

Land South of Coate Road, Devizes, Wiltshire

Robert Hitchins Ltd



**Flood Risk Assessment
&
Drainage Strategy**

March 2026



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Contents

Executive Summary.....	1
1. Introduction	3
2. Policy & Guidance	4
3. Existing Site Details	8
4. Flood Risk Assessment	25
5. Surface Water Run-off	40
6. Surface Water Drainage Strategy.....	41
7. SuDS Details	45
8. Water Quality.....	49
9. Foul Drainage Strategy.....	51
10. Management & Maintenance.....	53
11. Conclusions	60
Appendix A Locations Plan & Indicative Masterplan	62
Appendix B Topographical Survey, Elevations, & Slopes.....	63
Appendix C Existing Hydrology & Flood Risk	64
Appendix D Ground Investigation Extracts	65
Appendix E Greenfield Runoff Calculations	66
Appendix F Wessex Water Correspondence & Mapping.....	67
Appendix G Drainage Strategy	68
Appendix H Impermeable Area.....	69
Appendix I Flow SW Drainage Calculations	70

Executive Summary

This site-specific FRA has been produced in accordance with the requirements of the NPPF, Planning Practice Guidance (PPG), and EA advice notes, and demonstrates that the proposed development will be safe from flood risk and that it will not increase flood risk elsewhere.

The site is in Flood Zone 1 with a low flood risk (less than 1:1,000 or 0.1% annual probability of flooding from rivers).

The proposed residential development is classified as 'More Vulnerable' and is in Flood Zone 1; the proposed residential development is suitable in this zone and the NPPF Sequential and Exception Tests are not required.

Development levels will be designed to route surface water flows away from dwellings to protect them from flooding.

Flood risk from fluvial, pluvial, sewers, surface water, groundwater and artificial sources have been assessed, and it has been demonstrated that the proposed development will not be at risk from flooding from all sources now and in the future.

Details of the proposed Outline Drainage Strategy are shown on Drawing 639-P106 in Appendix G.

Surface water from the western part of the development will discharge into the highway drain in Windsor Drive with the discharge limited to Qbar for events up to and including the 1:100 + 45% climate change/urban creep allowance event with a minimum of 30% betterment provided compared with existing greenfield rates. This will ensure that flood risk is not increased in the receiving drainage systems downstream of the development for the lifetime of the development.

Surface water from the eastern part of the development will discharge into the drainage ditch system along Coate Road with the discharge limited to Qbar for events up to and including the 1:100 + 45% climate change/urban creep allowance event with a minimum 30% betterment provided compared with existing greenfield rates. This will ensure that flood risk is not increased in the receiving drainage systems downstream of the development for the lifetime of the development.

Attenuation will be provided in a basins or ponds, and swales with sewers discharging directly via precast concrete headwalls. The ponds will have a 0.9m deep permanent pool to provide treatment to the surface water run-off from the development. Bank slopes will be 1 in 3 in accordance with The SuDS Manual Ciria C753.

Flood routes will be provided for exceedance events, or for local failure of the drainage system (blockage, damage, etc.), and will ensure that flood flows are directed safely through or around the development to the downstream drainage system and watercourse. Details of flood exceedance routes will be provided with the reserved matters application.

Cutoff channels and Drains will be provided to intercept flows from the higher land to the south and will discharge to the ponds.

The use of SuDS will remove pollution from surface water run-off and improve water quality with additional SuDS features provided where practicable.

The foul flows from the site will connect to the existing sewage network in Harebell Way to the west of the site as confirmed by Wessex Water; full details of the connection will be agreed with Wessex Water. Due to the topography of the site foul flows from the 145 dwellings will need to be pumped. Details of the proposed Outline Drainage Strategy are shown on Drawing 639-P106 in Appendix G.

The foul sewers will be adopted by Wessex Water or other approved Water/Sewerage Undertaker to ensure that they will be maintained for the lifetime of the development.

The Flood Risk Assessment and Drainage Strategy demonstrate that the proposed development meets with all the national and local policy requirements and satisfies all the criteria of the Planning Authority, Lead Local Flood Authority, and Environment Agency.

The Flood Risk Assessment concludes that the site can be safely developed without flood risk and without increasing flood risk elsewhere using an appropriately designed and maintained Sustainable Drainage System.

1. Introduction

This Flood Risk Assessment (FRA) has been prepared by Phoenix Design Partnership Limited on behalf of Robert Hitchins Ltd and their successors in title to support an Outline Planning Application for the proposed residential development at Land South of Coate Road, Devizes, Wiltshire.

The proposed development is approximately 10.85Ha (including existing highway) and will involve the construction of a residential development of up to 175 no. dwellings, with access from Coate Road (east area) and Windsor Drive (west area). Indicative Masterplan is included in Appendix A.

This site-specific Flood Risk Assessment (FRA) has been produced in accordance with the National Planning Policy Framework document, Section 14 'Meeting the challenge of climate change, flooding and coastal change' and Planning Practice Guidance document 'Flood Risk and Coastal Change' together with Environment Agency FRA Guidance Notes.

The FRA demonstrates that the site is suitable for development without flood risk and without causing an increase in flood risk to others, including allowances for climate change. It also demonstrates how SuDS will be used to manage surface water from the development, and to ensure that water quality is not adversely affected.

2. Policy & Guidance

2.1. National Planning Policy Framework (NPPF): 2024

As set out in paragraph 170 of the NPPF, all strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. Footnote 62&63 in the NPPF states that a site specific Flood Risk Assessment should be provided for all developments in Flood 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified within a strategic flood risk assessment as being at increased flood risk in the future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use. This includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to caravan, camping or chalet site, or to a mobile home or park site, where the sequential and exception tests should be applied as appropriate.

Section 14 'Meeting the challenge of climate change, flooding and coastal change' sets out the government policies on development and flood risk.

2.2. Planning Practice Guidance: 2016 (Updated September 2025)

The Section 'Flood Risk & Coastal Change' (March 2014): The National Planning Policy Framework sets strict tests to protect people and property from flooding which all local planning authorities are expected to follow. Where these tests are not met, national policy is clear that new development should not be allowed. The main steps to be followed are set out in the guidance which, in summary, are designed to ensure that if there are better sites in terms of flood risk, or a proposed development cannot be made safe, it should not be permitted.

The section 'Climate Change' advises on how planning can identify suitable mitigation and adaptation measures in plan-making and the application process to address the potential impacts of climate change. Detailed guidance on climate change allowances for fluvial flows and rainfall intensity over the lifetime of development is included in the document 'Climate change allowances for planners' issued by the Environment Agency in September 2013.

The Section 'Water Supply, Wastewater & Water Quality' advises on how the Water Environment Regulations 2017 apply to surface waters (including some coastal waters) and groundwater (water below the surface of the ground). These regulations set out requirements to prevent the deterioration of aquatic ecosystems; protect, enhance and restore water bodies to 'good' status; and achieve compliance with standards and objectives for protected areas. Local planning authorities must, in exercising their functions, have regard to River Basin Management Plans. These plans contain the main issues for the water environment and the actions needed to tackle them.

Section 027 now states where a site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development.

2.3. Flood & Water Management Act 2010 (FWMA)

The FMWA provides legislation for better, more comprehensive management of flood risk. Changes to planning came in force in April 2015 requiring detail and SuDS now to be included in planning applications.

2.4. Wiltshire Core Strategy 2015

Core Policy 67: Flood Risk

Development proposed in Flood Zones 2 and 3 as identified within the Strategic Flood Risk Assessment will need to refer to the Strategic Housing Land Availability Assessment when providing evidence to the local planning authority in order to apply the sequential test in line with the requirements of national policy and established best practice.

All new development will include measures to reduce the rate of rainwater run-off and improve rainwater infiltration to soil and ground (sustainable urban drainage) unless site or environmental conditions make these measures unsuitable.

Core Policy 68: Water Resources

Development must not prejudice the delivery of the actions and targets of the relevant River Basin or Catchment Management Plan and should contribute towards their delivery where possible.

Non-residential development will be required to incorporate water efficiency measures. Developers will be expected to submit details of how water efficiency has been considered during the design of proposals.

Development proposals within a Source Protection Zone, Safeguard Zone or Water Protection Zone must assess any risk to groundwater resources and groundwater quality and demonstrate that these would be protected throughout the construction and operational phases of development.

2.5. Wiltshire Strategic Flood Risk Assessment (SFRA)

The most recent Level 1 SFRA was produced by JBA, dated November 2024.

Further details of the findings of the SFRA are within Section 4 of this report.

2.6. National standards for sustainable drainage systems June 2025

National standards for SuDS were published in June 2025 for the application in the design of surface water drainage systems for new infrastructure and development. These state the criteria that a surface water drainage system should satisfy.

The guidance sets out details of 7 overriding standards that are complementary and provide multiple benefits. The guidance notes that there may be specific circumstances in which it is not possible to deliver one or more of the standards.

2.7. Ciria C753 'The SuDS Manual'

Ciria C753 'The SuDS Manual' published in 2015 (latest v6 2019) provides comprehensive guidance on the implementation of Sustainable Drainage Systems (SuDS) in the UK. C753 guidance should be used to help develop the strategy and design of the SuDS.

2.8. Ciria C635 'Designing for Exceedance'

Ciria C635 'Designing for Exceedance in Urban Drainage – Good Practice' published in 2006 provides guidance on the design and management of urban sewerage and drainage systems to reduce the impacts from drainage exceedance. C635 guidance should be used to help develop the strategy and design of the flood routes for the development.

2.9. Design and Construction Guidance

Sewers for Adoption 7th Edition published by Water UK in August 2012 has now been replaced by '*Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code")*': November 2023 and provides guidance on the design and construction of foul and surface water drainage systems for adoption by Water Companies.

2.10. EA, Defra & DCLG

'Preliminary Rainfall Runoff Management for Developments' (R&D Technical Report W5-074/A/TR/1, Revision E) jointly published in January 2012 for the Department for Environment Food and Rural Affairs (Defra) and the Environment Agency (EA) provides

advice on the Management of Stormwater Drainage for developments at Planning stage and in particular the preliminary sizing of storage for the control and treatment of storm water runoff.

2.11. Building Regulations Part H 2015 ‘Drainage & Waste Disposal’.

The above documents should be used to assist in the design of the drainage and SuDS.

2.12. BS 8582:2013 Code of practice for surface water management for development sites

‘BS 8582:2013 Code of practice for surface water management for development sites’ published in November 2013 by BSI Standards Limited gives recommendations on the planning, design, construction and maintenance of surface water management systems for new developments and redevelopment sites.

2.13. Non-Statutory Technical Standards for Sustainable Drainage Systems 2015

This document sets out the Non-Statutory Technical Standards for Sustainable Drainage Systems and should be used in conjunction with the National Planning Policy Framework and Planning Practice Guidance.

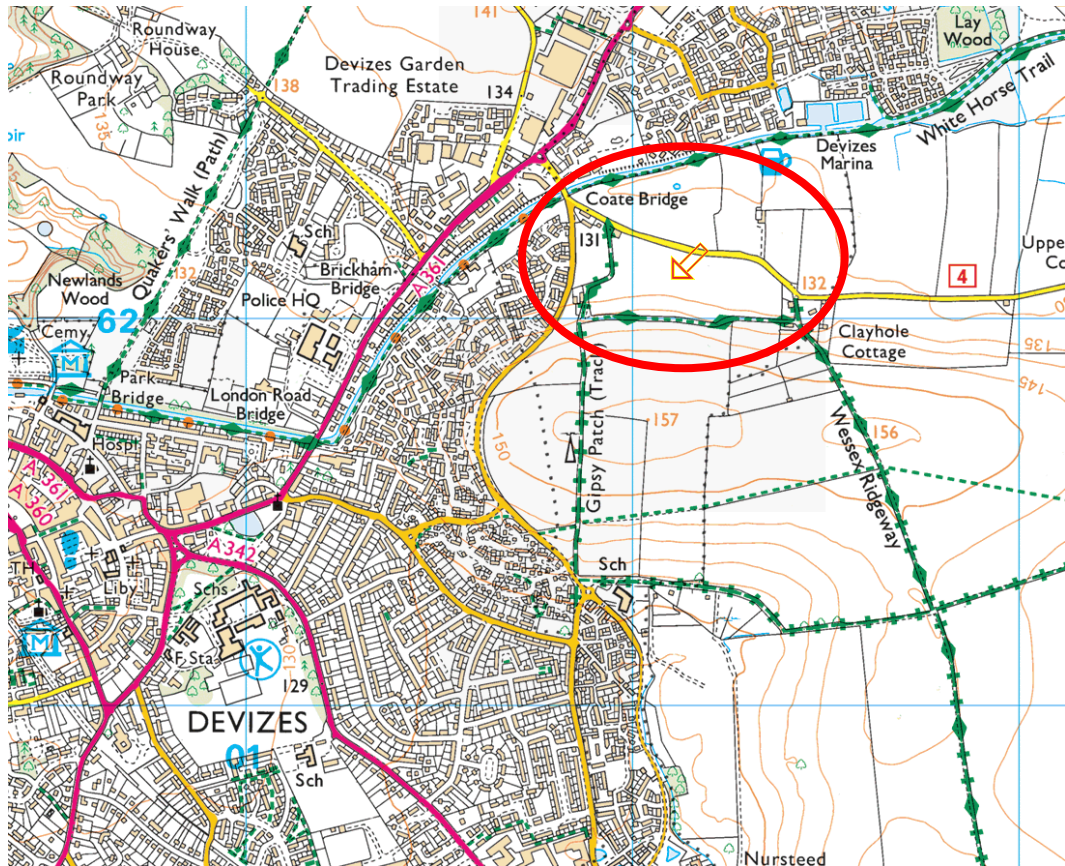
2.14. EA ‘Flood risk assessments: climate change allowances’ 2016 (Updated May 2022)

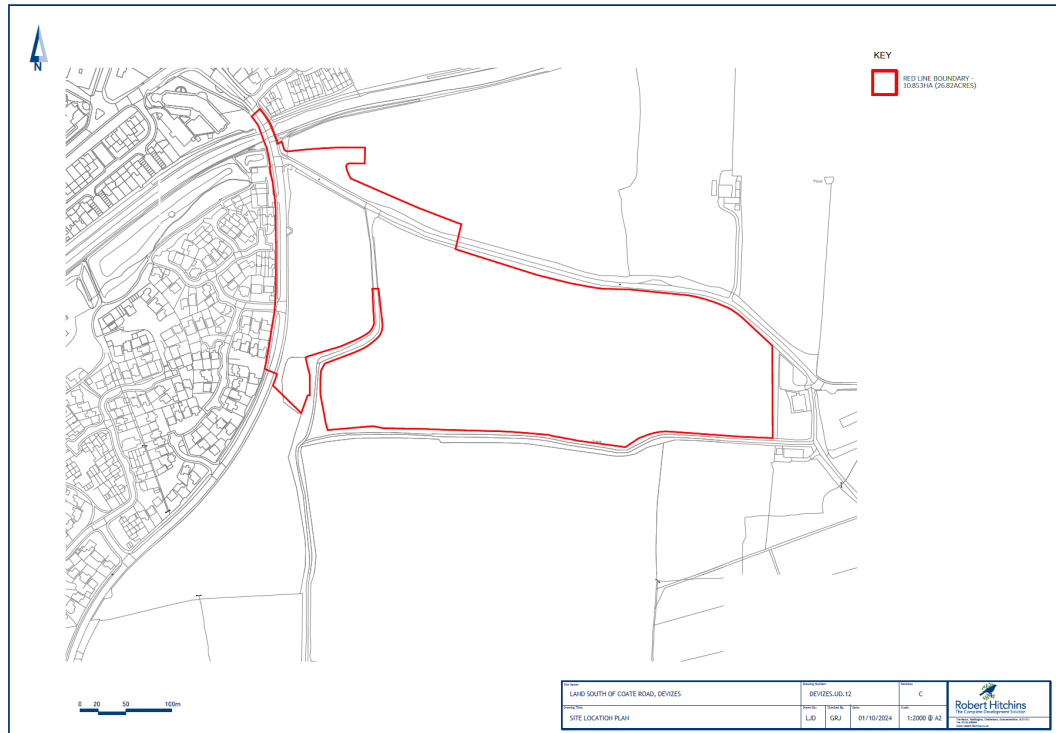
The NPPF sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. NPPF and supporting planning practice guidance on Flood Risk and Coastal Change explain when and how flood risk assessments should be used. This includes demonstrating how flood risk will be managed now and over the development’s lifetime, taking climate change into account. Local planning authorities refer to this when preparing local plans and considering planning applications. This advice updates previous climate change allowances to support NPPF. The Environment Agency (EA) has produced it as the government’s expert on flood risk.

