



Defence Infrastructure Organisation Bulford Service Families Accommodation Site - Bulford Camp Sling Road

Flood Risk Assessment and Drainage Strategy

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Flood Risk Assessment and Drainage Strategy

DEFENCE INFRASTRUCTURE ORGANISATION

PROPOSED DEVELOPMENT AT BULFORD, SLING ROAD

January 2026

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Executive Summary

WSP has undertaken this Flood Risk Assessment (FRA) and prepared this Outline Drainage Strategy (ODS) on behalf of Defence Infrastructure Organisation to support the planning application for the construction of a new residential (Use class C3) development sited on Bulford Barracks, Salisbury. The OS Grid Reference for the approximate centre of the 1.13 Ha Site is National Grid Reference 418914, 144399.

This FRA investigates flood risk on-site and in the area and outlines the mitigation measures proposed to ensure the sustainable and safe development of the Site in line with the requirements of the National Planning Policy Framework (NPPF), the Flood Risk and Coastal Change Planning Practice Guidance (PPG) and the Environment Agency's (EA) Standing Advice.

The Site is located in Flood Zone 1 where the probability of river or sea flooding is less than 0.1% (1 in 1,000) chance in any given year. Available baseline information indicates that Site is at low or very low risk of flooding from all sources, including fluvial, tidal, surface water, groundwater, sewer and reservoir flooding. The most recent EA Climate Change Guidance shows that the Site remains at low or very low risk for the project 2036 to 2069 climate change scenario.

Minimal flood risk mitigation measures are required to ensure the Proposed Development remains safe from flooding throughout its lifetime. A minimum finished floor levels 150mm above the average ground level, is considered appropriate. An Exceedance Flow Routes plan has been developed to show how surface water resulting from blockages or exceedance flow events can be safely accommodated within the Site.

No infiltration testing has taken place on site however the ground conditions are known to be underlain with chalk as such we assume soakaways are viable and as such the recommended method of surface water removal. Attenuation prior to infiltration is provided in permeable surfacing of driveways, a swale and geocollar tank units to the west of the buildings.

It is proposed to discharge foul water from the Proposed Development to the existing foul drain to the south of the site. It should be noted that as this drain is shallow ground levels off site will require lifting to protect the proposed connecting pipework.

This Flood Risk and Drainage Strategy report concludes that this development is appropriate in its proposed location, can be occupied safely for its lifetime and does not increase flood risk elsewhere. This will be secured through the implementation of the recommended flood risk mitigation measures and design for surface water and foul water drainage.

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Project Summary

WSP has been commissioned by Defence Infrastructure Organisation (DIO) to carry out a Flood Risk Assessment and Drainage Strategy in advance of proposed development at Bulford Camp, in Bulford, near Salisbury, Wiltshire. The scheme comprises the construction of eight homes with associated garages and supporting infrastructure. This report aims to prove that the site is safe from flooding and development does not increase flood risk elsewhere by employing a drainage strategy which follows best practice guidance.

1. Introduction

1.1 Appointment and Brief

- 1.1.1 WSP has been commissioned by Defence Infrastructure Organisation (DIO) to carry out a Flood Risk Assessment and Drainage Strategy in advance of proposed development at Bulford Camp, in Bulford, near Salisbury, Wiltshire. The scheme comprises the construction of eight homes with associated garages and supporting infrastructure.
- 1.1.2 This report is intended for the sole benefit of the parties named above and shall not be capable of assignment. WSP shall not be liable for any use of the report for any reasons other than that for which the report was originally prepared and provided.
- 1.1.3 Although this report was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances, please note that WSP cannot take responsibility for errors in the information provided by third parties.

1.2 Objective of Study and Methodology

- 1.2.1 This report investigates flood risk on Site and in the area and establishes the mitigation measures required to ensure the sustainability and safety of the Proposed Development over its lifetime.
- 1.2.2 The report has been produced in line with the requirements of the NPPF and the Environment Agency (EA) as well as through consultation with Wiltshire Council (NCC) as the Lead Local Flood Authority (LLFA) for this area.
- 1.2.3 The following documents and policies have been reviewed to inform this report:
- National Planning Policy Statement: Development and Flood Risk (PPS25) Annex B Climate Change.
 - National Standards for Sustainable Drainage Systems (SuDS), DEFRA 2025.
 - Sustainable Drainage Systems Written Statement HCWS161 (2014).
 - Climate Change Allowances for Rainfall Intensity in England.
 - The SuDS Manual (CIRIA C753), CIRIA (2021).
 - Part H of the Building Regulations HM Government (2015).
 - The Design and Construction Guidance (DCG) in Appendix C of the Sewerage Sector Guidance (SSG), Water UK (2022).
 - Wiltshire Council Level 1 SFRA
 - Wiltshire Council Drainage and Betterment Strategy (2024)
 - British Geological Society (BGS) Online Viewer, 1:50,000 Bedrock and Superficial deposits.

- DEFRA's online Magic Map; and
- GOV.UK's online Long-Term Flood Maps.

1.2.4 The following surveys also been reviewed to inform this report:

- WSP – Topographical Survey
- WSP – GPR Services Survey

1.2.5 In undertaking this study, the local policies discussed in **Section 5** have also been considered.

1.2.6 This report makes use of third-party information and contains Environment Agency information.

1.2.7 The insurance industry applies its own assessments to properties in terms of determining premiums and the insurability for flood risk. Those intending to undertake development in areas which may be at risk of flooding are advised to contact their insurers or the Association of British Insurers (ABI) to seek further guidance prior to commencement.

1.2.8 WSP does not warrant that the advice in this flood risk assessment will guarantee the availability of flood insurance either now or in the future.

2. Existing Site

2.1 Site Location

- 2.1.1 The Site is located within Bulford Barracks, off Sling Rd, Salisbury, SP4 9AT. The OS Grid Reference for the approximate centre of the Site is National Grid Reference 418914, 144399. Refer to figure 2.1 below for the Site Location Plan, also provided in **Appendix A**.



Figure 2.1 Site Location Plan

- 2.1.2 The site is bound by woodland to the south and west and residential properties to the north. Sling Rd is to the east.

2.2 Site Description

- 2.2.1 The 1.13-hectare (ha) site currently consists of open land.
- 2.2.2 Previously the site housed buildings during World War 1 however these have since been demolished.
- 2.2.3 The Site typically falls from east to west 40.70 and 41.00 m AOD with a high point of 41.45 m AOD located in the southern part of the Site. Mayfly Way is generally at a lower level, with levels along the northern and eastern boundary of the Site varying between 40.60 and 41.0 and rising slightly to the south.
- 2.2.4 Refer to **Appendix B** for the Topographical Survey.

2.3 Geology and Hydrogeology

- 2.3.1 The British Geological Survey (BGS) digital mapping has no information regarding the overlying ground strata on site however the bedrock is Seaford Formation Chalk. This suggests infiltration should be viable.
- 2.3.2 On site infiltration testing has been requested to confirm the viability of soakaways on site however the results of which are not yet available. As such at this stage we assume a conservative infiltration rate of 5mm/hr.

