

BPS

flood risk assessment & drainage strategy

for the proposed change of use from an annexe to a standalone dwelling

project: Iro Near Miss, Cockreed Lane

client: Mr and Mrs Kerr

date: Nov 25

| | | |
|-------------|-------------|----------|
| project no: | doc no: | version: |
| 25048 | RP-D-600-S4 | P01 |

Contents

1. Introduction
2. Development Description and Site Context
3. The Sequential Test
 - 3.1. Policy Context
 - 3.2. Flood Risk Vulnerability Classification
 - 3.3. Application of the Sequential Approach
 - 3.4. The Exception Test
4. Potential Sources of Flood Risk
 - 4.1. Sea / Estuaries (Tidal)
 - 4.2. Rivers (Fluvial)
 - 4.3. Artificial Sources (Reservoirs, Canals, etc.)
 - 4.4. Surface Water (Pluvial)
 - 4.5. Groundwater
 - 4.6. Sewers
 - 4.7. Effect of Development
 - 4.8. Summary of Flood Risk Sources (generic paragraph for all sites)
5. Climate Change Considerations
 - 5.1. Allowances for Peak River Flow
 - 5.2. Sea Level Rise
 - 5.3. Peak Rainfall Intensity
 - 5.4. Impact on Site and Drainage Design
6. Flood Risk Mitigation Measures
 - 6.1. Local Sequential Approach (on-site)
 - 6.2. Raising Floor Levels and Land Regrading
 - 6.3. Flood Resistance and Resilience
 - 6.4. Flood Defences and Surface-Water Control Features
 - 6.5. Flood Warning and Emergency Planning
 - 6.6. Management of Development Runoff
7. Existing Drainage Summary
8. Surface-Water Drainage Strategy
 - 8.1. SuDS Hierarchy and Feasibility
 - 8.2. Post-Development Design Parameters
 - 8.3. SuDS Component Suitability
 - 8.4. Water Quality and Pollution Mitigation
 - 8.5. Surface-Water Pumping
 - 8.6. Exceedance Flow Management
9. Foul-Water Strategy
10. On-Site Construction and Quality Control
11. Maintenance and Management
12. Conclusions

Appendix

1. Preliminary Drainage Assessment Calculations
2. Site Plans
3. Public Sewer Records
4. Environment Agency Product 4 Data (EIR/202515252 08/06/25)
5. Envirocheck Flood Screening Report and Data Assessment Summary
6. EA/NRW Flood Data Map
7. JBA 75, 100, 200, 1000yr Return Flood Maps
8. JBA Canal Failure Map
9. EA/NRW Surface Water Depth Maps for 30, 100, 1000yr return
10. EA/NRW Surface Water Velocity & Flow Direction Maps for 30, 100, 1000yr return
11. EA/NRW Surface Water Hazard Rating Maps for 30, 100, 1000yr return
12. Detailed River Network Map
13. EA/NRW Historic Flood Map
14. BGS Geological Indicators of Flooding Map
15. BGS Groundwater Flooding Susceptibility Map
16. ESI Groundwater Flood Map
17. EA/NRW Risk of Flooding from Rivers & Sea Data Map

References

- i. Geological Survey of Great Britain Solid Online Viewer
- ii. CIRIA Report C753 – The SuDS Manual (2015, with 2023 Addendum)
- iii. Defra National Standards for Sustainable Drainage Systems (June 2025)
- iv. EA Guidance – Flood Risk Assessments: Climate Change Allowances (Feb 2024)
- v. National Planning Policy Framework (NPPF, 2023) & Planning Practice Guidance
- vi. East Sussex County Council LLFA – Local SuDS Design and Adoption Guidance (2024)
- vii. Southern Water – Drainage and Wastewater Management Plans (DWMP, 2023)
- viii. Local Authority Strategic Flood Risk Assessment (SFRA, Level 1, 2020)

Document Control

| | Consultant | Date |
|-------------|------------|----------|
| Prepared By | rmh | 12/11/25 |

1. Introduction

This Flood Risk Assessment (FRA) and Drainage Strategy has been prepared by Borne Project Services Ltd (BPS) on behalf of Mr and Mrs Kerr in support of a planning application for a proposed change of use from an annexe to a standalone dwelling at Near Miss, Cockreed Lane, New Romney, Kent, TN28 8TE.

The purpose of this report is to demonstrate that the proposed development can be delivered safely and sustainably, in accordance with national and local policy, and without increasing flood risk on or off the site.

This assessment describes the existing site conditions, identifies potential sources of flood risk, and outlines the proposed drainage strategy, including attenuation, flow control, and water quality management measures.

It demonstrates compliance with the relevant policy framework and technical guidance for flood-risk and sustainable drainage design.

This report has been prepared in accordance with the following guidance and standards:

- Defra – *National Standards for Sustainable Drainage Systems (SuDS), June 2025*
- CIRIA C753 – *The SuDS Manual (2015, with 2023 Addendum)*
- Environment Agency (EA) – *Flood Risk Assessments: Climate Change Allowances (February 2024)*
- Building Regulations Part H (*2025 Updates*)
- National Planning Policy Framework (NPPF, 2023) – *Paragraphs 159–182*
- Lead Local Flood Authority (LLFA) – *Local SuDS design standards and guidance*
- British Standards – BS EN 752:2017 (Drain and Sewer Systems Outside Buildings)

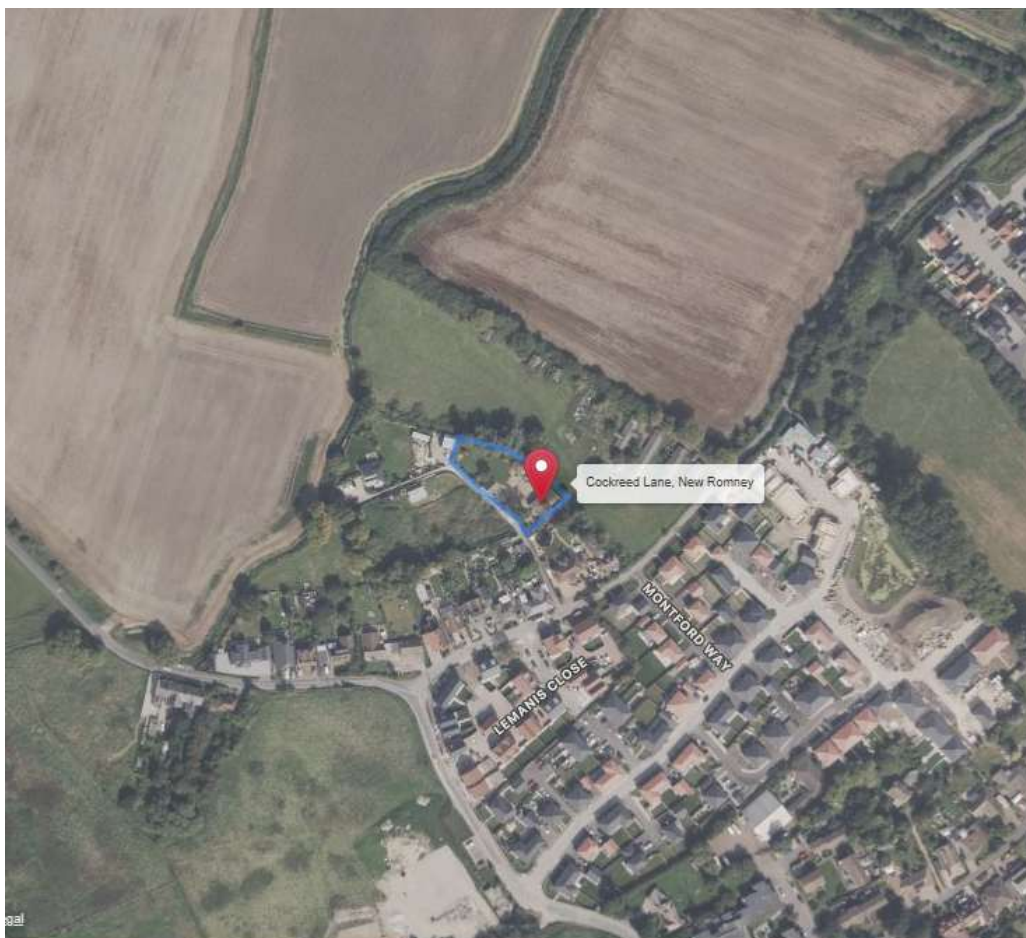
The report adopts a proportionate approach consistent with NPPF Paragraph 182, ensuring that technical assessment is commensurate with the scale and potential impact of the proposed development.

