha, the Institute of Hydrology(IoH). Report124 Flood Estimation for Small Catchments method has been used to estimate the site peak flow rates
	This is a brownfield site, runoff rates are calculated in accordance with best practice simulation modelling
	This is a brownfield site where the pre-development drainage isn't known therefore the runoff rates are calculated using the Greenfield run-off model (above) but using soil type 5

- 3.2 The runoff flow produced by the development will be controlled as per table 4.

Table 4: Runoff discharge rate control

Control Used	Description of runoff discharge
	Water will be discharged into the ground via a SuDS as described in table 6 below
	The peak discharge rate has been reduced to pre-development Qbar flow
	The limiting discharge rate requires a flow rate less than 5l/s at discharge point, therefore a rate of 5l/s is used
	The peak discharge rate has been agreed with the local water company to be 1:30 storm event flow rate

Run-off Volumes

- 3.3 Micro Drainage was used to calculate the size of the attenuation based on the available infiltration rate, the size of the soakaways are calculated for all events up to the 1 in 100 including an allowance for climate change of 40%. See table 5 for value and appendix C for calculations.

Table 5: Peak discharge rates and anticipated attenuation volumes for SuDS

Return Period Event	Runoff Volume (m3)	Peak Discharge Rate (l/s)	Infiltration Rate (m/hr)	Attenuated Storage Volume (m3)
Qbar(1 in 2)		10.0	n/a	0.0360
1 in 30		25.8	n/a	0.0360
1 in 100		36.4	n/a	0.0360
1 in 100 + CC			n/a	0.0360

Drainage Hierarchy Evaluation

- 4.1 The drainage hierarchy evaluation is set up within the NPPF and the local SuDS documents of the Lead Local Flood Authority. The following drainage strategy is proposed by this development.

Table 6: Drainage Hierarchy Evaluation

Hierarchy	Feasible	Proposed
1 Store rainwater for later use	✓	✓
2 Use infiltration techniques, such as porous surfaces	✓	✓
3 Attenuate rainwater in ponds or open water features for gradual release	✓	✓
4 Attenuate rainwater by storing in tanks or sealed water features for gradual release	✗	✗
5 Discharge rainwater direct to a watercourse	✗	✗
6 Discharge rainwater to a surface water sewer/drain	✗	✗
7 Discharge rainwater to the combined sewer.	✗	✗

- 4.2 The location and details of the SuDS can be seen drainage layouts in appendix D. Calculations are in appendix C.
- 4.3 The drainage calculations demonstrate:
- The post development runoff volumes have been reduced to the pre-development runoff values by infiltrating all the run-off produced by the development.
 - No flooding occurs for the 1 in 30 storm events.
 - Any flooding for the 1 in 100 year +40% climate change event can be safely contained on site
- 4.4 The proposed drainage strategy presents one possible solution to demonstrate that the development can be sustainably drained, to comply with the requirements of the NPPF. Other solutions may be feasible and may prove to be better suited to the site. These will become apparent during the detailed design stage.

Management of Exceedance Flows

- 4.5 The drainage network has been designed to attenuate surface runoff for all events up to and including the 1% AEP + CC(1 in 100 years). However consideration has been given to what may happen when the design capacity of the surface water drainage network is exceeded. Surface water will flow to the lowest points within the site located to the front of the property. The flood risk to the buildings would therefore remain low. See appendix D.



Foul Drainage

- 5.1 All foul water flows are treated on site and discharged into the ground. The proposed foul drainage system is shown in appendix D.

Treatment Plant and Drainage Field Evaluation

Foul Water Flows and Permits	Is there any part of the building or the treatment system serves is within 30 metres of a public sewer?	No
	Is the site near a designated sensitive area or within a Source Protection Zone 1?	No
	Proposed Development's expected flow	0.9 m3/day. See calculations in appendix C
	Is the discharge more than 2 m3/day to the ground?	No
	Is the discharge more than 10m3/day to a watercourse?	N/A
Ground Conditions	Has an infiltration test to the BS 6297:2007 +A1:2008 standard been carried out?	No, the infiltration rate has been assumed. A test is required to confirm this assumption.
	Is the site discharging 2 to 15 cubic metres a day to ground via a shallow sub-surface infiltration system in a source protection zone 1 (SPZ1)?	N/A
	Will the soakaway be located on artificially raised, made-up ground or ground likely to be contaminated?	The ground is not contaminated
Drainage Field Siting	Will it be at least 10m from a watercourse?	Yes
	Will it be at least 15m from any building?	Yes
	Will there be any access roads, driveways or paved	No
Treatment Plant Siting	Is it at least 7m from the habitable part of a building?	Yes
	Will there be vehicular access for emptying within 30m?	Yes

Maintenance

- 5.2 The treatment plant and drainage field will be maintained by the house



Maintenance and Management plan responsibility

- 6.1 The SuDS will be maintained by The Owner the property

Maintenance and Management plan for proposed SuDS

- 6.2 The maintenance and Management Plan Guidance from the SuDS Manual, CIRIA C753 (CIRIA, 2015) is to be followed for the effective maintenance of the proposed SuDS techniques outlined above. The maintenance for SuDS structures are as follow:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter, debris and trash	Monthly
	Cut grass – for landscaped areas and access routes	Monthly (during growing season) or as required
	Cut grass – meadow grass in and around basin	Half yearly: spring (before nesting season) and autumn
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
Occasional maintenance	Reseed areas of poor vegetation growth	Annually, or as required
	Prune and trim trees and remove cuttings	As required
	Remove sediment from pre-treatment system when 50% full	As required
Remedial actions	Repair erosion or other damage by reseedling or re-turfing	As required
	Realign the rip-rap	As required
	Repair or rehabilitate inlets, outlets and overflows	As required
	Rehabilitate infiltration surface using scarifying and spiking techniques if performance deteriorates	As required
	Relevel uneven surfaces and reinstate design levels	As required
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect banksides, structures, pipework etc for evidence of physical damage	Monthly
	Inspect inlets and pre-treatment systems for silt accumulation; establish appropriate silt removal frequencies	Half yearly
	Inspect infiltration surfaces for compaction and ponding	Monthly

Operation and maintenance requirements for pervious pavements

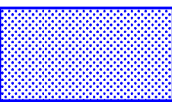
Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Appendix A

