

**WHITLOCKS, BISHOPSTONE
WILTSHIRE
Flood Risk Assessment**

**January 2026
IMA-23-132**

REVISIONS

Report No	Description	Date	Approved
FRA 1-1	First Issue	25-11-2023	DS
FRA 1-2	Foul drainage commentary expanded	5-12-2023	DS
FRA 1-3	Development layout updated	25-2-2025	DS
FRA 1-4	Minor text revisions	26-02-2025	DS
FRA 1-5	Development layout revised	27-01-2026	DS

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1 Executive Summary

1.1.1 IMA Transport Planning have prepared this Flood Risk Assessment in support of a planning application for a proposed 9 home development at Bishopstone, Wiltshire.

Description	Summary
Location	Bishopstone, Wiltshire. National Grid Reference 407000,126400.
Site Area	The total Red Line Plan area is about 1 ha.
Current / Existing Land Use	The site is currently used for pasture.
Flood Zone	The Environment Agency 'Flood Map for Planning' confirms that the proposed development area sits within Flood Zone 1
Fluvial Flood Risk	Low
Groundwater Flood Risk	Low
Surface Water Flood Risk	Low
Sewers Flood Risk	Low
Artificial Source Flood Risk	Low
Development Proposals	The proposals are to develop some 1 ha of pasture for 9 homes.
Drainage Strategy	The site sits above the flood plain of the River Ebbel and would appear to be underlain by chalk. Given the expectation of good ground infiltration it is proposed to dispose of surface water directly to ground via soakaways and porous paving. These would be sized to accommodate a 1 in 100 year storm with an additional allowance of 45% for climate change. Foul flows would be treated by a package treatment plant that would then discharge to a drainage field. Should ground infiltration prove not to be available then a discharge would be made to a local field ditch.

2 Introduction

2.1 Background

- 2.1.1 IMA Transport Planning Ltd are appointed by Cherrington Planning to prepare a Flood Risk Assessment (FRA) and Drainage Strategy in support of a planning application for the development of 1 ha of agricultural land, just to the east of the village of Bishopstone, Wiltshire.
- 2.1.2 The following assessment is undertaken in-line with the guidance as set out in the National Planning Policy Framework (NPPF), DEFRA Flood Risk Assessment Guidance for New Development, non-statutory technical standards for SuDS and other associated technical guidance.

2.2 Scope of work

- 2.2.1 The site is identified in relation to its geographical location and the existing stormwater drainage mechanisms described.
- 2.2.2 The flood risk from river, tidal, land/surface, groundwater, sewer and artificial sources will be assessed and, where necessary and feasible, appropriate mitigation measures suggested.
- 2.2.3 A proposal for a surface water drainage system serving the development site will be assessed in the context of identifying any site constraints. Sustainable Drainage Systems (SuDS) will be recommended and employed to reduce or remove any flood risks, as required and where possible.
- 2.2.4 Recommendations will be made on an appropriate method of disposal for foul flows generated by the proposed development.

2.3 The Existing Site

- 2.3.1 The site is presently used for agriculture and lies in the valley of the River Ebbel, the river itself running some 250m to the south east.
- 2.3.2 The land falls at about 1 in 15 to the south east, from a level of about 80m to 70m. Road access would be taken from the existing highway running along the south eastern boundary of the site. The underlying geology is chalk.
- 2.3.3 An indicative development plan forms Appendix C.

3 Planning Policy and Guidance

3.1 National Planning Policy Framework

3.1.1 The National Planning Policy Framework (NPPF, paragraphs 170 to 182) states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

3.1.2 The NPPF states that when determining planning applications, Local Planning Authorities (LPA) should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific Flood Risk Assessment. Development should only be allowed in areas at risk of flooding where it can be demonstrated that:

- Within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- The development is appropriately flood resistant;
- It incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
- Any residual risk can be safely managed; and
- Safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

3.1.3 Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

- Take account of advice from the lead local flood authority;
- Have appropriate proposed minimum operational standards;
- Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.

3.2 Planning Policy Statement 25

3.2.1 The Planning Policy Statement 25 (PPS25) provides additional guidance to LPAs to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding.

3.2.2 The PPS states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the

development, and the appropriate application of SuDS. Referencing information provided by the Environment Agency (EA), the PPS provides advice on taking account of climate change, setting out recommended contingency allowances for net sea level rise and peak rainfall intensities, which should be increased by between 5% and 105% from now until the year 2115. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.

3.2.3 The PPS also includes advice on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:

- Zone 1 - low probability: less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year;
- Zone 2 - medium probability: between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% to 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% to 0.1%) in any year;
- Zone 3a - high probability: 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
- Zone 3b - the functional floodplain: where water has to flow or be stored in times of flood; identification should take account of local circumstances but would typically flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme 1 in 1,000 (0.1%) flood.

3.2.4 Flood risk vulnerability is split into five classifications in Table D.2 of the PPS, as follows, and the compatibility of these within each Flood Zone is set out in Table D.3 of the PPS:

- Essential Infrastructure, e.g., essential transport and utility infrastructure, wind turbines.
- Highly Vulnerable, e.g. emergency services (those required to be operational during flooding), basement dwellings.
- More Vulnerable, e.g. residential dwellings, hospitals, schools, hotels, drinking establishments.
- Less Vulnerable, e.g. retail, offices, storage and distribution, leisure, restaurants; and Water- Compatible Development, e.g. docks, marinas, wharves.

3.2.5 In addition to this Flood Risk Assessment, it is necessary to determine whether development in areas at risk of flooding can be avoided by directing development away from areas at highest risk - the sequential approach. The aim of the sequential test is to steer new development to reasonably available sites in areas with the lowest risk of flooding.

- 3.2.6 These development proposals locate residential development (more vulnerable development uses) within Flood Zone 1. We therefore conclude that the proposed development meets the requirement of the Sequential Test.

Table D.3²³: Flood Risk Vulnerability and Flood Zone 'Compatibility'

Flood Risk Vulnerability classification (see Table D2)		Essential Infrastructure	Water compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see Table D.1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b 'Functional Flood plain'	Exception Test required	✓	✗	✗	✗

Key:

✓ Development is appropriate

✗ Development should not be permitted

3.3 DEFRA Non-Technical standards for Sustainable Drainage Systems

- 3.3.1 The Non-Statutory Technical Standards for Sustainable Drainage Systems were published in March 2015 and is the current non-statutory guidance for the design, maintenance and operation of SuDS.
- 3.3.2 The standards set out that the peak runoff rates should be as close as is reasonably practicable to the greenfield rate, but should never exceed the pre-development runoff rate.
- 3.3.3 The standards also set out that the drainage system should be designed so that flooding does not occur on any part of the Site for a 1 in 30-year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100-year rainfall event.

3.4 Environment Agency Flood Risk Assessment Guidance for New Development

- 3.4.1 The EA's Guidance for Assessing and Managing Flood Risk for New Development states the requirements for safe access and exit from new developments in flood risk areas, these being safe dry route for people and vehicles. As the development and its road access all sit within Flood Zone 1, a safe access and exit will be available.

3.5 Sustainable Drainage Systems Management Plan

- 3.5.1 Whichever SUD's system is eventually agreed and designed for the development it is noted that the PPS sets out the requirement for developers to consider the

operation, management and maintenance of all SuDS proposed. Other than the highway gullies and soakaway located at the site access junction, the on-site drainage network and SuDS would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately.

4 Review of Potential Sources of Flooding

There are several different ways in which flooding can occur. These different ways reflect the source of the floodwater and how it moves across the landscape. The different sources of flooding can occur individually, or they can be combined together. This section investigates the risks associated with all sources of flooding at the development site and surrounding catchment area.

4.1 Rivers/Fluvial

4.1.1 Flooding from rivers occurs when the water levels in the river rise to a point that the river cannot cope with the amount of water draining into it from the surrounding land, leading to overtopping or breach of the river bank.

4.1.2 The Environment Agency's "Flood Map for Planning" (Appendix D) identifies the extent of flooding from rivers and sea, ignoring the effects of flood defences, and categorises them according to the risk of flooding. The risk assessment scale contains three zones from 'Flood Zone 3' (highest risk) to 'Flood Zone 1' (lowest risk).