2.4 Existing Watercourses, Flood Defences and Structures

- 2.4.1 The closest surface waterbody is Nine Mile River approximately 350m to the west of the site
- 2.4.2 The site is not at risk of flooding; there are no flood defences in place around the site.

2.5 Existing Sewers and Drainage

- 2.5.1 There are no public sewers located in proximity to the site which are owned by Wessex Water. See sewer records in Appendix C
- 2.5.2 The site was previously occupied by Barrack residences during World War 2. This discharged foul and surface run off to private drains on the northern and southern edges of the site and off site to the west. An extract is shown below in. These have since been adopted by Veolia.
- 2.5.3 There are no surface water drains near the site. There are no gullies serving Sling Rd near the site.

3. The Proposed Development

3.1 Summary

- 3.1.1 The Proposed Development adds 8 dwellings to the site with associated roadways and parking areas.
- 3.1.2 A copy of the Proposed Site Plan can be seen in **Figure 3.1** and is included in **Appendix D**.

Figure 3.1 Proposed Site Plan



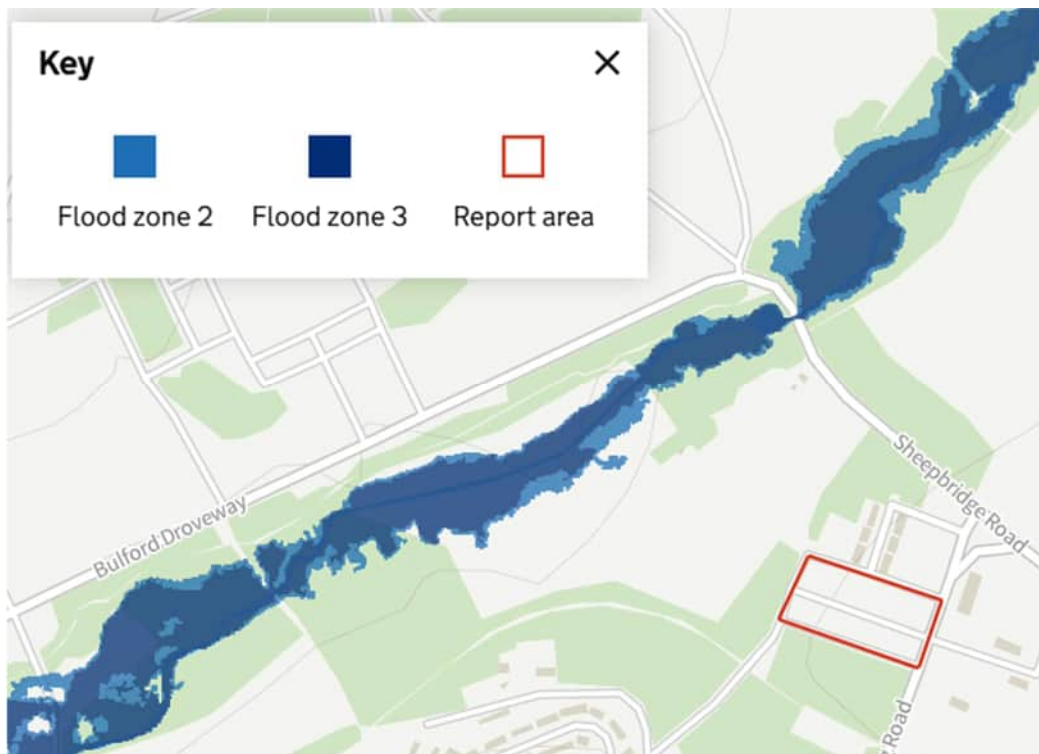
3.2 Flood Zone

3.2.1 The National Planning Policy Framework (NPPF) categorises flood risk as follows:

- **Zone 1 (low probability)** – Land assessed as having less than a 1 in 1,000 annual probability of river or sea flooding (<0.1%).
- **Zone 2 (medium probability)** – Land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year; and
- **Zone 3a (high probability)** - Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
- **Zone 3b The Functional Floodplain** - This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk.

3.2.2 Based on the EA Flood Map for Planning, seen in **Figure 3.2** below and provided in **Appendix E**, the Site is located in Flood Zone 1, at the lowest risk of flooding, suitable for all development

Figure 3.2 EA Flood Map for Planning



3.3 Vulnerability Classification

- 3.3.1 Based on Annex 3 of the Flood Risk and Coastal Change Chapter of the Planning Practice Guidance (PPG) (2016), the Proposed Development will have uses which are classified as “More Vulnerable”

3.4 Sequential Test

- 3.4.1 As stated in the PPG, a sequential risk-based approach to determine the suitability of land for development in flood risk areas should be applied at all stages of the planning process giving precedence to low flood risk areas wherever possible.
- 3.4.2 Since the Site is in Flood Zone 1 the development is considered appropriate and automatically meets the requirements of the Sequential Test.

3.5 Exception Test

- 3.5.1 In accordance with Table 3 of the PPG development classified as “More Vulnerable” is appropriate within Flood Zone 1 and therefore an Exception Test is not required.

4. Flood Hazard

4.1 Summary of Flood Risk

- 4.1.1 The potential risk of flooding to the Site from all current and future sources of flooding has been assessed in accordance with the National Planning Policy Framework.
- 4.1.2 **Table 4.1** below summarises the findings of the assessment. It should be noted that the designation of risk outlined in **Table 4.1** is prior to the inclusion of any mitigation measures, which may subsequently act to reduce the risk.

Table 4.1 Summary of degree of risk from each source of flooding

Source	Risk
Flood Zone	FZ1 - Low
Fluvial & Tidal	Very Low
Surface Water	Very Low
Groundwater	Low
Sewer	Low
Artificial Sources	Very Low

- 4.1.3 A detailed explanation of the flood risk issues on the Site and determination of flood risk ratings are presented in **Section 4.2 to 4.6**.
- 4.1.4 The flood mapping included in Wiltshire Council's Level 1 Strategic Flood Risk Assessment agree with the EA flood mapping

4.2 Fluvial & Tidal

- 4.2.1 The fluvial flood mapping is shown in section 3.2. The site is within Flood Zone 1, at the lowest risk of flooding from rivers and the sea.

4.3 Surface Water Flooding

- 4.3.1 Overland flow and surface water flooding typically arise following periods of intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems. It can run quickly off land and result in localised flooding. Localised flooding can be attributed to topographic depressions, insufficient capacity within ordinary watercourses and culverts, as well as obstructions to surface water flow paths.

4.3.2

The EA descriptions for the High, Medium and Low risk scenarios for surface water flooding are as follows:

- **High risk** means that each year this area has a chance of flooding of greater than 3.3%.
- **Medium risk** means that each year this area has a chance of flooding of between 1% and 3.3%.
- **Low risk** means that each year this area has a chance of flooding of between 0.1% and 1%.
- **Very Low** risk means that each year this area has a chance of flooding of less than 0.1%.

4.3.3

The Environment Agency Map of long-term flood risk from surface water, shown in **Figure 4.111**, indicates that the Site is generally at very low risk of surface water flooding (less than 1 in 1,000 annual probability).

