



**THE COWPLAIN SCHOOL, HART PLAIN
AVENUE, COWPLAIN, WATERLOOVILLE PO8
8RY**

**ERECTION OF A SCHOOL THEATRE BUILDING
AND CHANGING ROOMS TO SERVE
ADJACENT SPORTS FACILITIES WITH
ASSOCIATED LANDSCAPING, PLANTING AND
ANCILLARY WORKS**

Flood Risk Assessment & Drainage Strategy

Prepared on Behalf of

The Cowplain School

D2366/FRA1.2

March 2025

DOCUMENT CONTROL

Project: The Cowplain School, Hart Plain Avenue, Cowplain, Waterloooville PO8 8RY
Erection of a school theatre building and changing rooms to serve adjacent sports facilities with associated landscaping, planting and ancillary works

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- PL300** Proposed Impermeable Areas
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- Appendix A** JB Architecture Development Proposals
- Appendix B** Encompass Surveys Topographic Survey & GPR Survey
- Appendix C** BGS Information & Records
- Appendix D** Ground Management Ltd Intrusive Investigation & Infiltration Testing
- Appendix E** Southern Water Public Sewer Records
- Appendix F** Flood Maps for Planning Extracts
- Appendix G** Wallingford Greenfield Run-off Calculations
- Appendix H** Site 3D Hydraulic Calculations

1 INTRODUCTION

1.1 Background

- 1.1.1 BP Civils is instructed by The Cowplain School to prepare a flood risk assessment and drainage strategy to accompany a planning application for the erection of a school theatre building and changing rooms to serve adjacent sports facilities with associated landscaping, planting and ancillary works. The architectural development proposals are contained within **Appendix A**.
- 1.1.2 This report has been undertaken in accordance with National Planning Policy Framework (NPPF) and The Planning Practice Guidance Flood Risk and Coastal Change in addition to the use of SuDS for achieving sustainable development.
- 1.1.3 In preparing this report, BP Civils has referred to the following documents and information:
- Environment Agency Flood Maps for Planning
 - Environment Agency Long-term Flood Risk Service and Mapping
 - British Geological Survey (BGS) Information and Records
 - Ground Management Ltd Site Investigation
 - Partnership for South Hampshire (PfSH) Strategic Flood Risk Assessment
 - Southern Water Public Sewer Records
 - Site Topographic and Utilities Surveys
- 1.1.4 This report has been prepared to assess flood risk at the site, and to advise of any mitigation which may be required in order to ensure that the proposed development remains safe for its design life in accordance with current design standards.
- 1.1.5 This report has been prepared for the benefit of the named client only.

2 SITE LOCATION AND DESCRIPTION

- 2.1.1 A site location plan is included within **Appendix A**.
- 2.1.2 The National Grid Reference is SU 68502 10718.
- 2.1.3 The site is located to the south-west of the existing car park and adjacent to the existing sports court.
- 2.1.4 The site measures 7,778m² (0.78Ha) and is occupied by 2 No. trees and soft landscaping.
- 2.1.5 A topographic survey has been undertaken at the site by Encompass Surveys, dated November 2024. The survey identifies levels in the range of 46.40m AOD and 47.50m AOD.
- 2.1.6 The topographic survey provides contours which demonstrates the trends in local topography for the area of proposed development.
- 2.1.7 Drawing PL200 (LiDAR Contours) has been prepared to demonstrate wider trends in topography.

3 GROUND CONDITIONS

- 3.1.1 Reference has been made to the British Geological Survey (BGS) Geology of Britain Viewer to gain an understanding of the underlying geology at the site.
- 3.1.2 The BGS Geology of Britain Viewer identifies a bedrock geology consisting of 'London Clay Formation – Clay, silt and sand.'

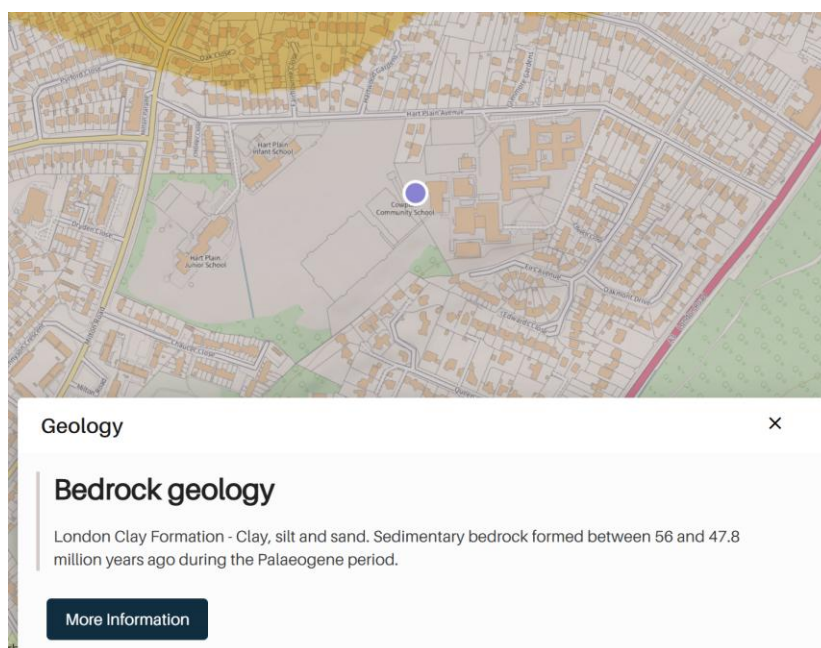


Figure 1. Geology of Britain Viewer – Bedrock Geology (BGS)

- 3.1.3 The BGS Geology of Britain Viewer largely does not identify superficial deposits at the site, although 'Head – Clay, silt, sand and gravel' is identified immediately to the west.