4.1.3 The extent of the area to be developed is within Flood Zone 1 and so be at the lowest risk of flooding.

4.2 Off-Site Impacts

As the Site is located within Flood Zone 1 and that attenuation of the development stormwater run-off will be located above the design River Ebbel flood level, there will be no material off-site impacts.

4.3 Access and Egress

4.3.1 It is a requirement under NPPF that safe access and egress is available throughout the 'design' 1 in 100-year plus climate change flood event. This section has been prepared making use of the guidance set out in the Flood Risk Assessment Guidance for New Development.

4.3.2 In line with the EA guidance on safe access and egress, a safe access and egress route would preferably be dry during the 'design' flood event. The proposed residential units and road access are located outside the floodplain and as such both vehicular and pedestrian access would be possible during an extreme flood event.

4.4 Sea/Tidal

4.4.1 Tidal flooding occurs through inundation of land by the sea, or estuary waters.

4.4.2 The development site is located far inland at a level in excess of 70m AOD. Hence the risk of flooding from sea/tidal sources is not considered to present a risk to the development site.

4.5 Groundwater

- 4.5.1 Groundwater flooding is caused by a rise in water table levels and the emergence of water, originating from sub-surface permeable strata, at the surface. Groundwater floods may emerge from either single point, or multiple widespread locations, and are usually long duration events.
- 4.5.2 With reference to the British Geological Survey mapping (Appendix B) the site is underlain by chalk. Chalk is generally permeable and so likely to facilitate the transmission of groundwater. However flooding from groundwater is considered to be unlikely due to the site topography, being a gradual fall at about 1 in 15.

4.6 Surface Water / Pluvial

- 4.6.1 Surface flooding is primarily caused by surface water running off the land, often in Urban areas when intense, short duration storms occur and rainfall is unable to enter drainage systems or soak into the ground. Flooding can also occur in rural areas during medium intensity, long duration events where saturated ground conditions prevent infiltration into the subsoil. This flood water would then be conveyed via overland flow routes dictated by the local topography.
- 4.6.2 The Environment Agency mapping for surface water flood risk contains data on three risk bands of surface water flooding: High, Medium and Low. Within each risk band data is available on the potential depth, velocity and direction of flooding. Areas not included within these risk bands are considered very low risk, with an annual probability of flooding of less than 0.1% (1 in 1000).
- 4.6.3 Reference to the EA Mapping (Appendix F) indicates that the Site is considered to be at very low risk of surface water flooding.

4.7 Sewers

- 4.7.1 Flooding from sewers can result when the sewer is overwhelmed by heavy rainfall resulting in surcharging, becomes blocked or is of inadequate capacity. Flooding from sewers is defined as flooding in an urban area with a comprehensive sewer network.
- 4.7.2 The development site is in a rural area. Furthermore a search of Wessex Water drainage assets shows they have no sewers locally. Hence it is considered that the risk of flooding from this source is considered to be low.

4.8 Reservoirs, Canals and Other artificial sources

- 4.8.1 Artificial sources include reservoirs, canals and lakes where water is retained above natural ground level. Overtopping, leakage or a breach in the canal/reservoir structure is considered an artificial source of flooding.
- 4.8.2 Breach is a catastrophic failure of a water retaining structure, normally leading to rapid loss of all impounded water unless emergency measures are taken. Breach is considered to be of low probability, but of high consequence and for this reason it is identified as a significant flood mechanism.
- 4.8.3 Reference to the EA Mapping (Appendix D) indicates that the site is not at risk from flooding from these sources and the risk can be considered low.

4.9 Summary

4.9.1 Summary of Flood Risk table

Receptor	Residential Development						
	Source	Rivers/ Fluvial	Sea/ Tidal	Surface/ Pluvial	Groundwater	Sewers	Artificial
Risk Class	Low	✓	✓	✓	✓	✓	✓
	Medium						
	High						

4.9.2 From the above table, the overall flood risk associated with the development site is considered to be low.

5 Surface Water Drainage Strategy

5.1 Existing Drainage

- 5.1.1 Wessex Water sewer records have been examined and demonstrate they have no assets locally to the site.
- 5.1.2 The development site is pasture that has a gradual fall to the south east. The underlying geology is chalk. By inspection, it is considered that at present rain falling on the site would for most storm events soak to ground. During more severe storms, water would discharge over land and flow across the public highway into the water meadow of the River Ebbel.

5.2 Proposed Stormwater Strategy

- 5.2.1 In line with Building Regulations and the PPG, the following hierarchy of surface water disposal should be adhered to, in decreasing order of preference.
- Store rainwater for re-use;
 - Discharge to ground;
 - Discharge to a surface water body;
 - Discharge to a surface water sewer;
 - Discharge to a combined sewer.
- 5.2.2 A plan showing the proposed schematic drainage strategy forms Appendix F. It is proposed that rainwater harvesting will be implemented in the development using rainwater butts for the purpose of irrigation or water re-use. The intention would be to locate water butts on the residential units 1 per property. The exact design will be submitted with technical design in due course following planning consultations etc.
- 5.2.3 The British Geological survey mapping (Appendix B) shows the site underlain by chalk. Permeability testing of the chalk has been undertaken and the results form Appendix I. These test results confirm that the strategy of discharging development stormwater to ground would be viable. It would appear that discharging surface water to soakaways is being utilised by adjacent housing developments.
- 5.2.4 The River Ebbel runs just to the south east of the site so it would be technically possible to discharge into it at an attenuated 1 in 1 year greenfield run-off rate. However this would not be as preferable as discharging direct to ground.
- 5.2.5 There are no sewers adjacent to the development site so discharging surface water to a sewer is not an available option.
- 5.2.6 The development road network will not be offered to the local Highway Authority and so will remain private. They will be surfaced in permeable asphalt as will the parking courtyards so that all rainfall falling on to them will discharge directly to ground. Roofs and private drives will either discharge to the porous paved parking courtyards or to house soakaways located within gardens. This would be resolved at detailed design stage.

5.3 Sustainable drainage systems

- 5.3.1 The most sustainable way to manage surface water runoff is through the use of SuDS, which need to be considered in relation to site-specific conditions.
- 5.3.2 SuDS mimic the natural drainage system and provide a method of surface water drainage which can decrease the quantity of water discharged, thereby reducing the risk of flooding. In addition to reducing flood risk, SuDS devices can improve water quality and provide amenity and biodiversity benefits.
- 5.3.3 A variety of SuDS devices are available to reduce or temporarily attenuate the discharge of surface water runoff. The potential for SuDS has been considered throughout the development of the scheme proposals. Table 2 below outlines the potential SuDS devices and their constraints and opportunities at the Site.
- 5.3.4 Table 5: SuDS Device Constraints

Device	Description	Constraints/Comments	✓/✗
Green/brown roofs (source control)	Provide soft landscaping at roof level which reduces surface water runoff	Living roofs are not considered feasible due to maintenance concerns in this instance.	✗
Infiltration devices & Soakaways (source control)	Store runoff and allow water to percolate into the ground via natural infiltration	Practicality needs to be confirmed by ground investigation to establish ground permeability and level of the water table.	✓
Pervious surfaces (source control)	Storm water is allowed to infiltrate through the surface into a storage layer, from which it can infiltrate and/or slowly discharge into sewers	Pervious surfaces are proposed for the parking courtyards that will not be offered to the highway authority for adoption. The practicality needs to be confirmed by ground investigation to establish ground permeability and level of the water table.	✓
Rainwater harvesting (source control)	Reduces the annual average rate of runoff from the site by reusing water for non-potable uses e.g. toilet flushing or water butts.	As noted previously rainwater harvesting in the form of rainwater butts are proposed within the development	✓