BPS confirms that this report has been prepared by suitably qualified professionals with experience in sustainable drainage design, hydraulic modelling, and flood-risk management.

Supporting technical data, including infiltration testing, hydraulic calculations, and layout drawings, is appended to this report.

2. Development Description and Site Context

| Parameter | Description |
|------------------------------------|---|
| Location: | Iro Near Miss, Cockreed Lane, New Romney, Kent, TN28 8TE. |
| NGR (approx.): | E 606198 N 125255 |
| Site Area (ha): | 0.145ha (1450m ²) |
| Existing Use: | Brownfield land comprising an existing annexe building and associated hardstanding areas within a residential curtilage. |
| Proposed Development: | Demolition of the existing annexe and construction of a new single-storey three-bedroom bungalow with associated parking and private garden area. |
| Flood Zone: | Entirely within EA Flood Zone 3a, indicating High Probability of fluvial or tidal flooding. |
| Surface Water Flood Risk: | EA surface-water mapping indicates that parts of the site and Cockreed Lane are subject to low to medium surface-water flood risk, with predicted overland flow paths along the northern boundary during the 1 in 100 and 1 in 1000 annual chance events |
| Ground Conditions: | According to the BGS Solid and Drift Geology Viewer, the site is underlain by Tidal Flat Deposits comprising clay and silt (sedimentary superficial deposits formed during the Quaternary period), overlying the Hastings Beds (subgroup) of sandstone, siltstone and mudstone (Cretaceous period). These conditions suggest a low infiltration potential, and infiltration-based SuDS are likely to be unsuitable without engineered measures or confirmatory percolation testing. |
| Existing Surface Water: (Disposal) | Existing surface water drainage is understood to flow into a local ditch system along the site's northern boundary. |
| Existing Foul-Water: (Disposal) | Foul water from the existing property is believed to connect to the public foul sewer network within Cockreed Lane, subject to confirmation by drainage survey. |
| Aerial Photograph Below: | |



3. The Sequential Test

3.1. Policy

The National Planning Policy Framework and accompanying Planning Practice Guidance (PPG) – Flood Risk and Coastal Change require Local Planning Authorities (LPAs) to adopt a risk-based approach to managing development in areas at risk of flooding.

The Sequential Test is the first stage in this process and aims to steer new development to areas with the lowest probability of flooding, thereby avoiding flood risk wherever possible.

The Environment Agency (EA) Flood Map for Planning defines flood zones based on the annual probability of river and tidal flooding, as set out in Table 1 of the PPG:

| Flood Zone | Definition |
|---------------------------------|--|
| Zone 1 (Low Probability) | Land having a less than 0.1% annual probability of river or sea flooding. |
| Zone 2 (Medium Probability) | Land having between a 1% and 0.1% annual probability of river flooding, or land having between a 0.5% and 0.1% annual probability of sea flooding. |
| Zone 3a (High Probability) | Land having a 1% or greater annual probability of river flooding, or Land having a 0.5% or greater annual probability of sea flooding. |
| Zone 3b (Functional Floodplain) | <p>This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:</p> <ul style="list-style-type: none"> land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). <p>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency.</p> |

The PPG also defines vulnerability classifications, which determine the suitability of development types within each Flood Zone.

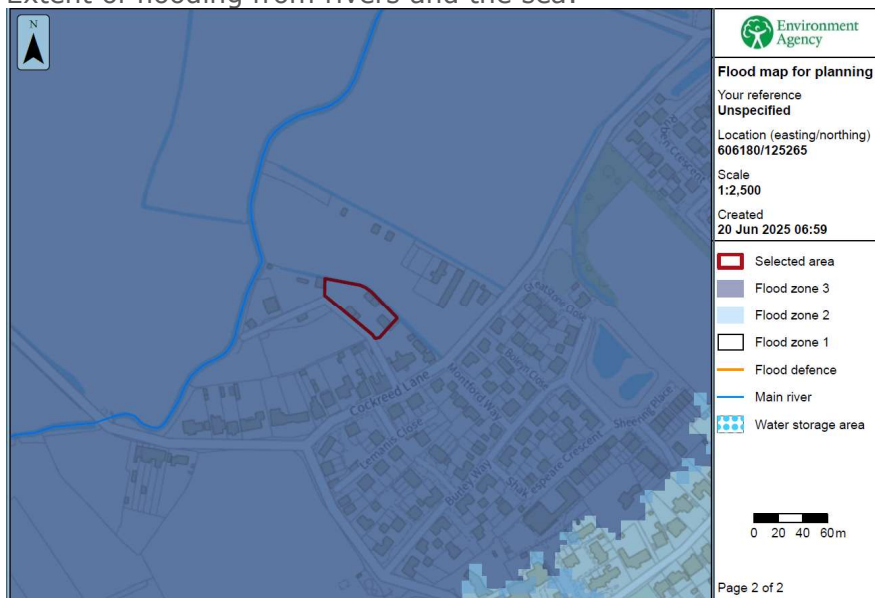
| Flood Risk Vulnerability Classifications | Zone 1 | Zone 2 | Zone 3a | Zone 3b |
|--|---------------|---------------|----------------|----------------|
| Essential Infrastructure Essential transport & utility infrastructure, including electricity-generating power stations, water treatment works and wind turbines | √ | √ | e | e |
| Highly Vulnerable Emergency services, basement dwellings, caravans, mobile homes, and park homes are intended for permanent residential use. Installations requiring hazardous substances consent. | √ | e | x | x |
| More Vulnerable Hospitals, residential care homes. Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs, and hotels. Non-residential uses for health services, nurseries, and educational establishments. | √ | √ | e | x |
| Less vulnerable shops; financial, professional, and other services; restaurants; offices; general industry, storage, and distribution; agriculture; waste & water treatment works | √ | √ | √ | x |
| Water-compatible development Flood control infrastructure, water and sewage transmission infrastructure and pumping stations; Docks, marinas, wharves, and Shipbuilding; Water-based recreation | √ | √ | √ | √ |
| Key: √ Development is appropriate x Development should not be permitted e Exception Test Retired  Denotes the classification of this development | | | | |

3.2. Site Classification

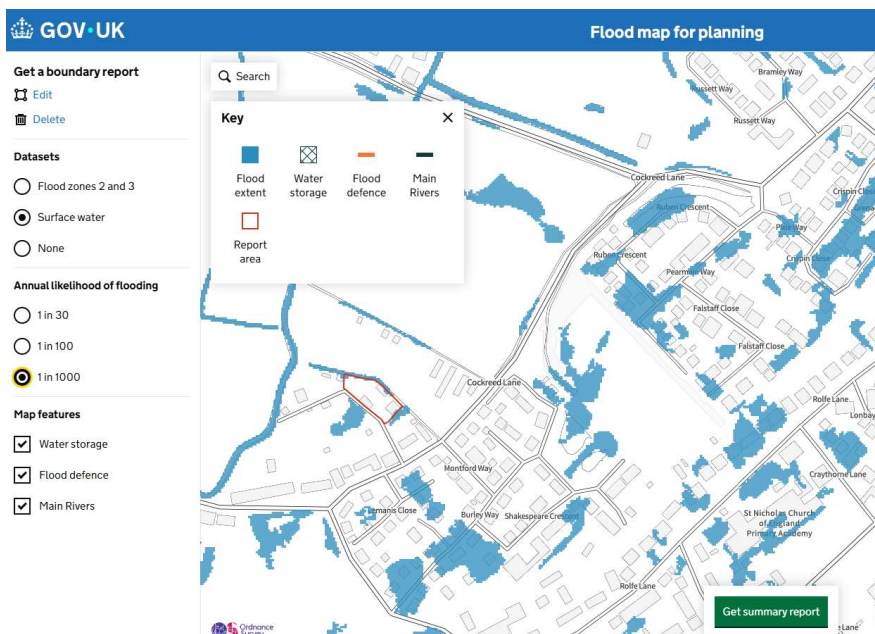
According to the EA Flood Map for Planning, the site lies within Flood Zone 3a corresponding to a High probability of fluvial or tidal flooding.