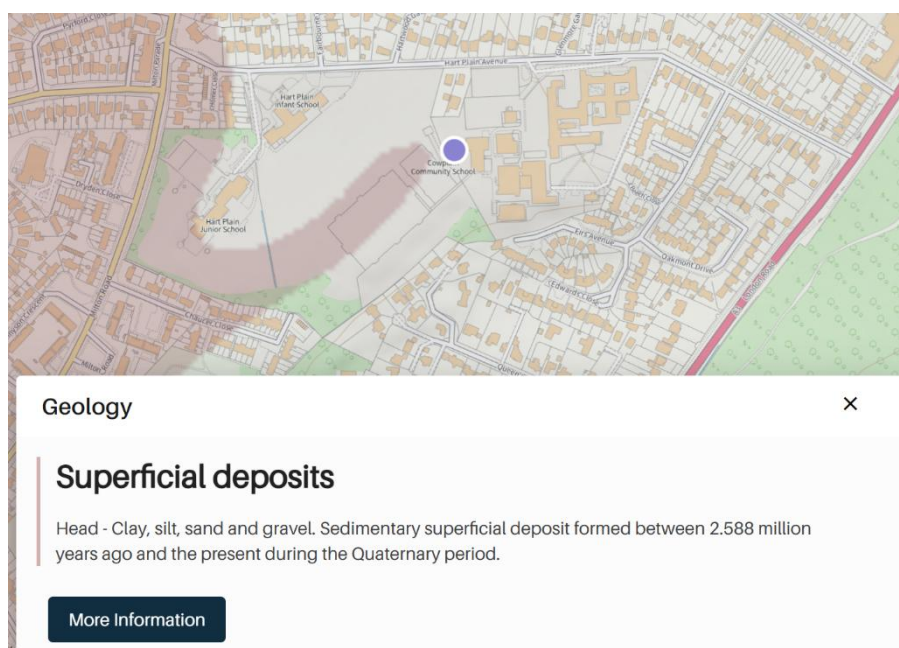


Figure 2. Geology of Britain Viewer – Superficial Deposits (BGS)

- 3.1.4 Historic borehole records from the Single Onshore Boreholes Index (SOBI) on the BGS website have also been reviewed. Historic boreholes are identified within the school's grounds.
- 3.1.5 The nearest historic borehole to the area of proposed development is located south-west of the proposed building (SU61SE53). Records are contained within **Appendix C**.

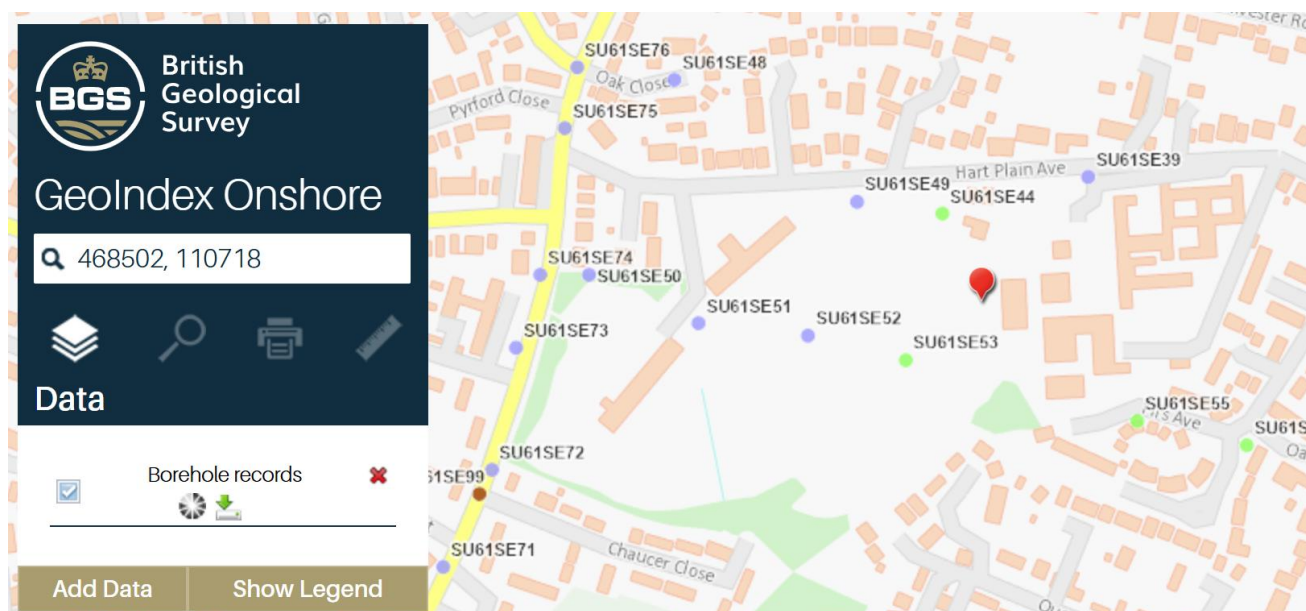


Figure 3. Historic Borehole Locations (BGS)