Swales (permeable conveyance)	Broad, shallow channels that convey/store runoff, and allow infiltration (ground conditions permitting)	Based on spatial constraints only limited use is considered to be feasible.	x
Filter drains & perforated pipes (permeable conveyance)	Trenches filled with granular materials (which are designed to take flows from adjacent impermeable areas) that convey runoff while allowing infiltration (ground conditions permitting)	Based on spatial constraints only limited use is considered to be feasible.	x
Filter strips (permeable conveyance)	Wide, gently sloping areas of grass or dense vegetation that remove pollutants from runoff from adjacent areas	Based on spatial constraints only limited use is considered to be feasible.	x
Infiltration basins (end of pipe treatment)	Depressions in the surface designed to store runoff and allow infiltration through the base	Based on spatial constraints only limited use is considered to be feasible.	x
Bio-retention systems/ rain garden (end of pipe treatment)	A shallow landscaped depression which allows runoff to pond temporarily on the surface before filtering through vegetation and underlying soils	Ditto above	x
Dry ponds/ detention basins (end of pipe treatment)	Depressions in the surface designed to store runoff without infiltration through the base	Based on spatial constraints only limited use is considered to be feasible.	x
Underground attenuation (end of pipe treatment)	Oversized pipes or geo-cellular tanks designed to store water below ground level	Currently not included	x

5.4 Hydraulic Modelling

- 5.4.1 An indicative hydraulic assessment of the permeable paving has been undertaken and forms Appendix G. At present the permeability of the underlying chalk is unknown so a mid-range chalk infiltration rate has been assumed of 5×10^{-4} m/s. A 1 in 100 year rainfall event with a 45% uplift for climate change has been imposed

on a nominal 100m² of porous paving. The resulting maximum depth of water within the porous subbase is 12mm. However in practice the porous paved areas represent only about one third of the total catchment, so a typical depth of water of some 36mm could be anticipated. This is still well within the total depth of subbase which typically would be 200mm to 300mm deep.

- 5.4.2 BRE digest soakage testing has been requested and the results will be appended to this FRA when available. A detailed hydraulic modelling of the proposed stormwater drainage strategy will then be undertaken.

5.5 Protection of the Underlying Aquifer

- 5.5.1 With development flows going to ground consideration will need to be given on the possible pollution impact on the underlying ground water. Guidance on this is available in the CIRIA SuDS manual C753.
- 5.5.2 Extracts of CIRIA C753 together with a pollution risk assessment form Appendix E. Table 26.2 provides pollution hazard indices for different land uses, while Table 26.4 provides indicative SuDS mitigation indices.
- 5.5.3 The C753 pollution assessment suggests that the aquifer should not be adversely impacted by this development.

5.6 Sustainable Drainage Systems Management Plan

- 5.6.1 The PPG sets out the requirement for developers to consider the operation, management and maintenance of all the proposed SuDS. Other than the single highway soakaway and road gullies at the site access junction, the on-site drainage network and SuDS would be privately managed and maintained for the lifetime of the development, ensuring that they remain fit for purpose and function appropriately.
- 5.6.2 Post-construction, an on-site management company would be responsible for the SuDS included within the development. Table 8 presents an indicative maintenance schedule of the typical maintenance and repairs, in line with guidance from the SuDS Manual.

Table 8: Indicative SuDS Maintenance Schedule

SuDS	
Task	Frequency
Rainwater Harvesting	
Inspect system to replace dead plants as required and ensure plants are sufficiently watered (during establishment period)	As required
Inspect system to replace dead plants (post establishment period)	Annually (in autumn)

Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
Inspect system to ensure substrate is not eroded and inlet/outlet drains are not blocked	Annually or as required (after severe storms)
Inspect system for debris/blockages	Annually or as required
Pervious Surfaces	
- Stabilise and mow contributing adjacent areas - Removal/management of weeds - Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving - 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
Initial sweeping	Monthly for 3 months after installation
Inspect for evidence of poor operation and/or weed growth	Three-monthly, 48 hours after large storms in first 6 months
Brushing and vacuuming	Once a year (after autumn) or as required
- Inspect silt accumulation rates and establish appropriate brushing frequencies - Monitor inspection chambers - Rehabilitation of surface and upped substructure removed by remedial sweeping	Annually
	Every 10-15 years or as required
Filter Drain	
SuDS	
Task	Frequency
- Clear perforated pipework of blockages - Remove or control tree roots where needed	As required
Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation	
- Remove litter and debris from surface, access chambers and pre-treatment devices - Inspect filter drain surface, inlet/outlet pipework and control systems for blockages, clogging, standing water and structural damage	Monthly or as required
Remove sediment from pre-treatment devices	6 monthly or as required

6 Foul Water Drainage Strategy

6.1 Sewer Records

- 6.1.1 An examination of the Wessex Water Asset Plan shows no adopted sewers locally to the development site. However it is noted that the existing housing just to the east is served by a package treatment plant which is located on the on the other side of the highway to the south east.

6.2 Foul Drainage Strategy

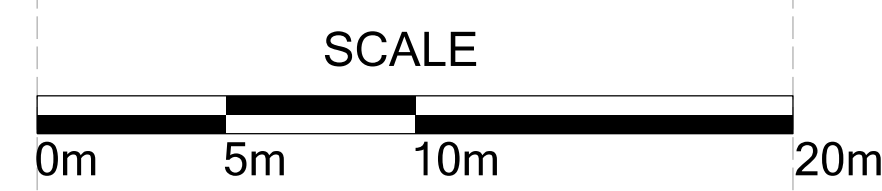
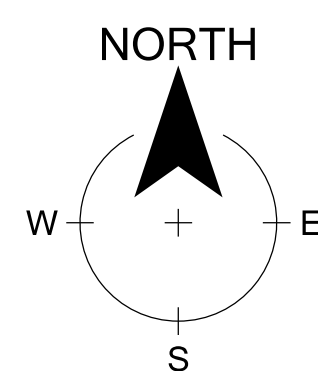
- 6.2.1 It is proposed to install a package treatment plant as no adopted foul sewers are available to serve this development. The plant would be located off-site just to the south east of the public highway. Treated flows would either discharge to ground via a drainage field or to an adjacent field ditch.
- 6.2.2 BRE digest 365 soakage testing has been requested and the results will inform the detailed design for the disposal of treated effluent.

7 Conclusions

- 7.1.1 The Site is located within Flood Zone 1 and therefore is very unlikely to flood.
- 7.1.2 On-site stormwater soakage systems will be provided sized to cater for a 1 in 100 year storm with a 45% uplift for climate change. Storage will be achieved above the design flood level of the River Ebbel to ensure that storage volume will be unaffected by flooding in the river valley.
- 7.1.3 Foul flows will be treated by a package treatment plant.

Appendix A

Topographical Survey



SURVEY STATISTICS				
Name	Existing	Notting	Height	Remark
T1	407672.569	126333.948	73.449	Not
T2	407584.401	126233.012	70.222	Pos
T3	407564.627	126333.772	72.437	Not
T4	407481.355	126069.863	73.673	Not
T5	407433.547	126241.144	73.935	Not
T6	407433.461	126355.566	81.820	Not
T7	407503.627	126333.867	75.345	Pos
T8	407563.364	126352.867	75.287	Not
T9	407523.218	126336.716	75.390	Not

[illegible]

NOTES

Level Datum: OS National Grid OSGM15

Grid Orientation: OS National Grid OSTN15

Scale Factor: Local Scale Factor=0.999653

The contractor is to check and verify all critical levels before work starts.

Every effort is made to identify all visible above ground features and structures. However, it may be possible that certain features are not visible at the time of survey.