Figure 4.11 GOV.UK's long term flood risk map for surface water flooding extract



4.3.4

The PFRA flood maps show that the Site is not located in an area susceptible to surface water flooding and there are no historic flood surface water flood events recorded in the vicinity of the Site.

4.3.5

The SFRA flood maps also show that the Site is not located in an area at risk of surface water flooding for either the 1% or 0.1% annual probability storm events.`

4.3.6

Based on the information available, the probability of surface water flooding can be assessed as **very low**.

4.4 Groundwater flooding

- 4.4.1 Groundwater flooding occurs when the water table, the level of water below the ground, rises above the ground surface or into cellars and basements. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks.
- 4.4.2 Wiltshire Council's SFRA identifies the risk of ground water flooding at surface level as low however subsurface assets may be at risk. Given the slope across the site flooding of assets around the site is low. Ground water flooding map included in Appendix F.
- 4.4.3 The government flood mapping website indicates the site is inside a groundwater flood alert area
- 4.4.4 Based on the information available and the assessment undertaken, the probability of groundwater flooding impacting the site is assessed as being **low**.

4.5 Sewer flooding

- 4.5.1 During heavy rainfall, flooding from the sewer system can occur if:
- The rainfall event exceeds the capacity of the sewer system/drainage system.
 - The system becomes blocked by debris, sediment or fat; and
 - The system surcharges due to high water levels in receiving watercourses.
- 4.5.2 There are no public sewers located in the vicinity of the site, therefore there is no risk of this occurring
- 4.5.3 There are no records of flooding from the private network on the site
- 4.5.4 Based on the information available the probability of flooding from the drainage network is assessed as low.

4.6 Artificial Sources of Flooding

- 4.6.1 Non-natural or artificial sources of flooding can include canals, reservoirs, lakes, etc. The potential effects of flood risk management infrastructure and other structures need to be considered.
- 4.6.2 According to the online GOV.UK's Long Term Flood Risk Map website, flooding from reservoirs and similar is unlikely.
- 4.6.3 Based on the above, it is considered the risk of flooding from artificial sources is **very low**.

5. Planning Policy and Guidance

- 5.1.1 This section of the report summaries local policy and guidance relevant to this Flood Risk Assessment and Drainage Strategy for the Site.

5.2 National Planning Policy

National Planning Policy Framework

- 5.2.1 The National Planning Policy Framework (NPPF) was revised in December 2024 (published in March 2012) with the aim of protecting the environment and to promote sustainable growth. There is an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision.
- 5.2.2 The following paragraphs/policies within the NPPF are considered relevant to this assessment:
- Paragraph 170: Requires 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.”*.
 - Paragraph 174: Explains that *“the aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding from any source”*; and
 - Paragraph 181: Explains that *“When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere.”*.
 - Paragraph 182: Recommends that *“major development should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:*
 - a) Take account of advice from the lead local flood authority.*
 - b) Have appropriate proposed minimum operational standards.*
 - c) Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and*
 - d) Where possible, provide multifunctional benefits”*.

Flood Risk and Coastal Change Planning Practice Guidance (PPG)

- 5.2.3 The NPPF is supported by the National Planning Practice Guidance (PPG). One of the specific guidance documents comprising the PPG focuses on Flood Risk and Coastal Change, providing information on the flooding risks that should be considered during the planning process.
- 5.2.4 The Flood Risk and Coastal Change PPG states that an FRA must outline the following:
- Whether a proposed development is likely to be affected by current or future flooding from any source.
 - Whether it will increase flood risk elsewhere; and,
 - Whether the measures proposed to deal with these effects and risks are appropriate.
- 5.2.5 The NPPF Flood Risk and Coastal Change Planning Practice Guidance (PPG) states that the lifespan of residential development should be considered as 100 years. The lifetime of a non-residential development depends on the characteristics of that development, but a period of at least 75 years is likely to form a starting point for assessment.

DEFRA National Standards for Sustainable Drainage Systems (SuDS) (2025)

- 5.2.6 The National Standards for Sustainable Drainage Systems (SuDS) replaces the 2015 Non-Statutory Sustainable Drainage Technical Standards. The document sets out a comprehensive framework of seven standards for managing surface water in new developments across England. That national standards are no longer non-statutory advice but form a performance or method-based requirement of the standards which can only be varied through a departure agreed with the approving body. The key points are summarised below.
- 5.2.7 A 'SuDS approach' shall be adopted to address the management of surface water be the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development. Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:
- Priority 1: collected for non-potable use i.e. rainwater harvesting
 - Priority 2: infiltrated to ground
 - Priority 3: discharged to an above ground surface water body
 - Priority 4: discharged to a surface water sewer, or another piped surface water drainage system
 - Priority 5: discharged to a combined sewer.

- 5.2.8 A 'SuDS approach' shall be adopted to address the management of development runoff during extreme rainfall, including allowances for climate change and urban creep. When discharging to an above ground surface water body, sewer or other piped drainage system, the surface water runoff (rate and volume) for the 1% annual exceedance probability (AEP) event shall be controlled to ensure the runoff from the development does not increase flood risk elsewhere. The surface water runoff rate for the 50% AEP event shall be controlled to ensure the development runoff has no negative impact.
- 5.2.9 Any flooding from the surface water drainage systems for events up to the 1% AEP event shall be managed within the development. Any flooding from off-site sources for the 1% AEP event should be managed on site or safely routed through the site, ensuring any downstream risks are not increased compared to the pre-development scenario. No flooding occurs on site for storm events upto the 1 in 100-year return period within climate change allowance.
- 5.2.10 A 'SuDS approach' shall be applied that protected surface waters, groundwater and coastal waters by managing the quality of the surface water runoff to adequately address water quality risks from the development. The proposed SuDS management train(s) shall be based on a robust water quality risk assessment, appropriate to the pollution hazard and sensitivity of receiving waters, reflecting industry recognised guidance or other quantitative assessment.

Part H of the Building Regulations

- 5.2.11 Requirement H3 of the Building Regulations 2010 (2015 Edition) establishes a preferred hierarchy for surface water disposal. Consideration should first be given to discharge into soakaways, infiltration systems and watercourses in that priority order.
- 5.2.12 Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, would be a suitable solution for surface water disposal appropriate in this situation.
- 5.2.13 If other methods of surface water disposal are not viable and subject to providing satisfactory evidence as to why they have been discounted, site surface water may discharge to the public sewer at a rate of discharge agreed with Yorkshire Water.

Sustainable Drainage Systems Written Statement HCWS161 (2014)

- 5.2.14 The Secretary of State for Communities and Local Government laid a Written Ministerial Statement in the House of Commons on 18th December 2014 setting out changes to planning that will apply for major development from 6th April 2015. This confirms that in considering planning applications, local planning authorities should consult the relevant Lead Local Flood Authority on the management of surface water; satisfy themselves that the proposed minimum standards of operation are appropriate and ensure through the use of planning conditions or obligations that there are clear arrangements in place for ongoing maintenance over the lifetime of the development.