Drawing Scale Bar			
Drawing scale	Line length	Drawing scale	Line length
1:5	= 0.25 metres	1:200	= 10.0 metres
1:10	= 0.5 metres	1:250	= 12.5 metres
1:20	= 1.0 metres	1:500	= 25.0 metres
1:25	= 1.25 metres	1:1000	= 50.0 metres
1:50	= 2.5 metres	1:1250	= 62.5 metres
1:100	= 5.0 metres	1:2500	= 125 metres
Measure length of line above for checking of scale			

GENERAL NOTES

KEY

-  PERMEABLE AREAS
-  IMPERMEABLE AREAS
-  STUDY AREA

Rev	Details	Date	By	Chd

Drawing Status
PRELIMINARY



4 Bean Acre Road, Hook Norton, Banbury, Oxfordshire
e: info@rida-reports.co.uk
t: 01608 510 121
www.rida-reports.co.uk

Client:

Project:
Land at Caldyne Park,Turners Hill Rd, RH10 4NB

Drawing:
Existing and Proposed Areas
Permeable and Impermeable

Print Size	Project No	Drawing No	Revision
A1	0228	002	P1



EXISTING SITE 1:100

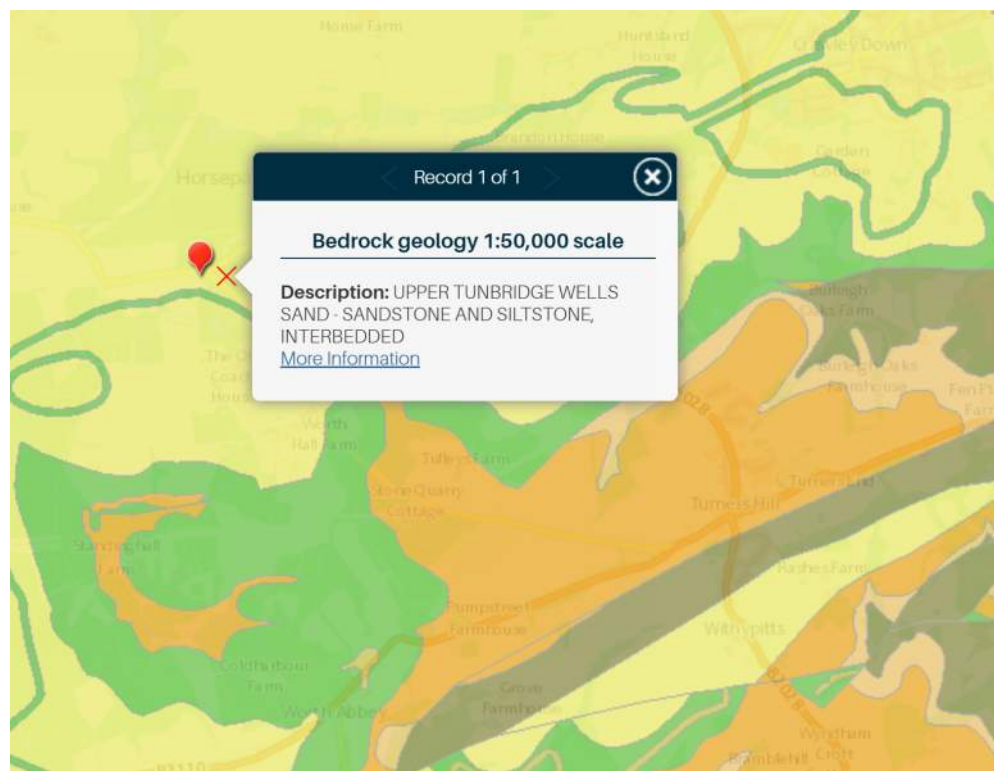


PROPOSED SITE 1:100

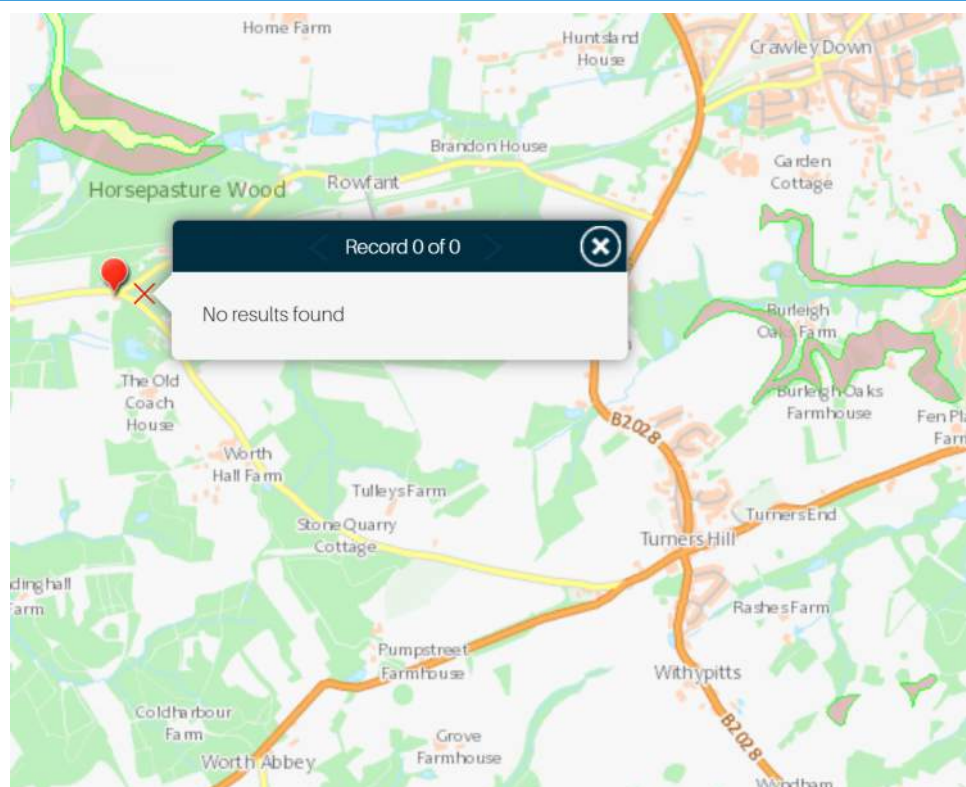
Appendix C

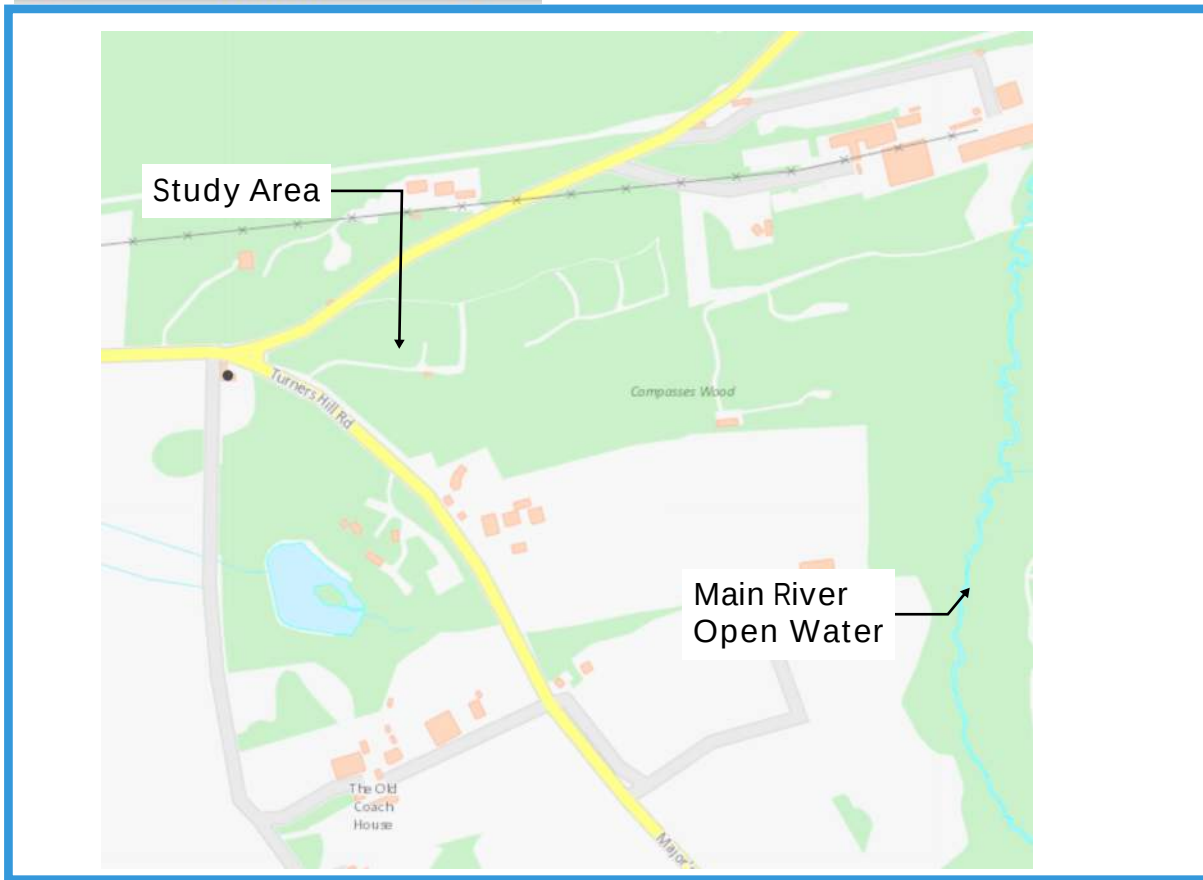


GEOLOGY - BEDROCK - SAND STONE FORMATION



GEOLOGY - SUPERFICIAL DEPOSITS - NONE



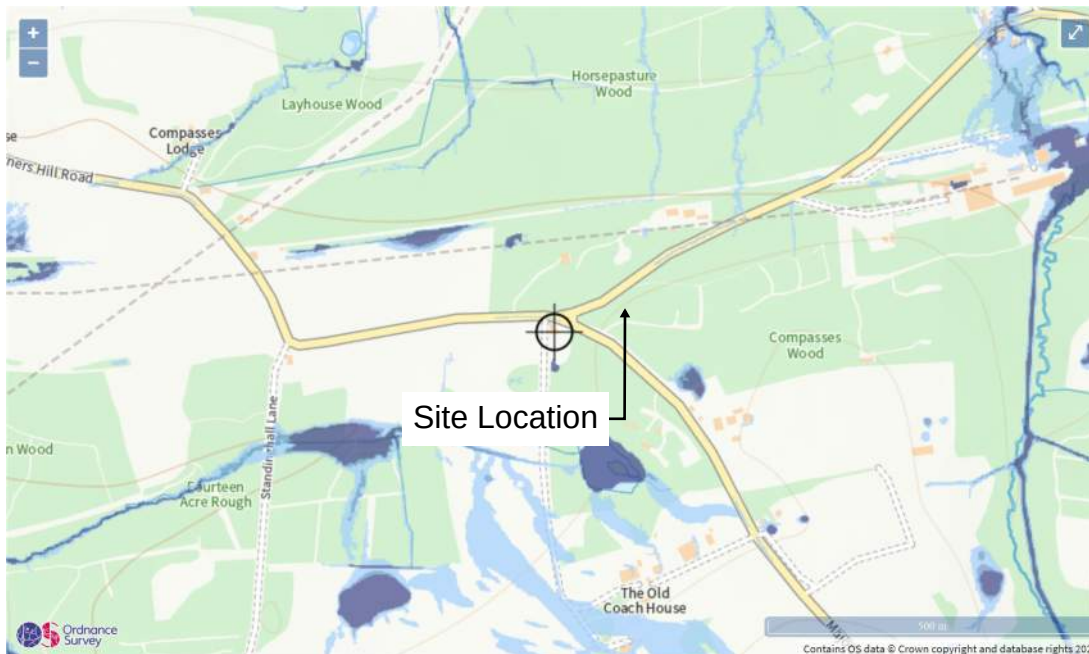


SITE FLOOD RISK


Flood risk from surface water


Extent of flooding

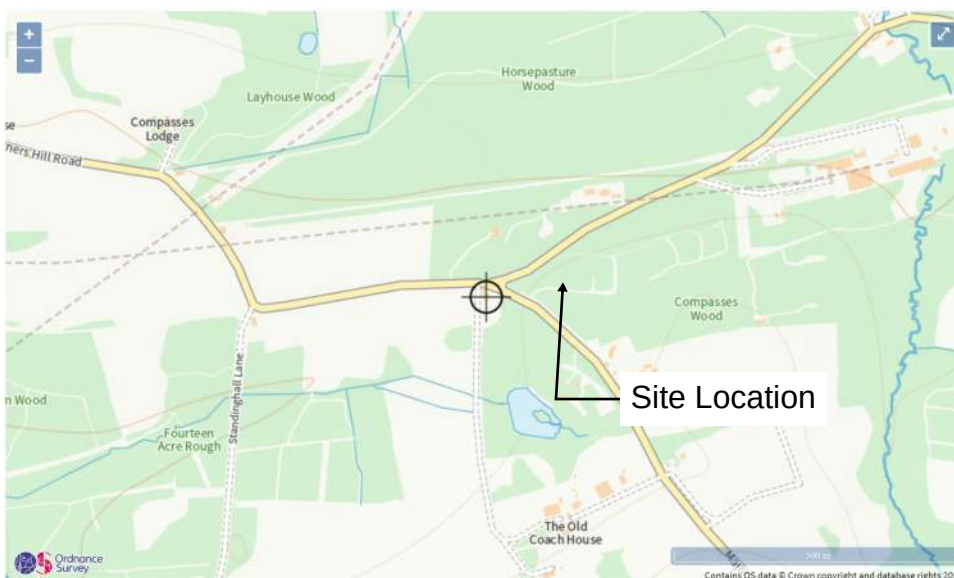
High risk means a chance of flooding greater than 3.3% (1:30)
 Medium risk means a chance of flooding of btw 1% (1:100) and 3.3%
 Low risk means a chance of flooding of btw 0.1% (1:1000) and 1%
 Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding



Map taken from:
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=384177&northing=255346&address=10000852442&map=RiversOrs>
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Flood risk from reservoirs


Extent of flooding



Map taken from:
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=384177&northing=255346&address=10000852442&map=RiversOrs>
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Areas of Outstanding Natural Beauty (England)

Reference	14
Name	High Weald
Date Designated	Oct-83
Hyperlink	http://www.landscapesforlife.org.uk/about-aonbs/visit-aonbs/high-weald-aonb
Statutory Area in Sq.km	1461.72

SSSI Impact Risk Zones - to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)