3. Existing Site Details

3.1. Site Location and Description

The site is located to the south of Coate Road in the east of Devizes in Wiltshire. The location is indicated on the images below and the site centred OS Grid Co-ordinate is E402100, N162100; the nearest postcode is SN10 2TH.





Location Plan



Aerial Image

The site is mainly a green-field site of approximately 10.85Ha including existing highway. In the northwest of the site are two existing buildings

To the north is Coate Road, to the west is Windsor Drive and residential development, to the south are fields, Gypsypatch (track/PROW) runs through the western part of the site, and to the east a Guide Hut. Hedgerows run along the southern and eastern boundaries,

and alongside Gypsypatch; the north and west boundaries with Coate Road and Windsor Drive are generally open with a post and wire fence.



Coate Road: Existing Building in Northwest of the site.



Coate Road: Looking South.



Coate Road: Looking East.



Coate Road: Looking West.



West of site from Windsor Drive.



Indicative Masterplan

3.2. Topographical Survey

A Topographic Survey was undertaken by Ruxton Surveys in June 2020 and can be seen on the drawing included in Appendix B.

The site generally falls from the southeast towards Winsor Drive. Levels vary from approximately 144mAOD in the south to approximately 13mAOD in the north. Slopes are generally from 1% (1:100) in the north gradually increasing to 12.5% (1:8) in the south.

Details of the elevations and slopes are shown on the drawings listed below and included in Appendix B.

639-P102	Existing Elevations
639-P103	Existing Slopes
639-P104	Existing Slope Direction

3.3. Existing Hydrology

Details of the existing hydrology are shown on drawings 639-P101 'Existing Topography & Hydrology' and 326.E.12 'Drainage Investigation Plan' included in Appendix C.

The only relevant hydrological features are the drainage ditches alongside Coate Road, and the highway drain in Windsor Drive.

Runoff from the site flows north onto Coate Road and to the highway ditches/drains.

3.4. FEH Rainfall

FEH Point Rainfall Date (obtained February 2026):

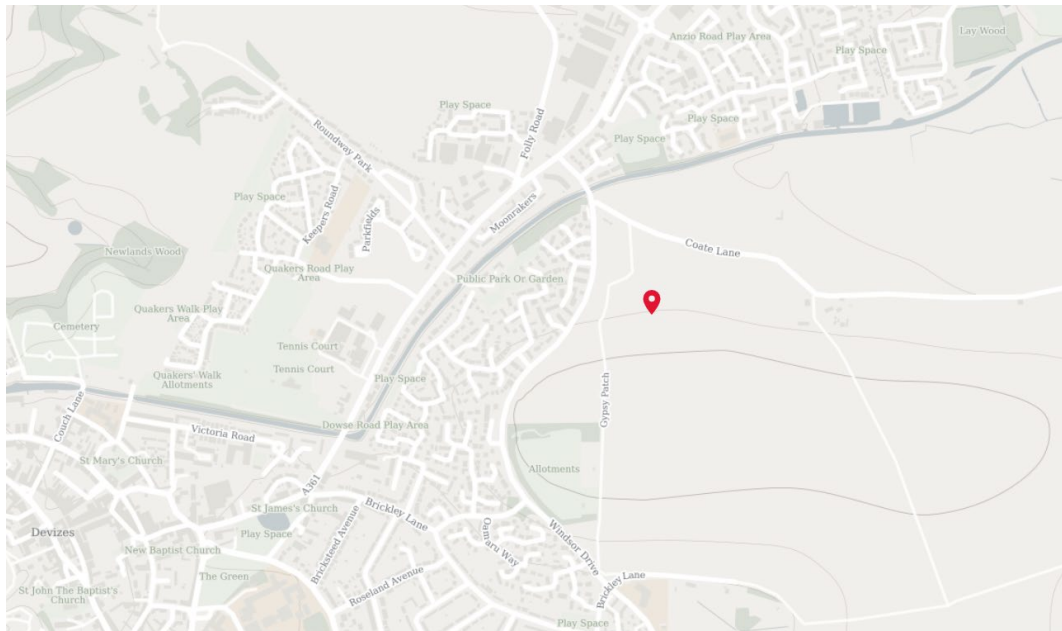
Point data at 402000,162000 ✎

Point: 402000,162000 📄

Tag: 638/639 DEVIZES

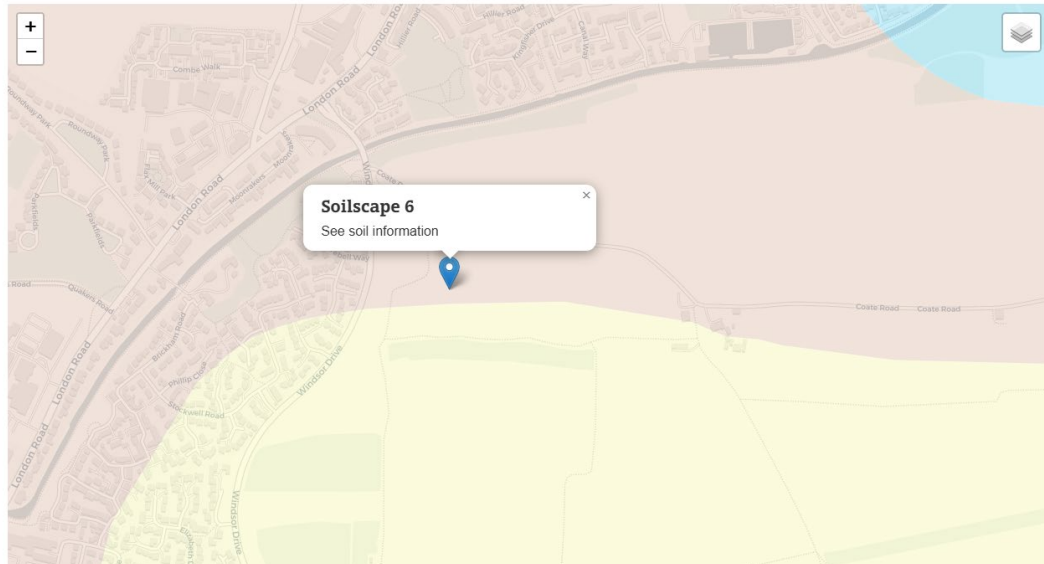


Descriptor	Value
NGR	SU 02000 62000
BFIHOST	0.82
BFIHOST19	0.671
BFIHOST19SCALED	0.671
PROPWET	0.34
SAAR6190	737 mm
SAAR9120	778 mm



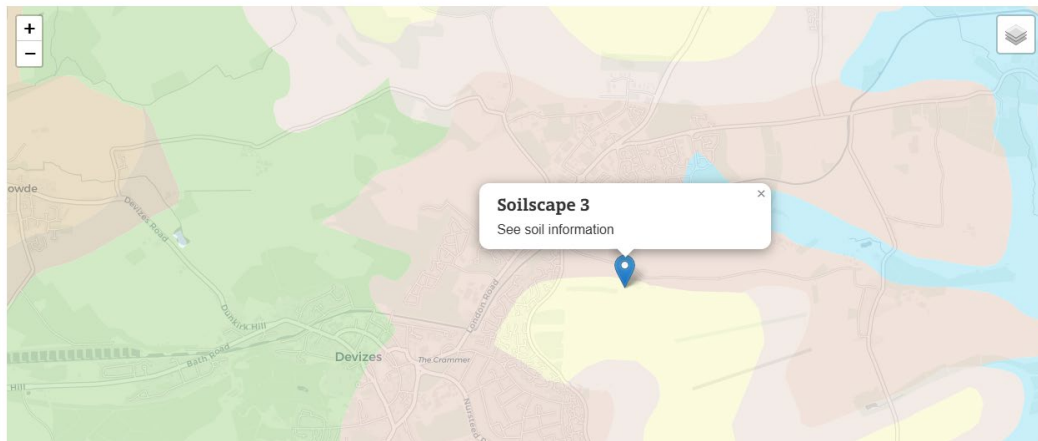
3.5. Soilscape – Soil Classification

The Soilscape Soil Classification map extract below shows the site to be in an area of:



NORTH: Soilscape 6 – Freely draining slightly acid loamy soils

Soil Information
Soilscape 6: Freely draining slightly acid loamy soils
Texture: Loamy
Coverage: England: 15.5%, Wales: 24.4%, England & Wales: 16.7%
Drainage: Freely draining 
Fertility: Low 
Landcover: Arable and grassland
Habitats: Neutral and acid pastures and deciduous woodlands; acid communities such as bracken and gorse in the uplands
Carbon: Low
Drains to: Local groundwater and rivers
Water protection: Groundwater contamination with nitrate; siltation and nutrient enrichment of streams from soil erosion on certain of these soils
General cropping: Suitable for range of spring and autumn sown crops; under grass the soils have a long grazing season. Free drainage reduces the risk of soil damage from grazing animals or farm machinery. Shortage of soil moisture most likely limiting factor on yields, particularly where stony or shallow



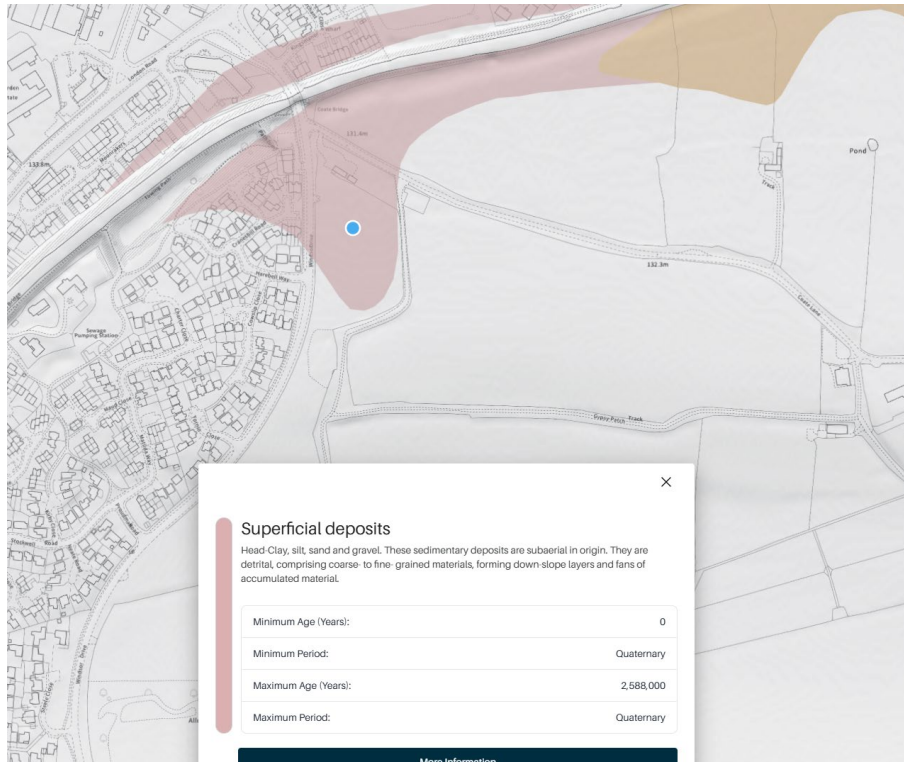
SOUTH: Soilscape 3 – Shallow lime-rich soils over chalk or limestone

Soil Information
Soilscape 3: Shallow lime-rich soils over chalk or limestone
Texture: Loamy
Coverage: England: 7.0%, Wales: 0.0%, England & Wales: 6.0%
Drainage: Freely draining 
Fertility: Lime-rich 
Landcover: Arable and grassland
Habitats: Herb-rich Downland and limestone pastures; limestone pavements in the uplands; Beech hangers and other lime-rich woodlands
Carbon: Low/Medium
Drains to: Chalk or limestone groundwater
Water protection: Particularly vulnerable to leaching of nitrate and pesticides to groundwater; surface capping and erosion of chalk soils on steeper slopes under cereals is linked with eutrophication and silting of chalk streams and their gravel spawning beds
General cropping: Over chalk, spring and autumn cereals can be grown but the soils are especially vulnerable to nitrate leaching and attract stricter fertiliser limits. Suitable only for grassland where there is hard limestone. Lack of soil moisture is most likely limiting factor to yields

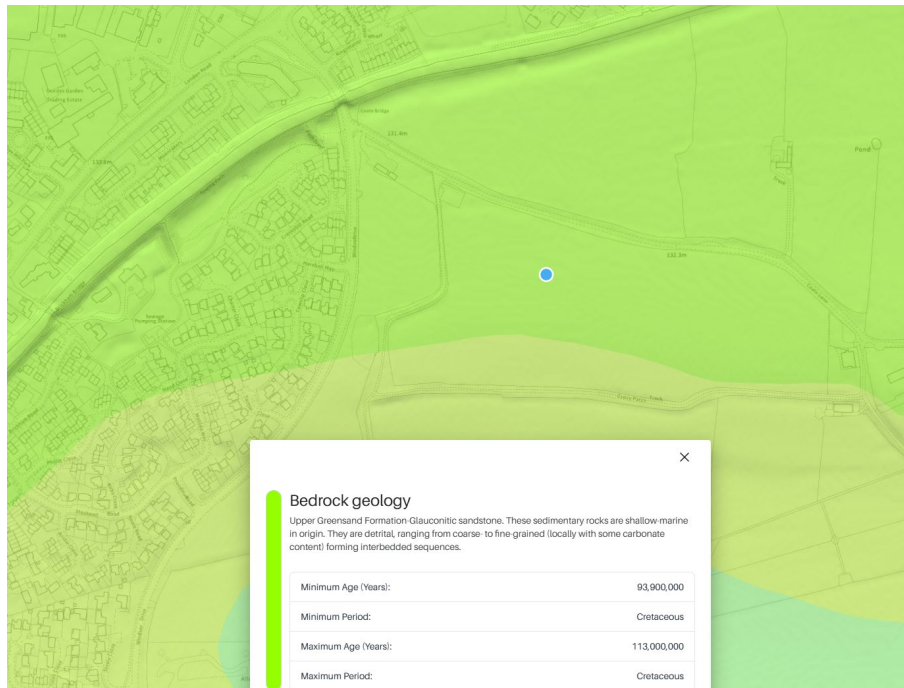
Refer to Ground Investigation details in Section 3.8.

3.6. The British Geological Survey (BGS)

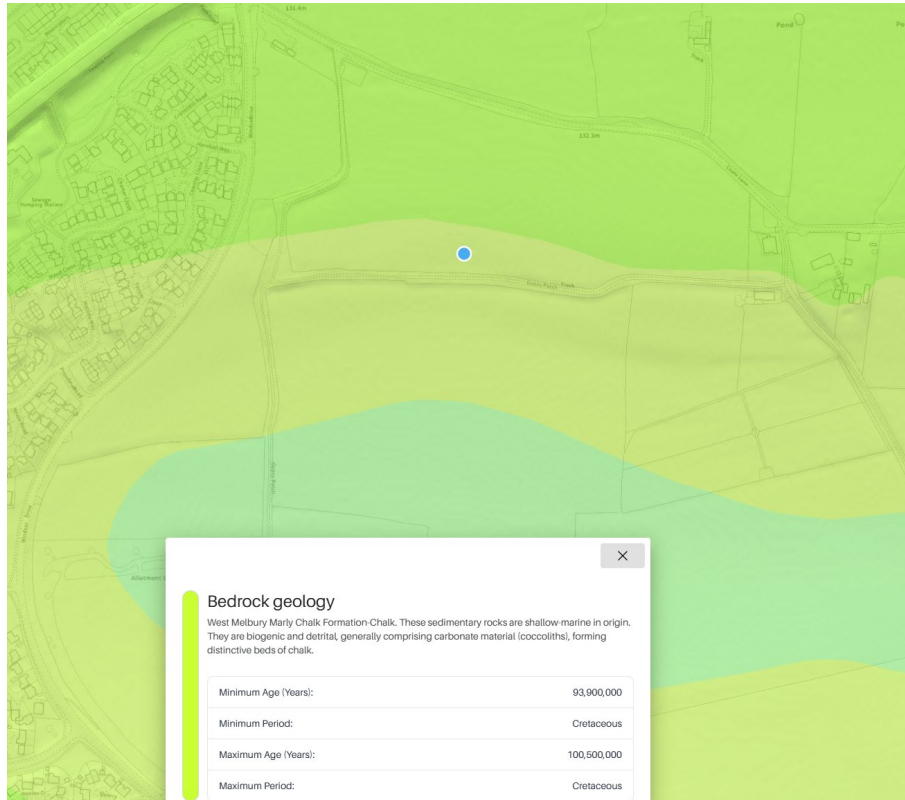
Geological Survey of Great Britain mapping for Superficial Deposits indicates that the West of the site is: Head-Clay, silt, sand and gravel.