- 5.2.15 Therefore, from 6th April 2015 local planning policies and decisions on planning applications relating to major development are required to ensure that sustainable drainage systems (SuDS) are used for the management of surface water.
- 5.2.16 Major development is development involving any one or more of the following:
- The winning and working of minerals or the use of land for mineral-working deposits.
 - Waste development.
 - The provision of 10 dwellings or more.
 - The provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more: or
 - Development carried out on a site having an area of 1 hectare or more.

5.3 Local Planning Policy

Wiltshire Council Level 1 Strategic Flood Risk Assessment (2024)

- 5.3.1 The SFRA prepared by JBA on behalf of Wiltshire Council is a high-level screening exercise to located areas in which the risk of surface water and groundwater flooding is significant and warrants further examination through the production of maps and management plans.
- 5.3.2 The flood maps, where different from the government mapping contained within the SFRA are addressed in **Section 4** of this report.

Wiltshire Core Strategy (January 2015)

- 5.3.3 The Wiltshire Core Strategy report describes the planning policies affecting proposed developments within the catchment. These are referred to as 'Core Policies'. The policies that are relevant to this report are as follows:

Policy 37 Military Establishments

- 5.3.4 New development and changes of use at operational facilities that help enhance or sustain their operational capability will be supported.
- 5.3.5 Redevelopment, conversion or change of use of redundant MoD sites and buildings will be supported provided they are well related to an existing settlement in terms of both location and scale. Sites that are remote from settlements should only be considered where the existing buildings and infrastructure on the site are suitable for redevelopment, conversion or change of use. Redevelopment proposals will not exceed the existing building footprint and floorspace unless they are well located to an existing settlement. The focus will be on employment-led development, and other uses should be determined through a master planning approach with the local community.

- 5.3.6 Development at operational or redundant sites should enhance the overall character of the site. All development at operational or redundant sites should mitigate any adverse impacts on local infrastructure and not erode the character of the surrounding area. All proposals must ensure that the cultural and historical significance of the military facilities located on the site are understood and inform the scope of future development of that site.

Policy 67 Flood Risk

- 5.3.7 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.
- 5.3.8 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

6. Climate Change

6.1 Background Information

- 6.1.1 As explained in the Climate Change Adaptation Sub-Committee Progress Report 2014, increased flood risk is the greatest threat to the UK from climate change. Models of the climate system suggest floods of the type experienced in England and Wales in autumn 2000, and between December 2013 and February 2014, have become more likely as a consequence of increased concentrations of greenhouse gases in the atmosphere.
- 6.1.2 More frequent short-duration, high intensity rainfall and more frequent periods of long-duration rainfall could be expected. Sea levels are also expected to continue to rise.
- 6.1.3 This Environment Agency 'Flood Risk Assessments: Climate Change Allowances' guidance was updated on 27th May 2022.

6.2 Peak Rainfall Intensity

- 6.2.1 In the latest EA guidance peak rainfall allowances are provided for the 1% and 3.3% annual exceedance probability events (AEP) for two epochs.
- 6.2.2 The guidance on how to apply peak rainfall allowances has changed, using the central allowance for development with a lifetime up to 2100 and the upper end allowance for development with a lifetime from 2100 to 2125.
- 6.2.3 The updated guidance for peak rainfall intensities states that for developments with a lifetime beyond 2100 *"For flood risk assessments and strategic flood risk assessments assess the upper end allowances. You must do this for both the 1% and 3.3% annual exceedance probability events for the 2070s epoch (2061 to 2125). Design your development so that for the upper end allowance in the 1% annual exceedance probability event: there is no increase in flood risk elsewhere and your development will be safe from surface water flooding."*
- 6.2.4 For development with a lifetime of between 2061 and 2100 the same approach should be taken but use the central allowance for the 2070s epoch.
- 6.2.5 The contingency allowances for climate change that are potentially applicable to this site are stated in the NPPF:
- 6.2.6 The PPG guidance states that for non-residential developments a development lifespan of at least 75 years is likely to form a starting point for assessment.
- 6.2.7 Based on an assumed development lifespan of 75 years, it is prudent to utilise the 2070s epoch upper end allowances which are as follows:
- 35% increase for 3.3% annual exceedance rainfall event.
 - 40% increase for the 1% annual exceedance rainfall event.
- 6.2.8 When undertaking the drainage strategy design, the attenuation volumes will be determined using these allowances.

7. Flood Risk Mitigation Measures

7.1 Flood Risk Mitigation

- 7.1.1 This section of the report details the flood risk mitigation measures required to manage the identified risk of flooding from different sources. The below is based on best practice.
- 7.1.2 As stated in section 4 the risk of flooding to the site is minimal therefore more extensive mitigation methods are not required

7.2 Finished Floor Levels

- 7.2.1 The Site is located in Flood Zone 1 and has been shown to have a very low or low risk of flooding from all sources, both now and when the impact of climate change is considered. As such there are no specific restrictions on minimum finished floor levels (FFL).
- 7.2.2 It is recommended that floor levels be raised 150mm above the average ground level of the Site and adjacent road level in line with general guidance.

7.3 Surface Water Drainage Strategy

- 7.3.1 Any potential risk linked to surface water runoff is limited through design. A new fit-for purpose drainage system designed with capacity to safely attenuate surface water runoff to the 1 in 1-year greenfield runoff rate for all storms up to and including the 1 in 100-year event, plus a 40% allowance for climate change is proposed in the ODS. Refer to **Section 8** below.

7.4 External Site Levels

- 7.4.1 External finished ground levels should be engineered to provide positive drainage, prevent ponding and channel flows away from buildings during exceedance events. It is recommended that buildings have raised thresholds, typically 150mm above external finished ground levels, with a gentle slope falling away.
- 7.4.2 External finished ground levels should also consider where flooding might occur and where water would flow in the event of a drainage system blockage, failure or during exceedance storm events. An Exceedance Flow Route Plan will be prepared following the detailed external levels strategy; runoff will flow away from buildings and run westward toward the watercourse Nine Mile River.
- 7.4.3 The plan will show how excess water that cannot be contained within the pipe network or SuDS features should be directed. It is shown that water can be directed away from buildings and contained on site by manipulating ground levels.

8. Surface Water Drainage Strategy

8.1 Method of disposal

- 8.1.1 It is essential for any new development that surface water is managed effectively to limit the risk off-site as well as on site.
- 8.1.2 Best practise for the management of surface water is based on the DEFRA National Standards for SuDS (2025) and Wiltshire Council's Drainage and Betterment which states that runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development. Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:
- Priority 1: collected for non-potable use i.e. rainwater harvesting
 - Priority 2: infiltrated to ground
 - Priority 3: discharged to an above ground surface water body
 - Priority 4: discharged to a surface water sewer, or another piped surface water drainage system
 - Priority 5: discharged to a combined sewer.

8.2 Rainwater re-use

- 8.2.1 Rainwater harvesting (RWH) is the collection of rainwater runoff for use. Runoff can be collected from roofs and other impermeable areas, stored, treated (where required) and then used for a variety of non-potable purposes such as flushing toilets and external uses such as vehicle washing and irrigation.
- 8.2.2 As the development consists of several separate dwellings RWH beyond the provision of waterbutts serving the downpipes from the roofs would be excessive.