- 3.1.6 The recorded encountered geology is consistent with the BGS Geology of Britain mapping reviewed for the full extent of the borehole.
- 3.1.7 Ground Management Ltd has undertaken intrusive ground investigation and infiltration testing at the site. Works were undertaken between 27th March 2025 and 2nd April 2025.
- 3.1.8 A single trial pit (TP1) was excavated to a depth of 1.53m below ground level.
- 3.1.9 Topsoil was encountered to a depth of 150mm below ground level, beneath which Made Ground was recorded to a depth of 650mm below ground level. 'Firm yellow brown mottled light grey silty CLAY' was recorded for the remaining depth of the trial pit.
- 3.1.10 Infiltration testing was attempted within TP1. Compliant testing could not be completed owing to the underlying conditions.
- 3.1.11 Reporting from Ground Management Ltd is contained within **Appendix D**.

3.2 Groundwater

- 3.2.1 The historic borehole records reviewed confirm that groundwater was encountered at shallow depths. The exact depth is not recorded.
- 3.2.2 Ground Management Ltd has confirmed that groundwater was not encountered on site during intrusive investigation.
- 3.2.3 Mapping managed by MAGIC (magic.defra.gov.uk) provides geographic information concerning the natural environment from across government. This mapping tool has been referred to in order to confirm aquifer designations, as well as whether the site is located within any groundwater source protection

zones, groundwater vulnerability zones, drinking water protected areas or drinking water safeguard zones.

- 3.2.4 The site falls within an area designated as both an 'Unproductive' bedrock aquifer, as well as an 'Unproductive' superficial drift aquifer.

Landscape

Geology and Soils

Aquifer Designation Map (Bedrock) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unproductive

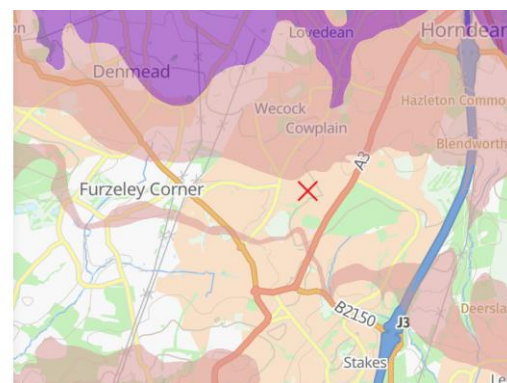


Figure 4. Bedrock Aquifer Designation Map (DEFRA)

Landscape

Geology and Soils

Aquifer Designation Map (Superficial Drift) (England)

- Principal
- Secondary A
- Secondary B
- Secondary (undifferentiated)
- Unknown (lakes+landslip)
- Unproductive

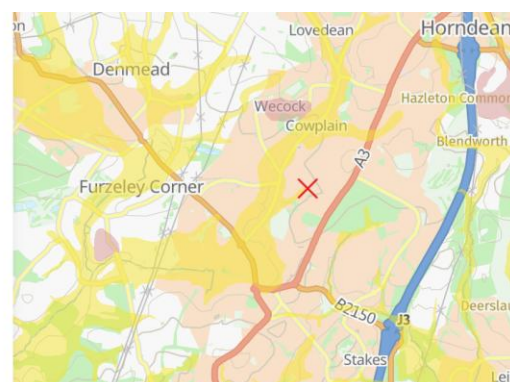


Figure 5. Superficial Drift Aquifer Designation Map (DEFRA)

- 3.2.5 The site falls within an 'Unproductive' groundwater vulnerability zone.

Landscape

Geology and Soils

Groundwater Vulnerability Map (England)

- Local Information
- Soluble Rock Risk
- High
- Medium - High
- Medium
- Medium - Low
- Low
- Unproductive



Figure 5. Groundwater Vulnerability Map (DEFRA)

- 3.2.6 The site is not identified as being in or within the vicinity of any drinking water protected areas or drinking water safeguard zones, although is located within a 'Zone I – Subsurface Activity' source protection zone.