Supporting EA datasets confirm:

- Extent of flooding from rivers and the sea:



- Extent of flooding from surface water:



3.3. Application of the Sequential Approach

The site at Near Miss, Cockreed Lane, New Romney lies within Flood Zone 3a (high probability of flooding). The proposal involves the replacement of an existing annexe with a new dwelling within the curtilage of an established residential plot, therefore constituting previously developed (brownfield) land.

Residential use is already established, and the proposal does not increase flood-risk vulnerability or introduce new development onto undeveloped land. Under Annex 3 of the NPPF the dwelling is classed as "More Vulnerable" and may be appropriate in Flood Zone 3a where flood risk is effectively managed.

Given the existing lawful use, brownfield status, and inclusion of site-specific flood-mitigation measures, the sequential approach is considered satisfied. The proposal therefore accords with paragraphs 167–169 of the NPPF (2023) and the PPG: Flood Risk and Coastal Change.

3.4. The Exception Test

In accordance with the National Planning Policy Framework (NPPF, 2023), the Exception Test applies where development is proposed in areas of higher flood risk (Flood Zones 2 or 3) and cannot be reasonably located in an area of lower risk.

To pass the Exception Test, it must be demonstrated that:

- a. The development provides wider sustainability benefits to the community that outweigh the flood risk, informed by the relevant Strategic Flood Risk Assessment (SFRA); and
- b. A site-specific Flood Risk Assessment (FRA) demonstrates that the development will be safe for its lifetime, taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, reduces overall flood risk..

The demonstration of wider sustainability benefits under part (a) falls primarily within the remit of the planning assessment.

This report addresses part (b) by identifying all potential sources of flood risk and setting out appropriate mitigation and management measures to ensure the development remains safe, resilient, and compliant with current flood-risk policy.

Accordingly, the Exception Test is satisfied, subject to the implementation of the mitigation measures outlined within this report and adherence to the final detailed drainage design.

4. Potential Sources of Flood Risk

Flooding can arise from a range of natural and artificial sources. In accordance with the National Planning Policy Framework (NPPF, 2023) and the Planning Practice Guidance (Flood Risk and Coastal Change, 2024), all potential sources of flood risk fluvial, tidal, pluvial, groundwater, sewer, and artificial must be considered when assessing site conditions and the potential impact of development.

The table below summarises potential flood risk sources applicable to typical development sites. Each risk level should be confirmed using the latest Environment Agency (EA) Flood Map for Planning, Strategic Flood Risk Assessment (SFRA), and relevant local datasets. Further details are provided in the accompanying appendices.

Sources of Flood Risk Summary

| Flood Source | Potential Risk (Low/Medium/High) | Typical Appraisal Method |
|---------------------------|----------------------------------|--|
| • Sea/Estuaries (Tidal) | High | EA Flood Map for Planning, Product 4 Data, JBA Tidal Model Outputs |
| • Rivers (Fluvial) | Low | EA Flood Zone Mapping, JBA Undefended Fluvial Modelling, Site Level Review |
| • Artificial Sources | Low | JBA Canal/Reservoir Failure Mapping |
| • Surface Water (Pluvial) | Low–Moderate | EA Surface Water Flood Map (30, 100 & 1000 yr), Topographic Assessment |
| • Ground Water | Moderate | BGS & GeoSmart Groundwater Susceptibility Mapping |
| • Sewers | Low | Southern Water Records, EA Historic Flood Map, Local Drainage Data |
| • Effects of Development | Low | Review of runoff rate, attenuation volume, and flow control under pre- and post-development conditions |

The table above identifies the potential flood risk pathways relevant to a development site in its existing condition and summarises how these risks can be assessed or mitigated. These are reviewed in greater detail below.

4.1. Sea/Estuaries (Tidal)

The site lies within the low-lying Romney Marsh coastal plain, an area influenced by tidal conditions from the English Channel. Tidal flooding may occur due to high tides, storm surges, or the overtopping of coastal defences, often acting in combination with the local Romney Marsh drainage network.

The Environment Agency Flood Map for Planning confirms that the site is entirely within Flood Zone 3a, indicating a high probability of tidal flooding.

Modelled undefended flood levels from the Romney Marsh Tidal Mapping Study (JBA, 2020) indicate tidal flood levels of approximately 3.37m AOD for a 1 % AEP (1 in 100 year) event, increasing to around 3.89m AOD when allowing for climate change to 2070.

However, the site benefits from protection afforded by the Romney Marsh sea defence system, which includes:

- Greatstone Dunes – natural dune system providing a 0.5 % AEP (1 in 200 year) standard of protection.
- Romney Sands and Littlestone Defences – shingle beach, rock groynes and a concrete sea wall providing 0.5 % AEP (1 in 200 year) protection (completed 2003, EA-maintained).
- St Mary's Bay Sea Wall – concrete wave return wall with stepped revetment, providing a 0.75 % AEP (1 in 150 year) protection standard (completed 1995).

These defences form part of the Folkestone to Cliff End Strategy, which aims to maintain a minimum 1 in 200 year standard of protection along the Romney Marsh frontage by 2025.

Under the defended scenario, no tidal inundation is predicted at the site for events up to and including the 0.1% AEP (1 in 1000-year) flood. Consequently, while the area remains designated as Flood Zone 3a due to its residual tidal risk, the current standard of protection is high, and on-site mitigation measures (such as raised floor levels and resilient construction) will ensure the development remains safe for its lifetime.

4.2. Rivers (Fluvial)

Fluvial flooding can occur when a watercourse exceeds its capacity or becomes obstructed, causing water to overtop its banks and inundate adjacent land.

The nearest fluvial feature is a drainage ditch located immediately north of the site. EA and JBA mapping confirm the site lies outside all modelled fluvial flood extents, under both defended and undefended conditions.

No main rivers are present nearby, and there are no significant fluvial flow routes affecting the site.

Accordingly, the fluvial flood risk is considered low.

4.3. Artificial Sources

Artificial flooding can occur due to the failure or overtopping of man-made structures such as canals, reservoirs, sluices, or storage lagoons.

There are no reservoirs, canals, sluices, or impounded water bodies within 1 km of the site. The Environment Agency's reservoir failure mapping confirms the site is not at risk of inundation in the event of a structural breach or failure.

Accordingly, the flood risk from artificial sources is considered low.

4.4. Surface Water (Pluvial)

Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils or the capacity of drainage infrastructure is overwhelmed, leading to the accumulation of surface water and the generation of overland flow routes. Flooding from surface water is challenging to predict as rainfall location and volume are difficult to forecast. In addition, local features can significantly affect the chance and severity of flooding.

The surface water risk categories are classified as follows: -

- **'Very Low'** Probability defined as land having less than a 1 in 1000 (<0.1%) annual probability of surface water flooding
- **'Low'** Probability is defined as land having between a 1 in 1000 (0.1%) and 1 in 100 (1.0%) annual probability of surface water flooding.
- **'Medium'** Probability defined as land having between a 1 in 100 (1.0%) and 1 in 30 (3.3%) annual probability surface water flooding.
- **'High'** Probability) defined as land having a 1 in 30 (3.3%) or greater annual probability of surface water flooding

The Environment Agency's Surface Water Flood Map confirms that no flooding is predicted for the 1 in 30-year or 1 in 100-year events. A small area at the northern & western boundaries may be affected during the 1 in 1000-year (0.1% AEP) event, indicating a low probability of surface water accumulation during extreme rainfall.