Geological Survey of Great Britain mapping for Bedrock indicates that the North of site is: Upper Greensand Formation-Glauconitic sandstone.



Geological Survey of Great Britain mapping for Bedrock indicates that the North of site is: West Melbury Marly Chalk Formation-Chalk



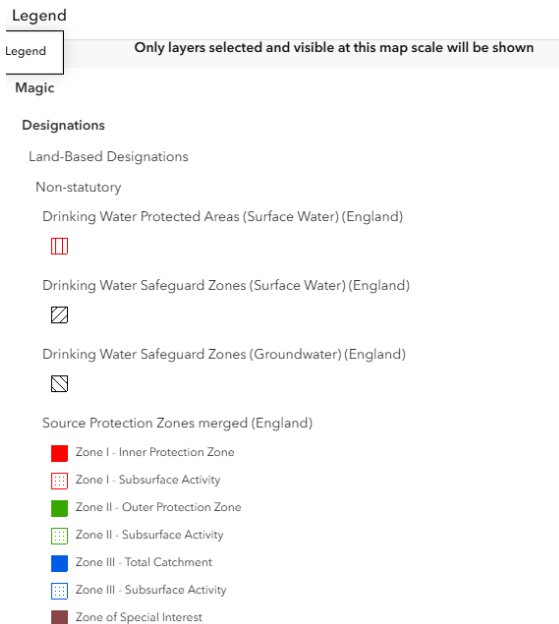
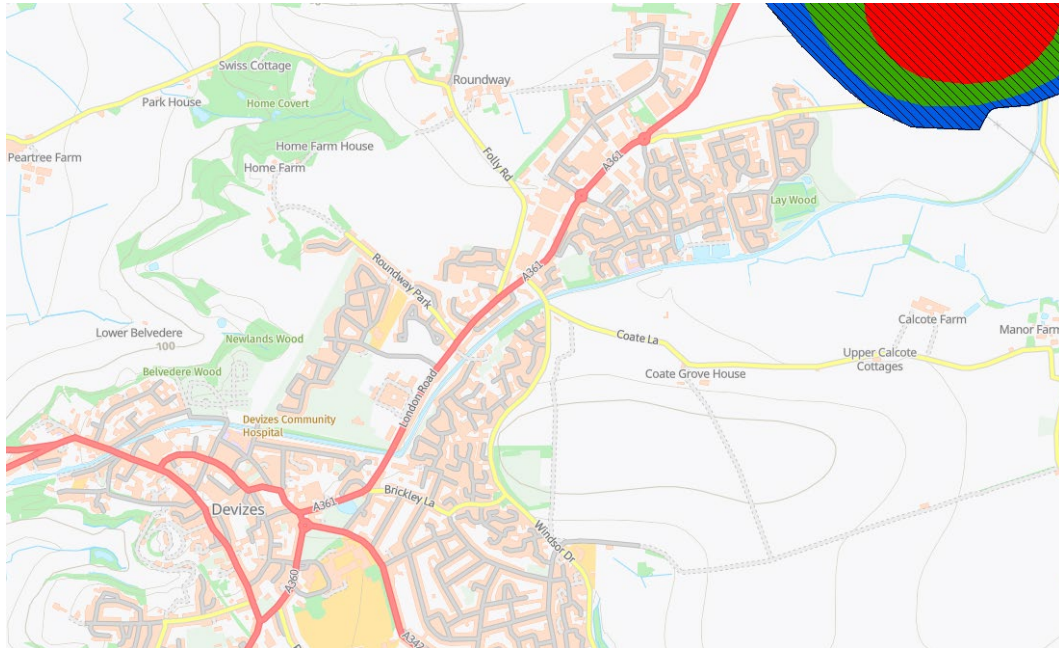
The bedrock geology suggests that infiltration in the chalk formation along the southern edge of the site might be possible.

Refer to Section 3.8 below for details of Ground Investigation.

3.7. Environment Agency Hydrogeology Information

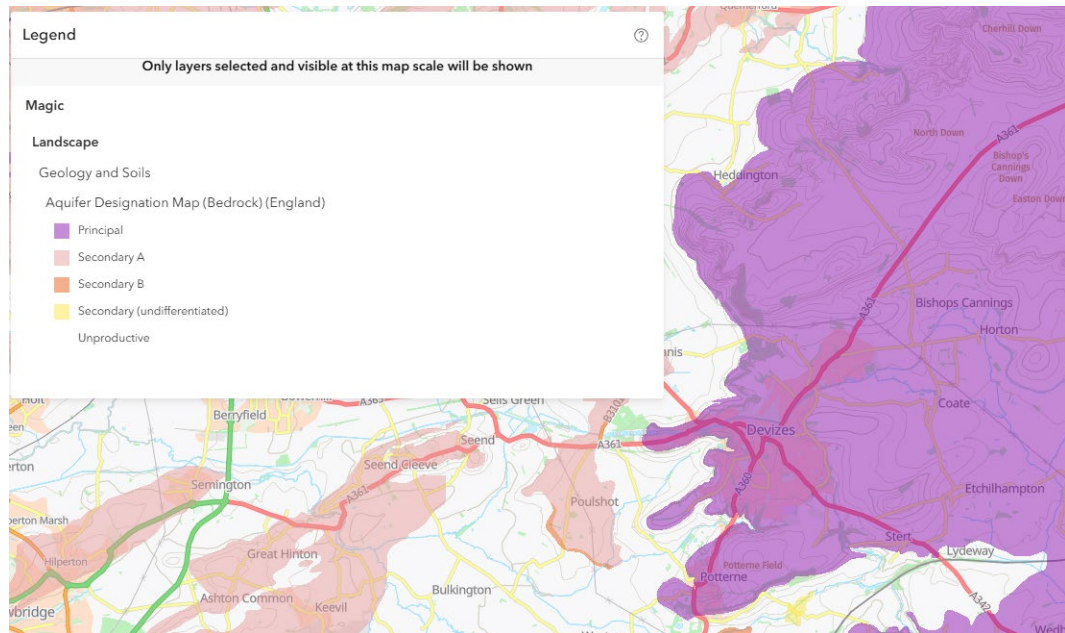
Drinking Water Protected Areas (Surface Water), Drinking Water Safeguard Zones (Surface Water), Drinking Water Safeguard Zones (Groundwater), Groundwater Source Protection Zones

Groundwater provides a third of our drinking water in England, and it also maintains the flow in many of our rivers. In some areas of Southern England, groundwater supplies up to 80% of the drinking water. The site is not located within a Drinking Water Protected or Safeguarded area, or Source Protection Zone.

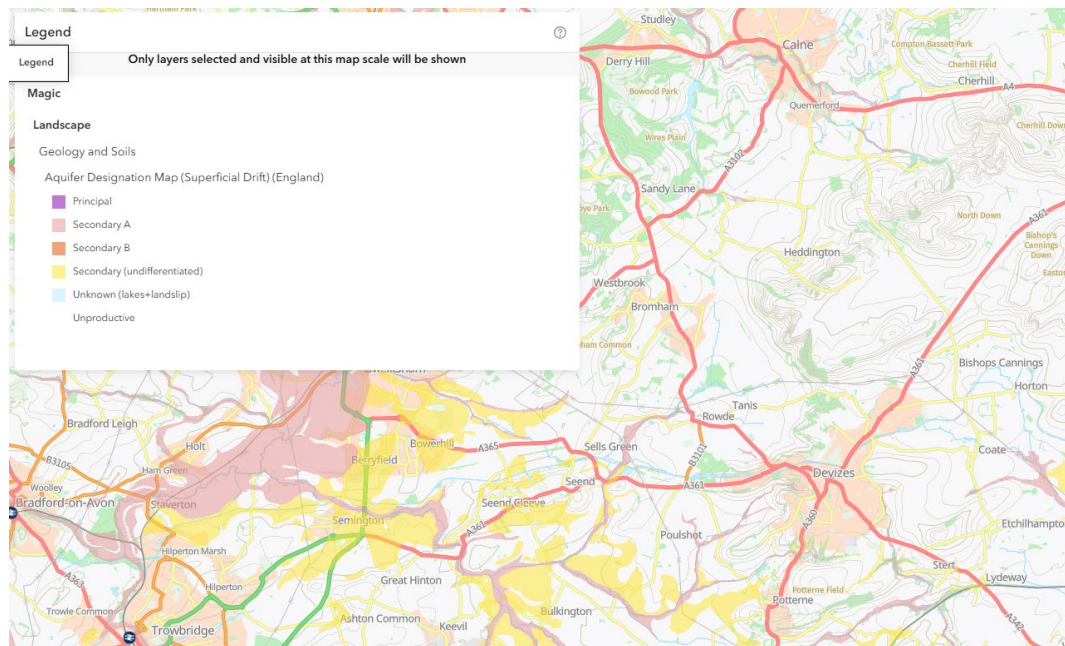


The site is not within any of these protection areas and zones.

Aquifer Designation Map Bedrock



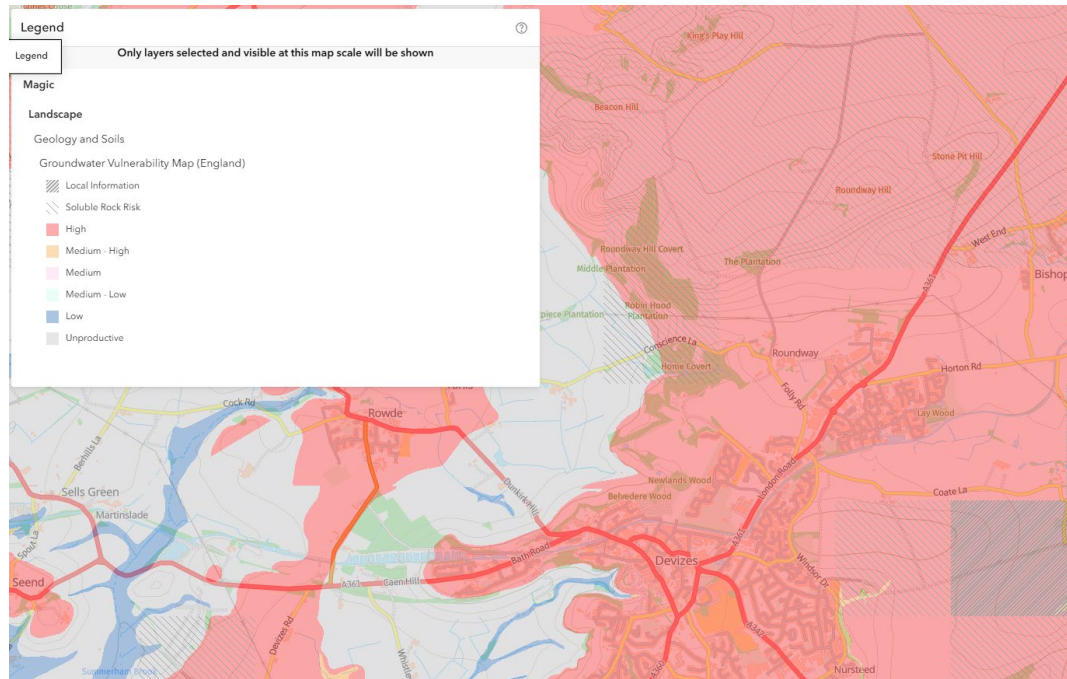
Aquifer Designation Map Superficial Drift



The site is in an area where the bedrock is classified as a Principle Aquifer. These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

The superficial drift is not classified as a aquifer.

Groundwater Vulnerability Map



The site is in an area classified as High Groundwater Vulnerability.

Overall, the site is in an area of Medium to High Vulnerability in terms of Groundwater sensitivity.

3.8. Ground Investigation

A ground investigation report was prepared by Wilson Associates dated January 2026, report No 5499. Test hole locations, logs, and infiltration test results are included in Appendix D.

Key extracts from the report are shown below:

GI Table 6: Summary of Observed Strata

Stratum	Base Depth (m)	Notes / Occurrences
TOPSOIL: probable soft, brown, dry, organic, locally desiccated, slightly sandy CLAY	0.24 - 0.35	Encountered in TP's 1-8
TOPSOIL: probable loose, brown, dry, organic well sorted fine SAND	0.1 - 0.17	Encountered in WS1-2
MADE GROUND: probable loose, grey, very gravelly SAND with occasional cobbles and many roots from overlying grass and weeds. Gravel is medium to coarse brick and concrete. Cobbles are whole brick, concrete slab and breeze blocks.	0.5	Encountered in TP3 only
SAND/CLAY: recovered as probable loose clayey SAND / probable stiff, desiccated very sandy CLAY	0.83 - 1.55	Encountered in WS1-2 & TP1-2
SAND: medium dense, greenish-grey, locally clayey, fine to medium SAND with coarse gravel to cobbles of probable extremely weak sandstone (UPPER GREENSAND FORMATION)	>3.0m	Encountered in WS1-2 and TP1-5
CHALK: variable weathered deposit recovered as probable medium dense to dense, light grey, fine to coarse GRAVEL and COBBLES of subangular to angular low density CHALK. See individual logs for specific details. (WEST MARLBURY MARLY CHALK FORMATION)	>1.99	Encountered in TP6-8
Perched / Groundwater	None encountered	
Roots	Generally restricted to surface topsoil/made ground/	
Desiccation	Visually appears restricted to surface topsoil/ cohesive head deposits	

GI Extract: Soakaway Testing – Soakaway Feasibility

- 6.17** Percolation testing has been completed within all eight trial pits TP1-TP8 with test zone depths variably between 0.54m and 2.155m (test records shown on logs in Appendix 2). Given the limited time to complete testing, the limited water supply and to maximise the area covered by insitu testing, with the exception of TP8 only a single test was completed in all other pits. A single repeat test was achieved in TP8.
- 6.18** Tests took place into the Hd, the granular UGS and the weathered structureless chalk of the recorded WMCK. With the exception of TP5 and TP8, due to the proportion of fine grained soil material present, very low infiltration was recorded in all other test pits, meaning that it has not been possible to calculate soil infiltration rate at these test locations. Infiltration did occur within the UGS at the location of TP5 and within the WMCK at the location of TP8 and results are presented in Table 7.

TABLE 7: SUMMARY OF PERCOLATION TEST RESULTS

Trial Pit No.	Test Strata	Test No	Test Depth (m)	Soil Infiltration Rate (m/s)
1	UGS	1	1.6-2.155	Negligible
2	Hd & UGS	1	0.62-1.85	Negligible
3	UGS	1	0.68-1.90	Negligible
4	UGS	1	0.54-1.50	Negligible
5	UGS	1	0.59-2.00	2.6x10 ⁻⁶ *
6	WMCK	1	0.71-1.55	Negligible
7	WMCK	1	0.95-1.90	Negligible
8	WMCK	1	0.86-1.90	1.1x10 ⁻⁶ *
		2	0.59-1.90	1.3x10 ⁻⁶ *

Hd = Head / UGS = Upper Greensand Formation / WMCK = West Melbury Chalk Formation

* = Extrapolated Test Result

- 6.19** Based on the above findings it would appear that overall the site is generally unsuitable for the installation of soakaway sustainable drainage systems (SuDS), however it is recognised that both the UGS and WMCK both show signs of localised suitability. Based on these findings it is currently recommended that an alternative drainage option be considered for the site such as transmission of storm water run-off to an attenuation pond or the existing drainage network, however subject to the proposed development layout (once known) it may be possible to locally off-set the foregoing with the localised adoption of soakaways. In the case of the former it will be necessary to provide evidence to the local drainage authority that the adoption of soakaways within the site is not practical given the impermeable nature of the underlying geology, and the results on the logs in Appendix 2 should suffice. Should the developer wish to further pursue the option of soakaway drainage, supplementary targeted testing would be prudent once a development layout has been made available.