Designations

Land-Based Designations

Non-statutory

Drinking Water Protected Areas (Surface Water) (England)



Drinking Water Safeguard Zones (Surface Water) (England)



Drinking Water Safeguard Zones (Groundwater) (England)



Source Protection Zones merged (England)

Zone I - Inner Protection Zone

Zone I - Subsurface Activity

Zone II - Outer Protection Zone

Zone II - Subsurface Activity

Zone III - Total Catchment

Zone III - Subsurface Activity

Zone of Special Interest

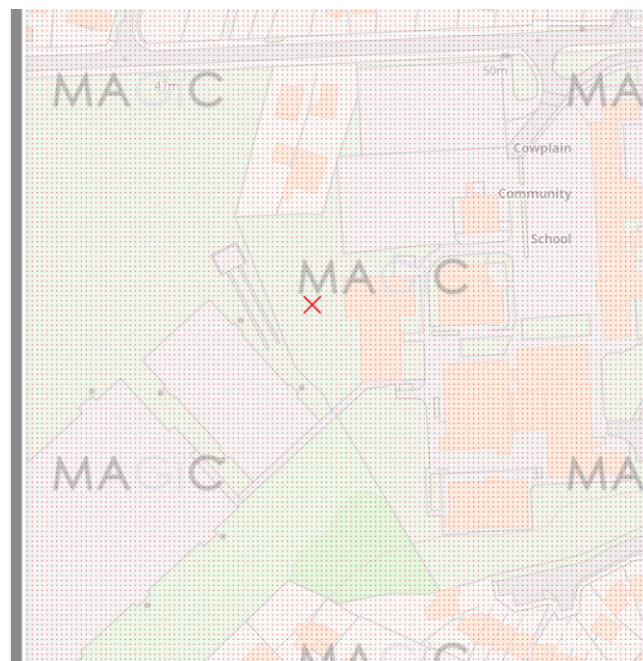


Figure 6. Drinking Water Protected Areas, Drinking Water Safeguard Zones and Source Protection Zones Map (DEFRA)

4 EXISTING DRAINAGE

4.1 Surface Water

- 4.1.1 The area where the proposed new theatre building is to be located is not served by any formal drainage infrastructure and drains naturally.
- 4.1.2 There are no ordinary watercourses and/or Main Rivers on site, or within the vicinity of the site.
- 4.1.3 The local sewerage authority is Southern Water. Public sewer records have been obtained from Southern Water as contained within **Appendix E**.
- 4.1.4 Southern Water's public sewer records identify public surface water sewers within the vicinity of the site.
- 4.1.5 A 450mm dia. public surface water sewer is identified south of the site, flowing in a westerly direction.
- 4.1.6 A second 450mm dia. public surface water sewer is identified west of the site, flowing in a south-westerly direction.
- 4.1.7 These two sewers converge, and continue to flow in south-westerly direction.
- 4.1.8 Encompass Surveys has undertaken a utilities survey which has identified private surface water drainage assets within the area of proposed works. The survey identifies a 150mm dia. pipe incoming from the existing car park, falling to the south. Additional surface water drainage infrastructure is identified serving the existing adjacent building. It is not known where these existing drainage assets discharge to. It is assumed, however, that they drain to Southern Water's public surface water sewer network.
- 4.1.9 Greenfield run-off rates have been calculated in relation to the site area, using HR Wallingford's 'Greenfield run-off rate estimation' tool. 7,778m² (0.78Ha) has been used for this assessment.
- 4.1.10 Greenfield run-off rates have been calculated as follows;
- $Q_{BAR} = 4.3 \text{ l/s}$
 - 1 in 1 Year – 3.7 l/s
 - 1 in 10 Year – 7 l/s
 - 1 in 30 Year – 10 l/s
 - 1 in 100 Year – 13.8 l/s
 - 1 in 200 Year – 16.2 l/s

4.2 Foul Water

- 4.2.1 The area where the proposed new theatre building is to be located is not currently served by any formal foul water drainage infrastructure.

- 4.2.2 Southern Water's public sewer records identify public foul water sewers within the vicinity of the site.
- 4.2.3 A 225mm dia. public foul water sewer is identified passing through the site, at the southern extent, flowing in a westerly direction.
- 4.2.4 A second 1350mm dia. public foul water sewer is identified west of the site, flowing in a south-westerly direction.
- 4.2.5 These two sewers converge to the west of the site, before flowing in a south-easterly direction.

4.3 Highway Drainage

- 4.3.1 Hart Plain Avenue is served by traditional road gullies. It is understood that these discharge to the public surface water sewers located beneath Hart Plain Avenue.

5 PROBABILITY

5.1 Sources of Information

5.1.1 The NPPF requires that all sources of flooding are considered being tidal, fluvial, pluvial, groundwater, sewers and man-made reservoirs/canals.