Unit 50, Strivenham Hundred Business Park
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EMAIL: admin@brunel-surveys.com
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CLIENT
Cherrington Planning
3 High Street
Devizes
Wiltshire
SN10 1AT

Topographical Survey
Land At Bishopstone
Salisbury
Wiltshire

REVISIONS	
SCALE	
A0 Sheet @ 1 to 200	
DATE	SURVEYED BY
Jan 2024	AW
DRAWN BY	CHECKED BY
AW	PJA
DRAWING NO.	
26368-200-01	

Appendix B

British Geological Survey

British Geological Survey



Appendix C

Indicative Development Layout Plan



BIODIVERSITY AREA
North-most section of site to be retained and managed for the purpose of biodiversity and wildlife

RETAINING WALL
Face brick retaining wall to west edge with dense screen planting

LOW RETAINING WALL
Face brick retaining wall between plot 07 & 08

SLOPED BANKS
All sloped banks across site to be planted with native mixed shrubs and grasses to provide naturalistic visual landscape setting and enhance privacy and wildlife

NEW PERIMETER PLANTING
New indigenous perimeter mixed hedge, shrub and tree species around new development, to provide privacy and enhance biodiversity

VEHICLE ACCESS
New vehicular access and visibility splay see highways report

NEW & EXISTING HEDGE
Retain/prune existing hedge where required as landscape plans | New native mixed hedge, shrub and tree species set back from footpath edge/frontage to enhance biodiversity and privacy

MEADOW SWATHES
Native meadow swathe planting to edge of BNG area to provide transition to domestic garden

EXISTING TREES
Manage and retain existing Ash Trees to edge of cutting - subject to arboriculturalist

MEADOW SWATHES
Native meadow swathe planting to open areas to enhance wildlife

PEDESTRIAN ACCESS
New footpath created to link housing with bus stop

Access & turning area for waste vehicle

New Packaged Sewage Treatment Plan

NEW SEWAGE TREATMENT PLANT
Subject to specialist drainage engineer specification

P L A N N I N G

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All dimensions to be checked on site and any discrepancies reported to the Architect immediately. All structural and specialist elements/components/details, including glazing, are to be approved by the Structural Engineer or Specialist Contractor.

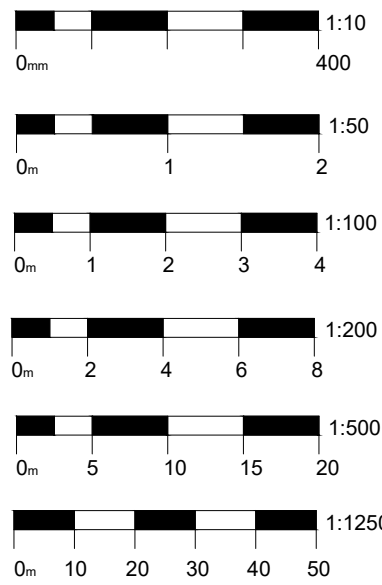
DESIGNERS RISK ASSESSMENT:
HEALTH AND SAFETY
THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015
Building Products and Construction Execution Hazards

Common/everyday hazards associated with Building Products and Construction processes are not listed below and will be assumed to be controlled by the Principal Contractor following good safety, management and site practice procedures.

The proposed works are designed on a well established method of construction, which can be carried out by a competent contractor. However, should the contractor find any area of concern he must inform the designer immediately in order that appropriate action can be taken.

THESE DRAWINGS ARE FOR PLANNING PURPOSES ONLY.

Structures to be removed



B Highways/Landscape updates 28.01.26
A Highways/Landscape updates 26.01.26
Rev Comment Date

Project: New Dwellings
Land at Bishopstone,
Salisbury, Wiltshire

Client: Cherrington Planning

Drawing Title: Proposed Site Plan

Job No: 250821
Drawn: RM | NH
Date: 16.01.2026
Scale: as indicated @ A1

Drawing No: PL02

Rev: B

DMW
architects

46a East St, Wimborne, Dorset, BH21 1DX
0 1 2 0 2 8 8 4 0 2 4 www.dmw.co.uk

Appendix D

Environment Agency Flood Maps for Planning

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
407512/126347

Created
7 Jul 2023 13:33

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

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

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.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
407512/126347