The GI concludes that the underlying soils are not suitable for the proposed development to drain to infiltration.

Groundwater was not encountered in any of the test pits or window sampling boreholes:

3.9. Existing Green-field Run-off Rates

The green-field run-off rate for the development catchment area has been calculated using ReFH2 Rainfall descriptors from the FEH web service:

Point data at 402000,162000 ✎

Point: 402000,162000 📄

Tag: 638/639 DEVIZES



Descriptor	Value
NGR	SU 02000 62000
BFIHOST	0.82
BFIHOST19	0.671
BFIHOST19SCALED	0.671
PROPWET	0.34
SAAR6190	737 mm
SAAR9120	778 mm

Flow software results are included in Appendix E and summarised below:

WEST Development Area

Catchment	Development Area		Total Application Catchment	
Area (Ha)	1.10		1.70	
Betterment (%)	0	30	0	30
Q2 (l/s)	1.8	1.3	2.7	1.9
Q30 (l/s)	4.8	3.4	7.4	5.2
Q100 (l/s)	6.3	4.4	9.4	6.8
Qbar (l/s)	2.0	1.5	3.1	2.2

EAST Development Area

Catchment	Development Area		App Catchment		Total Catchment	
Area (Ha)	4.54		8.12		20.15	
Betterment (%)	0	30	0	30	0	30
Q2 (l/s)	7.3	5.1	11.9	8.3	29.3	20.5
Q30 (l/s)	19.6	13.7	31.6	22.1	71.07	50.2
Q100 (l/s)	25.9	18.1	41.8	29.3	94.2	65.9
Qbar (l/s)	8.3	5.8	13.5	9.4	33.3	23.3

3.10. Existing Greenfield Run-off Volume.

Ciria C753 & the EA/DEFRA guide 'Preliminary Rainfall Runoff Management for Developments' recommend that the basis for considering the run-off volume is the difference pre- and post-development for the 1:100 6-hour event.

Ciria C753 (Section 24.10)

Green-field Run-off Volume = $10 \times RD \times A \times SPR$

RD: 1:100 6-hour rainfall (6 hours @ 10.126mm/hr, from Flow) = 60.8mm

SPR: Soil Type Standard Percentage Run-off (BFIHOST19 = 0.671)* = 27 (SPR = 0.27)

WEST Area: A (Ha): = 1.10Ha & 1.70

EAST Area: A (Ha) = 4.54, 8.12, & 20.15

WEST:

Existing 1:100 6-hour Green-field Run-off Volume: $10 \times 60.8 \times 1.10 \times 0.27 = 181\text{m}^3$

Existing 1:100 6-hour Green-field Run-off Volume: $10 \times 60.8 \times 1.70 \times 0.27 = 279\text{m}^3$

EAST:

Existing 1:100 6-hour Green-field Run-off Volume: $10 \times 60.8 \times 4.54 \times 0.27 = 745\text{m}^3$

Existing 1:100 6-hour Green-field Run-off Volume: $10 \times 60.8 \times 8.12 \times 0.27 = 1,333\text{m}^3$

Existing 1:100 6-hour Green-field Run-off Volume: $10 \times 60.8 \times 20.15 \times 0.27 = 3,308\text{m}^3$

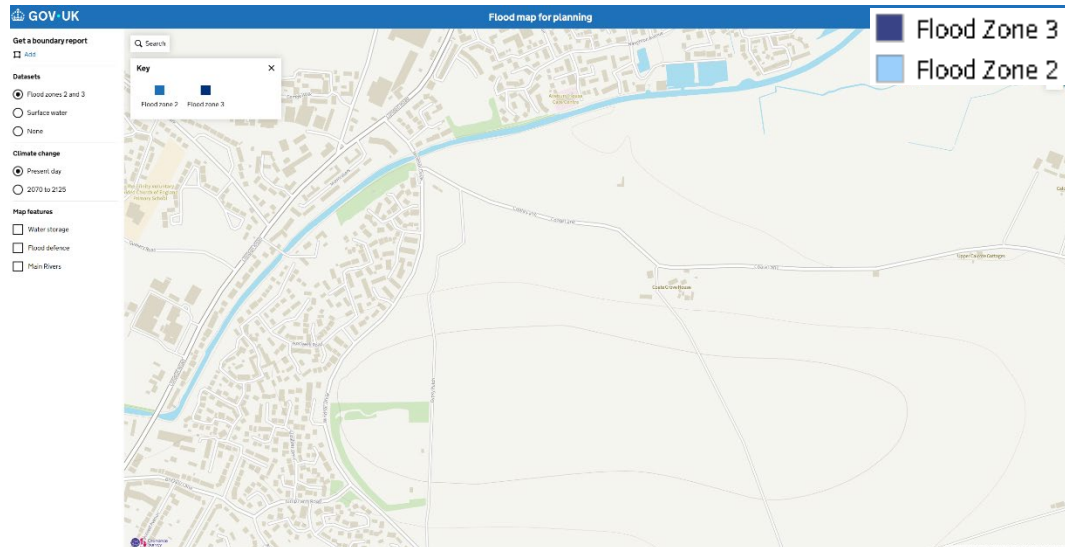
* BFIHOST19 = $(72 - SPR) / 66.5$: $SPR = 72 - (BFIHOST \times 66.5)$

4. Flood Risk Assessment

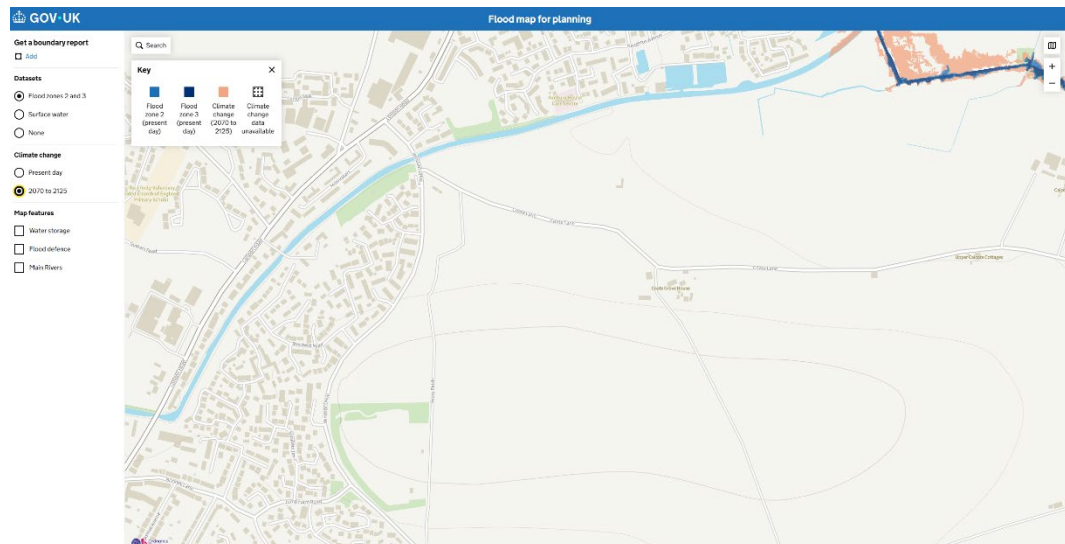
4.1. Environment Agency Flood Zone Mapping

The site benefits from various flood maps as listed below.

EA Flood Map for Planning – Flood Zones



EA Flood Map for Planning – Flood Zones Climate Change 2070 to 2125



Flood mapping shows that the site is Flood Zone 1 now, and in the future allowing for climate change, and that it is not at risk from fluvial flooding.

EA Flood Map for Planning – Surface Water

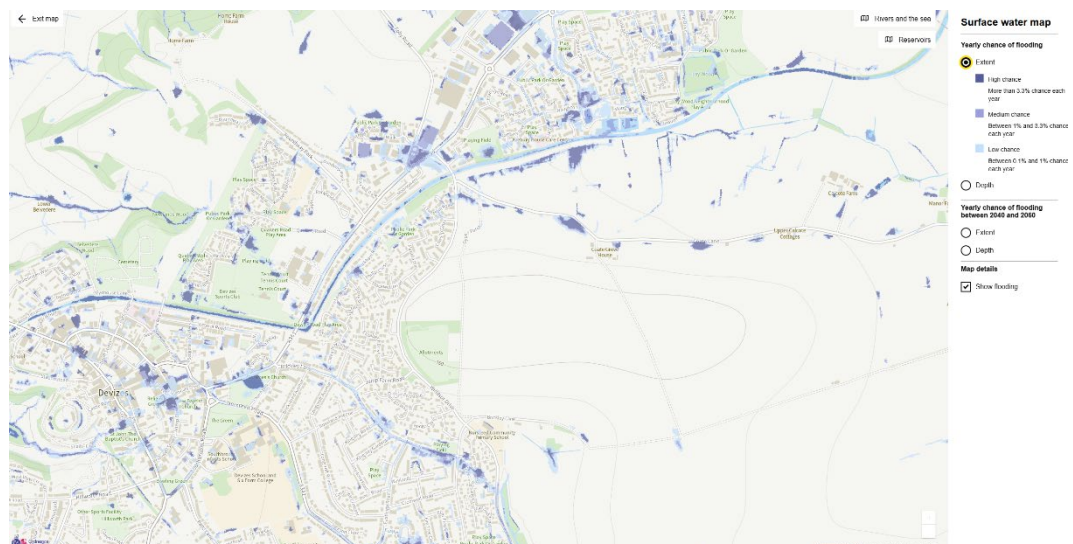
The mapping is created by dropping a volume of rainfall on the land for the various events (0.1%, 1%, & 3.3%) and modelling where it flows, and the depth and velocity of the flow. The modelling does not include smaller bridges, culverts, etc. and is intended to provide guidance on areas where flood risk from surface water needs to be considered in more detail.

The EA states that: ‘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.’

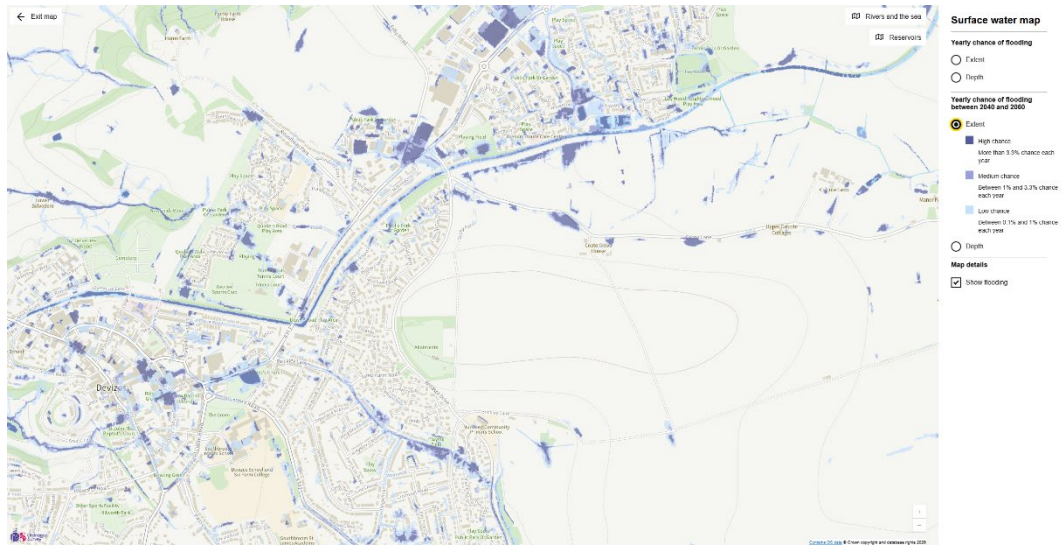
Definition of risk categories:

- **Very low risk** means that each year this area has a chance of flooding of less than 0.1% (<1:1,000). This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped or fail.
- **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1% (1:1,000 – 1:100). This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.
- **Medium risk** means that each year this area has a chance of flooding of between 1% and 3.3% (1:100 – 1:30). This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.
- **High risk** means that each year this area has a chance of flooding of greater than 3.3% (>1:30). This takes into account the effect of any flood defences in the area. These defences reduce but do not completely stop the chance of flooding as they can be overtopped, or fail.

Surface Water Extents (Present Day)

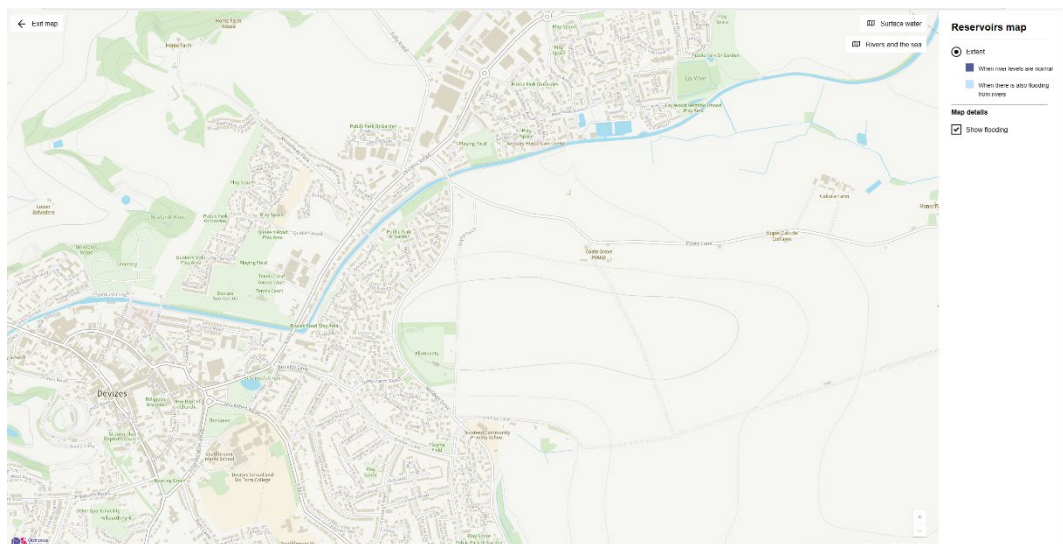


Surface Water Extents (Climate Change 2040 to 2060)



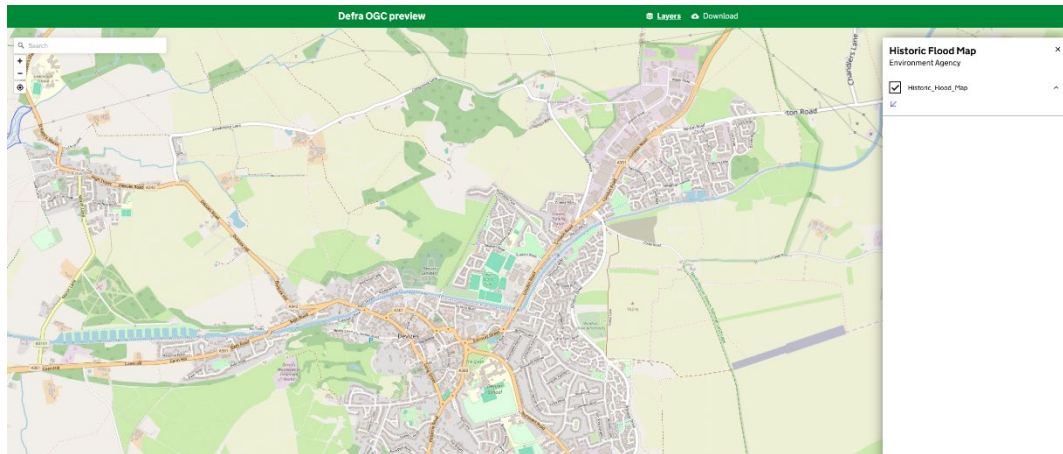
The maps show that the northern edge of the site adjacent to Coate Road is at risk of flooding from surface water now and in the future allowing for climate change. The flood risk shown is generally associated with the existing drainage ditches running alongside the road. This flood risk can be mitigated for by the development drainage system and SuDS.