This potential risk can be effectively mitigated through the implementation of infiltration-based SuDS measures, positive drainage connections, and managed exceedance routing to ensure surface runoff is safely controlled within the site.

Accordingly, the flood risk from surface water (pluvial) sources is considered low, with mitigation easily achievable through appropriate drainage design.

4.5. Ground Water

Groundwater flooding occurs when the water table rises to, or above, the ground surface—typically in low-lying areas underlain by permeable strata.

The BGS and GeoSmart datasets confirm that the site is located within an area of “very low” susceptibility to groundwater flooding, with no recorded groundwater flood incidents within 1km.

Given the low-lying but well-drained character of the local geology and absence of mapped risk, the flood risk from groundwater sources is considered low.

4.6. Sewers

Sewer flooding can occur when rainfall exceeds the capacity of the public sewer network, when outfalls are restricted by high downstream levels, or due to localised blockages or infrastructure failure.

Southern Water sewer records confirm the presence of a public foul sewer within highway.

No surface water sewers are recorded nearby, and no historic incidents of sewer surcharge flooding have been identified within the local area.

Given the distance from the nearest public sewer and the lack of recorded issues, the flood risk from sewers is considered low.

4.7. Effect of Development

Provided that the drainage strategy and mitigation measures outlined within this report are implemented, the proposed development will not increase surface water runoff rates or volumes.

The scheme will ensure that surface water is managed on-site through infiltration-based SuDS and controlled discharge, thereby preventing any increase in flood risk to the site or the wider catchment.

Accordingly, the development will have no adverse effect on local or downstream flood risk.

5. Climate Change

Climate change is expected to increase the frequency and intensity of extreme rainfall, raise river flows, and elevate sea levels throughout the UK. These changes will progressively reduce the standard of protection offered by existing flood defences and conventional drainage systems.

The National Planning Policy Framework (NPPF) and Planning Practice Guidance (Flood Risk and Coastal Change) require all development proposals to assess and address the potential impacts of climate change over the lifetime of the development. Accordingly, Environment Agency (EA) climate change allowances must be applied, appropriate to the region, development type, and design life of the proposed scheme.

In accordance with EA and PPG guidance, the following design life periods should be used:

| Development Type | Minimum Design Life (Years) | Rationale / Source |
|--|-----------------------------------|---|
| Residential (Dwellings, Apartments, Care Homes, Student Accommodation) | 100 years | EA guidance: "Consider residential development to have a minimum lifetime of 100 years." |
| Non-Residential / Commercial / Industrial (Retail, Offices, Warehouses, Workshops) | At least 75 years | EA guidance: "The lifetime of a non-residential development depends on its characteristics, but a period of at least 75 years is likely to form a starting point for assessment." |
| Educational and Community Facilities (Schools, Nurseries, Health Centres) | 75 years | Reflects typical building life and EA starting point for non-residential development. |
| Major or Essential Infrastructure (Utilities, Energy, Water, Highways, Emergency Facilities) | 100 years or more (site-specific) | EA guidance recognises that longer lifetimes may be appropriate for strategic or critical infrastructure. |
| Temporary or Short-Term Development | Up to 25 years | A proportionate reduction in lifetime may be applied where removal is secured by condition or legal agreement. |

5.1. Peak River Flow

The EA provides updated regional allowances for peak river flow by river basin district to reflect projected increases in fluvial flows under different climate scenarios.

Rother Management Catchment peak river flow allowances:

| Epoch | Central | Higher | Upper |
|---------|---------|--------|-------|
| • 2020s | 15% | 19% | 29% |
| • 2050s | 16% | 23% | 38% |
| • 2080s | 28% | 38% | 66% |

For residential development (100-year design life), the upper-end allowance should typically be applied for fluvial assessments to ensure resilience under the most extreme scenarios.

5.2. Sea level

Global sea levels are projected to continue rising throughout this century due to ocean thermal expansion and ice melt.

The EA provides regional sea-level rise allowances (based on a 1981–2000 baseline) for each epoch.

South East River Basin District – Sea Level Rise Allowances:

| Allowance | 2000-2035 (mm) | 2036- 2065 (mm) | 2066 -2095 (mm) | 2096 -2125 (mm) | Cumulative Rise 2000-2125 (m) |
|----------------|-------------------|--------------------|--------------------|--------------------|----------------------------------|
| Higher central | 5.7 (200) | 8.7 (261) | 11.6 (348) | 13.1 (393) | 1.20 |
| Upper end | 11.3 (339) | 11.3 (339) | 15.8 (474) | 18.2 (546) | 1.60 |

Where development lies within coastal or tidal influence, finished floor levels and drainage outfalls should account for cumulative sea-level rise over the full design life.

5.3. Peak Rainfall Intensity

Increased rainfall intensity directly affects surface-water flooding and the capacity of urban drainage networks.

The EA (2024) provides allowances for small catchments (<5 km²) and urban drainage systems, expressed as a percentage increase over the 1961–1990 baseline:

Rother Management Catchment peak rainfall allowances:

3.3% annual exceedance rainfall event:

| Epoch | Central allowance | Upper-end allowance |
|---------|-------------------|---------------------|
| • 2050s | 20% | 40% |
| • 2070s | 20% | 40% |

1% annual exceedance rainfall event:

| | | |
|---------|-----|-----|
| • 2050s | 20% | 45% |
| • 2070s | 20% | 45% |

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

For residential development, a +45% rainfall-intensity uplift is applied to design storms up to the 1 in 100-year return period, ensuring long-term drainage system resilience and compliance with EA and LLFA design guidance.

5.4. Impact on Site and Drainage Design

The potential effects of climate change on the development include:

- Increased surface-water runoff volumes and peak flows;
- Greater likelihood of surcharge within sewers and drainage systems;

- Higher exceedance flow depths during extreme events; and
- Long-term performance considerations for attenuation and SuDS components.

Accordingly:

- Surface-water drainage systems should be designed to manage the 1 in 100-year rainfall event with +45% climate change allowance
- Finished floor levels (FFLs) should include a minimum 300 mm freeboard above surrounding ground or the design flood level.
- Exceedance flow routing should ensure that any residual surface-water flooding is safely directed away from buildings and access routes.

5.5. Summary

This Flood Risk Assessment and Drainage Strategy has incorporated the most recent EA climate change allowances for rainfall, river flow, and sea-level rise.

The design approach applies appropriate design life periods for the proposed land uses, ensuring that flood risk will be appropriately managed for the lifetime of the development.

The proposed measures are fully consistent with the requirements of the NPPF, PPG, and EA Climate Change Allowance Guidance.

6. Flood Risk Mitigation

Section 3.0 has identified the flooding sources that could pose a risk to the site. This section sets out the mitigation measures to be incorporated to address and reduce the risk of flooding to within acceptable levels.

If all mitigation measures noted below are implemented, the overall flood risk would be lower than it is currently.

The key objectives of flood risk mitigation are:

- to reduce the risk of the development being flood
- to ensure continued operation and safety during flood events
- to ensure that the flood risk downstream of the site is not increased by increased run-off
- to ensure that the development does not increase flood risk elsewhere

Mitigation Measures Summary

| Mitigation Measure | Appropriate |
|--|-------------|
| 6.1 Careful location of development within site boundaries (i.e., Sequential Approach) | ✓ |
| 6.2 Raising Floor Levels & Land Raising | ✓ |
| 6.3 Compensatory floodplan storage | ✗ |
| 6.4 Flood resistance & resilience | ✓ |
| 6.5 Alterations / Improvements to channels and hydraulic structures | ✗ |
| 6.6 Flood defences | ✓ |
| 6.7 Flood Warning & Emergency Planning | ✓ |
| 6.8 Management of development run-off | ✓ |

6.1. Application of the Sequential Approach at a Local Scale

The proposal involves the demolition of an existing single-storey annexe and the construction of a new three-bedroom dwelling within the same footprint.