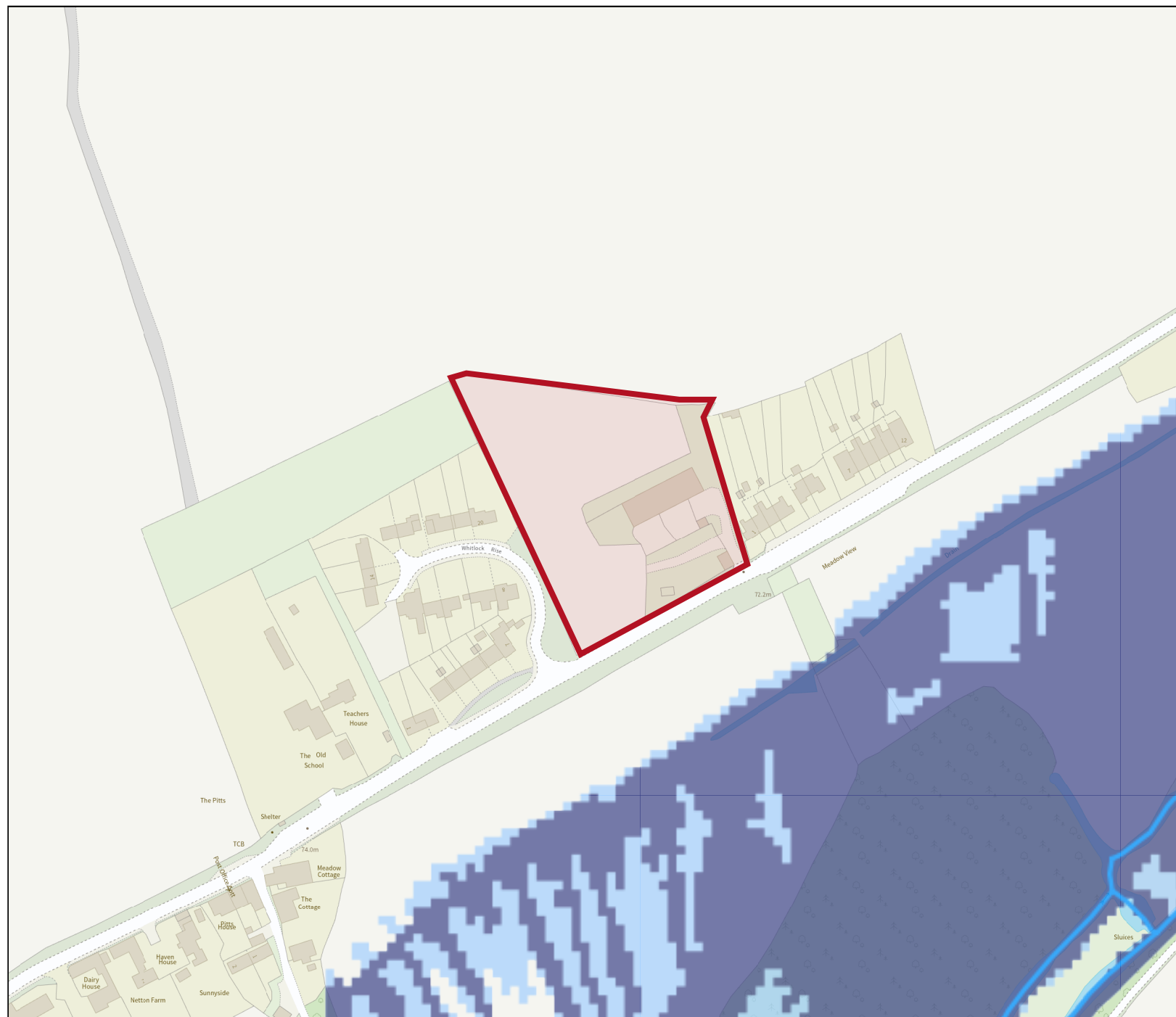
Scale
1:2500

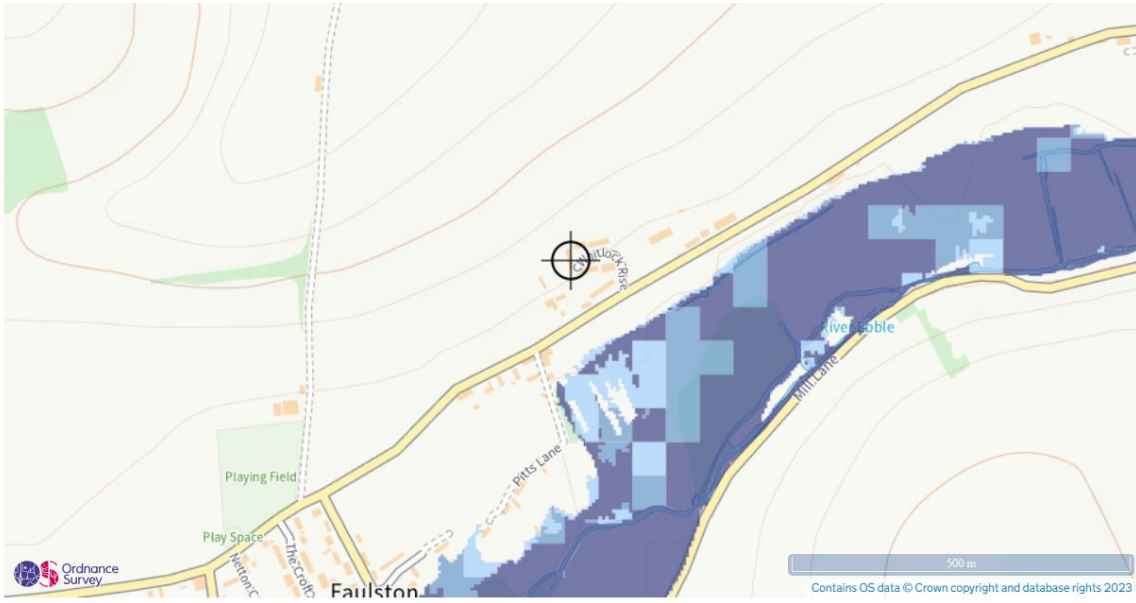
Created
7 Jul 2023 13:33

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 20 40 60m

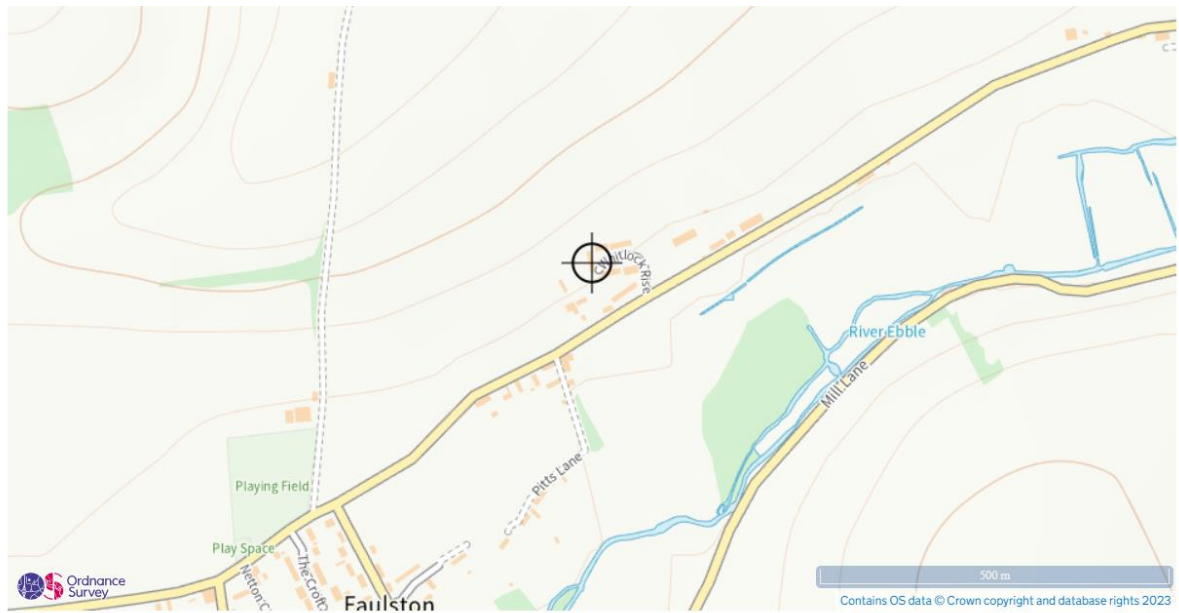
Page 2 of 2





Extent of flooding from rivers or the sea

● High ● Medium ● Low ● Very low ⊕ Location you selected



Maximum extent of flooding from reservoirs:

● when river levels are normal ● when there is also flooding from rivers ⊕ Location you selected



Extent of flooding from surface water

● [High](#) ● [Medium](#) ● [Low](#) ○ [Very low](#) ⊕ Location you selected

Appendix E

Extracts from CIRIA SuDs Manual C753 and Pollution Risk Assessment

- detailed risk assessment methods
- process-based treatment modelling methods (which, where used, are likely to form part of a detailed risk assessment).

Each of these methods is summarised in **Table 26.1** and described in more detail in the subsequent sections.

TABLE 26.1 Approaches to water quality risk management

Design method	Hazard characterisation	Risk reduction	
		For surface water	For groundwater
Simple index approach	Simple pollution hazard indices based on land use (eg Table 26.2 or equivalent)	Simple SuDS hazard mitigation indices (eg Table 26.3 or equivalent)	Simple SuDS hazard mitigation indices (eg Table 26.4 or equivalent)
Risk screening ¹	Factors characterising traffic density and extent of infiltration likely to occur (eg Table 26.5 or equivalent)	N/A	Factors characterising unsaturated soil depth and type, and predominant flow type through the soils (eg Table 26.5 or equivalent)
Detailed risk assessment	Site specific information used to define likely pollutants and their significance	More detailed, component specific performance information used to demonstrate that the proposed SuDS components reduce the hazard to acceptable levels	
Process-based treatment modelling	Time series rainfall used with generic pollution characteristics to determine statistical distributions of likely concentrations and loadings in the runoff	Models that represent the treatment processes in the proposed SuDS components give estimates of reductions in event mean discharge concentrations and total annual load reductions delivered by the system	

Note

¹ Risk assessment may be required as a result of the risk screening process.

Table 4.3 (Chapter 4) sets out which of these methods is required – for different generic land use types and receiving waters. Process-based modelling is not currently readily available for SuDS design in the UK, and is not therefore specified as a requirement. However, where robust models can be developed by designers, this approach should not be discounted as a future option for SuDS design.

It is important to ensure that risks to both surface and groundwater are managed effectively, and the approach taken should be agreed with the drainage approving body and/or environmental regulator in advance of the design, as local differences in requirements may exist.

Approaches that consider a number of key pollutant types are recommended because:

- receiving water quality standards tend to be specified in terms of individual pollutant thresholds (**Section 26.4**)
- different components tend to have different capacities to remove different types of pollutants (**Section 26.6**)
- any component (proprietary product or otherwise) will need to demonstrate performance across a range of pollutants, or where this is not possible, different types of component will be needed to remove different pollutants. A series of sediment removal components, such as gulley pots, would be unlikely to meet the performance requirements for the full suite of pollutants.

26.7.1 Simple index approach

The simple method described in this section, and summarised in **Box 26.2**, has been developed from that set out in Ellis *et al* (2012), a summary of which is presented in **Annex 5**.

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
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

Notes

- 1 Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).
- 2 These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Where a site land use falls outside the defined categories, the indices should be adapted (and agreed with the drainage approving body) or else the more detailed risk assessment method should be adopted.

Where nutrient or bacteria and pathogen removal is important for a particular receiving water, equivalent indices should be developed for these pollutants (if acceptable to the drainage approving body) or the risk assessment method adopted.

Where the mitigation index of an individual component is insufficient, two components (or more) in series will be required, where:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

Where:

mitigation Index_n = mitigation index for component n

A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations.

TABLE 26.4 Indicative SuDS mitigation indices for discharges to groundwater

Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates ¹	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.6 ⁴	0.5	0.6
A soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.4 ⁴	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment, ie graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20 mm gravel) underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.4 ⁴	0.4	0.4
Constructed permeable pavement (where a suitable filtration layer is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.8 ⁴	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 inflow concentrations relevant to the contributing drainage area.		

Notes

- 1 All designs must include a minimum of 1 m unsaturated depth of aquifer material between the infiltration surface and the maximum likely groundwater level (as required in infiltration design – **Chapter 25**).
- 2 For example as recommended in Sniffer (2008a and 2008b), Scott Wilson (2010) or other appropriate guidance.
- 3 Alternative depths may be considered where it can be demonstrated that the combination of the proposed depth and soil characteristics will provide equivalent protection to the underlying groundwater – see note 1.
- 4 If significant volumes of sediment are allowed to enter an infiltration system, there will be a high risk of rapid clogging and subsequent system failure.
- 5 See **Chapter 14** for approaches to demonstrate product performance. Note: a British Water/Environment Agency assessment code of practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: www.britishwater.co.uk/Publications/codes-of-practise.aspx
- 6 SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution, where there is a requirement to retrofit treatment. WAT-RM-08 (SEPA, 2014) also provides a flowchart with a summary of checks on suitability of a proprietary system.