EA Map Risk of Flooding from Reservoirs



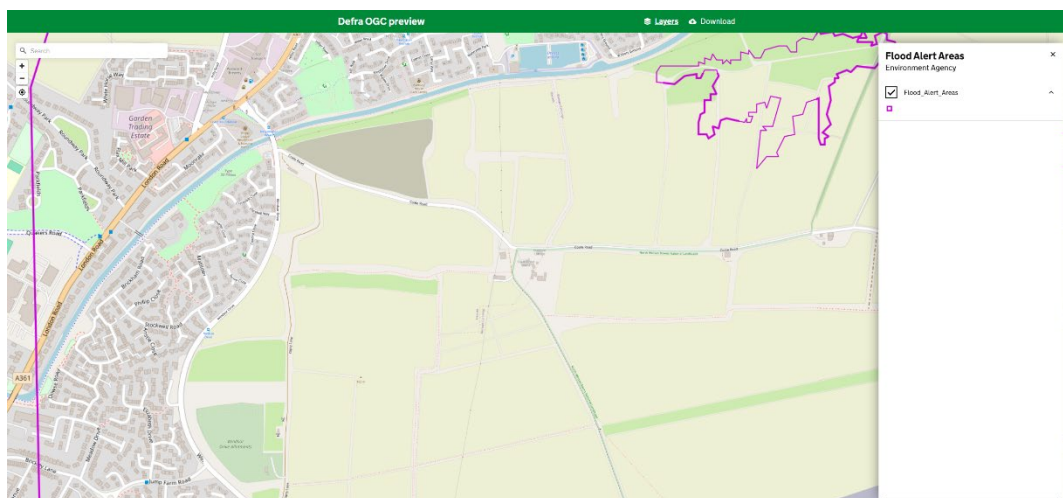
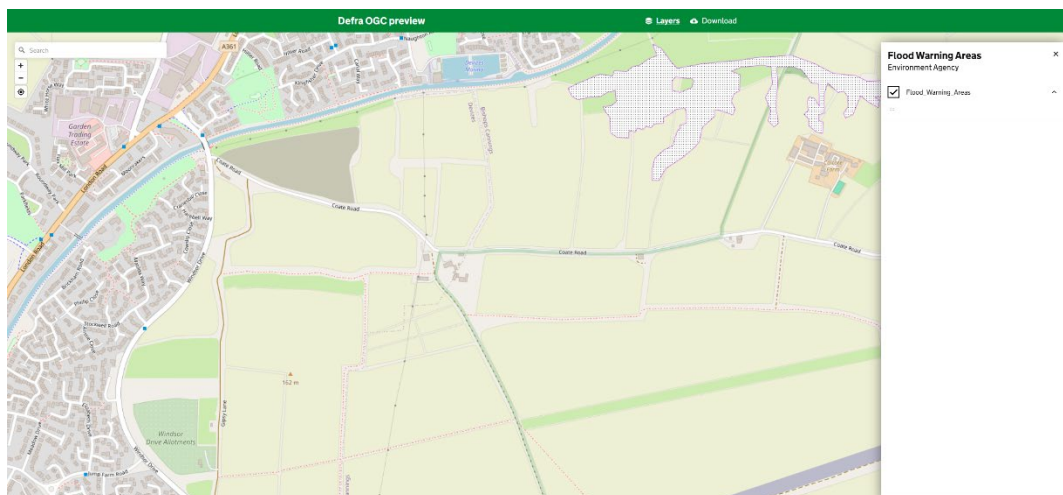
The site is not at risk of flooding from Reservoirs.

EA Historic Flood Map



There are no records of the site flooding in the past.

EA Flood Warning & Alert Areas



The site is not in a Flood Warning or Alert Area.

4.2. Strategic Flood Risk Assessment (Level 1 SFRA) JBA Final Version November 2024

The most recent Level 1 SFRA was undertaken by JBA with the final report dated November 2024.

The Appendices are available via the Council's Strategic Flood Risk Assessment Data Explorer found at:

<https://wiltscouncil.maps.arcgis.com/apps/webappviewer/index.html?id=28c00215d87b468a9a0cd79c63d3d270>

The table below lists the risk of flooding for the relevant appendices.

Appendix	Flood Risk Information
<i>Appendix C – Flood Map for Planning*</i>	Site is Flood Zone 1.
<i>Appendix D - Flood Zone 3b</i>	Site is Flood Zone 1
<i>Appendix E – Risk of Flooding from Surface Water*</i>	The northern edge of the site is risk of flooding from surface water but can be mitigated for.
<i>Appendix F – Impact of Climate Change on RoFSW *</i>	The site is at risk of flooding in the 1:100 + CC event but can be mitigated for.
<i>Appendix G – Groundwater Emergence*</i>	The site is in an area where Flooding from Groundwater is Negligible (North), Unlikely (South), and at risk (Central Band). The flood risk for the emergence of groundwater can be mitigated for by the development drainage & SuDS.
<i>Appendix H – Risk of Flooding from Reservoirs</i>	The site is not at risk of flooding from Reservoirs.
<i>Appendix I – Risk of Flooding from Sewers*</i>	The site is in an area where there has been between 1 & 10 sewer flooding incidents. There are no sewers within or adjacent to the site that would cause flooding of the site.
<i>Appendix J – Recorded Flood Outlines*</i>	There are no recorded flood outlines or incidents within or adjacent to the site.
<i>Appendix K – Flood Alert and Warning Areas*</i>	The site is within the groundwater alert and flood alert areas.
<i>Appendix L1 – Type of Flood Defences</i>	No Flood Defences are shown on or near the site.
<i>Appendix L2 – Flood Defences Standard of Protection</i>	There are no Flood Defences.
<i>Appendix L3 – Condition of Flood Defences</i>	There are no Flood Defences.

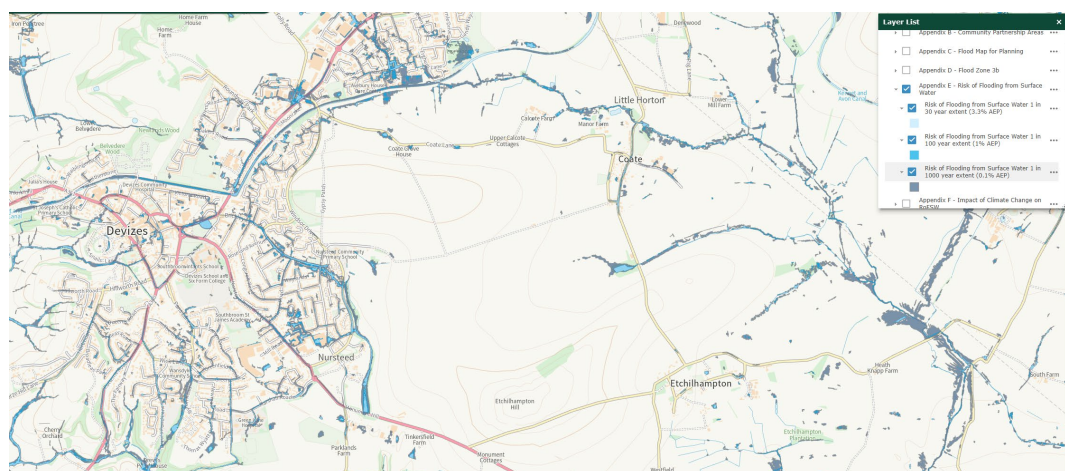
<i>Appendix L4 – Reduction in Risk of Flooding from Rivers and Sea</i>	The site is not at risk of flooding from rivers and sea.
<i>Appendix M – Risk of Flooding from Canals and Recorded Incidents*</i>	The site is not at risk of Canal Flooding and there are no recorded incidents.
<i>Appendix O – Cumulative Impact Assessment*</i>	Cumulative Impact Score is Low
<i>Appendix P - Fluvial plus Central Climate change Flood Risk</i>	Not at risk of Fluvial Flooding.
<i>Appendix Q – Fluvial plus Higher Central Climate Change Flood Risk</i>	Not at risk of Fluvial Flooding

*Denotes an extract of drawing that can be seen below, the remainder can be seen at the link above.

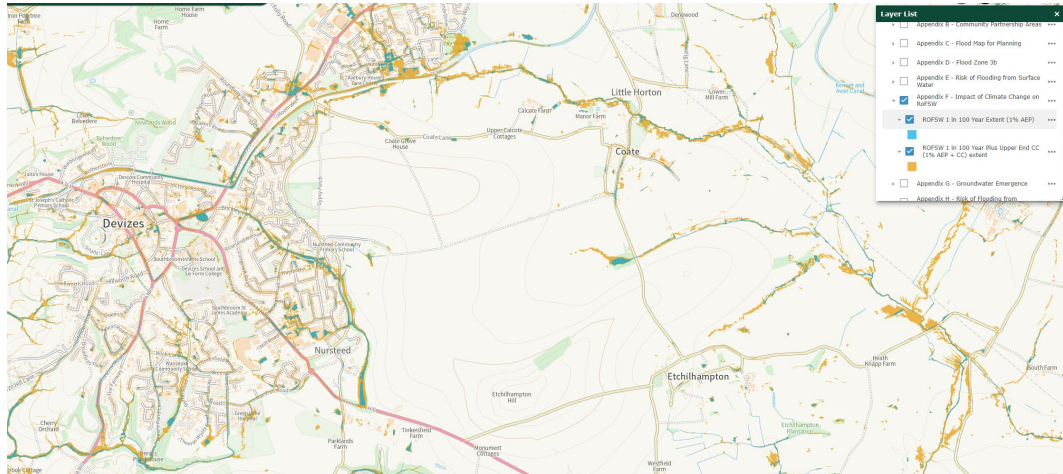
Appendix C – Flood Map for Planning



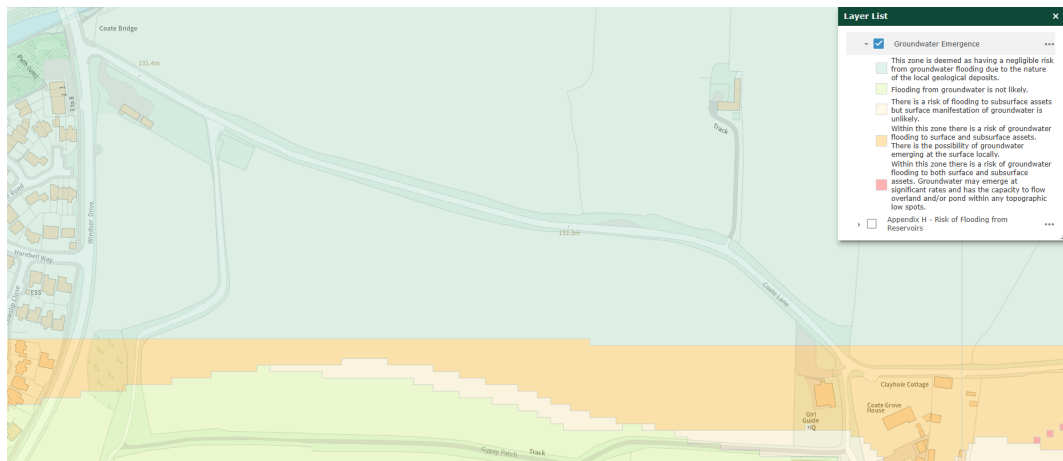
Appendix E – Risk of Flooding from Surface Water



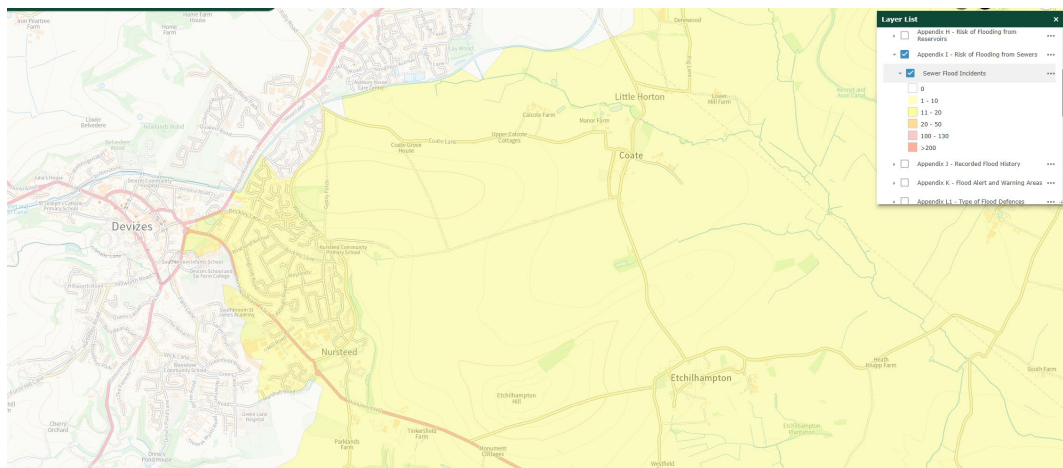
Appendix F – Impact of Climate Change on RoFSW



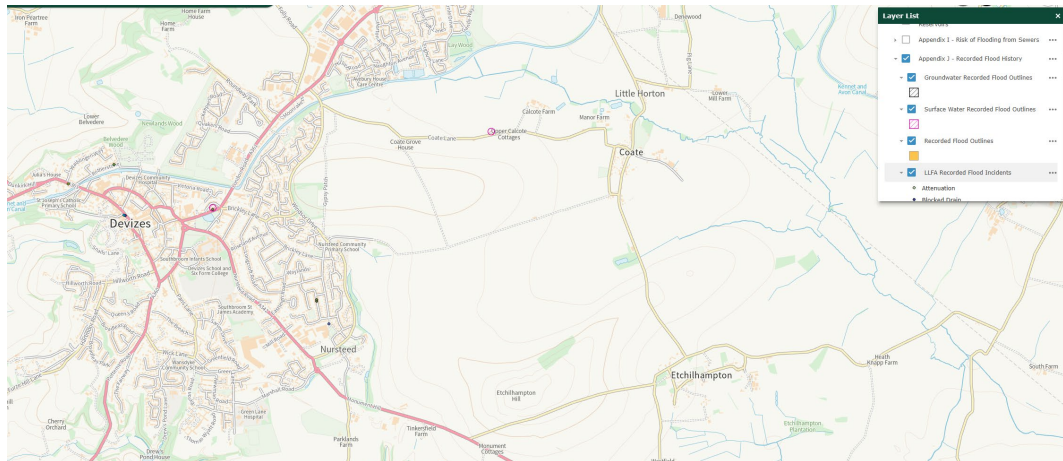
Appendix G – Risk of Flooding from Groundwater



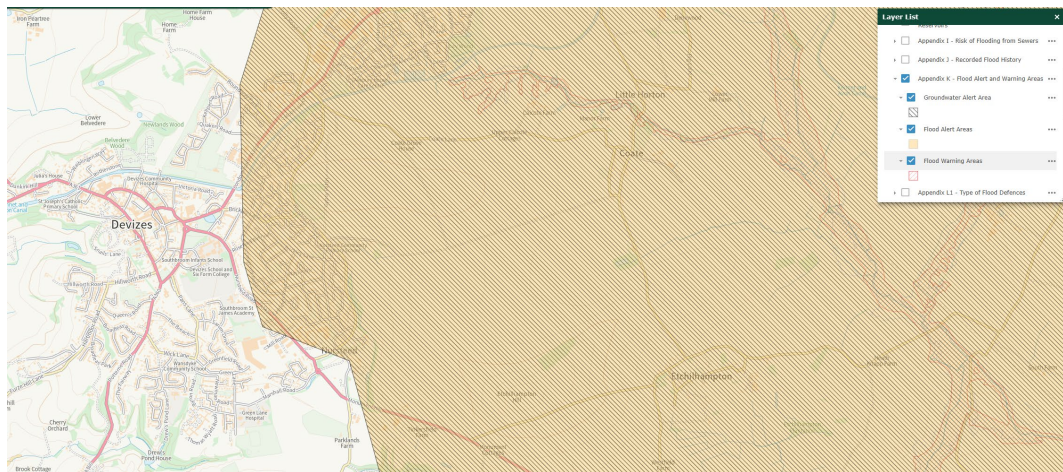
Appendix I – Risk of Flooding from Sewers