Classified as a 'More Vulnerable' use under the NPPF the dwelling has been designed with all sleeping accommodation located at first-floor level, ensuring habitable areas remain safely above predicted flood levels.

The ground floor will contain the kitchen, lounge, utility, and office, which are considered less sensitive uses and will incorporate flood-resilient construction measures, where appropriate.

The development remains within the existing curtilage. Surface water will be managed through SuDS components and controlled exceedance routing, ensuring effective on-site drainage and flood resilience.

Accordingly, the scheme demonstrates an appropriate application of the sequential approach at a site level, ensuring the dwelling remains safe for its lifetime without increasing flood risk elsewhere.

6.2. Raising Floor Levels & Land Raising

Raising floor levels and land is a flood risk mitigation method commonly employed in the UK and elsewhere to reduce the vulnerability of buildings and infrastructure to flooding. This approach involves elevating the level of floors in buildings or raising the ground level of properties to minimise the risk of inundation and damage during flood events. Here's a breakdown of the method:

The Environment Agency recommends that finished floor levels for a development that does not include sleeping accommodation on the ground floor should normally be set to whichever is higher of the following, where relevant:

- A minimum of 300mm above the fluvial 1% AEP + 35% climate change level.
- The fluvial 1% AEP + 70% climate change level.
- A minimum of 300mm above the tidal 0.5% AEP level and appropriate allowance should be made for climate change based on the vulnerability classification of the development.
- 300mm above the general ground level of the site.

Finished Floor Levels for sleeping accommodation should normally be set to whichever is higher of the following:

- A minimum of 600mm above the fluvial 1% AEP + 35% climate change level.
- The fluvial 1% AEP + 70% climate change level
- A minimum of 600mm above the tidal 0.5% AEP level plus an allowance for climate change.

Based on EA Product 4 data (Nodes 16 & 19), the existing ground level around the site structure is approximately 2.1 m AOD.

Under undefended conditions, modelled tidal flood levels reach around 3.37m AOD (1 % AEP) and 3.89m AOD with a 2070 climate-change allowance.

However, the site benefits from the Romney Marsh coastal defence system, which provides a minimum 0.5 % AEP (1 in 200-year) standard of protection, meaning no tidal inundation is predicted in the defended scenario.

To maintain resilience in line with EA Standing Advice and NPPF (2023), the following levels are proposed:

- Typical Ground Level: 2.10m AOD
- Minimum Ground-Floor FFL: 2.40m AOD (\geq 300 mm above ground)
- First-Floor Sleeping Accommodation: Est min 5.4m AOD, well above the 0.1 % AEP + climate-change tidal level (3.9–4.0m AOD)

This design ensures all habitable areas remain safely above predicted flood levels. Minor local regrading will direct exceedance flows away from building thresholds, with runoff managed through infiltration-based SuDS and perimeter drainage to maintain existing flow paths.

Accordingly, the proposed finished floor levels provide an appropriate level of flood protection and resilience, ensuring the development will remain safe for its lifetime without increasing flood risk elsewhere, consistent with the NPPF and PPG (Flood Risk and Coastal Change).

6.3. Compensatory floodplan storage

Compensatory floodplain storage is a flood risk mitigation method utilised to manage floodwaters and reduce the impact of flooding on communities and infrastructure. This method involves creating or restoring additional storage capacity within floodplains to accommodate excess water during flood events. The concept is based on the idea that by increasing the volume of water that can be temporarily stored in floodplains, the peak flow of water downstream can be reduced, thereby lowering flood risk.

Compensatory floodplan storage are not considered an appropriate form of mitigation for this site.

6.4. Flood Resistance and Resilience

During a flood event, floodwater can find its way into properties through a variety of routes, including:

- Ingress around closed doorways
- Ingress through airbricks and up through the ground floor.
- Backflow through overload sewers discharging inside the property through ground floor toilets and sinks.
- Seepage through the external walls
- Seepage through the ground and up through the ground floor
- Ingress around cables services through external walls.

Since flood management measures only manage the risk of flooding rather than eliminate it, flood resilience and resistance measures may need to be incorporated into the buildings' design. The two possible alternatives are:

Flood Resistance or 'dry proofing' - Water Exclusion Strategy

Flood water is prevented from entering the building, for example, using flood barriers across doorways and airbricks, or raising floor levels. These measures are considered appropriate for 'more vulnerable' development, where recovery from internal flooding is not considered practical.

Flood Resilience or 'wet proofing' - Water Entry Strategy

Accepts that flood water will enter the building and allow for this situation through careful internal design, such as raising electrical sockets and fitting tiled floors. The finishes and services are such that the building can quickly be returned to use after the flood. Such measures are generally only considered appropriate for some 'less vulnerable' uses and where the use of an existing building is to be changed where it can be demonstrated that no other measure is practicable.

The approach for flood Resistance/Resilience design and construction has been considered in the following table: -

| Design Water Depth* | Approach |
|--------------------------------------|---|
| Design Water Depth above 0.6m | <ul style="list-style-type: none">• Allow water through the property to avoid the risk of structural damage.• Attempt to keep water out for low depths of flooding 'Water Entry Strategy' ** |
| Design Water Depth from 0.3m to 0.6m | <ul style="list-style-type: none">• Attempt to keep water out, in full or in part, depending on the structural assessment.• If structural concerns exist, follow approach above** |
| Design Water Depth up to 0.3m | <ul style="list-style-type: none">• Attempt to keep water out 'Water Exclusion Strategy.' |

*Design water depth should be based on assessing all flood types that can impact the building.

** In all cases the 'water exclusion strategy can be followed for flood water depths up to 0.3m

Environment Agency surface water flood depth mapping indicates that the site could experience localised surface water ponding up to 0.20m during a low-probability (1 in 1000-year) event.

No flooding is indicated during the 1 in 30-year or 1 in 100-year events. This predicted depth is well within the ≤0.3m threshold for a dry-proofing (water exclusion) strategy to be effective.

Proposed Flood Resistance and Resilience Measures:

- External door thresholds raised $\geq 300\text{mm}$ above adjacent ground.
- External ground regraded to fall away from the building at $\geq 1:40$ gradient for 3m minimum.
- Perimeter channel drains are provided at low points and doorways to intercept runoff.
- Solid ground-bearing concrete floors with integral damp-proof membranes (DPM) and waterproof tanking up to 300 mm above adjacent ground.
- External walls sealed using waterproof render, bituminous coatings, or crystalline waterproof additives to a minimum of 300 mm above predicted flood level.
- Flood-resistant airbricks or demountable covers provided at all ventilation points below 300mm AOD.
- Non-return valves (NRVs) fitted to all surface and foul outlets to prevent backflow during surcharge events.
- Service entries sealed with expanding closed-cell foam or proprietary waterproof grommets.
- Electrical sockets, meters, and boiler controls installed ≥ 450 mm above predicted flood depth.
- HVAC and communications systems housed above finished floor level or in elevated service zones.
- Durable, low-porosity materials below finished floor level: engineering brick, dense concrete blockwork, waterproof screeds.
- Closed-cell insulation to all services and ducts below FFL.
- Internal finishes (tiles, plasterboard on metal studs) designed for quick reinstatement if wetted.

These combined measures will effectively mitigate the limited residual surface water flood risk, providing protection against the 0.2m design depth and ensuring the buildings remain safe, functional, and recoverable after extreme events.

In addition to these design measures, it is recommended to refer to national best practice guidance, including:

- "Preparing for Floods" – Department for Communities and Local Government (DCLG)
- "Floodline: Damage Limitation" – Environment Agency (EA)

These documents provide further technical detail on material selection, installation techniques, and floodproofing standards appropriate for residential development in flood-prone areas.