The following should be noted:

- Where the indices are not considered representative by the designer, a risk assessment can be undertaken (**Section 26.7.3**).
- Components should always be designed for treatment, as described in the design guidance set out in the individual component chapters. If they are undersized, incorrectly designed or constructed or inadequately maintained, their treatment performance could be significantly affected. Component checklists (**Appendix B**) can be used to confirm design and construction adequacy and set appropriate maintenance regimes.
- Where the infiltration component itself does not provide sufficient pollution mitigation, the design should include upstream SuDS components that are lined to prevent infiltration from occurring. The mitigation indices set out in **Table 26.3** (for discharges to surface water) should be used for any upstream treatment.

Whitlocks, Bishopstone

Pollution Risk Assessment – Simple Index Approach – CIRIA 753

IMA-23-132

January 2026

House Roofs

Table 26.2 classifies the pollution hazard level from residential roofs as very low.

Private Drives

In general it is proposed to surface private drives and car parking areas with porous paving. Table 26.2 identifies pollution hazard indices for residential car parks at 0.5, 0.4 and 0.4 (TSS, metals and hydrocarbons). Table 26.4 lists mitigation indices for permeable pavement at 0.7, 0.6 and 0.7 (TSS, metals and hydrocarbons). As the mitigation indices are greater than the hazard indices the design would acceptably address the pollution risks.

Development Access Road

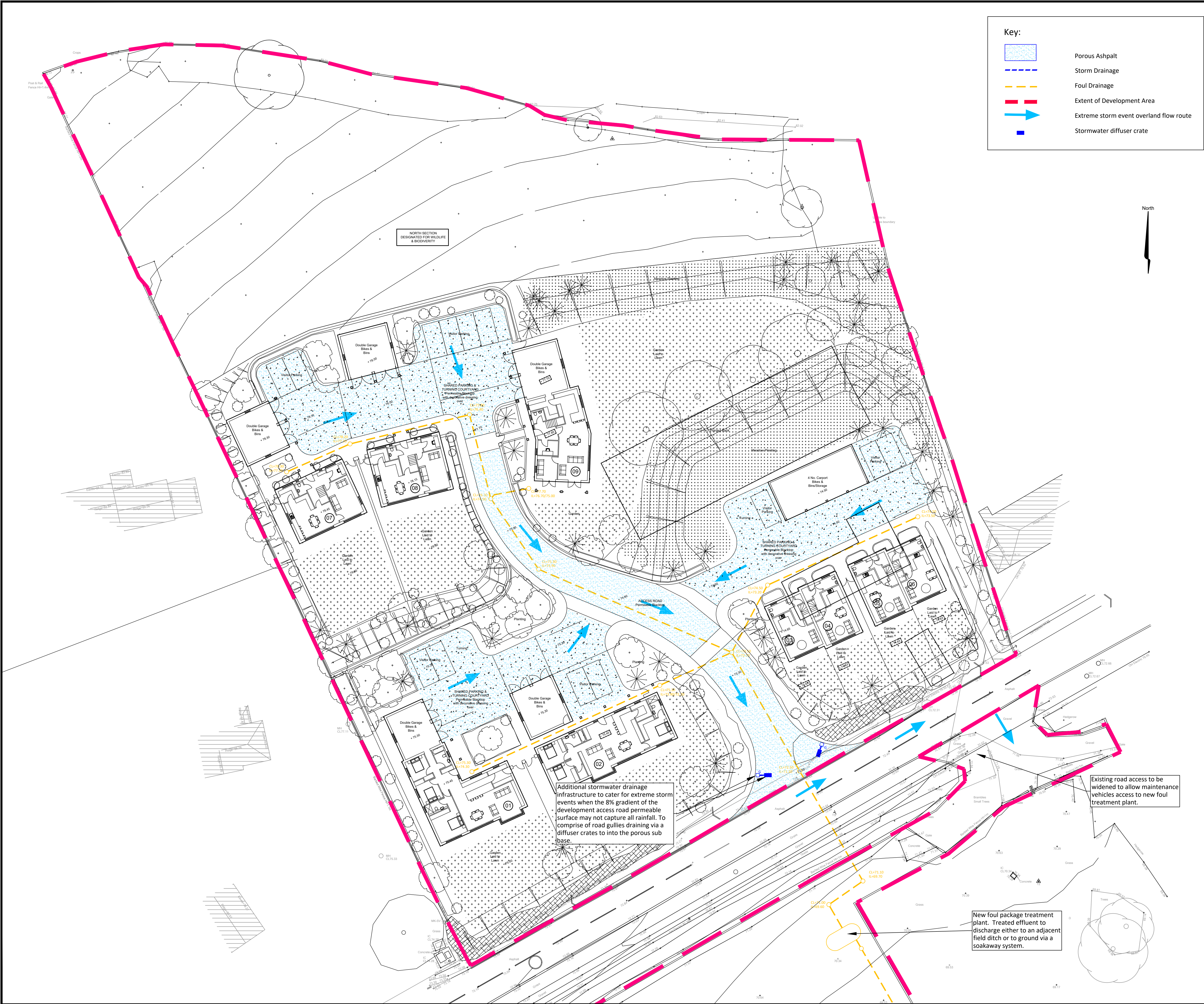
It is proposed to drain the highway to porous paving. Table 26.2 identifies pollution hazard indices for low traffic roads at 0.5, 0.4 and 0.4 (TSS, metals and hydrocarbons). Table 26.4 lists mitigation indices for permeable pavement at 0.7, 0.6 and 0.7.

Conclusions

We conclude that these proposals to discharge surface water to ground will not adversely impact the underlying aquifer.

Appendix F

Schematic Drainage Layout



- Notes:
1. Trafficked surfaces to be generally in permeable asphalt and drain to ground.
 2. At the access junction additional road gullies will be provided that will discharge into the porous sub base. This will provide further containment of surface water flows during extreme stormwater events so limiting the probability of development surface water discharging onto the public highway.
 3. Roof drainage and private drives to either discharge to the porous paved parking courtyards or to private house soakaways. To be resolved at detailed design stage.
 4. Foul drainage to discharge to a new package treatment plant located to the south of the adjacent highway.

REV	DATE	BY	DESCRIPTION	CHK	APP
C	30.01.2026	JMS	Development layout revised	DS	DS
B	18.01.2026	JMS	Development layout revised	DS	DS
A	26.02.2025	JMS	Overland flow routes added	DS	DS
-	2.02.2025	JMS	First issue	DS	DS

DRAWING STATUS: FOR CONSULTAION

I

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A

TRANSPORT PLANNING

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BATH BA1 2BT
T: 01225 444 011
www.ima-tp.com

CLIENT: Cherrington Planning

PROJECT: Whitlocks, Bishopstone
Wiltshire

TITLE: Schematic
Drainage
Layout

SCALE: (A3)	CHECKED:	APPROVED:
1:250	DS	DS
CAD FILE:	DESIGN/DRAWN:	DATE:
IMA-23-132-002.dwg	JMS	March 2025
PROJECT No:	DRAWING No:	REV:
IMA-23-132	002	C