1. DOES PLANNING PROPOSAL FALL INTO ONE OR MORE OF THE CATEGORIES BELOW? **2. IF YES, CHECK THE CORRESPONDING DESCRIPTION(S) BELOW. LPA SHOULD CONSULT NATURAL ENGLAND ON LIKELY RISKS FROM THE FOLLOWING:**

All Planning Applications

Infrastructure

Airports, helipads and other aviation proposals.

Wind & Solar Energy

Minerals, Oil & Gas

Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.

Rural Non Residential

Residential

Rural Residential

Air Pollution

Livestock & poultry units with floorspace > 500m², slurry lagoons > 750m² & manure stores > 3500t.

Combustion

General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Waste

Composting

Discharges

Water Supply

Notes 1

Notes 2

GUIDANCE - How to use the Impact Risk Zones

[/Metadata_for_magic/SSSI IRZ User Guidance MAGIC.pdf](#)

Aquifer Designation Map (Bedrock) (England)

Typology	Secondary A
-----------------	-------------

Soilscape (England)

Reference	8
Name	SLIGHTLY ACID LOAMY AND CLAYEY SOILS WITH IMPEDED DRAINAGE
Main Surface Texture Class	LOAMY
Natural Drainage Type	SLIGHTLY IMPEDED DRAINAGE
Natural Fertility	MODERATE TO HIGH
Characteristic Semi-natural Habitats	WIDE RANGE OF PASTURE AND GENERALLY BROADLEAVED AND MIXED WOODLAND TYPES
Main Land Cover	ARABLE AND GRASSLAND
Hyperlink	/Metadata_for_magic/soilscape_summary.pdf

Aquifer Designation Map (Superficial Drift) (England)

No Features found

Limestone Pavement Orders (England)

No Features found

Local Nature Reserves (England) - points

No Features found

Local Nature Reserves (England)

No Features found

Moorland Line (England)

No Features found

National Nature Reserves (England) - points

No Features found

National Nature Reserves (England)

No Features found

National Nature Reserves (Scotland) - points

No Features found

National Nature Reserves (Scotland)

No Features found

National Nature Reserves (Wales) - points
No Features found

National Nature Reserves (Wales)
No Features found

National Parks (England)
No Features found

Ramsar Sites (England) - points
No Features found

Ramsar Sites (England)
No Features found

Proposed Ramsar Sites (England) - points
No Features found

Proposed Ramsar Sites (England)
No Features found

Ramsar Sites (Scotland) - points
No Features found