5.1.2 The likelihood of the site flooding has been established by reviewing the following information:

- Environment Agency Flood Maps for Planning
- Long-Term Flood Risk Service and Mapping (Gov.uk)
- Partnership for South Hampshire (PfSH) Strategic Flood Risk Assessment

5.2 Flood Maps and Modelling

5.2.1 Flood Maps for Planning identifies that the site is located in Flood Zone 1.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b).
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. (Land shown in light blue on the Flood Map).
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. (Land shown in dark blue on the Flood Map).
Zone 3b The 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 function 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 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 flooding). <p>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional</p>

	floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map).
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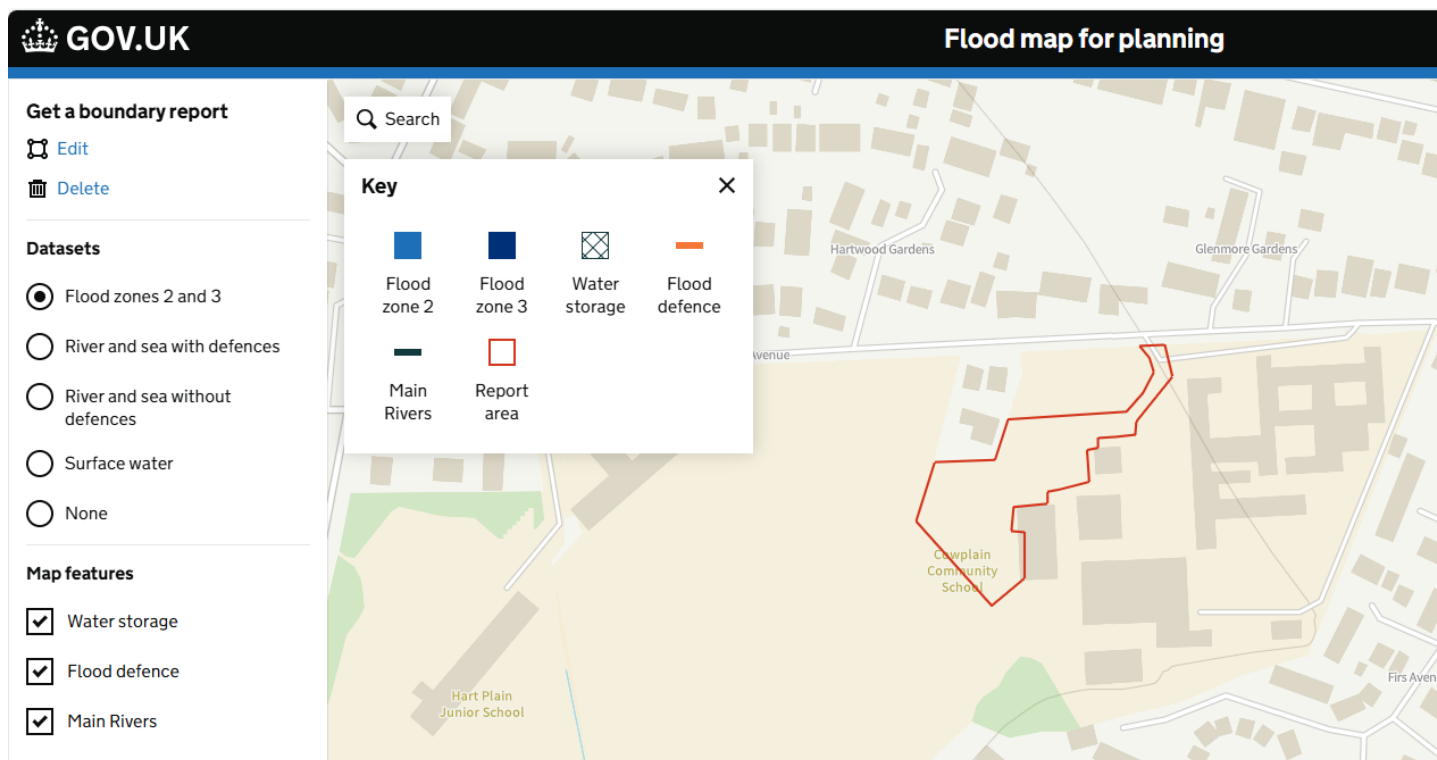


Figure 7. Flood Maps for Planning (Gov.uk)

- 5.2.2 Flood Maps for Planning, Rivers and the Sea, do not identify the site as being at risk of flooding from such sources.
- 5.2.3 Flood Maps for Planning, Surface Water, largely do not identify the site as being at risk of surface water flooding. Extents are identified as at risk of surface water flooding adjacent to the existing building, to the east of the proposed new theatre building location (1 in 30, 1 in 100 and 1 in 1000).
- 5.2.4 Flood Maps for Planning extracts are contained within **Appendix F**.
- 5.2.5 The Long-term Flood Risk Service indicates that groundwater and/or reservoir flooding is 'unlikely' at the site.

Other flood risks
[More about groundwater and reservoirs](#)

Groundwater
 Flooding from groundwater is unlikely in this area.

Reservoirs
 Flooding from reservoirs is unlikely in this area.

Figure 8. Long-term Flood Risk Service – Groundwater and Reservoirs (Gov.uk)

5.3 Strategic Flood Risk Assessment

- 5.3.1 Havant Borough Council has a published Strategic Flood Risk Assessment, dated June 2024. This forms part of the Partnership for South Hampshire's collaborative Strategic Flood Risk Assessment.
- 5.3.2 The site is not specifically referenced within the Strategic Flood Risk Assessment.
- 5.3.3 Interactive mapping available online in relation to the Partnership for South Hampshire's Strategic Flood Risk Assessment provides greater clarity in relation to the risk of surface water flooding.