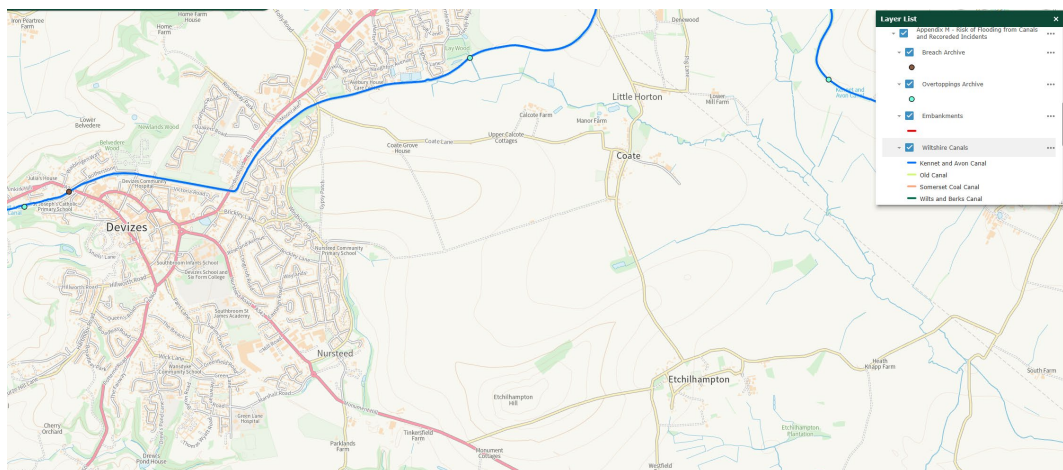
Appendix J – Recorded Flood History



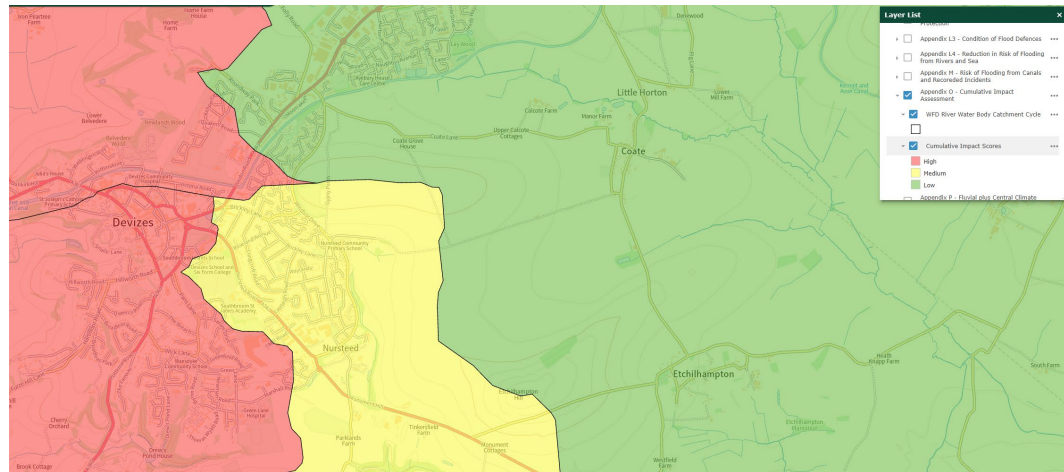
Appendix K – Flood Alert and Warning Areas



Appendix M – Risk of Flooding Canals & Recorded Incidents



Appendix O – Cumulative Impact Assessment



4.3. Fluvial Flood Risk

The EA and SFRA mapping show the site in Flood Zone 1 now and in the future.

The Risk of Fluvial Flooding is therefore Low.

4.4. Risk of Flooding Surface Water (RoFSW)

The EA and SFRA mapping shows RoFSW as generally very low now and in the future. The maps show a risk along the northern edge of the site from the existing drainage ditched alongside Coate Road. The risk can be mitigated for by the development drainage & SuDS.

Surface run-off from the higher land to south will be intercepted and diverted through the site.

The RoFSW is therefore Low.

4.5. Flood Risk from Groundwater

The SFRA mapping shows that Flooding from Groundwater is generally negligible/unlikely. There is however a central band where the risk is higher, most likely from the chalk bedrock in this area. Groundwater flood risk can be mitigated for by the development drainage & SuDS.

The underlying geology also reduces the likelihood of high groundwater levels as the Head Deposits form a low permeability confining layer over the underlying Chalk Bedrock. No groundwater was encountered in any of the GI pits or boreholes.

The risk of flooding from groundwater is low.

4.6. Flood Risk from Sewers

Details of the existing drains and sewers are shown on drawing 638-P100 included in Appendix C and on Wessex Water sewer records in Appendix F:

- There are no surface water sewers in the vicinity of the site.
- A Highway Drain runs along the southeastern side of Windsor Drive flowing northeast and eventually discharging to the Kennet & Avon Canal.
- There are no foul sewers within or adjacent to the site.
- There is a Wessex Water foul sewage pumping main that runs through the site.

Flood risk from the highway drain is low; flood flows would run northeast along Windsor Drive and not on to the site. There is no risk of flooding from foul sewers, and a low risk of flooding from the pumping main.

The SFRA mapping does not show any incidents of sewer flooding in or adjacent to the site.

The risk of flooding from Sewers is Low.

4.7. Flood Risk from Artificial and Other Sources

The EA and SFRA mapping shows that the site is not at risk of flooding from any artificial or other sources.

The risk of flooding from Artificial and Other Sources is low.

4.8. Flood Risk Vulnerability Classification

The proposed development, classified in accordance with Table 3 of the Planning Practice Guidance 'Flood Risk and Coastal Change', is 'More Vulnerable' (residential).

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Paragraph: 067 Reference ID: 7-067-20140306

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	x	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	x	x	x	✓ *

Key:

- ✓ Development is appropriate
- x Development should not be permitted.

4.9. Sequential Test

Paragraph 174 of the NPPF states that:

'Within this context the aim of the sequential test is to steer new development to areas with the lowest risk of flooding from any source. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test

Paragraph 175 of the NPPF states that:

The sequential test should be used in areas known to be at risk now or in the future from any form of flooding, except in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future (having regard to potential changes in flood risk).

PPG Section 027

A site-specific flood risk assessment demonstrates clearly that the proposed layout, design, and mitigation measures would ensure that occupiers and users would remain safe from current and future surface water flood risk for the lifetime of the development

A site-specific flood risk assessment has been undertaken. The site is at low risk of flooding from all sources now and in the future.

The proposals are therefore considered to be in accordance with the NPPF sequential approach to locate development in areas of lowest flood risk and a sequential test is therefore not required

4.10. Exception Test

Paragraph 177 of the NPPF states that:

‘Having applied the sequential test, if it is not possible for development to be located in areas with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in Annex 3’

Paragraph 178 of the NPPF states that:

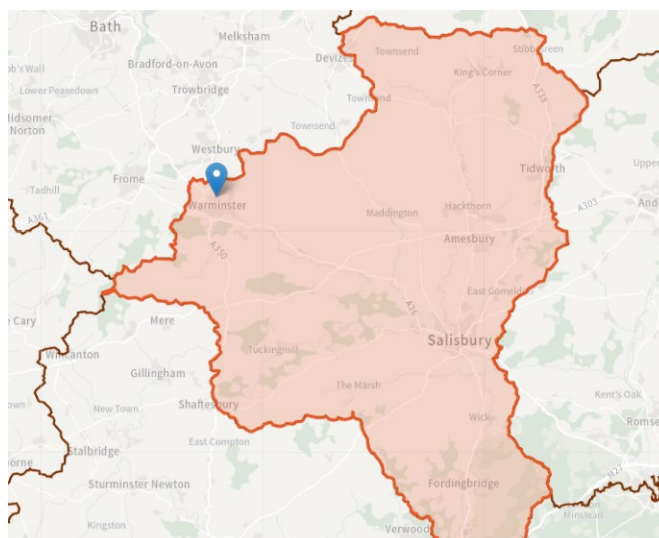
The application of the exception test should be informed by a strategic or site specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. To pass the exception test it should be demonstrated that:

- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and*
- b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.*

The Flood Risk Vulnerability and Flood Zone ‘Compatibility’ Table 3 within Section 5.3 shows that the proposed development is appropriate and compatible and therefore an exception test is not required. The development levels and drainage will be designed to manage surface water and ensure that the proposed development is not at risk of flooding.

4.11. Climate Change

In accordance with the 2016 EA guidance (updated 2022) ‘Flood risk assessments: climate change allowances’ the SuDS design will include a 45% (upper end) allowance for the predicted increase in rainfall intensity over the lifetime of the residential development (100-year design life to 2070 to 2115). Extract from guidance below:



Avon Hampshire Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	35%
2070s	25%	40%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	25%	45%

*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.

4.12. Urban Creep

To allow for additional run-off resulting from the extending of properties, conservatories, additional parking and larger patios an additional allowance of 10% for Urban Creep will be included in the SuDS design.

Drawing 639-P105 (Appendix H) shows the assumed Urban Creep areas (roofs, and drives & parking areas) within the impermeable area plan. The effective Urban Creep for these areas is 6%.

4.13. Exceedance

To manage any residual flood risk, the Proposed Development will include flood exceedance routes to direct any flows from extreme events or localised failures away from existing or proposed properties safely to the downstream surface water drainage system. Existing routes with either be maintained, managed, or diverted.

4.14. Probability of Flood Risk

The risk of flooding from all sources has been assessed and the FRA demonstrates how flood risk and surface water run-off will be managed to ensure that the development will be safe from flood risk and that it will not increase flood risk elsewhere, including allowance for climate change.

IT IS CONCLUDED THAT THE PROPOSED DEVELOPMENT WILL BE AT A LOW RISK OF FLOODING NOW AND IN THE FUTURE.

5. Surface Water Run-off

5.1. Sustainable Drainage System (SuDS)

SuDS will be used to manage surface water run-off from the proposed development. The SuDS will be designed to ensure that the existing run-off regime is maintained as closely as possible and that there is no increase in flood risk because of the development of the site. The SuDS will also prevent pollution of the receiving watercourses.

5.2. Run-off Volumes

Guidance recommends that the run-off volume for the 1:100 6-hour event is used to compare existing and proposed volumes. Existing run-off from the development area has been calculated at 1,879m³. The developed run-off has been calculated using formulae from Ciria C753 as shown below.

Developed Run-off Volume:

$$10.RD.A[((PIMP/100)\alpha 0.8) + ((1-(PIMP/100))\beta SPR)] \text{ (C753 Section 24.10)}$$

RD = Rainfall Depth (mm)

A = Catchment Area

SPR = Standard Percentage Run-off (0.27 for BFIHOST19 of 0.671)

α = Proportion of impermeable draining to system at 80% (0.8) run-off (roofs, parking, roads, etc). Can be increased to 100 % (1.0) for more conservative assessment (will depend on materials, drainage...).

β = Proportion of pervious areas draining to system, 0-1.0 (gardens, open space, etc).

RD: 1:100 6-hour rainfall (6 hours @ 10.126m/hr, from Micro Drainage) = 60.8mm

WEST A: Imp Area = 0.66Ha (39%), Total Dev Catchment = 1.70Ha, PIMP: 39%

EAST A: Imp Area = 2.62Ha (39%), Total Dev Catchment = 8.12Ha, PIMP: 32%

SPR: Soil Type Standard Percentage Run-off = 0.27

α : 1.0 (100%) assumed

β : 1.0 (100%) assumed

WEST 1:100 Year + 45% 6-hour Volume (1.70Ha) = **723m³**

EAST 1:100 Year + 45% 6-hour Volume (8.12Ha) = **3,147m³**

The calculations show that there is an increase in the volume of run-off from the development. As the underlying soils are impermeable and are not suitable for infiltration it will be necessary to follow alternative guidance to mitigate for the increase in run-off volume resulting from the development.

To mitigate for the additional run-off volume EA/Defra and Ciria guidance together with BS8582 recommend that Extended Attenuation Storage is provided and that run-off is restricted to the Mean Annual Flood Flow (Qbar) green-field rate for all events above the 1:1 up to the 1:100 with an allowance for climate change and urban creep.

6. Surface Water Drainage Strategy

6.1. Surface Water Parameters

A preliminary surface water drainage strategy has been developed that incorporates a Sustainable Drainage System. The SuDS will ensure that flood risk resulting from pluvial events (rainfall) will be managed on-site and that flood risk will not be increased elsewhere because of the development.

The surface water drainage and SuDS will be designed in accordance with the following:

- Building Regulations Part H: Drainage & Waste Disposal
- Design and Construction Guidance (formerly Sewers for Adoption)
- The requirements of Wessex Water or other approved Water/Sewerage Undertaker
- Ciria C753: The SuDS Manual.
- National standards for sustainable drainage systems
- Lead Local Flood Authority requirements
 - 10% Urban Creep allowance (drives/parking, & roofs)
 - 30% betterment on greenfield runoff rates
 - MADD factor 0
 - Cv of 1
 - Use SuDS features / source control where practicable

The hierarchy for the disposal of surface water is that rainwater shall discharge to one of the following, listed in order of priority:

- a) an adequate soakaway, or some other adequate infiltration system: or, where that is not reasonably practicable,
- b) a watercourse: or, where that is not reasonably practicable,
- c) a sewer.

6.2. Surface Water Outfall

The ground investigation (Section 3.8) shows that the site is not suitable for the use of soakaways or infiltration, and there are no watercourses in or near to the site.

There are drainage ditches along Coate Road that are a suitable outfall for the eastern part of the site. In the east surface water runs north to the ditches on the south side of Coate Road. The water ponds in a low area in the east and then flows under Coate Road to the ditches on the north side of the road. There is an existing 300mm diameter pipe under Coate Road linking the ditches on the south side of the road to the ones on the north side. Details are shown on the drawings in Appendix C.

The western part development will discharge to the existing 375mm diameter highway drain in Windsor Drive.

Details of the surface water drainage are shown on drawing 639-P106 'Drainage Strategy' included in Appendix G. The proposed strategy will reduce flows significantly particularly in the more extreme events.

6.3. Flood Risk, Development Levels, and Flood Routes

The external levels of dwellings will generally be a minimum of 150mm below the floor levels; levels and flood routes will be designed to direct surface water flows away from the dwellings. Flood exceedance routes will be designed to direct flows safely through or around the development to ensure that all properties are safe from flooding.

6.4. Proposed Strategy

Details of the outline surface water drainage strategy are shown on drawing 639-P106 'Drainage Strategy' included in Appendix G.

Discharge for the WEST area will be limited to existing 1.70Ha (Total Catchment) Qbar Mean Annual Flood Flow of 2.2l/s (approx. 1:2.3 annual probability event) for events up to 1:100 event with a 45% allowance for climate change and 6% allowance for Urban Creep (see Section 3.9 for existing greenfield runoff rates). Flow will be restricted using a Vortex Control device (Hydrobrake or similar) located downstream of the attenuation. The discharge will be reduced to 30% less than the existing greenfield rates (see Section 6.5). The calculations include an Input Hydrograph (outlet to pond/basin) with an area of 0.60Ha to represent the undeveloped open space.

Discharge for the EAST area will be limited to existing 8.12Ha (Total Application Catchment) Qbar Mean Annual Flood Flow of 13.5l/s (approx. 1:2.3 annual probability event) for events up to 1:100 event with a 45% allowance for climate change and 6% allowance for Urban Creep (see Section 3.9 for existing greenfield runoff rates). Flow will be restricted using a Vortex Control device (Hydrobrake or similar) located downstream of the attenuation. The discharge will be reduced to 30% less than the existing greenfield rates (see Section 6.5). The calculations include an Input Hydrograph (head of swale) with an area of 3.58Ha to represent the undeveloped open space, and one of 14.66Ha (downstream of the vortex control) to represent the higher ground to the south.

Betterment of at least 30% will be provided for discharges compared with existing greenfield runoff rates for the 1:2, 1:30, and 1:100 events including allowance for climate change and urban creep.

Attenuation will be provided primarily in a basin or pond as detailed in Section 7 below. Surface water will discharge into the Basin or Pond, and Swale via precast concrete headwalls that will be to adoptable standards. Guardrails will be provided on the headwalls to reduce the risk of falls as will safety gratings to prevent unauthorised access.

Cutoff channels and Drains will be provided to intercept flows from the higher land to the south and will discharge to the pond.

It is proposed that the surface water sewers will be adopted by Wessex Water or other approved Water/Sewerage Undertaker (NAV) under a Section 104 Agreement.

The estimated total volume of attenuation required for events up to the 1:100 + 45% allowance for climate change/urban creep is listed below. Impermeable areas are shown on drawing 639-P105 along with assumed urban creep allowance.