The proposed flood resistance strategy is proportionate to the modelled risk level, ensuring that the development remains safe, resilient, and serviceable even under residual flood risk conditions. Furthermore, it supports the viability of the proposed Finished Floor Levels (FFLs) while maintaining compliance with EA guidance for 'more vulnerable' residential uses.

All flood resilience and resistance measures will be reviewed and agreed with Local Authority Building Control as part of the detailed design and pre-construction process.

6.5. Alterations / Improvements to channels and hydraulic structures

Channel and Hydraulic Structure Improvements refer to a set of actions and enhancements aimed at reducing the risk of flooding by modifying existing channels and hydraulic structures. These improvements typically involve constructing new channels, installing structures such as headwalls and diffusers, and integrating pipes and culverts to manage and redirect surface water runoff effectively.

These enhancements aim to intercept, collect, and control excess surface water flow, particularly from areas prone to flooding, and direct it away from vulnerable locations. By improving the capacity and efficiency of channels and hydraulic structures, these measures help mitigate the impact of flooding events, protect property and infrastructure, and enhance overall resilience to flood hazards.

Alterations / Improvements to channels and hydraulic structures are not considered an appropriate form of mitigation for this site.

6.6. Flood defences

Structures such as walls, ditches and embankments may provide a flood defence function, although they are not considered formal flood defences. These enhancements aim to intercept, and control excess surface water flow, particularly from areas prone to flooding, and direct it away from vulnerable locations.

No formal flood defences protect the site. However, the proposed development incorporates sustainable drainage measures that provide equivalent flood risk mitigation at the site scale.

Key features include:

- Channel drains at low points and external thresholds to capture and redirect local surface flows into the drainage network
- Open channel (northeast Boundary) (low point) Captures rural overland flow and safely conveys it toward the ordinary water course, reducing the risk of water entering plot.

These interventions are designed in accordance with the CIRIA SuDS Manual (C753) and national drainage standards. While not formally designated flood defences, these measures collectively provide effective flood mitigation, ensuring the site is resilient to overland flow without requiring additional engineered barriers.

6.7. Flood Warning & Emergency Planning

This section outlines measures for flood warning and emergency response to ensure the safety of future occupants.

All future residents will be required to register with the Environment Agency's Floodline Warning Service, which provides free flood alerts via phone, text, or email. Early warnings will help ensure that there is sufficient time to prepare, safeguard property, and evacuate if necessary. Residents can register online at www.gov.uk/sign-up-for-flood-warnings or by calling 0345 988 1188.

A detailed, site-specific Flood Emergency Evacuation Plan (FEEP) must be prepared before occupation. This plan will be developed in consultation with the Local Planning Authority (LPA) and local emergency services, and will include the following:

- Instructions on how to prepare the property in advance of a flood event
- Procedures for securing belongings and critical items
- Defined evacuation routes and procedures
- Contingency plans in case access routes are cut off
- A communications strategy for delivering timely warnings and updates

The plan will be provided to all occupants as part of the property handover pack and will include clear visual aids (e.g., site maps, refuge locations). It will be regularly reviewed and updated to reflect changes in flood risk data, emergency contacts, or site layout.

The site's drainage strategy has been specifically designed to remove localised surface water flooding around the dwellings, using a combination of permeable paving and channel drains. These measures reduce the likelihood of surface water ingress and support the continued usability of ground floor areas.

The site lies within a defended tidal area (Flood Zone 3a) benefiting from the Romney Marsh coastal defence system, which provides protection exceeding the 1 in 200-year (0.5 % AEP) event. Under all design and climate-change scenarios modelled, flood depths around the building remain shallow (< 0.2m) and are safely managed by the proposed surface-water drainage system.

Accordingly:

- Safe refuge is achievable at the ground-floor level during all predicted flood events, including the 1 in 100-year + 45% climate-change scenario.
- In the residual exceedance scenario of overtopping or failure of the coastal defences, temporary refuge can be safely maintained at the first-floor level, where sleeping accommodation is situated above 5.0m AOD, well above modelled tidal flood levels.

Nevertheless, safe evacuation remains the preferred response, consistent with national planning guidance. The FEEP will define clear coordination procedures with emergency services to ensure timely evacuation when warnings are issued or access routes are compromised.

by implementing robust drainage design, early warning registration, and coordinated emergency planning, the development will be well-prepared to manage residual flood risk. These measures ensure long-term resilience, safeguard occupant safety, and align with national policy and best practice guidance.

6.8. Management of development run-off

The management of development run-off primarily focuses on controlling and managing the flow of water from urban areas into watercourses to prevent or minimise flood risks. The increased impervious surfaces (such as roads, buildings, and pavements) can lead to higher volumes of surface water run-off during rainfall events, intensifying flooding in downstream areas.

The drainage strategy for this site has been developed to ensure that post-development runoff rates and volumes do not exceed pre-development levels, even during extreme rainfall events, in accordance with Building Regulations Part H3, the NPPF, and LLFA requirements.

Key design principles:

- **SuDS Integration:** The scheme follows the Sustainable Drainage Systems (SuDS) hierarchy, managing rainfall close to source and encouraging infiltration, attenuation, and controlled discharge in line with CIRIA SuDS Manual (C753) best practice.

Treatment Train Approach: Surface water is conveyed through a sequence of SuDS components that provide progressive stages of collection, conveyance, storage, infiltration, and treatment, ensuring both flow control and improved water quality.

Attenuation and Climate Change Allowance: Drainage elements are designed to accommodate rainfall events up to the 1 in 100-year + 45 % climate-change allowance, maintaining adequate storage capacity and resilience to future climate scenarios.

Water Quality Protection: The SuDS treatment train achieves the required pollutant-removal performance in accordance with CIRIA mitigation indices, providing effective pre-treatment before infiltration or discharge to the receiving environment.

This integrated, SuDS-led approach ensures that surface water is managed safely, sustainably, and for the lifetime of the development, maintaining compliance with national policy and preventing any increase in flood risk on-site or elsewhere within the catchment.

7. Existing Drainage Summary

Pre-development Catchments and Runoff Rates

Brownfield Site

- 1450m² Total site area

Estimated Pre-development Catchments:

- 819m² open space (greenfield/permeable area)
- 320m² Existing impermeable roof area discharged via private drains into the ordinary watercourse.
- 330m² Existing impermeable hardstanding area discharging into the ordinary watercourse.

The total impermeable area pre-development is approximately 631m². The existing drainage systems are to be retained and reused where practicable.

Pre-Development Brownfield run-off rates estimated using Modified Rational Method considering a 30min Time of Concentration, Cv of 0.84 for impermeable area:

- 3.9 l/s 2-year return period
- 10.1 l/s 30-year return period
- 12.7 l/s 100-year return period

- 35m³ Estimate discharge volume (100yr, 360min event)

The supporting calculations produced are included in the Appendix.

8. Surface Water Drainage Strategy

The drainage strategy has been developed in accordance with the National Standards for Sustainable Drainage Systems (SuDS). In accordance with Standard 1 – Runoff Destinations, the design process has followed the established surface water drainage hierarchy to identify the most sustainable and practicable method of surface water disposal

8.1. SuDS Hierarchy and Feasibility

The SuDS hierarchy sets out the preferred methods of surface-water disposal in order of sustainability, as defined by the Defra National Standards and Building Regulations Part H3.

| Surface Water Hierarchy | Comment |
|---|---|
| × 1. Reuse / Rainwater Harvesting | Rainwater harvesting is a feasible option for managing roof runoff and can be utilised for garden irrigation or non-potable reuse. While this offers limited attenuation (typically up to 2m ³ for small-scale systems), the roof drainage layout has been designed to allow for the future integration of rainwater harvesting units. |
| × 2. Infiltration into the Ground | Based on the Ground Investigation results, it has been determined that Infiltration is not an appropriate means of surface water discharge. |
| ✓ 3. Discharge to a Watercourse | An ordinary watercourse runs parallel to the northern boundary. Discharge subject to Land Drainage Consent from the RMIDB/LLFA. |
| - 4. Discharge to a Surface Water Sewer | No public surface-water sewer recorded locally. |
| - 5. Discharge to a Combined Sewer | No combined sewers are recorded in the vicinity. |
| - 6. Discharge to a Foul Sewer | The existing foul sewer in the highway serves domestic wastewater only and is not suitable for surface-water disposal. |

This approach ensures compliance with Defra Standard 1 (Managing Flood Risk) and the drainage hierarchy required by Building Regulations Part H.