Ramsar Sites (Scotland)
No Features found

Ramsar Sites (Wales) - points
No Features found

Ramsar Sites (Wales)
No Features found

Sites of Special Scientific Interest Units (England) - points
No Features found

Sites of Special Scientific Interest Units (England)
No Features found

Sites of Special Scientific Interest (England) - points
No Features found

Sites of Special Scientific Interest (England)
No Features found

Sites of Special Scientific Interest (Scotland) - points
No Features found

Sites of Special Scientific Interest (Scotland)
No Features found

Sites of Special Scientific Interest (Wales) - points
No Features found

Sites of Special Scientific Interest (Wales)
No Features found

Special Areas of Conservation (England) - points
No Features found

Special Areas of Conservation (England)
No Features found

Possible Special Areas of Conservation (England) - points
No Features found

Possible Special Areas of Conservation (England)
No Features found

Special Areas of Conservation (Scotland) - points
No Features found

Special Areas of Conservation (Scotland)
No Features found

Special Areas of Conservation (Wales) - points
No Features found

Special Areas of Conservation (Wales)
No Features found

Special Protection Areas (England) - points
No Features found

Special Protection Areas (England)
No Features found

Potential Special Protection Areas (England) - points
No Features found

Potential Special Protection Areas (England)
No Features found

Special Protection Areas (Scotland) - points
No Features found

Special Protection Areas (Scotland)
No Features found

Special Protection Areas (Wales) - points
No Features found

Special Protection Areas (Wales)
No Features found

Biosphere Reserves (England) - points
No Features found

Biosphere Reserves (England)
No Features found

Biosphere Reserves (Scotland) - points
No Features found

Biosphere Reserves (Scotland)
No Features found

Biosphere Reserves (Wales) - points
No Features found

Biosphere Reserves (Wales)
No Features found

Less Favoured Areas (England)
No Features found

Nitrate Vulnerable Zones 2017 Designations (England)
No Features found

Wild Bird General Licence Protected Sites Condition Zone (England)
No Features found