Infiltration

- 8.2.3 As discussed in **Section 2.3** infiltration testing in accordance with BRE Digest 365 has not been carried out however expected viable
- 8.2.4 For the purposes of the report, we assume infiltration is the assumed method of discharge from the site.

Discharge to watercourse

- 8.2.5 As discussed in **Section 2.4.1** the watercourse is over 350m away, therefore impractical to construct a connection.

Discharge to sewer

- 8.2.6 As discussed in **Section 2.5.2** the site has drains to the north and south of the proposed development. These have been determined as foul and as such cannot accept surface water flows.
- 8.2.7 From the Anglian Water records there are no surface water sewers in the vicinity of the site. As such surface water discharge to sewer is not viable.

8.3 Impermeable area

- 8.3.1 The Proposed Site Plan provided in **Appendix D** was measured to determine the impermeable area made up of roofs, access roads and parking bays within the Site boundary.
- 8.3.2 The Site area and impermeable areas are summarised in **Table 8.111**, adapted from the LLFA SuDS Proforma.

Table 8.11 Impermeable areas

	Area (Ha)
Total Application Site Area	1.13
Total area which is to be drained by SuDS	0.216
Impermeable area inside Application Site	0.216
Creep Allowance (0%)	10
Total impermeable area	0.237

8.4 Greenfield runoff rates

- 8.4.1 The Wiltshire Council Drainage and Betterment Strategy states that the LLFA expect to see that discharge rates are restricted to the 1 in 1-year greenfield runoff rate for all events up to and including the 1 in 100 year rainfall event plus climate change.
- 8.4.2 Alternatively, if restricting to the 1 in 1 year greenfield rate is not possible, discharge rates can be limited to a range of equivalent greenfield discharge rates. If this approach is used there should also be an inclusion of long-term storage.
- 8.4.3 The greenfield runoff rates have been calculated using FSR rainfall data using the ICP SuDS method. A coefficient of runoff (Cv) of 1 has been used. The results are summarised in **Table 8.222** below with the full calculations provided in **Appendix I**.

Table 8.22 Greenfield runoff rates

Rainfall Event	Site Discharge (Q in l/s)
1 in 1 year	0.2
1 in 30 year	0.5
1 in 100 year	0.7

8.4.4 As per the above table discharge from the development, should infiltration prove unviable will be restricted to 0.1l/s for storm events upto the 1 in 100 year return period with 40% climate change .

8.5 Attenuation

- 8.5.1 It is proposed that surface water runoff from the site discharge via infiltration at the rates stated in paragraph 2.3, a conservative figure of 5mm/hr.
- 8.5.2 Infodrainage hydraulic modelling software has been used to determine the required amount of attenuation to accommodate the 1 in 100 year storm event plus 40% allowance for climate change using a quick storage estimate.
- 8.5.3 Storage has been calculated using FEH rainfall data to be consistent with the consented drainage strategy for the wider site. A coefficient of runoff (Cv) of 1 has been used in line with LLFA requirements.
- 8.5.4 Between 171 and 250 cubic metres of attenuation are required. Modelling results are included in Appendix H.
- 8.5.5 Should on site testing prove infiltration rates greater than the 5mm/hr assumed is viable on site the required attenuation volume in the tank can be reduced.

8.6 Suds Approach

- 8.6.1 In order to provide the required treatment and attenuation volume, a sequence of SuDS measures are proposed. These reduce the size of the attenuation tank, increase the resilience of the system and increase the scope for providing wider amenity and biodiversity benefits.
- 8.6.2 The SuDS appraisal method defined in the SuDS Manual C753 has been used to identify the most appropriate methods of providing a sustainable surface water attenuation and conveyance to support the development proposals. Potential SUDS features are summarised in the **Table 8.333** below.

Table 8.33 Potential suitability of SuDS features

Type of SuDS	Suitability for Development Proposals	
Rainwater Harvesting	Yes	Water Butts can be provided for the properties however this provides minimal attenuation
Green Roof	No	Simple apex-ed building structures are preferred.
Infiltration Systems	-	To be determined following on site testing
Filter Strips	No	Insufficient land width to accommodate filter strips to the perimeter of the Site.
Filter Drains	No	Insufficient land width to accommodate
Swales	No	Insufficient land width to accommodate swales to the perimeter of the Site.
Bioretention Systems	No	Insufficient land width to accommodate
Pervious Pavements	Yes	Permeable paving systems could be used on the parking areas providing treatment and attenuation
Attenuation Storage Tanks	Yes	Underground storage tanks could be used to provide attenuation
Detention Basins	Yes	Basins can be used to attenuate flow in the land to the west of the development however due to the ground slope extensive ground remodelling may be required
Ponds and Wetlands	Yes	See above, detention basin could be designed to have a permanent water level in dry weather conditions
In Pipe Storage	Yes	Incorporation could offset size of underground storage tank required to achieve the volume of attenuation required.

- 8.6.3 The outline drainage layout and SuDS features is shown in WSP Drawing in Error! Reference source not found.. Attenuation for the site is provided in an infiltration basin with geo-cellular units beneath.

8.7 Water quality

- 8.7.1 The Ardleigh Reservoir which supplies potable water to the area is located downstream of the surface water discharge point. Water quality is therefore a high priority and sufficient treatment provided to surface water is expected as part of the drainage strategy for the Site.
- 8.7.2 The Simple Index Approach to water quality risk management outlined in Chapter 26 of the SuDS Manual (CIRIA C753) has been adopted.
- 8.7.3 Table 26.2 of The SuDS Manual outlines typical pollution hazard indices for expected land uses and is summarised in **Table 8.444** below.

Table 8.44 Pollution hazard indices for expected land use classifications

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leave from the roof)	0.05
Non-residential car parking with infrequent change (e.g. offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas	Medium	0.7	0.6	0.7
Sites where chemicals and fuels are to be delivered, handled, stored, used or manufactured	High	0.8	0.8	0.9

8.7.4 In order to ensure removal of the pollutant loadings as indicated above, a treatment chain of SuDS should be used to ensure no onward pollution of the natural aquatic environment. Table 26.3 of C753, summarised in **Table 8.555** below, outlines pollution mitigation potential of various SuDS components.

Table 8.55 Indicative SuDS mitigation indices for discharge to surface waters

Type of SuDS Component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Filter Strip	0.4	0.4	0.5
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	0.7	0.7	0.5
Proprietary Treatment Systems	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		

8.7.5 Where discharge is to occur to groundwater the groundwater indices in Table 26.4 of C753, summarised in **Table 8.666** below, should be used.