Preliminary Causeway Flow software calculations are included in Appendix I

WEST Area (1.70Ha)

Event (+CC+UC)	Discharge (l/s)	Water Level (m)	Attenuation Depth (m)	Attenuation Volume (m3)	Freeboard (m)
1:2	1.8	130.34	0.34	150	1.16
1:30+40%+6%	2.0	131.06	1.06	560	0.44
1:100+45%+6%	2.2	131.39	1.39	790	0.11

Existing Qbar for 1.7Ha WEST Catchment = 3.1l/s

EAST Area (18.12Ha) – Including Flow from Higher Land to the South (14.66Ha)

Event (+CC+UC)	Discharge at Control (l/s)	Water Level (m)	Attenuation Depth (m)	Attenuation Volume (m3)	Freeboard (m)
1:2	8.3	131.04	0.44	410	1.06
1:30+40%+6%	8.4	131.73	1.13	1220	0.37
1:100+45%+6%	13.5	132.10	1.5	1740*	0.00

Existing Qbar for 8.12Ha EAST Catchment = 13.5l/s

* A maximum of approx. 250m3 flooding from pond (1440 Minute Summer Event), flows north to Coate Road and existing drainage ditches. A maximum of approx. 340m3 of flooding occurs from the cutoff channel (480 Minute Summer Event). The volume of flooding will be reduced at reserved matters stage using additional at source SuDS.

6.5. Betterment

In accordance with Wiltshire Council's policy discharge rates for 1:2, 1:30 and 1:100-year events provide at least a 30% betterment when compared to the equivalent existing greenfield rates.

The Betterment between existing rates and proposed rates are shown below

WEST Area (1.70Ha) – Hydrobrake 2.1l/s @ 1.24m Head (65mm Diameter) *

Event	Existing Greenfield Rate (l/s)	Proposed Discharge Rate (l/s)	Betterment
1:2	2.7	1.8	30%
1:30	7.4	2.0	73%
1:100	9.4	2.2	77%

* Discharge would need to increase to approx. 5l/s for 100mm diameter

EAST Area (8.12Ha) – Hydrobrake 8.3l/s @ 1.225m Head (13mm Diameter), & overflow orifice 0.069m diameter @ 131.80mAOD.

Event	Existing Greenfield Rate (l/s)	Proposed Discharge Rate (l/s)	Betterment
1:2	11.9	8.3	30%
1:30	31.6	8.4	73%
1:100	41.8	13.5	68%

The proposed rates above all provide 30% betterment or more when compared with the existing greenfield runoff rates. Betterment is significant more for the more extreme events.

6.6. Additional SuDS features

The use of additional SuDS features can be used to improve water quality, to decelerate the surface water and meet the requirements of the National SuDS standards

It is proposed that where practicable driveways and Rainwater Pipes could connect into either a swale or rain gardens, although this would be limited by site gradients which are very steep in places.

Permeable pavements are not currently proposed but could be used in private areas if required and subject to gradients. The impermeable nature of the existing ground means that any permeable paving would not infiltrate but instead connect into the proposed drainage network.

Water Butts could also be used for garden irrigation.

The anticipated features would be confirmed during reserved matters.

7. SuDS Details

7.1. Attenuation Pond Design

To provide treatment to the surface water run-off from the development and remove pollutants prior to discharge to the downstream receiving drainage system the ponds will have a permanent pool with a 0.9m depth of water.

The pond will have storage for surface water attenuation for events up to and including the 1:100 event with a 45% climate change & 6% urban creep allowance. The higher land to the south of the east area will connect downstream of the control chamber and will not be attenuated in the pond.

The pond has been designed with bank slopes of 1 in 3 in accordance with The SuDS Manual Ciria C753.

The pond will have a shallow zone (aquatic bench) along the edge of the permanent pool to support wetland planting which will act as a biological filter and safety margin (3m width with a slope of 1:20). The pond will provide ecology, amenity and biodiversity benefits and will add to the aesthetics of the open space.

7.2. Detention Basin

The alternative to an attenuation pond is a detention basin.

A basin is used to attenuate surface water during rainfall events and has no permanent water, i.e. is dry outside of rainfall events. An internal swale could be used as a low flow channel.

The basin will have storage available for surface water attenuation for events up to and including the 1:100 event with a 45% climate change & 6% urban creep allowance. As with the pond the higher land to the south of the east area will connect downstream of the control chamber and will not be attenuated in the basin.

The basin will be designed with bank slopes of 1 in 3 in accordance with The SuDS Manual Ciria C753.

7.3. Landscaping

The landscaping and aquatic planting for the pond will be designed by the Landscape Architect to provide a diversity of plant species to enhance visual interest and provide a variety of wildlife habitats. Details of the planting will be agreed with the Local Planning Authority and adopting body at the detailed engineering stage.

7.4. Pond or Basin Access

Access to the pond will be via the new development roads. A grassed maintenance strip will be provided around the perimeter of the pond to allow routine maintenance activities and inspections to be carried out.

7.5. Water Butts

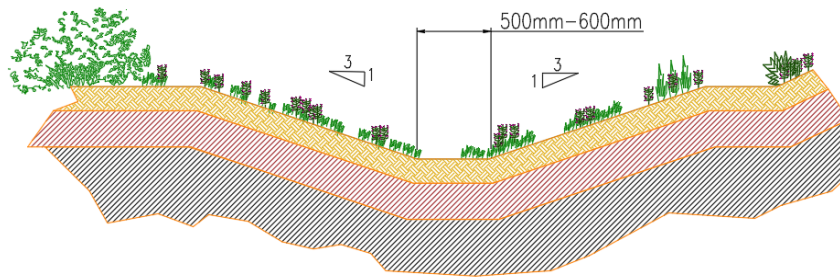
Water butts collect surface water from House and Garage roofs to be used in gardens. Once they reach capacity excess runoff will discharge to the drainage network. Water butts could be used where appropriate in gardens but not where a Rainwater pipes connection is not possible.

7.6. Swales

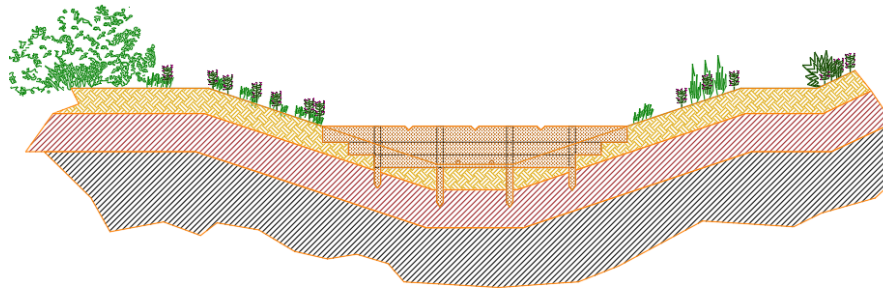
These are shallow, flat bottomed, vegetated open channels designed to convey, treat and sometimes attenuate surface water run-off. When incorporated into the site design, they can enhance the natural landscape and provide aesthetic and biodiversity benefits. They are often used to drain roads, paths, roofs, or drives/parking areas and can replace conventional pipework as a means of conveying run-off. The use of adjacent filter strips can also remove the need for kerbs and gullies.

Swales will typically be 500-600mm wide at the base, 300-600mm deep with side slopes of 1:3. The minimum gradient is typically 1:200 with check dams provided where gradients exceed 1:30.

Some examples of swales are shown below including a check dam. Filter medium could also be placed underneath to allow rainwater pipe connections.



TYPICAL UNLINED
SWALE



TYPICAL CHECK DAM
ELEVATION

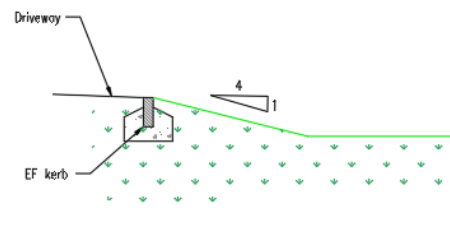
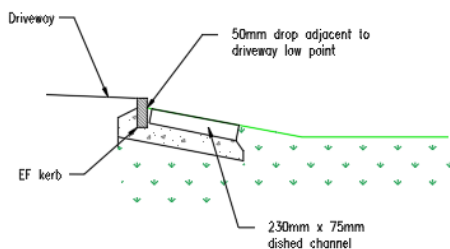
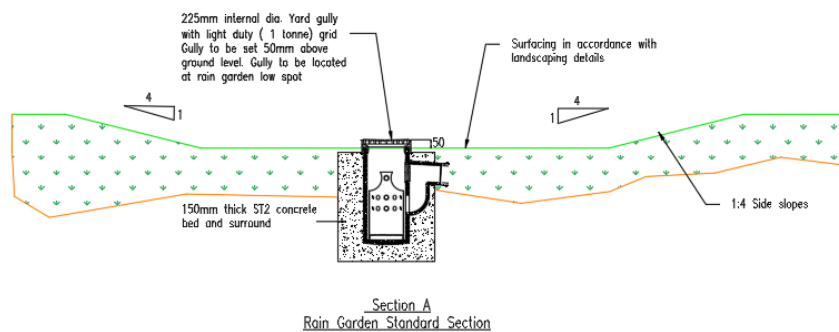
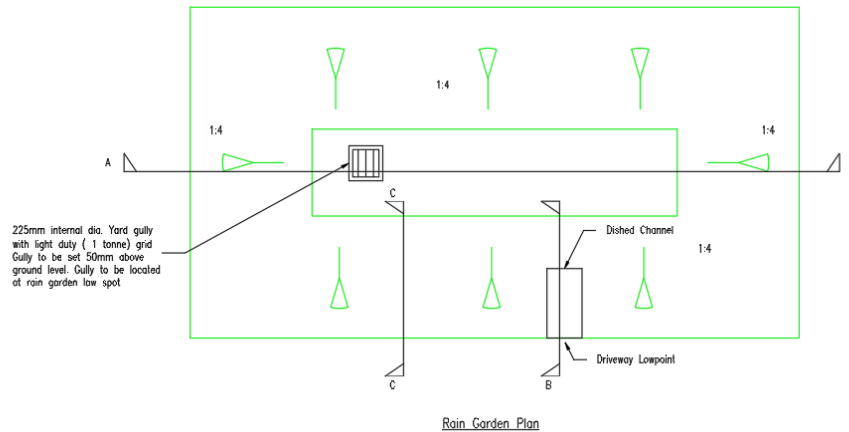
The proposed conveyance wet swale/channel along the south side of Coate Road in the east part of the site will be formed by widening and deepening the existing ditch. Bank slopes will where possible be 1:3 however in areas where there is sufficient width slopes will be steeper or low retaining structures used. The channel has been modelled as 1.2m wide, 1.5m deep with 1:2 side slopes.

7.7. Rain Gardens

Rain Gardens are shallow landscaped depressions that use soil and vegetation to treat pollutants and can reduce surface water runoff. They are also an attractive landscape feature providing habitat and biodiversity. They are more informal than other forms of bioretention.

Rain gardens will be fed by a small number of driveways, have an above ground overflow and connect into the sewer network.

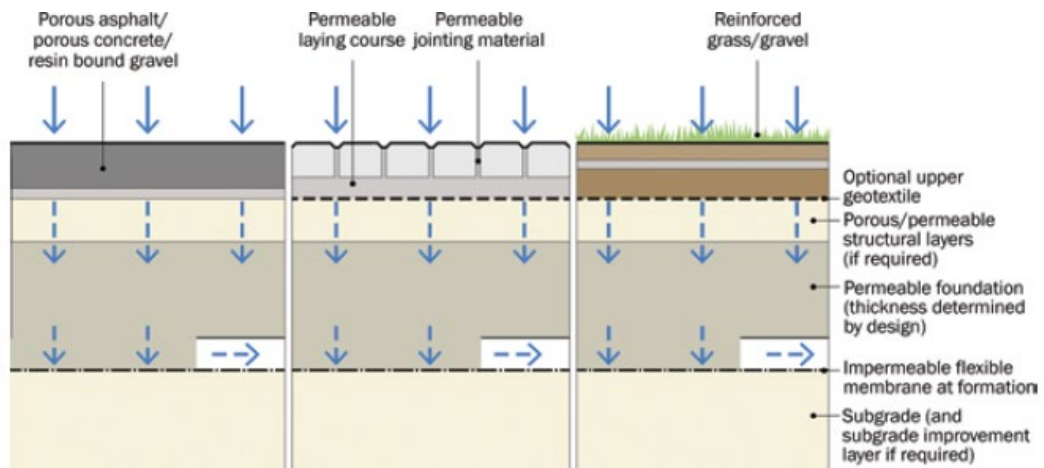
An example of a rain garden arrangement is shown below.



7.8. Permeable Pavement

Permeable pavements allow surface water to infiltrate through the surface providing treatment to surface water. As infiltration is not possible due to ground conditions then surface water would need to be collected and connect into the sewer network via a fin drainage / diffuser.

The pavement can be either block paved or a porous asphalt. C753 shows the potential types of permeable pavement.



7.9. Health and Safety

Fencing would isolate the pond and reduce its amenity benefit. Barrier planting and landscaping will therefore be used to discourage public access to the open areas of water.

Safety signage and information boards can be provided around the perimeter to improve awareness, discourage unauthorised access and to inform the public of the potential danger, and the purpose and benefits of the pond.

Fencing or guarding will be provided around any structures such as headwalls where there is a vertical drop of 600mm or more.

Full safety details will be considered prior to construction and will be agreed with the Local Planning Authority and adopting body at the detailed design stage.

8. Water Quality

The proposed development will include roads, hard standings, roofs and landscaped areas. Run-off from roofs is unlikely to contain significant pollution. Run-off from roads and hard standings will pick up fuel, oil, heavy metals, rubbish and other pollutants. Run-off from landscaped areas could include pesticides and fertilisers.

Ciria C753, Chapter 26 provides guidance on Water Quality Management: Design Methods. The SuDS pollution mitigation index should equal or exceed the pollution hazard index. Tables 26.2 and 26.3 below provide details of the indices.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways ¹	High	0.8 ²	0.8 ²	0.9 ²

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters

Type of SuDS component	Mitigation indices ¹		
	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4 ²	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond ⁴	0.7 ³	0.7	0.5
Wetland	0.8 ³	0.8	0.8
Proprietary treatment systems ^{5,6}	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

The table below summarizes the Indices for the proposed development. The mitigation index for the pond can be seen to exceed the pollution index for all hazards.

Pollution & Mitigation Indices

	Total Suspended Solids	Metals	Hydrocarbons
Pollution Index (Residential Roofs)	0.2	0.2	0.05
Pollution Index (Driveways, Residential Roads)	0.5	0.4	0.4
Mitigation Index (Attenuation Pond)	0.7	0.7	0.5
Mitigation Index (Swale)	0.5	0.6	0.6
Mitigation Index (Rain Gardens / Bioretention system)	0.8	0.8	0.8

Trapped gullies will also be used for Access Roads, Drives and Parking Areas which will remove sediments and debris.

9. Foul Drainage Strategy

9.1. Existing Sewers

There is an existing 150mm diameter Wessex Water Sewer in Harebell Way to the west of the site, refer to Drawing 639-P106 'Drainage Strategy' included in Appendix G. Wessex Water has confirmed that a 150mm diameter connection to Manhole SU016277116 in the junction of Harebell Way and Cowslip Close will be acceptable. Wessex Water correspondence and mapping is included in Appendix F.

Windsor Drive, Dezizes



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WATER MAINS	SEWERS	STRATEGIC PUBLIC	PRIVATE	SECTION 104	OTHER WESSEX PIPES	NON-WESSEX / UNKNOWN
— Distribution	Foul	—	—	—	— Rising Mains	— Private Rising Mains
— Washout	Surface	—	—	—	— Standing Rising Mains	— Culverted Watercourse
- - - Raw Water	Combined	—	—	—	— EDN Effluent Disposal	— Highway Drain
- - - Abandoned	Abandoned	—	—	—	— Overflow	— ? Use Unknown
- - - Private	Colours generally indicate the use of the sewer/drain (i.e. Red - Foul, Dark Blue - Surface, Magenta - Combined/Dual Use, Light Green - Highway Drain, Mid Green - Overflow).	—	—	—	— S Syphon	— SU Status Unknown

Some styles of line and symbol are shown on the key in sample/typical colours.