Source Protection Zones merged (England)
No Features found

Flood map for planning

Your reference
RH10 4NB

Location (easting/northing)
531912/136538

Created
24 May 2021 22:14

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

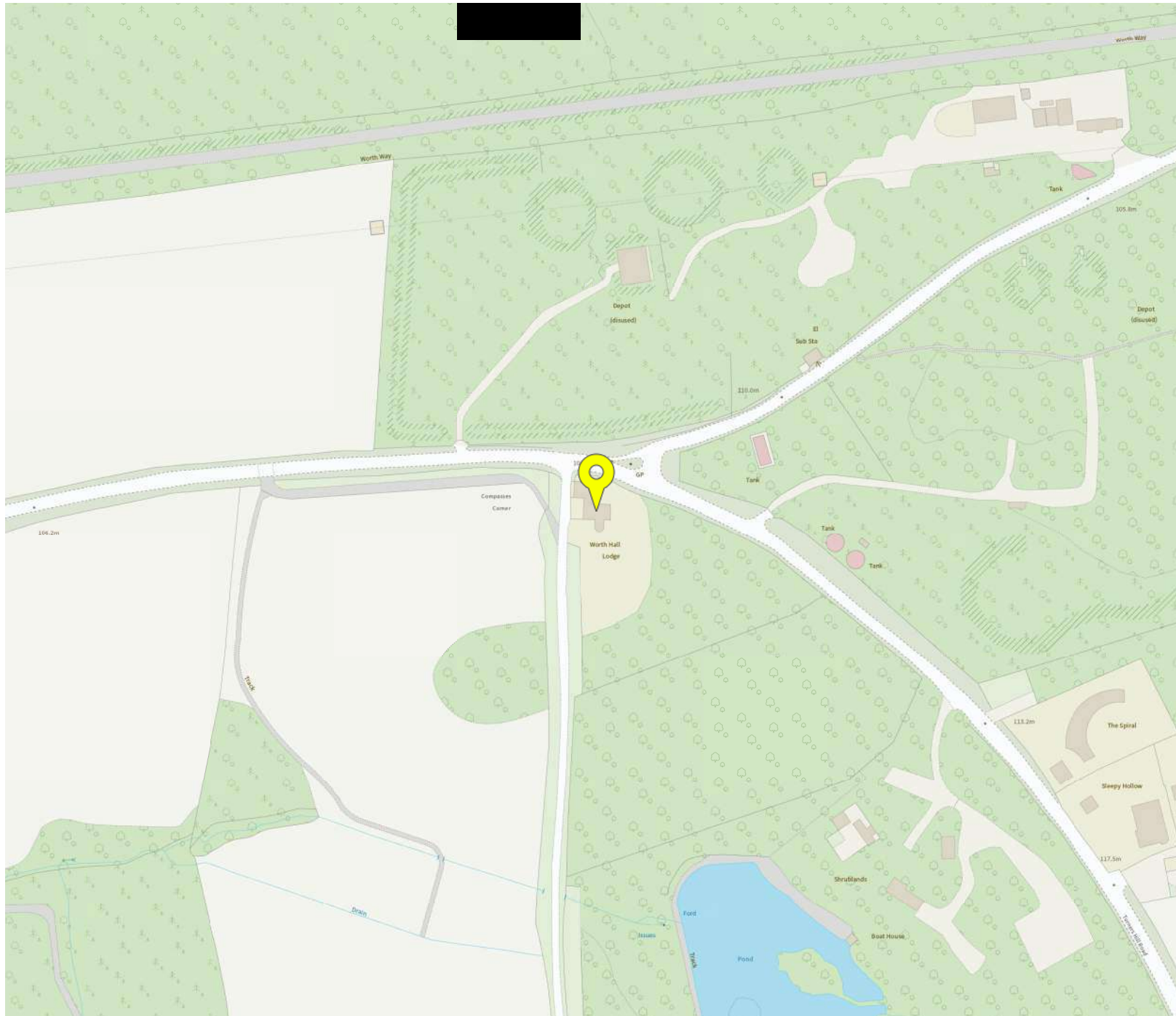
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

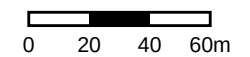


RH10 4NB

531912/136538

1:2500

24 May 2021 22:14



Appendix C

RIDA Reports		Page 1
- - -		
Date 24/05/2021 22:27 File PROPOSED MODEL.SRCX	Designed by Argemiro Checked by	
Innovyze	Source Control 2018.1.1	
ICP SUDS Mean Annual Flood Input Return Period (years)2Soil0.450 Area (ha) 2.100Urban0.000 SAAR (mm)839Region NumberRegion 6 Results1/s QBAR Rural11.4 QBAR Urban11.4 Q2 years10.0 Q1 year9.7 Q30 years25.8 Q100 years36.4		
©1982-2018 Innovyze		