Table 8.66 Indicative SuDS mitigation indices for discharges to groundwater

Type of SuDS Component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
A layer of dense vegetation underlain by a soil with good contaminant attenuation potential of at least 300 mm in depth	0.6	0.5	0.6
A soil with good contaminant attenuation potential of at least 300 mm in depth	0.4	0.3	0.3
Infiltration trench (where a suitable depth of filtration material is included that provides treatment i.e. graded gravel with sufficient smaller particles but not single size coarse aggregate such as 20mm gravel) underlain by a soil with good contaminant attenuation potential of at least 300mm in depth	0.4	0.4	0.4
Constructed permeable paving (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 of at least 300mm in depth	0.7	0.6	0.7
Bioretention underlain by a soil with good contaminant attenuation potential of at least 300 mm in depth	0.8	0.8	0.8
Proprietary Treatment Systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for inflow concentrations relevant to the contributing drainage area		

8.7.6 A SuDS hierarchy will be identified to provide sufficient pollution mitigation for discharges to groundwater and surface water.

8.7.7 The tables above show that permeable paving and detention basins provide sufficient pollution mitigation for areas with medium pollution hazard levels as may occur on site.

9. Foul water strategy

9.1 Residential Foul water

- 9.1.1 It is proposed to discharge foul water from the Proposed Development to the adjacent MoD foul sewer which is owned and managed by Veolia for MoD's use.
- 9.1.2 The anticipated average foul flow from the Proposed Development has been calculated in accordance with the DCG guidance in chapter B3.1.1. This is quoted at peak of 4000l/dwelling per day or 0.05 l/s. As there are 8 dwellings this is taken as a peak discharge **of 0.4 l/s**. As this is negligible it is assumed that the existing drainage system has capacity to drain and treat these flows.
- 9.1.3 From surveyed ground levels the connection from site to the existing foul sewer can flow via gravity.
- 9.1.4 The sewers on site discharge to Ratfyn waste water treatment works, operated by Wessex Water.

10. Drainage maintenance and management strategy

- 10.1.1 Regular inspection and maintenance is required to ensure the effective long-term operation of the drainage network, including any SuDS and WWTP.
- 10.1.2 From the Drainage Strategy Layout drawing, these drainage features are identified as follows:
- Gullies and Channel Drains;
 - Drainage Pipes;
 - Permeable Paving Systems;
 - Detention Basin or Pond;
 - Underground Attenuation Tank;
- 10.1.3 A Drainage Maintenance and Management Strategy which builds on the information provided within the SuDS Manual has been produced by WSP and is shown in **Table 10.1**

Table 10.1 Proposed drainage maintenance strategy

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
Drainage Channels/ Gullies	Inspections will be frequent and regular, depending on local conditions, but at least annually by Site management. Inspections will include gratings; covers including their locking bolts; sumps and sump buckets; exposed concrete surround and adjacent paving. Channels will be flushed with water or high-pressure jetting (no boiling water or cleaning agent will be used). All silt buckets and sumps will be cleaned out replaced back into the units ensuring they are correctly fitted.	All channel surfaces and joints will be checked and repaired as necessary.	Inspected every 6 months or after large storm.
Manholes / Inspection Chambers	Inspection chambers will be checked every 6 months for the accumulation of debris and silt and cleaned as necessary.		Inspect every 6 months or after large storm.
Permeable Paving System	Remove debris and sand from catchment surface where may cause risks to performance.	Removal of weeds or management using glyphosate.	Monthly Every 10-15 years.

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
	Monitoring for signs of clogging and cell infill loss.	Rehabilitation of surface and upper substructure.	
Detention Basin or pond	Remove litter and debris. Cut grass, manage vegetation and remove nuisance plants. Inspect all components for blockages, damage and accumulation of silt.	Reseed areas of poor vegetation growth. Remove sediment from inlets, outlets, forebay and main basin.	Monthly for regular maintenance. Remove sediment every 1-5 years.
Attenuation Tank	Remove debris and sand from catchment surface where it may cause risks to performance. Remove sediment from pre-treatment structures and/or internal forebays.	Inspect all inlets, outlets, overflows and vents are in good condition and repair/rehabilitate as required. Survey inside tank for sediment build up and remove if necessary.	Monthly removal of debris. Annually inspection and inspection inside tank every 5 years.

11. Conclusions

- 11.1.1 This FRA and ODS has been prepared on behalf of MoD to support the planning application for the construction of a new residential development on the Bulford Camp site.
- 11.1.2 The EA Flood Map for Planning shows that the Site is located in Flood Zone 1 where the probability of river or sea flooding is less than 0.1% (1 in 1,000) chance in any given year. Available baseline information indicates that Site is at low or very low risk of flooding from all sources, including fluvial, tidal, surface water, groundwater, sewer and reservoir flooding.
- 11.1.3 Minimal flood risk mitigation measures are required to ensure the Proposed Development remains safe from flooding throughout its lifetime. A minimum finished floor level of 150mm above the average ground level, is considered appropriate.
- 11.1.4 Surface water from the development discharges via infiltration to ground. Prior to infiltration to ground flows will be stored within the permeable paving of driveways, geo-cellular tank and swale for storm events upto the 1 in 100 year return period with 40% climate change allowance.
- 11.1.5 Foul flows from the development discharge to the foul sewer to the south of the site which is an MoD asset maintained by Veolia. The MoD have rights to discharge within capacity limits without further agreement. The MOD have confirmed this network has capacity and connection is possible.
- 11.1.6 This Flood Risk and Drainage Strategy report concludes that this development is appropriate in its proposed location, can be occupied safely for its lifetime and does not increase flood risk elsewhere. This will be secured through the implementation of the recommended flood risk mitigation measures and design for surface water and foul water drainage.



Appendix A

Site location plan



2025





Appendix B

Topographical survey



DO NOT SCALE

NOTES

Grid: Local Grid orientated to Ordnance Survey Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM15)
Site Centred Local Scale Factor: 1:000000
Site Centred about station STN01
Contour Interval: 0.2m

STATIONS

SURVEY STATIONS			
Name	Easting	Nothing	Height
STN01	418065.130	144374.530	95.240
STN02	419014.017	144509.375	94.029
STN01A	418839.001	144418.731	89.556

SURVEY LEGEND

	Black Arrow
	Black Arrow
	Cover - inspection line
	Road entrance
	Cover - manhole box
	Cover - manhole box
	Manhole
	Hedge, edge of
	Junction
	Kiosk - entrance line
	Kiosk - entrance
	Overhead powerlines
	Black up
	Cover - manhole edge
	Gravel - reinforced edge
	Vegetation - edge of
	Tarmac - reinforced edge
	Gate
	Hydrant
	Cover Post - no symbol
	Cover - manhole square
	Cover - manhole square
	Cover - water stop (see note)
	Water - square
	Flat Plot
	Market Plot symbol
	Market Plot Water
	Siding
	Confusion tree
	Distance tree
	Cover - manhole round
	Slope
	Slope
	Flat Sign Water
	Telegraph Pole

SHEET LAYOUT

REV	DATE	BY	DESCRIPTION	CHK	APP



Suites 120-160, 1st Floor, Exchange Station,
Tithebarn Street, Liverpool, L2 2QP, UK
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wsp.com

CLIENT:

Defence Infrastructure Organisation (DIO)

PROJECT / DRAWING TITLE:

UK-Project Falcon 2025

DRAWING NAME:

Bulford Barracks Topographic Survey Sheet 1 of 1

SCALE: 1:200	SIZE: A0	DATE: 26/11/2025
DRAWN BY: MP	CHECKED BY: MR	APPROVED BY: CJ
DRAWING No: UK0038589.3630_WSP_DRG_A0_001		REV:

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Appendix C

Wessex Water Records



Wessex Water Web Map



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WATER MAINS	SEWERS	PUBLIC	PRIVATE	SECTION 104	OTHER WESSEX PIPES	NON-WESSEX / UNKNOWN
Distribution Main	Foul	Surface	Combined	Abandoned	Rising Mains	Private Rising Mains
Washout Main	Surface	Combined	Abandoned	Abandoned	Standby Rising Mains	Culverted Watercourse
Raw Water Main	Combined	Abandoned	Abandoned	Abandoned	Effluent Disposal	Highway Drain
Abandoned Main	Abandoned	Abandoned	Abandoned	Abandoned	Overflow	Use Unknown
Private Main	Abandoned	Abandoned	Abandoned	Abandoned	Syphon	Status Unknown
SITES	STRUCTURES	OTHER STRUCTURES	OTHER STRUCTURES	OTHER STRUCTURES	OTHER STRUCTURES	OTHER STRUCTURES
Source	Manhole - Foul	Attenuation Tank	Storage Tank	Chamber	Tunnel	Interceptor
Reservoir	Manhole - Surface	Pumping Station - Surface	Pumping Stn - Foul/Combined	Gully	Vent Column	Rodding Eye
Pump	Manhole - Combined	Catchpit	Flushing Chamber	Soakaway	Non Return Valve	Washout
Treatment Works	Outfall	Inlet	Lamphole	Bifurcation - Foul	Bifurcation - Surface	Bifurcation - Combined
Valve - Open	Inlet	Bifurcation - Foul	Bifurcation - Surface	Bifurcation - Combined	Combined Sewage Overflow	Air Valve
Valve - Closed	Lamphole	Bifurcation - Surface	Bifurcation - Combined	Combined Sewage Overflow	Air Valve	Hatch Box
Fire Hydrant	Combined Sewage Overflow	Air Valve	Hatch Box	Hatch Box	Hatch Box	Hatch Box
Pressure Reducing Valve	Air Valve	Hatch Box	Hatch Box	Hatch Box	Hatch Box	Hatch Box
Meter	Hatch Box	Hatch Box	Hatch Box	Hatch Box	Hatch Box	Hatch Box

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) styles of line are shown on the key in sample/typical colours.

Information in this plan is provided for identification purposes only. No warranty as to accuracy is given or implied. The precise route of pipe work may not exactly match that shown. Wessex Water does not accept liability for inaccuracies. Sewers and lateral drains adopted by Wessex Water under the Water Industry (Schemes for Adoption of Private Sewers) 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 pipe work has been precisely located. If you are considering any form of building works and pipe work is shown within the boundary of your property or a property to be purchased (or very close by) a surveyor should plot its exact position prior to commencing works or purchase. Building over or near Wessex Water's apparatus is not normally permitted.

Date: 27/10/2025
Centre: 418273E, 143992N
Scale: 1:3,536
(when printed at A1 size)



Appendix D

Proposed site plan





© 2025 Microsoft Corporation © 2025 Maxar © CNES (2025) Distribution Airbus DS

Key



Site Boundary

Client



Defence
Infrastructure
Organisation

Land at Sling Road, Bulford

Proposed Plan

January 2026



0 m 250m

Scale 1:2,500 @ A4

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Appendix E

EA flood maps



Flood map for planning

Your reference
Bulford

Location (easting/northing)
418886/144405

Created
29 January 2026 13:22

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 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
Bulford

Location (easting/northing)
418886/144405

Scale
1:2,500

Created
29 Jan 2026 13:22

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


0 20 40 60m



Appendix F

Groundwater flood maps

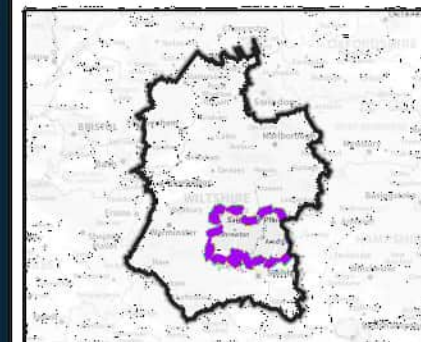




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Wiltshire Council



Groundwater Emergence: Amesbury

Legend

- Wiltshire Boundary
- Community Partnership Area

Groundwater Emergence:

- This area is deemed as having a negligible risk from groundwater flooding due to the nature of the local geological deposits.
- Flooding from groundwater is not likely.
- There is a risk of flooding to subsurface assets but surface manifestation of groundwater is unlikely.
- Within this zone there is a risk of groundwater flooding to surface and subsurface assets. There is the possibility of groundwater emerging at the surface locally.
- Within this zone there is a risk of groundwater flooding to both surface and subsurface assets. Groundwater may emerge at significant levels and this the ability to discharge surface pond within any topographic low spots.

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0 3 6 km





Appendix G

Greenfield run off calculations



ICP SUDS / IH 124

ADAS 345

FEH

ReFH2

Greenfield Volume

Method ☒ ICP SUDS ☐ IH 124Area (ha) SAAR (mm)

Map

Soil Region ...

Additional Options

Urban Return Period (years) Growth Curve 

Calculate

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 100 (years) (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	0.2	0.2	0.7	0.2	0.5	0.7

OK

Cancel



Appendix H

Attenuation calculations



Quick Storage Estimate

Input

Input Type

User Input

Area (ha)

0.237

Volumetric Runoff Coefficient

1.000

Discharge Rate (L/s)

0.0

Infiltration Rate (m/hr)

0.005

Safety Factor

2.0

Quick

Calculate

Create New

From Library

All

FSR

FEH

Method

FEH

Number of Storms

24

Max. Run Time (mins)

2880

Input

Results

2D Graph

OK

Cancel

0.0 <= Infiltration Rate (m/hr) <= 1000.0

Help

Quick Storage Estimate

Results

Quick Storage Estimate variables require approximate storage of between 263m³ - 263m³.

With Infiltration storage is reduced to between 171m³ - 250m³.

These values are estimates only and should not be used for final design purposes.