FITTINGS	STRUCTURES	OTHER STRUCTURES	Chamber
● Hydrant	● Manhole - Foul	■ Pumping Station - Surface	■ Tunnel
● Other	● Manhole - Surface	■ Pumping Stn - Foul/Combined	■ Interceptor
	● Manhole - Combined	■ Gully	
	● Inlet — Outfall	■ Vent Column	
	● Lamphole	■ Rodding Eye	
	■ Bifurcation - Foul	■ Catchpit	
	■ Bifurcation - Surface	■ Flushing Chamber	
	■ Bifurcation - Combined	■ Soakaway	
	■ Combined Sewage Overflow	■ Non Return Valve	
		■ Air Valve	
		■ Hatch Box	
		■ Washout	

Information in this map is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work will not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and storm drains adopted by Wessex Water are shown in red (Subject for Adoption or Private Sewer). Regulations 2011 are to be plotted over time and may not yet be shown. In carrying out any works, you accept liability for the cost of any repairs to Wessex Water apparatus damaged as a result of your works. You are advised to commence excavations using hand tools only. Mechanical digging equipment should not be used until works have been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your premises or a prospect to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. If you are proposing to build over or near Wessex Water's apparatus you should contact the Developer Services Team, Wessex Water, 1000 Bath Road, Bath, BA1 1QJ.

9.2. Proposed Strategy

The proposed foul strategy is shown on drawing 639-P106 in Appendix G

The proposed development of 145 dwellings will drain by gravity to a new sewage pumping station. Flows will then be pumped to a new gravity sewer (F13 to SU01627116) connecting to the WW sewer in Harebell Way. Peak flows to the pumping station will be 6.7l/s for 145 dwellings (6xDWF) and pumped flows to Harebell Way will be approximately 3.4l/s (3xDWF).

The foul sewers for the proposed development will be adopted by Wessex Water or other approved Water/Sewerage Undertaker under a Section 104 Agreement; private foul drainage will be in accordance with Part H of the Building regulations approved documents and will remain in private or management company ownership.

10. Management & Maintenance

10.1. General

The table below lists the proposed drainage and anticipated Maintenance / Management responsibilities.

Drainage Feature	Management and Maintenance Responsibility
Sewers (Foul & Surface Water).	Wessex Water or other approved Water/Sewerage Undertaker.
Precast Concrete Headwalls	Regulated Adopting Body (for example Wessex Water)
Attenuation Pond or Basin	Regulated Adopting Body (for example Wessex Water) or a Private Management Company with appropriate experience
Flow Control	Regulated Adopting Body (for example Wessex Water) or a Private Management Company with appropriate experience
Highway Drains and Gullies	Wiltshire Council Highways.
Drainage for buildings, drives, parking areas, landscaping, etc. in private ownership	The owners where in sole ownership, and either shared responsibility or a Private Management Company for shared features.
Swales	Regulated Adopting Body or a Private Management Company with appropriate experience or the homeowners where in sole ownership
Rain Gardens	The homeowners where in sole ownership or Management Company with appropriate experience
Permeable Pavement	The homeowners where in sole ownership or Management Company with appropriate experience
Water Butts	The homeowners where in sole ownership

The exact maintenance regime will be confirmed although it is likely it will be similar to that recommended by the SUDS manual.

TABLE 32.1 Typical key SuDS components operation and maintenance activities (for full specifications, see Chapters 11–23)

Operation and maintenance activity	SuDS component											
	Pond	Wetland	Detention basin	Infiltration basin	Soakaway	Infiltration trench	Filter drain	Modular storage	Pervious pavement	Swale/bioretention/trees	Filter strip	Green roofs
Regular maintenance												
Inspection	■	■	■	■	■	■	■	■	■	■	■	■
Litter and debris removal	■	■	■	■	□	■	■	□	■	■	■	□
Grass cutting	■	■	■	■	□	■	■	□	□	■	■	■
Weed and invasive plant control	□	□	□	□	■	□	□	□	□	□	■	■
Shrub management (including pruning)	□	□	□	□	■	■	■	■	□	□	□	■
Shoreline vegetation management	■	■	□	■	■	■	■	■	■	■	■	■
Aquatic vegetation management	■	■	□	■	■	■	■	■	■	■	■	■
Occasional maintenance												
Sediment management ¹	■	■	■	■	■	■	■	■	■	■	■	■
Vegetation replacement	□	□	□	□	■	■	■	■	□	□	■	■
Vacuum sweeping and brushing	■	■	■	■	■	■	■	■	■	■	■	■
Remedial maintenance												
Structure rehabilitation /repair	□	□	□	□	□	□	□	□	□	□	□	□
Infiltration surface reconditioning	■	■	■	■	■	■	■	■	■	■	■	■

Key

- will be required
- may be required

Notes

- 1 Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

10.2. Pond

TABLE 23.1 Operation and maintenance requirements for ponds and wetlands

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass – public areas	Monthly (during growing season)
	Cut the meadow grass	Half yearly (spring, before nesting season, and autumn)
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage and/or physical damage	Monthly
	Inspect water body for signs of poor water quality	Monthly (May – October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options	Half yearly
	Check any mechanical devices, eg penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1 m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1 m above water level	Annually
	Tidy all dead growth (scrub clearance) before start of growing season (Note: tree maintenance is usually part of overall landscape management contract)	Annually
	Remove sediment from any forebay.	Every 1–5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays.	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, eg every 25–50 years
Remedial actions	Repair erosion or other damage	As required
	Replant, where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair / rehabilitate inlets, outlets and overflows.	As required

10.3. Basins

TABLE 22.1 Operation and maintenance requirements for detention basins

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly
	Cut grass – for spillways 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)
	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 facility surface for silt accumulation. Establish appropriate silt removal frequencies.	Monthly (for first year), then annually or as required
	Check any penstocks and other mechanical devices	Annually
	Tidy all dead growth before start of growing season	Annually
	Remove sediment from inlets, outlet and forebay	Annually (or as required)
	Manage wetland plants in outlet pool – where provided	Annually (as set out in Chapter 23)
Occasional maintenance	Reseed areas of poor vegetation growth	As required
	Prune and trim any trees and remove cuttings	Every 2 years, or as required
	Remove sediment from inlets, outlets, forebay and main basin when required	Every 5 years, or as required (likely to be minimal requirements where effective upstream source control is provided)
Remedial actions	Repair erosion or other damage by reseedling or re-turfing	As required
	Realignment of rip-rap	As required
	Repair/rehabilitation of inlets, outlets and overflows	As required
	Relevel uneven surfaces and reinstate design levels	As required

10.3. Swales

TABLE 17.1 Operation and maintenance requirements for swales

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Remove litter and debris	Monthly, or as required
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours	Monthly, or when required
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies	Half yearly
Occasional maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or reseed	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

10.4. Rain Gardens

TABLE 18.3 Operation and maintenance requirements for bioretention systems

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	Quarterly
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	As required
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years

10.5. Water Butts

TABLE 11.6 Operation and maintenance requirements for RWH systems

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdrawal devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

10.6. Permeable Pavement

TABLE 20.15 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

10.7. Management & Maintenance Plan

A management and Maintenance Plan will be produced for agreement with the LPA at reserved matter stage identifying ownership and maintenance responsibilities for the drainage system to ensure that it will be maintained and will operate effectively for the lifetime of the development.

11. Conclusions

11.1. Flood Risk

This site-specific FRA has been produced in accordance with the requirements of the NPPF, Planning Practice Guidance (PPG), and EA advice notes, and demonstrates that the proposed development will be safe from flood risk and that it will not increase flood risk elsewhere.

The site is in Flood Zone 1 with a low flood risk (less than 1:1,000 or 0.1% annual probability of flooding from rivers).

The proposed residential development is classified as 'More Vulnerable' and is in Flood Zone 1; the proposed residential development is suitable in this zone and the NPPF Sequential and Exception Tests are not required.

Development levels will be designed to route surface water flows away from dwellings to protect them from flooding.

Flood risk from fluvial, pluvial, sewers, surface water, groundwater and artificial sources have been assessed, and it has been demonstrated that the proposed development will not be at risk from flooding from all sources now and in the future.

11.2. Surface Water Drainage

Details of the proposed Outline Drainage Strategy are shown on Drawing 639-P106 in Appendix G.

Surface water from the western part of the development will discharge into the highway drain in Windsor Drive with the discharge limited to Qbar for events up to and including the 1:100 + 45% climate change/urban creep allowance event with a minimum 30% betterment provided compared with existing greenfield rates. This will ensure that flood risk is not increased in the receiving drainage systems downstream of the development for the lifetime of the development.

Surface water from the eastern part of the development will discharge into the drainage ditch system along Coate Road with the discharge limited to Qbar for events up to and including the 1:100 + 45% climate change/urban creep allowance event with a minimum 30% betterment provided compared with existing greenfield rates. This will ensure that flood risk is not increased in the receiving drainage systems downstream of the development for the lifetime of the development.

Attenuation will be provided in a basins/ponds, and swale with sewers discharging directly via precast concrete headwalls. The ponds will have a 0.9m deep permanent pool to provide treatment to the surface water run-off from the development. Bank slopes will be 1 in 3 in accordance with The SuDS Manual Ciria C753.

Flood routes will be provided for exceedance events, or for local failure of the drainage system (blockage, damage, etc.), and will ensure that flood flows are directed safely through or around the development to the downstream drainage system and watercourse. Details of flood exceedance routes will be provided with the reserved matters application.

Cutoff channels and Drains will be provided to intercept flows from the higher land to the south and will discharge to the ponds.

The use of SuDS will remove pollution from surface water run-off and improve water quality with additional SuDS features provided where practicable.

11.3. Foul Drainage

The foul flows from the site will connect to the existing sewage network in Harebell Way to the west of the site as confirmed by Wessex Water; full details of the connection will be agreed with Wessex Water. Due to the topography of the site foul flows from the 145 dwellings will need to be pumped. Details of the proposed Outline Drainage Strategy are shown on Drawing 639-P106 in Appendix G.

The foul sewers will be adopted by Wessex Water or other approved Water/Sewerage Undertaker to ensure that they will be maintained for the lifetime of the development.

11.4. Summary

The Flood Risk Assessment and Drainage Strategy demonstrate that the proposed development meets with all the national and local policy requirements and satisfies all the criteria of the Planning Authority, Lead Local Flood Authority, and Environment Agency.

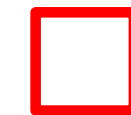
The Flood Risk Assessment concludes that the site can be safely developed without flood risk and without increasing flood risk elsewhere using an appropriately designed and maintained Sustainable Drainage System.

Appendix A

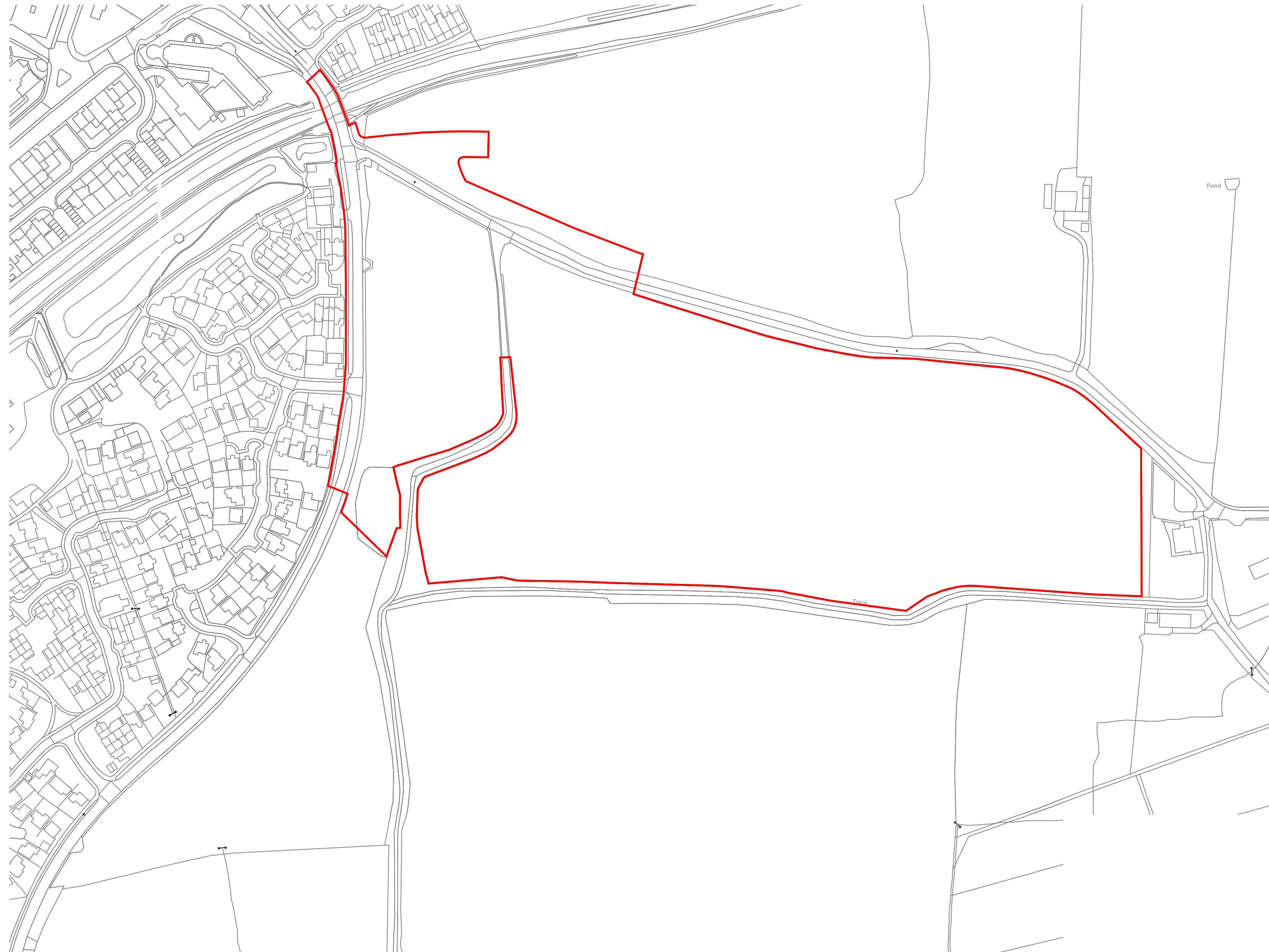
Locations Plan & Indicative Masterplan



KEY



RED LINE BOUNDARY -
10.853HA (26.82ACRES)



0 20 50 100m

Site Name: LAND SOUTH OF COATE ROAD, DEVIZES	Drawing Number: DEVIZES.UD.12	Revision: C	 Robert Hitchins The Complete Development Solution The Manor, Boddington, Cherttenham, Gloucestershire, GL51 0TJ Tel: 01242 680994 www.robert-hitchins.co.uk
Drawing Title: SITE LOCATION PLAN	Drawn By: LJD	Checked By: GRJ	Date: 01/10/2024
		Scale: 1:2000 @ A2	



KEY

- PROPOSED VEHICULAR ACCESS INTO THE SITE
- PROPOSED RESIDENTIAL
- MAIN ROAD WITH GREEN VERGE AND STREET TREE PLANTING
- SECONDARY ROAD/ TERTIARY ROAD
- PRIVATE DIRVEWAY
- PROPOSED WOODLAND PLANTING
- PROPOSED CYCLE/FOOTWAY ROUTE
- EXISTING PROW
- PROPOSED PLAY AREA
- PROPOSED ATTENUATION
- KEY BUILDING
- POTENTIAL PEDESTRIAN/ CYCLE LINK
- RISING MAIN WITH 3M EASEMENT
- PUMPING STATION WITH HEDGEROW SCREEN
- PROPOSED SWALE



Site Name: LAND SOUTH OF COATE LANE, DEVIZES	Drawing Number: 382.UD.11	Revision: K	 Robert Hitchens The Complete Development Solution The Manor, Boddington, Cheltenham, Gloucestershire, GL51 0TJ Tel: 01242 480914 www.robert-hitchens.co.uk
Drawing Title: INDICATIVE MASTERPLAN	Drawn By: LD	Checked By: GRJ	Date: 05/09/2025
			Scale: 1:1250 @ A2

Appendix B

Topographical Survey, Elevations, & Slopes