8.2. Post-development Design Parameters

In accordance with Defra Standard 1 and Building Regulations Part H3, the discharge hierarchy has been assessed in order of preference in section 8.1. SuDS Hierarchy and Feasibility.

The proposed surface-water drainage system is designed to discharge into the existing ordinary watercourse located along the northern boundary.

Discharge will be restricted and controlled to ensure that post-development peak runoff rates do not exceed the pre-development brownfield rates, in compliance with the Non-Statutory Technical Standards for SuDS and current Lead Local Flood Authority (LLFA) guidance.

Consistent with best practice and Defra's updated drainage policy (DEPTRA, 2024–2025), the design also incorporates a minimum 50% betterment on existing discharge rates for equivalent storm events, reducing hydraulic loading on the downstream network and improving overall catchment resilience.

The design applies only to positively drained impermeable areas and includes a 45% allowance for climate change, in accordance with Environment Agency guidance for residential development. A runoff coefficient (Cv) of 1.0 has been adopted for impermeable areas (representing 100% runoff) and 0.0 for permeable areas, assuming no effective runoff from landscaped or permeable surfaces.

Estimate Post-development Catchments:

- 819m² open space (greenfield/permeable area)
- 320m² impermeable roof area discharged via private drains into the ordinary watercourse.
- 330m² impermeable hardstanding area discharging via private drains into the ordinary watercourse.

Estimated Post-development positive discharge rates for critical storm return periods:

- 2.0 l/s 2-year return period
- 3.3 l/s 30-year return period
- 3.7 l/s 100-year return period
- 4.7 l/s 100-year return period + 45% climate change allowance

The peak volume of post-development water runoff would be greater than the existing volume. Stormwater management is essential to prevent an increase in on-site and surrounding-area flood risk.

Preliminary analysis indicates that 28m³ of storage volume will be required to safely accommodate the increased stormwater runoff volume. This capacity effectively mitigates flood risks over its 100-year design life, ensuring compliance with Sustainable Drainage System (SuDS) principles.

8.3. SuDS Component Suitability

A range of Sustainable Drainage Systems (SuDS) components has been assessed for suitability, taking into account the site’s ground conditions (Wadhurst Clay Formation, low permeability), limited open space, topography, and maintenance accessibility.

All proposed systems are impermeable (non-infiltrating), as infiltration techniques are not feasible due to low-permeability clay strata and shallow groundwater. The adopted components achieve the required balance of attenuation, treatment, and controlled discharge, in line with the Defra National Standards (June 2025) and CIRIA C753 SuDS Manual.

Suitability of SuDS Components

| SuDS Component | Suitability | Description |
|-------------------------------|-------------|--|
| Green Roofs | ✗ | Vegetated roofs providing source control and water quality benefits. Not suitable for existing buildings. |
| Soakaways | ✗ | Infiltration units storing and draining water to ground. Not viable due to poor infiltration and high groundwater. |
| Rainwater Harvesting | ✓ | Collects roof runoff for non-potable reuse, reducing discharge volumes. |
| Permeable Pavements | ✓ | Porous surfacing stores and filters runoff before controlled release. |
| Geocellular Systems | ✓ | Below-ground modular crates for temporary attenuation before discharge. |
| Channels and Rills | ✗ | Open conveyance routes providing flow control and minor treatment. |
| Bioretention Systems | ✗ | Shallow-planted basins filter and store surface runoff. |
| Infiltration trench | ✗ | Stone-filled trenches promote infiltration. Unsuitable due to poor ground conditions. |
| Filter Strips | ✗ | Vegetated strips slow and filter sheet flow from hard surfaces. |
| Filter Drains | ✗ | Gravel-filled trenches with perforated pipes for storage and conveyance. |
| Swales | ✓ | Shallow vegetated channels convey and treat runoff. |
| Detention Basin | ✗ | Shallow vegetated area providing temporary runoff storage. |
| Retention Pond and Wetlands | ✗ | Permanent water body providing settlement and treatment. Oversized for the site. |
| Proprietary Treatment Systems | ✓ | Manufactured devices remove pollutants before discharge. |

This storage provides adequate capacity for the 1 in 100-year + 45% climate change event, maintaining discharge below the agreed restricted rate and delivering improvements over the pre-development runoff regime.

All components have been designed to:

- Manage runoff as close to its source as practicable;
- Provide sediment and pollutant capture through pre-treatment (sump filter chambers and channel drains);
- Ensure long-term system access and maintainability in accordance with Defra Standard 4.

8.4. Water Quality & Pollution Mitigation

Surface-water runoff from hardstanding and roofed areas can contain suspended solids, hydrocarbons, and trace metals that may impact water quality if left untreated. The CIRIA C753 SuDS Manual (2015, with 2023 Addendum) sets minimum treatment requirements through Pollution Hazard Indices (PHI) based on land use.

Table 8.4a - Pollution Hazard Indices (PHI) for different land use classifications:

| Land use | Pollution hazard level | Total Suspended Solids (TSS) | Metals | Hydrocarbons |
|---|------------------------|------------------------------|--------|--------------|
| Residential roofs | Very low | 0.2 | 0.2 | 0.05 |
| Individual Driveways, parking courts, and low-traffic residential access roads (<300 vehicle movements/day) | Low | 0.5 | 0.4 | 0.05 |

(Adapted from Table 26.2, CIRIA C753 – The SuDS Manual, 2015)

Given the brownfield context and low-permeability ground conditions, infiltration is not viable. Surface water will therefore be managed using non-infiltrating SuDS features designed to achieve treatment at source before discharge to the existing northern watercourse.

Table 8.4b - Indicative SuDS mitigation indices for discharges to surface waters

| Type of SuDS component | Proposed | Total Suspended Solids (TSS) | Metals | Hydrocarbons |
|------------------------|----------|------------------------------|--------|--------------|
| Geocellular Tank | ✓ | - | - | - |
| Filter Strip | ✗ | 0.4 | 0.4 | 0.5 |
| Filter Drain | ✗ | 0.4 | 0.4 | 0.4 |
| Swale | ✗ | 0.5 | 0.6 | 0.6 |
| Bioretention System | ✗ | 0.8 | 0.8 | 0.8 |
| Permeable pavement | ✓ | 0.7 | 0.6 | 0.7 |
| Detention Basin | ✗ | 0.5 | 0.5 | 0.6 |
| Pond | ✗ | 0.7 | 0.7 | 0.5 |
| Wetland | ✗ | 0.8 | 0.8 | 0.8 |

Proprietary treatment systems



These must demonstrate that they can address each contaminant type 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.

(Adapted from Table 26.3, CIRIA C753 – The SuDS Manual, 2015)

After the first treatment stage (source control), a 50% reduction in mitigation efficiency is typically applied when assessing combined treatment performance

The proposed drainage design delivers a two-stage treatment train providing water-quality improvement and pollution control as follows:

- Permeable paving to driveways and parking areas provides source control, filtering sediments and hydrocarbons while attenuating flows.
- Sump filter chambers, installed upstream of the geocellular attenuation system, capture coarse sediments and suspended solids prior to discharge.

This combination provides treatment indices exceeding the PHI values for both roof and paved surfaces, thereby satisfying CIRIA C753 water-quality standards.

Together, these features deliver a maintainable and proportionate two-stage treatment system, ensuring compliance with:

- Defra National SuDS Standard 2 (Water Quality) – through effective pollutant removal; and
- CIRIA C753 Treatment Index requirements – achieving equal or greater mitigation indices than the pollution hazard level of the contributing surfaces.