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<u>Summary of Results for 100 year Return Period (+40%)</u> Half Drain Time : 444 minutes. <table><thead><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></thead><tbody><tr><td>15 min Summer</td><td>112.813</td><td>0.113</td><td>0.5</td><td>11.3</td><td>Flood Risk</td></tr><tr><td>30 min Summer</td><td>112.851</td><td>0.151</td><td>0.5</td><td>15.1</td><td>Flood Risk</td></tr><tr><td>60 min Summer</td><td>112.889</td><td>0.189</td><td>0.5</td><td>18.9</td><td>Flood Risk</td></tr><tr><td>120 min Summer</td><td>112.922</td><td>0.222</td><td>0.5</td><td>22.2</td><td>Flood Risk</td></tr><tr><td>180 min Summer</td><td>112.936</td><td>0.236</td><td>0.5</td><td>23.6</td><td>Flood Risk</td></tr><tr><td>240 min Summer</td><td>112.941</td><td>0.241</td><td>0.5</td><td>24.1</td><td>Flood Risk</td></tr><tr><td>360 min Summer</td><td>112.943</td><td>0.243</td><td>0.5</td><td>24.3</td><td>Flood Risk</td></tr><tr><td>480 min Summer</td><td>112.941</td><td>0.241</td><td>0.5</td><td>24.1</td><td>Flood Risk</td></tr><tr><td>600 min Summer</td><td>112.938</td><td>0.238</td><td>0.5</td><td>23.8</td><td>Flood Risk</td></tr><tr><td>720 min Summer</td><td>112.934</td><td>0.234</td><td>0.5</td><td>23.4</td><td>Flood Risk</td></tr><tr><td>960 min Summer</td><td>112.925</td><td>0.225</td><td>0.5</td><td>22.5</td><td>Flood Risk</td></tr><tr><td>1440 min Summer</td><td>112.905</td><td>0.205</td><td>0.5</td><td>20.5</td><td>Flood Risk</td></tr><tr><td>2160 min Summer</td><td>112.874</td><td>0.174</td><td>0.5</td><td>17.4</td><td>Flood Risk</td></tr><tr><td>2880 min Summer</td><td>112.847</td><td>0.147</td><td>0.5</td><td>14.7</td><td>Flood Risk</td></tr><tr><td>4320 min Summer</td><td>112.803</td><td>0.103</td><td>0.5</td><td>10.3</td><td>Flood Risk</td></tr><tr><td>5760 min Summer</td><td>112.772</td><td>0.072</td><td>0.5</td><td>7.2</td><td>Flood Risk</td></tr><tr><td>7200 min Summer</td><td>112.754</td><td>0.054</td><td>0.5</td><td>5.3</td><td>Flood Risk</td></tr><tr><td>8640 min Summer</td><td>112.746</td><td>0.046</td><td>0.5</td><td>4.6</td><td>Flood Risk</td></tr><tr><td>10080 min Summer</td><td>112.742</td><td>0.042</td><td>0.4</td><td>4.2</td><td>Flood Risk</td></tr><tr><td>15 min Winter</td><td>112.828</td><td>0.128</td><td>0.5</td><td>12.8</td><td>Flood Risk</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>131.851</td><td>0.0</td><td>26</td></tr><tr><td>30 min Summer</td><td>88.566</td><td>0.0</td><td>40</td></tr><tr><td>60 min Summer</td><td>56.713</td><td>0.0</td><td>68</td></tr><tr><td>120 min Summer</td><td>35.004</td><td>0.0</td><td>126</td></tr><tr><td>180 min Summer</td><td>25.973</td><td>0.0</td><td>184</td></tr><tr><td>240 min Summer</td><td>20.877</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>15.365</td><td>0.0</td><td>342</td></tr><tr><td>480 min Summer</td><td>12.341</td><td>0.0</td><td>398</td></tr><tr><td>600 min Summer</td><td>10.402</td><td>0.0</td><td>460</td></tr><tr><td>720 min Summer</td><td>9.042</td><td>0.0</td><td>524</td></tr><tr><td>960 min Summer</td><td>7.241</td><td>0.0</td><td>660</td></tr><tr><td>1440 min Summer</td><td>5.284</td><td>0.0</td><td>930</td></tr><tr><td>2160 min Summer</td><td>3.848</td><td>0.0</td><td>1328</td></tr><tr><td>2880 min Summer</td><td>3.068</td><td>0.0</td><td>1712</td></tr><tr><td>4320 min Summer</td><td>2.226</td><td>0.0</td><td>2428</td></tr><tr><td>5760 min Summer</td><td>1.771</td><td>0.0</td><td>3112</td></tr><tr><td>7200 min Summer</td><td>1.483</td><td>0.0</td><td>3752</td></tr><tr><td>8640 min Summer</td><td>1.284</td><td>0.0</td><td>4416</td></tr><tr><td>10080 min Summer</td><td>1.137</td><td>0.0</td><td>5152</td></tr><tr><td>15 min 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File PROPOSED MODEL.SRCX		Checked by			
Innovyze		Source Control 2018.1.1			
<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	112.870	0.170	0.5	17.0	Flood Risk
60 min Winter	112.913	0.213	0.5	21.3	Flood Risk
120 min Winter	112.952	0.252	0.5	25.2	Flood Risk
180 min Winter	112.969	0.269	0.5	26.9	Flood Risk
240 min Winter	112.977	0.277	0.5	27.7	Flood Risk
360 min Winter	112.982	0.282	0.5	28.2	Flood Risk
480 min Winter	112.979	0.279	0.5	27.9	Flood Risk
600 min Winter	112.974	0.274	0.5	27.4	Flood Risk
720 min Winter	112.969	0.269	0.5	26.9	Flood Risk
960 min Winter	112.956	0.256	0.5	25.6	Flood Risk
1440 min Winter	112.925	0.225	0.5	22.5	Flood Risk
2160 min Winter	112.879	0.179	0.5	17.9	Flood Risk
2880 min Winter	112.838	0.138	0.5	13.7	Flood Risk
4320 min Winter	112.775	0.075	0.5	7.5	Flood Risk
5760 min Winter	112.748	0.048	0.5	4.8	Flood Risk
7200 min Winter	112.740	0.040	0.4	4.0	Flood Risk
8640 min Winter	112.735	0.035	0.4	3.5	Flood Risk
10080 min Winter	112.731	0.031	0.3	3.1	Flood Risk
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	88.566	0.0	40		
60 min Winter	56.713	0.0	68		
120 min Winter	35.004	0.0	124		
180 min Winter	25.973	0.0	182		
240 min Winter	20.877	0.0	238		
360 min Winter	15.365	0.0	350		
480 min Winter	12.341	0.0	454		
600 min Winter	10.402	0.0	490		
720 min Winter	9.042	0.0	564		
960 min Winter	7.241	0.0	716		
1440 min Winter	5.284	0.0	1014		
2160 min Winter	3.848	0.0	1432		
2880 min Winter	3.068	0.0	1820		
4320 min Winter	2.226	0.0	2508		
5760 min Winter	1.771	0.0	3016		
7200 min Winter	1.483	0.0	3752		
8640 min Winter	1.284	0.0	4488		
10080 min Winter	1.137	0.0	5160		
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<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>20.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.350</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+40</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.048 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From:</th> <th>To:</th> <th>From:</th> <th>To:</th> <th>From:</th> <th>To:</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>4 0.016</td> <td>4</td> <td>8 0.016</td> <td>8</td> <td>12 0.016</td> </tr> </tbody> </table>			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)	20.000	Shortest Storm (mins)	15	Ratio R	0.350	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+40	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From:	To:	From:	To:	From:	To:	0	4 0.016	4	8 0.016	8	12 0.016
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Date 24/05/2021 22:21 File PROPOSED MODEL.SRCX	Designed by Argemiro Checked by									
Innovyze	Source Control 2018.1.1									
Model Details Storage is Online Cover Level (m) 113.000 Infiltration Basin Structure Invert Level (m) 112.700 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.03600 Porosity 1.00 Infiltration Coefficient Side (m/hr) 0.03600 <table><thead><tr><th>Depth (m)</th><th>Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th></tr></thead><tbody><tr><td>0.000</td><td>100.0</td><td>0.300</td><td>100.0</td></tr></tbody></table>			Depth (m)	Area (m²)	Depth (m)	Area (m²)	0.000	100.0	0.300	100.0
Depth (m)	Area (m²)	Depth (m)	Area (m²)							
0.000	100.0	0.300	100.0							
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FLOW AND LOADS CALCULATION TREATMENT PLANT