Appendix G

Microdrainage Assessment of Porous Paving

IMA Transport Planning Ltd				Page 1																																																																																																																																																																																																																			
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<u>Summary of Results for 100 year Return Period (+45%)</u> Half Drain Time : 1 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>99.012</td><td>0.012</td><td>6.1</td><td>0.4</td><td>O K</td></tr><tr><td>30 min Summer</td><td>99.011</td><td>0.011</td><td>5.6</td><td>0.3</td><td>O K</td></tr><tr><td>60 min Summer</td><td>99.008</td><td>0.008</td><td>4.1</td><td>0.2</td><td>O K</td></tr><tr><td>120 min Summer</td><td>99.006</td><td>0.006</td><td>2.9</td><td>0.2</td><td>O K</td></tr><tr><td>180 min Summer</td><td>99.004</td><td>0.004</td><td>2.1</td><td>0.1</td><td>O K</td></tr><tr><td>240 min Summer</td><td>99.004</td><td>0.004</td><td>1.9</td><td>0.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>99.003</td><td>0.003</td><td>1.4</td><td>0.1</td><td>O K</td></tr><tr><td>480 min Summer</td><td>99.002</td><td>0.002</td><td>1.1</td><td>0.1</td><td>O K</td></tr><tr><td>600 min Summer</td><td>99.002</td><td>0.002</td><td>0.9</td><td>0.1</td><td>O K</td></tr><tr><td>720 min Summer</td><td>99.002</td><td>0.002</td><td>0.9</td><td>0.1</td><td>O K</td></tr><tr><td>960 min Summer</td><td>99.001</td><td>0.001</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>99.001</td><td>0.001</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>99.001</td><td>0.001</td><td>0.6</td><td>0.0</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>99.001</td><td>0.001</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>99.001</td><td>0.001</td><td>0.4</td><td>0.0</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>99.000</td><td>0.000</td><td>0.1</td><td>0.0</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>99.000</td><td>0.000</td><td>0.0</td><td>0.0</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>99.000</td><td>0.000</td><td>0.0</td><td>0.0</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>99.000</td><td>0.000</td><td>0.0</td><td>0.0</td><td>O K</td></tr><tr><td>15 min Winter</td><td>99.012</td><td>0.012</td><td>6.1</td><td>0.4</td><td>O K</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>135.811</td><td>0.0</td><td>10</td></tr><tr><td>30 min Summer</td><td>91.234</td><td>0.0</td><td>18</td></tr><tr><td>60 min Summer</td><td>58.437</td><td>0.0</td><td>34</td></tr><tr><td>120 min Summer</td><td>36.084</td><td>0.0</td><td>62</td></tr><tr><td>180 min Summer</td><td>26.785</td><td>0.0</td><td>92</td></tr><tr><td>240 min Summer</td><td>21.529</td><td>0.0</td><td>122</td></tr><tr><td>360 min Summer</td><td>15.846</td><td>0.0</td><td>182</td></tr><tr><td>480 min Summer</td><td>12.728</td><td>0.0</td><td>242</td></tr><tr><td>600 min Summer</td><td>10.729</td><td>0.0</td><td>312</td></tr><tr><td>720 min Summer</td><td>9.326</td><td>0.0</td><td>344</td></tr><tr><td>960 min Summer</td><td>7.469</td><td>0.0</td><td>474</td></tr><tr><td>1440 min Summer</td><td>5.451</td><td>0.0</td><td>708</td></tr><tr><td>2160 min Summer</td><td>3.970</td><td>0.0</td><td>1104</td></tr><tr><td>2880 min Summer</td><td>3.166</td><td>0.0</td><td>1360</td></tr><tr><td>4320 min Summer</td><td>2.297</td><td>0.0</td><td>2356</td></tr><tr><td>5760 min Summer</td><td>1.827</td><td>0.0</td><td>2888</td></tr><tr><td>7200 min Summer</td><td>1.531</td><td>0.0</td><td>0</td></tr><tr><td>8640 min Summer</td><td>1.325</td><td>0.0</td><td>0</td></tr><tr><td>10080 min Summer</td><td>1.173</td><td>0.0</td><td>0</td></tr><tr><td>15 min Winter</td><td>135.811</td><td>0.0</td><td>11</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	99.012	0.012	6.1	0.4	O K	30 min 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7200 min Summer	99.000	0.000	0.0	0.0	O K																																																																																																																																																																																																																		
8640 min Summer	99.000	0.000	0.0	0.0	O K																																																																																																																																																																																																																		
10080 min Summer	99.000	0.000	0.0	0.0	O K																																																																																																																																																																																																																		
15 min Winter	99.012	0.012	6.1	0.4	O K																																																																																																																																																																																																																		
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)																																																																																																																																																																																																																				
15 min Summer	135.811	0.0	10																																																																																																																																																																																																																				
30 min Summer	91.234	0.0	18																																																																																																																																																																																																																				
60 min Summer	58.437	0.0	34																																																																																																																																																																																																																				
120 min Summer	36.084	0.0	62																																																																																																																																																																																																																				
180 min Summer	26.785	0.0	92																																																																																																																																																																																																																				
240 min Summer	21.529	0.0	122																																																																																																																																																																																																																				
360 min Summer	15.846	0.0	182																																																																																																																																																																																																																				
480 min Summer	12.728	0.0	242																																																																																																																																																																																																																				
600 min Summer	10.729	0.0	312																																																																																																																																																																																																																				
720 min Summer	9.326	0.0	344																																																																																																																																																																																																																				
960 min Summer	7.469	0.0	474																																																																																																																																																																																																																				
1440 min Summer	5.451	0.0	708																																																																																																																																																																																																																				
2160 min Summer	3.970	0.0	1104																																																																																																																																																																																																																				
2880 min Summer	3.166	0.0	1360																																																																																																																																																																																																																				
4320 min Summer	2.297	0.0	2356																																																																																																																																																																																																																				
5760 min Summer	1.827	0.0	2888																																																																																																																																																																																																																				
7200 min Summer	1.531	0.0	0																																																																																																																																																																																																																				
8640 min Summer	1.325	0.0	0																																																																																																																																																																																																																				
10080 min Summer	1.173	0.0	0																																																																																																																																																																																																																				
15 min Winter	135.811	0.0	11																																																																																																																																																																																																																				
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IMA Transport Planning Ltd					Page 2	
11 Kingsmead Square		Bishopstone				
Bath		IMA-23-132				
BA1 2AB		Porous Paving				
Date 2/24/2025 11:20 AM		Designed by JMS				
File		Checked by				
Causeway		Source Control 2020.1				
Summary of Results for 100 year Return Period (+45%)						
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	
30 min Winter	99.010	0.010	4.9	0.3	O K	
60 min Winter	99.007	0.007	3.4	0.2	O K	
120 min Winter	99.004	0.004	2.1	0.1	O K	
180 min Winter	99.003	0.003	1.6	0.1	O K	
240 min Winter	99.003	0.003	1.4	0.1	O K	
360 min Winter	99.002	0.002	1.1	0.1	O K	
480 min Winter	99.002	0.002	0.9	0.1	O K	
600 min Winter	99.001	0.001	0.6	0.0	O K	
720 min Winter	99.001	0.001	0.6	0.0	O K	
960 min Winter	99.001	0.001	0.6	0.0	O K	
1440 min Winter	99.001	0.001	0.4	0.0	O K	
2160 min Winter	99.001	0.001	0.4	0.0	O K	
2880 min Winter	99.001	0.001	0.4	0.0	O K	
4320 min Winter	99.001	0.001	0.4	0.0	O K	
5760 min Winter	99.000	0.000	0.0	0.0	O K	
7200 min Winter	99.000	0.000	0.0	0.0	O K	
8640 min Winter	99.000	0.000	0.0	0.0	O K	
10080 min Winter	99.000	0.000	0.0	0.0	O K	
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)			
30 min Winter	91.234	0.0	18			
60 min Winter	58.437	0.0	32			
120 min Winter	36.084	0.0	60			
180 min Winter	26.785	0.0	92			
240 min Winter	21.529	0.0	134			
360 min Winter	15.846	0.0	188			
480 min Winter	12.728	0.0	216			
600 min Winter	10.729	0.0	286			
720 min Winter	9.326	0.0	356			
960 min Winter	7.469	0.0	438			
1440 min Winter	5.451	0.0	718			
2160 min Winter	3.970	0.0	1320			
2880 min Winter	3.166	0.0	1248			
4320 min Winter	2.297	0.0	2140			
5760 min Winter	1.827	0.0	0			
7200 min Winter	1.531	0.0	0			
8640 min Winter	1.325	0.0	0			
10080 min Winter	1.173	0.0	0			
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11 Kingsmead Square	Bishopstone	
Bath	IMA-23-132	
BA1 2AB	Porous Paving	
Date 2/24/2025 11:20 AM	Designed by JMS	
File	Checked by	
Causeway	Source Control 2020.1	