All treatment devices will be inspected twice annually and after major storm events, with sediment and hydrocarbon removal undertaken as required to maintain treatment efficiency and hydraulic capacity.

8.5. Exceedance Flow Management

Surface-water exceedance flows (greater than the 1 in 100-year + CC event) will be directed along safe, overland flow routes, avoiding buildings and critical infrastructure.

Exceedance will be contained by site levels, kerb lines, and landscaping features, ensuring no adverse impact to third-party land.

Flow-control chambers will include a high-level overflow to prevent localised ponding during extreme rainfall.

This approach aligns with Defra Standard 1 (Managing Flood Risk) and ensures that exceedance is safely managed in a controlled manner.

9. Foul Water Strategy

The foul-water drainage system will collect and convey wastewater from the proposed development to the existing public foul sewer via a gravity connection, in accordance with Building Regulations Part H1, the Design and Construction Guidance (DCG, 2020), and the Water Industry Act 1991

All foul drainage operates on a separate system, preventing cross-connection with surface-water drains.

Design Summary:

- Foul flows from each dwelling will discharge by gravity to the public foul sewer at the agreed point of connection (subject to Section 106 approval from the sewerage undertaker).
- Pipework will comprise 100mm diameter uPVC or vitrified-clay pipes laid at gradients sufficient to achieve self-cleansing velocity (≥ 0.75 m/s at one-third design flow) If this cannot be achieved, no foul water gravity sewer or lateral drain should be laid to a gradient flatter than:
 - $\varnothing 100\text{mm}$ - 1 in 40 (without WC or under a structure)
 - $\varnothing 100\text{mm}$ - 1 in 80 (minimum of one WC serving ten or less properties)
 - $\varnothing 150\text{mm}$ - 1 in 150 (serving a minimum of ten dwellings)
- The design flow is based on the Southern waters foul water daily discharge calculator.
- Inspection chambers will be provided at all junctions and changes in direction, with maximum spacing of 45 m between access points.
- All joints will be watertight and constructed in accordance with BS EN 1401 / BS EN 295 standards.

Pre-Development

Foul water from the existing dwelling currently discharges by gravity connection into the public foul sewer.

CCTV survey established that the existing foul flows are disposed of from the site via existing private drains into the Public Sewer MH7001

Foul discharge based on the following usage:

- 1No. Dwelling (1-bed)
- 2.4 Occupancy rate of person /dwelling
- 0.01l/s Estimated discharge rate (based on SW daily discharge calculator)

CCTV survey to establish that the existing foul flows are disposed of from the site via existing private drains into the Public Sewer MH1203

Post-Development

Foul water to be discharged under gravity into the public sewer network

Foul discharging upstream the storm of Public Sewer MH1203 based on the following usage:

- 1 No. Dwelling (3-Bed)
- 4 Occupancy rate of person /dwelling

- 0.015 l/s Estimated discharge rate (based on SW daily discharge calculator)

The post-development scenario increases total foul water discharge into the public sewer network. Final approval will be subject to confirmation from the Sewerage Undertaker.

10. On-Site Construction

All foul and surface water drainage works shall be carried out in accordance with the approved design drawings, Building Regulations Part H, the Design and Construction Guidance (2020), and relevant British Standards, including BS EN 752 and BS EN 1610.

Drainage systems shall be installed by competent contractors using approved materials and methods. Pipework shall be laid to the specified gradients, ensuring correct line, level, and alignment. All pipes, joints, and chambers must be watertight, with air or water testing completed before backfilling.

During construction:

- Adequate measures shall be taken to prevent the entry of silt, debris, or construction materials into the drainage system.
- Temporary silt-control features (e.g., filter socks or silt traps) shall be used to protect the network and water quality.
- Flow-control devices, attenuation crates, and inspection chambers shall be installed in accordance with manufacturer instructions and verified for correct positioning before final cover.

On completion, the Contractor shall provide:

- Photographic records of key installation stages;
- Testing certificates confirming system integrity; and
- As-built drawings and level surveys showing final locations and invert levels.

All records shall be included in the Health & Safety File and Operation & Maintenance Manual to demonstrate that both foul and surface water systems have been constructed in accordance with the approved design and regulatory standards.

11. Maintenance and Management

Both surface-water and foul-water drainage networks will remain in private ownership and will not be adopted by the local authority or statutory undertaker.

Ongoing inspection and maintenance will therefore be the responsibility of a Management Company appointed by the developer or future landowners.

A maintenance schedule must be implemented to ensure that all drainage features continue to function effectively throughout the lifetime of the development. The following table provides an indicative framework, to be expanded during construction once proprietary products and equipment are selected.

Maintenance Schedule for Main Drainage

| Activity | Indicative Frequency | Typical Tasks |
|-----------------------------|----------------------|---|
| Routine/regular maintenance | Monthly | <ul style="list-style-type: none"> Litter removal and general visual inspection. Clear debris and vegetation from inlets, gullies, and channels. Cut grass and remove growth around drainage features. |
| | Every six months | <ul style="list-style-type: none"> Sweep roads and paved areas. Inspect and clear flow-control chambers, orifice plates, and silt traps. Inspect for blockages or damage in drainage channels and pipework. Service any foul treatment plant or pumping equipment (if applicable). |
| Occasional maintenance | Annually | <ul style="list-style-type: none"> Suction sweep permeable paving (if applicable). Check performance of flow-control devices CCTV inspection and jetting of key surface and foul runs. Inspect and clean attenuation tanks and filter chambers Remove accumulated silt and debris. |
| Remedial Maintenance | As required | <ul style="list-style-type: none"> Repair damaged pipework, chambers, or inlets/outlets. Reinstate surfaces following excavation or erosion. Clean and restore systems following flooding or pollution events. |

All inspection and maintenance records shall be logged by the Management Company and retained within the Health & Safety File and Site Maintenance Manual.

These documents should be updated following construction to include any manufacturer-specific recommendations and maintenance intervals for installed proprietary products.

12. Conclusions

This Flood Risk Assessment and Drainage Strategy has been prepared in accordance with the National Planning Policy Framework (NPPF, 2023), Planning Practice Guidance (Flood Risk and Coastal Change, 2024), and the standards of the Environment Agency (EA) and Lead Local Flood Authority (LLFA).

The assessment confirms that the proposed development can be safely delivered and will not increase flood risk to the site or elsewhere. The principal conclusions are as follows:

- The site lies within Flood Zone 3a, an area of high probability of tidal flooding; however, it benefits from the Romney Marsh coastal defences, which provide protection exceeding the 0.5% AEP (1 in 200-year) tidal event. The residual risk of tidal inundation is therefore low.
- No significant flood risk has been identified from fluvial, surface water (pluvial), groundwater, sewer, or artificial sources, based on EA and JBA mapping and supporting datasets.
- The development incorporates finished floor levels that provide safe refuge at ground-floor level for all design flood events, with temporary refuge at first-floor level in the unlikely event of coastal defence overtopping or breach.
- The surface-water drainage strategy has been designed to discharge into the existing northern watercourse at a restricted rate not exceeding the pre-development brownfield runoff rate, achieving a minimum 50% betterment in accordance with Defra's (2024–2025) drainage policy (DEPTRA).
- The system follows Sustainable Drainage System (SuDS) principles, incorporating source control, attenuation, and treatment in line with CIRIA C753, Building Regulations Part H3, and LLFA guidance.
- Foul drainage will connect to the public sewer in compliance with Southern Water's design guidance, and a Flood Emergency and Evacuation Plan (FEED) will ensure occupant safety under residual conditions.

In conclusion, the proposed development:

- Will remain safe and resilient for its lifetime;
- Will not increase flood risk on- or off-site; and
- Fully complies with national and local planning policy requirements relating to flood risk and sustainable drainage.

Accordingly, the development is considered acceptable in flood risk and drainage terms and suitable for planning approval.