Key

Input

Calculation

Model Result

Linked

Population

As per British Water Code of Practice Flow and Loads-4

Description	No. Rooms	Occupancy	Population (P)
Main House	4	n/a	6
Total Population			6
Reduction factor (if P>12P)			1.0
Total Population (P)			6

If P btw 13-25P factor 0.9 or 26-50P factor 0.8

Flows and Loads - Values taken from table in Code of practice- Flows and Loads 4

Population	Flow	BOD	Ammonia
(P)	l/day	Grams	As N
6	150	60	8
		0	0
TOTAL	900	360	48

Effluent Quality Requested

BOD	20	mg/l
Suspended Solids (SS)	30	mg/l
Amonia (NH3 N)	20	mg/l

DRAINAGE FIELD CALCULATION

Calculation as per BS6297:2007

Key

	Input
	Calculation
	Model Result
	Linked

Drainage Field Area

Type of Treatment System **eatment Plant**

P	6	Number of Population equivalent served (See flow calculations)
Vp	75 s/mm	Percolation Value from Test Results. If percolation value is >100 or HWT then create a mound
Rf	0.2	
Total Trench Area	90 m2	

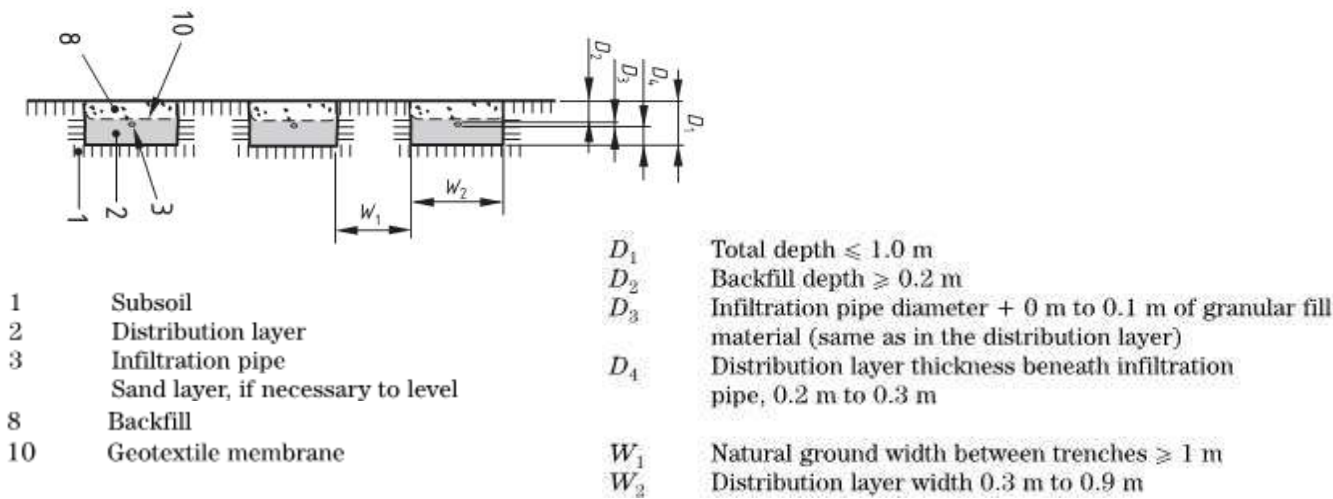
Drainage field layout

Distribution Layer Width (W2)	0.9 m	Could be 0.3m, 0.6 or 0.9m
Natural Ground btw trenches (W1)	1 m	=>1m
Margin of undisturbed ground around the trenches (M)	1 m	>1m
Number of distribution trenches	4	2 or more
Trench Distribution Layer Length Max (L1)	24.3 m	OK <30m