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.900	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.010

Time (mins)		Area
From:	To:	(ha)
0	4	0.010

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11 Kingsmead Square	Bishopstone	
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File	Checked by	
Causeway	Source Control 2020.1	

Model Details

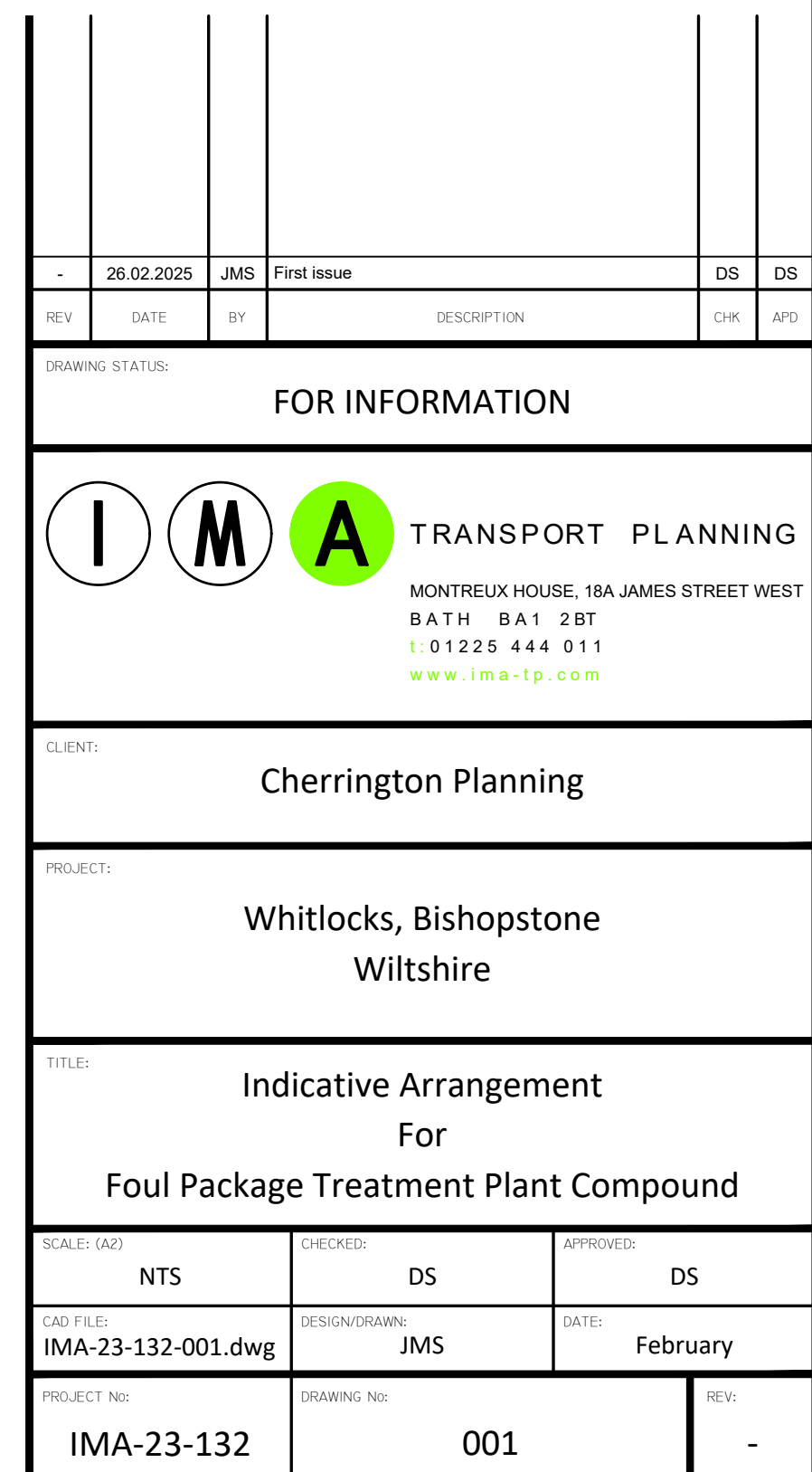
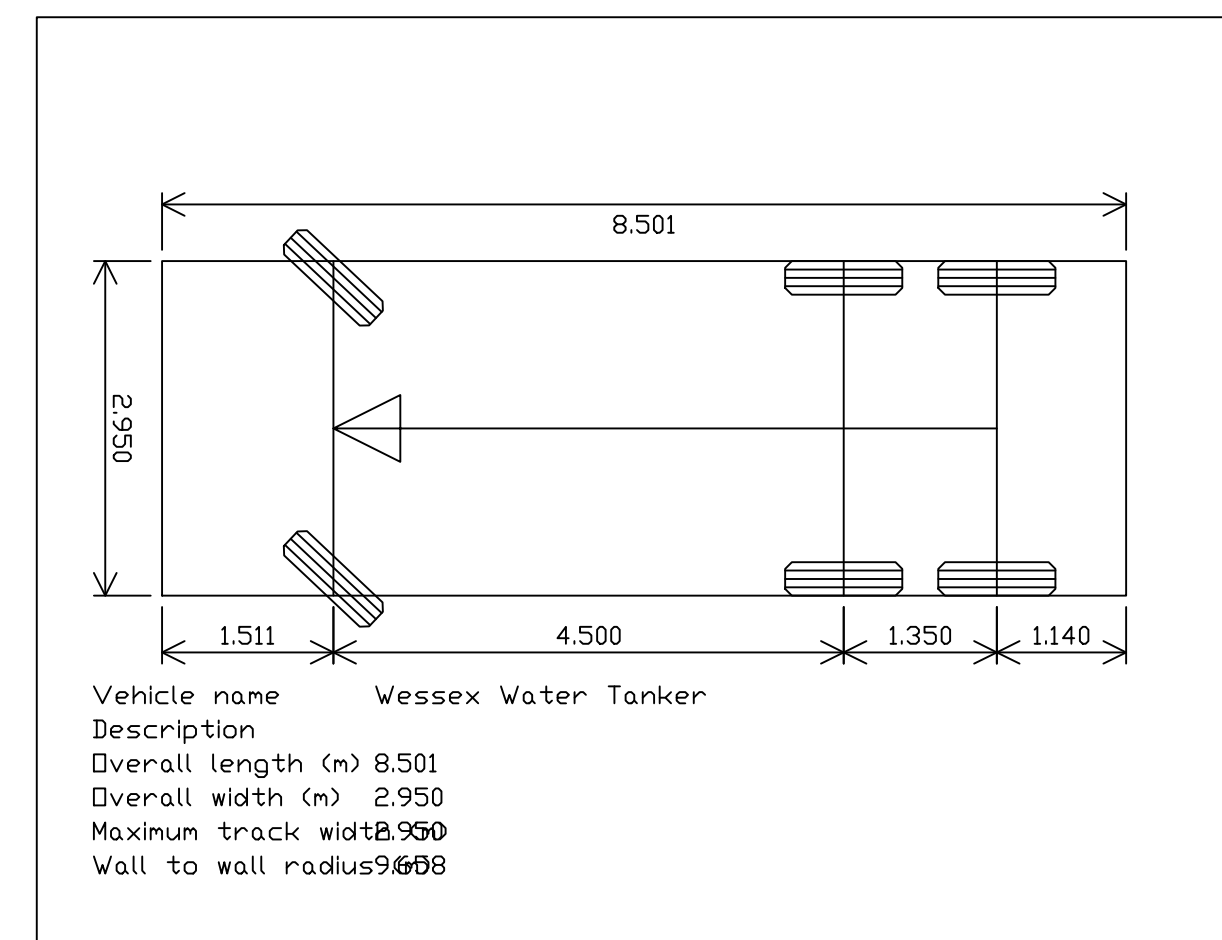
Storage is Online Cover Level (m) 100.000

Porous Car Park Structure

Infiltration Coefficient Base (m/hr)	1.80000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	99.000	Membrane Depth (m)	0

Appendix H

Indicative Arrangement for Foul treatment Plant



Appendix I

Ground Permeability Testing