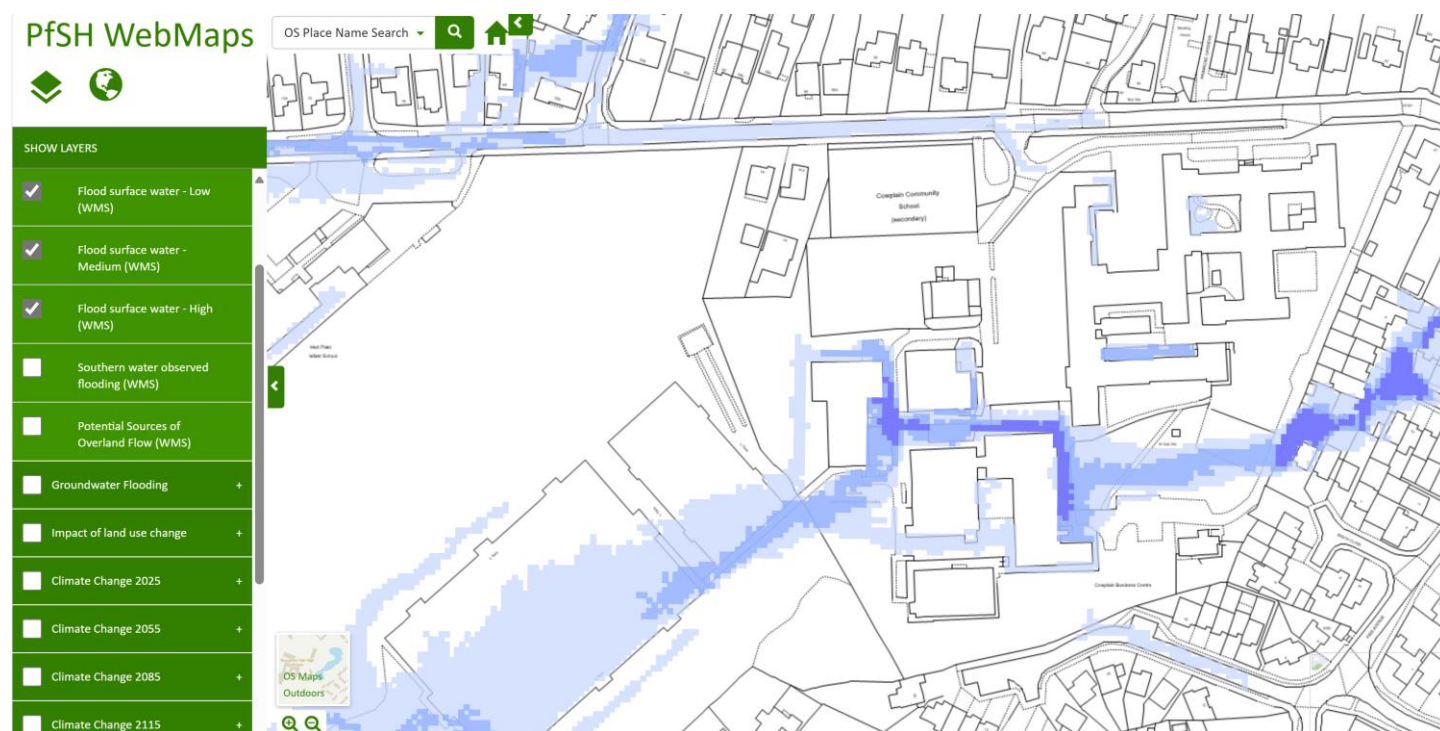


Figure 9. Partnership for South Hampshire Strategic Flood Risk Assessment – Surface Water Flood Risk

- 5.3.4 The available mapping identifies the area of proposed development as being at 'Very Low' to 'Low' risk of surface water flooding.
- 5.3.5 The Potential Sources of Overland Flow mapping identifies a 'High' to 'Very High' risk.