Drainage Field Size

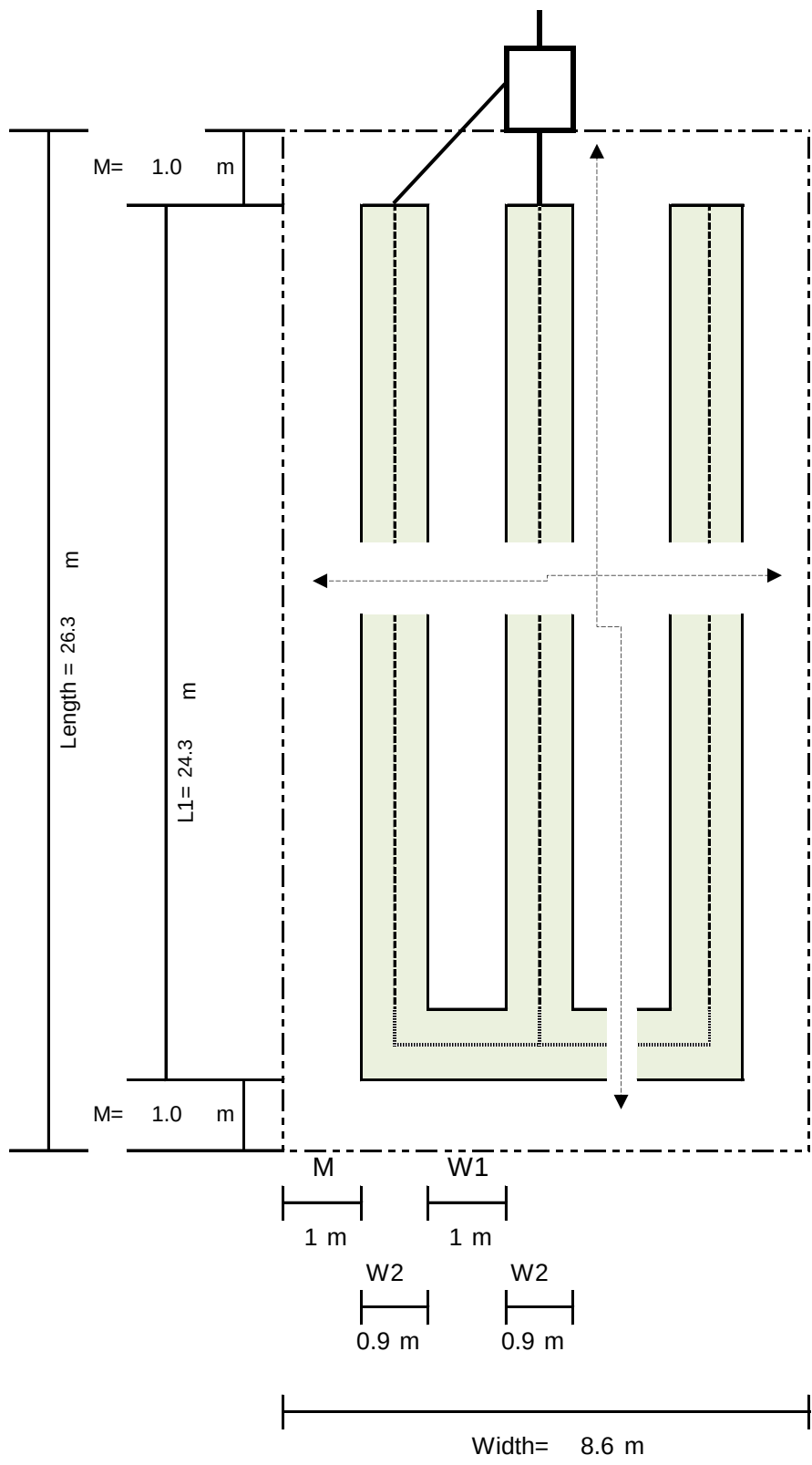
Length	26.3 m
Width	8.6 m
Depth	0.6 m

Typical Drainage Field Crossection



DRAINAGE FIELD CALCULATION

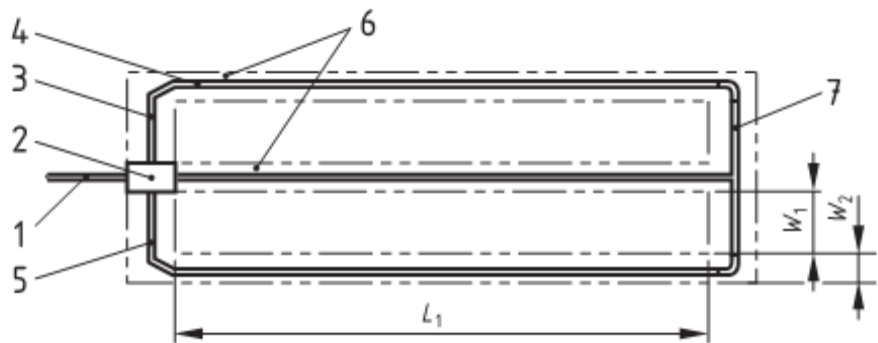
Number of distribution trenches shown in this sketch does not correspond to the number of trenches in the calculation.



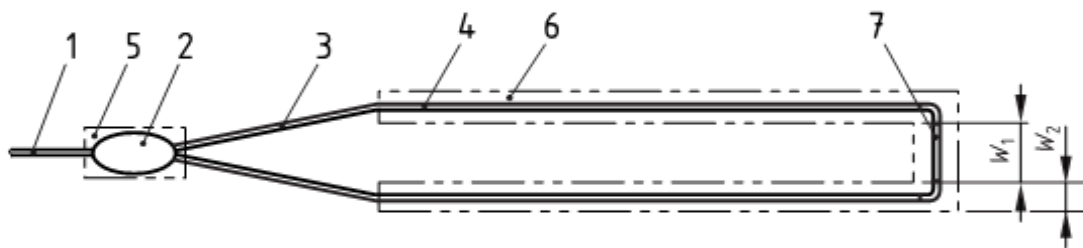
a)



b)



c)



Key			
a)	Five trenches	5	Sand layer, if necessary to level distribution chamber
b)	Three trenches	6	and pipework
c)	Two trenches	7	Distribution layer
1	Connection pipe	End connection with ventilation and access, if necessary	
2	Distribution chamber	W_1	Natural ground width between trenches ≥ 1 m
3	Distribution pipe	W_2	Distribution layer width 0.3 m to 0.9 m
4	Infiltration pipe	L_1	Distribution layer length ≤ 30 m

Appendix D

Do not scale from this drawing. Refer to figured dimensions only. RIDA Reports Ltd registered in England and Wales No. 10590566. This drawing is copyright of RIDA Reports Ltd.

Drawing scale	Line length	Drawing scale	Line length
1:5	= 0.25 metres	1:200	= 10.0 metres
1:10	= 0.5 metres	1:250	= 12.5 metres
1:20	= 1.0 metres	1:500	= 25.0 metres
1:25	= 1.25 metres	1:1000	= 50.0 metres
1:50	= 2.5 metres	1:1250	= 62.5 metres
1:100	= 5.0 metres	1:2500	= 125 metres
Measure length of line above for checking of scale			

GENERAL NOTES

1. All dimensions are in millimetres and levels in m AOD unless stated otherwise.
2. Do not scale. If in any doubt, consult Engineer.
3. Read in conjunction with the architects and engineers schedule drawings.
4. Check inverts and sizes of existing pipes prior to the commencement of any work. Report any discrepancies to the engineer and await instructions.



Rev Details Date By Chd

Drawing Status: PRELIMINARY

RIDA
FLOOD RISK ASSESSMENT & DRAINAGE STRATEGIES

4 Bean Acre Road, Hook Norton, Banbury, Oxfordshire
e: info@rida-reports.co.uk
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Client:

Project:

Land at Caldine Park, Turners Hill Rd, RH10 4NB

Drawing:
Proposed Drainage Strategy

Print Size: Project No: Drawing No: Revision:
A1 0228 003 P1