Input

Results

2D Graph

OK

Cancel

0.0 <= Infiltration Rate (m/hr) <= 1000.0

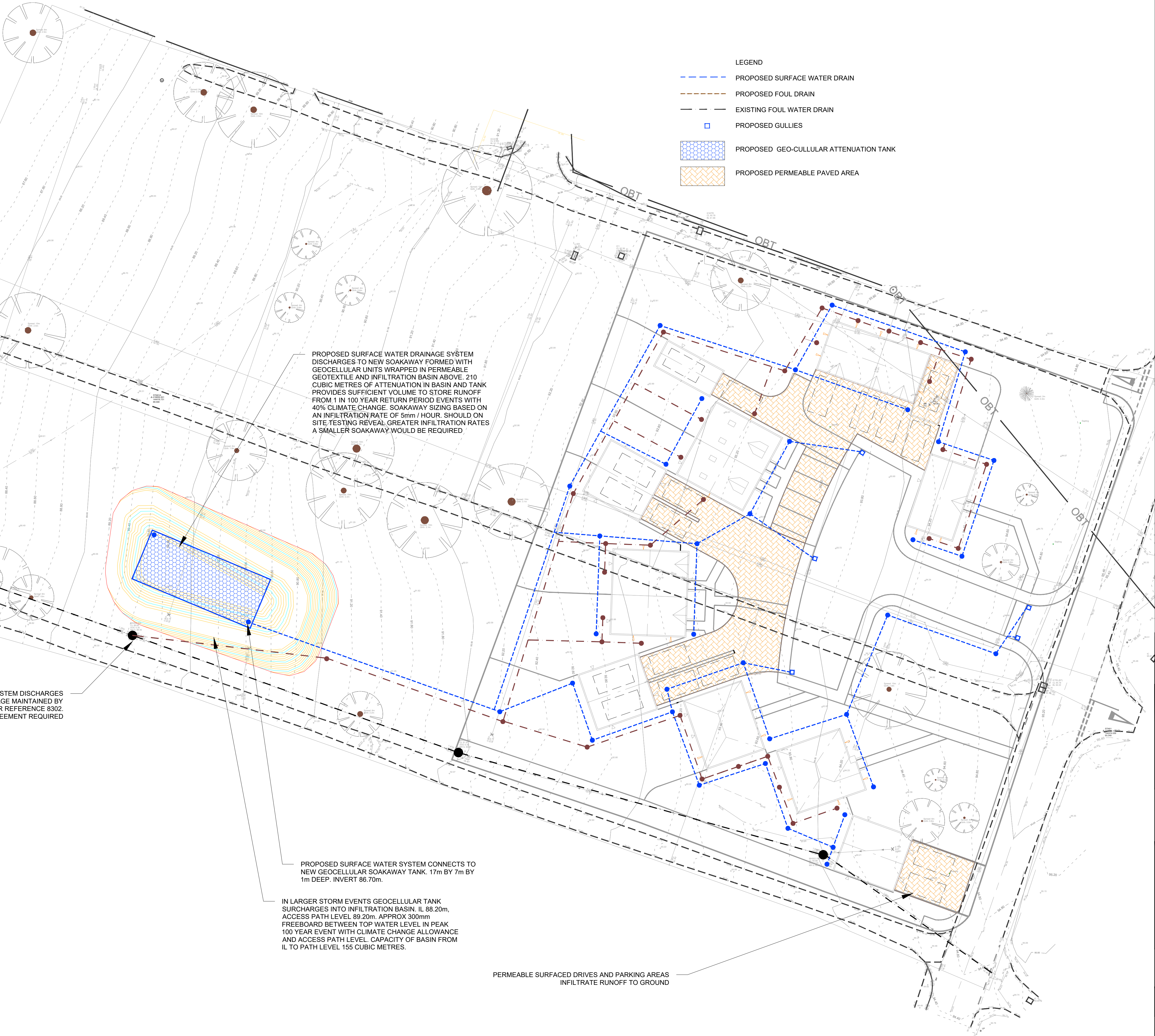
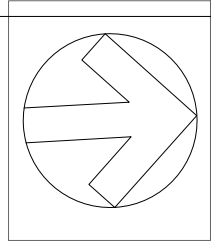
Help



Appendix I

Drainage plan





DO NOT SCALE

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT WSP, ARCHITECTS AND M & E CONSULTANTS DRAWINGS AND PROJECT SPECIFICATIONS.
2. ALL BUILDING DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH BS EN-752 DRAINAGE AND SEWER SYSTEMS OUTSIDE BUILDING, THE CURRENT BUILDING REGULATIONS AND THE LOCAL AUTHORITY BUILDING CONTROL SPECIFICATIONS AND REQUIREMENTS.
3. DRAINAGE TO REMAIN UNDER THE OWNERSHIP OF THE MOD AND MAINTAINED UNDER SERVICE CONTRACT FOR THE LIFETIME OF THE DEVELOPMENT.
4. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS/ SEWERS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
5. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES / OPERATORS.
6. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN-OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
7. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
8. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN/NEAR CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
9. THE CONTRACTOR SHALL ALLOW FOR OBTAINING ALL APPROVALS FROM THE RELEVANT AUTHORITIES WHEN WORKING IN THE HIGHWAY AND ON THE SEWERAGE SYSTEMS.
10. THE CONTRACTOR SHALL SUITABLY PROTECT PEDESTRIANS AND VEHICLES FROM THE WORKING AREAS.
11. ALL PIPES SHALL BE LAID WITH SOFFITS LEVEL AND ALL MANHOLE/ INSPECTION CHAMBER INVERT LEVELS SHOWN ARE FOR THE OUTLET PIPE (UNLESS OTHERWISE SHOWN). PIPE RUNS SHALL BE LAID TO THE LEVELS INDICATED, AND ALL PIPE GRADIENTS INDICATED ARE APPROXIMATE.
12. ALL RAINWATER PIPES/INTERNAL FOUL DRAIN CONNECTIONS ARE TO BE AS SHOWN, WITH ADAPTORS AT FINISHED FLOOR LEVEL TO SUIT CONNECTION DETAILS BY OTHERS.
13. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE PUBLIC SEWER OR WATERCOURSE SYSTEM. ALL THE DRAINS SHALL BE CCTV SURVEYED.
14. ALL EXISTING DRAINAGE WITHIN THE SITE NOT REQUIRED FOR THE NEW DEVELOPMENT IS TO BE ABANDONED. THE CONTRACTOR SHALL UNDERTAKE A PRE ABANDONMENT CCTV SURVEY OF DRAINS AND CONFIRM NO DEPENDENT CONNECTIONS. SEWERS LESS THAN 1.5m DEEP WHICH ARE IN OPEN GROUND SHOULD, AS FAR AS IS PRACTICABLE, BE REMOVED. ALL OTHER PIPES SHOULD BE SEALED AT BOTH ENDS AND AT ANY POINT OF CONNECTION. LARGER PIPES 2256 OR ABOVE SHOULD BE GROUT FILLED TO PREVENT SUBSIDENCE OR DAMAGE TO BUILDINGS OR SERVICES IN THE EVENT OF COLLAPSE.
15. ALL PIPES UNDER TRAFFICKED AREAS WITH CLASS S BED AND SURROUND SHALL HAVE 1.2m MINIMUM COVER TO CROWN. OTHERWISE SHALLOWER DRAINS SHALL BE LAID WITH CLASS Z CONCRETE SURROUND OR CONCRETE PROTECTION SLAB WHERE GREATER THAN 150 DN.

P01	30/01/2026	JS	FIRST ISSUE	JS	DV
REV	DATE	BY	DESCRIPTION	CHK	APP

DRAWING STATUS: S2 - FOR INFORMATION



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CLIENT: Defence Infrastructure Organisation

SITE/PROJECT: Proposed Development at Bulford, Sling Road

TITLE: Proposed Drainage Layout

SCALE @ A1:	1:250	CHECKED:	DV	APPROVED:	DV
PROJECT NO:	2026UK293630	DESIGNED:	JS	DRAWN:	JS
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