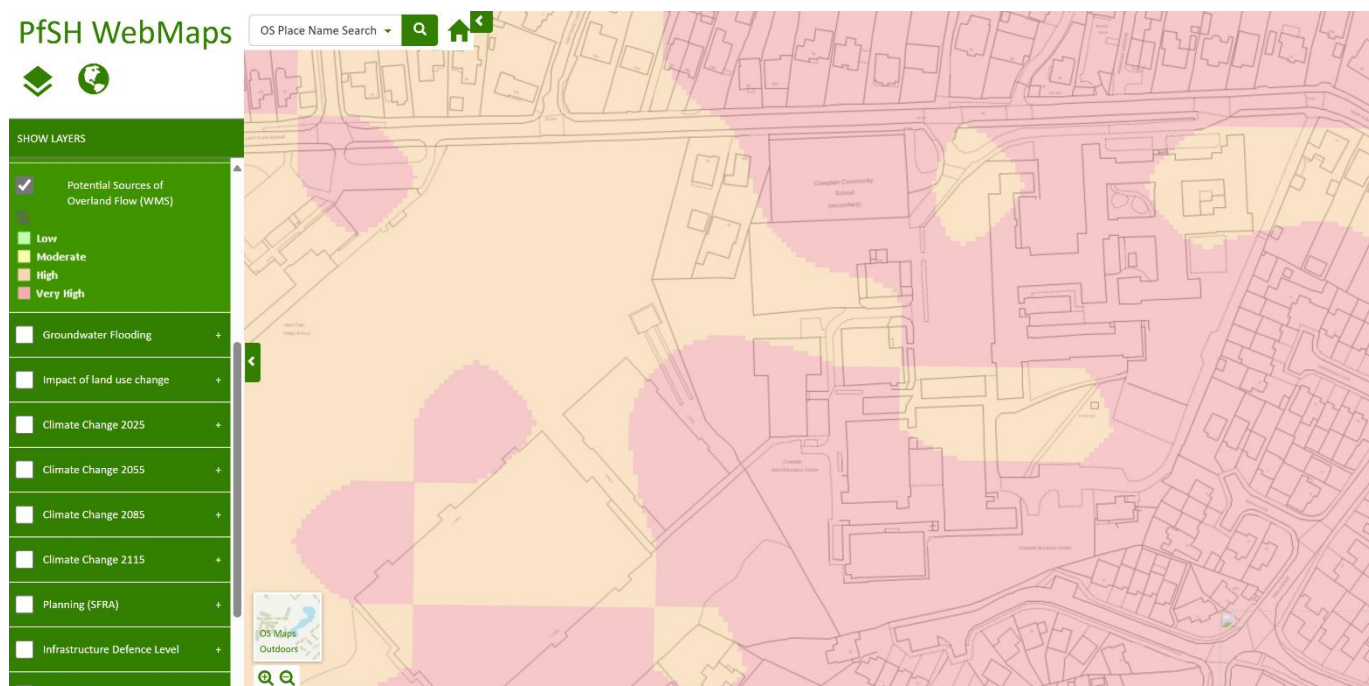


Figure 10. Partnership for South Hampshire Strategic Flood Risk Assessment – Potential Sources of Overland Flow

5.4 Historic Flooding

- 5.4.1 Anecdotal information has been provided by the school, confirming an historic surface water flood event. Run-off entered the site, flowing across the playground and falling to the artificial sports pitch (to the south-west of the proposed new theatre building).
- 5.4.2 No other records of historic flooding have been identified which have directly impacted upon the site, from the sources of information assessed in the undertaking of this flood risk assessment.

5.5 Summary of Flood Risk

5.5.1 The potential sources of flooding are:

Source of Flooding	Level of Risk
Rivers and Coastal	Very Low The site is located in Flood Zone 1 and is not identified as being at risk of flooding from such sources.

Surface Water	<p>Very Low to High</p> <p>The Long-term Flood Risk Maps for Surface Water largely do not identify the site as at risk of surface water flooding. A corridor is identified as being at risk of flooding, adjacent to the existing building and to the east of the proposed new theatre building (1 in 30, 1 in 100 and 1 in 1000).</p> <p>The potential for an overland flow route, and its likely catchment, has been considered.</p> <p>Given the largely urbanised location, with highway drainage (gullies) on Hart Plain Avenue, it is unlikely that there is potential for a significant flow route through the site. Any catchment is likely to be localised, and limited to the school grounds itself (for example, the existing car park) and the area of proposed development.</p> <p>With the various features, including kerbs, planting and buildings, between Hart Plain Avenue and the area of proposed development – features that the flooding maps do not consider the effects of – these would likely affect and/or impede flows.</p> <p>The school has confirmed one known historic flood event where surface water entered the site, crossing the playground, reaching the artificial sports pitch.</p> <p>The extents identified as being at risk of surface water flooding have been avoided, with the proposed position of the new theatre building located further west. Should the extents of identified surface water flood risk represent part of an overland flow route, this is maintained and not impeded.</p> <p>It is recommended that the school liaises with Hampshire County Council Highways to ensure sufficient measures are provided at the site entrance to intercept run-off from the public highway.</p>
Groundwater	<p>Low</p> <p>Ground Management Ltd did not encounter groundwater whilst undertaking the intrusive site investigation works and infiltration testing.</p>

Sewers	Very Low In view of the locations of the public sewers identified as per Southern Water's public sewer records, and the topography of the site and wider area, the risk of sewer flooding is considered to be 'Very Low'.
Artificial Sources	None The site is not shown to be at risk of flooding due to artificial sources.

- 5.5.2 The proposed development will need to mitigate the risks of flooding as identified and summarised in the table, above.
- 5.5.3 The greatest risk of flooding is associated with surface water flooding. The proposed new theatre building has been positioned to avoid the extents identified as being at increased risk of surface water flooding.
- 5.5.4 The surface water drainage system which is to serve the proposed new theatre building shall be designed in order to provide capacity up to the design event and provide consideration of potential exceedance routes, so as to not increase the risk of surface water flooding on or off the site.

6 PROPOSED DEVELOPMENT

6.1 Description of Development

- 6.1.1 The proposed development will involve the erection of a school theatre building and changing rooms to serve adjacent sports facilities with associated landscaping, planting and ancillary works. The architectural development proposals are contained within **Appendix A**.
- 6.1.2 The new building will be situated within Flood Zone 1.
- 6.1.3 The type of development proposed falls within the "More Vulnerable" flood risk vulnerability classification (Annex 3: Flood risk vulnerability classification, NPPF) and is appropriate in Flood Zone 1 (Flood Risk and Coastal Change Table 2).

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	Exception Test Required	✓	✓	✓
Flood Zone 3a†	Exception Test Required †	✗	Exception Test Required	✓	✓
Flood Zone 3b*	Exceptions Test Required *	✗	✗	✗	✓*
✓ = Development is appropriate ✗ = Development should not be permitted					

- 6.1.4 The proposed development will see the introduction of new impermeable surfaces at the site, which can lead to an increase in the rate of run-off generated. SuDS measures will be used where possible in order to mitigate this.
- 6.1.5 The post-development impermeable area will be 1,161m² (0.1Ha).
- 6.1.6 The proposed theatre building will have a roof area totalling 711m².
- 6.1.7 The use of SuDS methods and techniques, where site conditions and constraints allow, will be utilised to assist in the management of surface water run-off generated by the proposed development, whilst adhering to the SuDS hierarchy as stated within Building Regulations (Part H) and The SuDS Manual (C753).
- 6.1.8 The specific surface water and foul water drainage proposals are detailed in **Section 8** of this report.

7 SEQUENTIAL AND EXCEPTION TESTS

7.1 Sequential Test

- 7.1.1 The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.
- 7.1.2 Where it is not possible to locate development in low-risk areas, the Sequential Test should look to compare reasonably available sites within medium risk areas, and then only where there are no reasonably available sites in low and medium risk areas, within high-risk areas.
- 7.1.3 The site is located fully within Flood Zone 1, and the proposed building has been set out sequentially to avoid areas identified as being at risk of surface water flooding.
- 7.1.4 In view of the above factors, the Sequential Test is passed.

7.2 Exception Test

- 7.2.1 Paragraph 031 of Flood Risk and Coastal Change states 'The Exception Test requires two additional elements to be satisfied (as set out in paragraph 164 of the National Planning Policy Framework) before allowing development to be located or permitted in situations where suitable sites at lower risk of flooding are not available following application of the sequential test. It should be demonstrated that; development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; and the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.'
- 7.2.2 As confirmed in 7.1, the proposed development will be located in Flood Zone 1, and therefore, passes the Sequential Test.
- 7.2.3 As detailed in 6.1.3, "More Vulnerable" development is appropriate in Flood Zone 1, and application of the exception test is not required.

8 PROPOSED DRAINAGE STRATEGY

8.1 Surface Water

8.1.1 The SUDS Manual (CIRIA C753) and Building Regulations, Approved Document H (Drainage and Waste Disposal) set out a hierarchy of drainage methods to ensure that developments maximise the use of sustainable drainage techniques. The hierarchy favours infiltration methods of disposal over other methods such as watercourse and sewers, as detailed below;

- i. Utilise infiltration techniques
- ii. Attenuate rainwater in ponds or open water features for gradual release
- iii. Attenuate rainwater by storing in tanks or sealed water features for gradual release
- iv. Discharge rainwater direct to a watercourse
- v. Discharge rainwater to a surface water sewer/drain
- vi. Discharge rainwater to a combined sewer

SUDS Technique	Suitable	Comments
Living Roof	Yes	230m ² of green roof is proposed, c .32% of the overall roof area.
Basins and Ponds (such as Wetlands, Balancing Ponds, Detention Basins, Retention Ponds)	No	Not appropriate in terms of the scale of development and setting (i.e. a school), whilst spatial constraints are restrictive.
Filter strips and swales	No	Not appropriate in view of development proposals.
Infiltration Devices - Soakaways - Infiltration trenches and basins	No	Infiltration testing conducted on site was unsuccessful owing to the underlying ground conditions.
Permeable surfaces and filter drains (such as gravelled areas and porous block paving)	No	Minimal impermeable surfacing proposed at ground level, limited to a single pedestrian footpath, therefore unlikely to offer significant benefit.
Tanked systems (such as oversized pipes or cellular tanks)	Yes	Locations of existing buried services to be considered.

- 8.1.2 Infiltration testing that was attempted on site has confirmed that infiltration is not viable owing to the underlying ground conditions. It was not possible to complete a single test cycle, with the attempted test failing to complete despite being left for 6 No. days.
- 8.1.3 There are no watercourses on site or within the vicinity of the site to which surface water could discharge to.
- 8.1.4 It is therefore proposed that surface water will discharge to Southern Water's public surface water sewer network, with flows restricted to 1.00 l/s.
- 8.1.5 230m² of green roof is proposed as part of the design.
- 8.1.6 Attenuation will be provided in the form of an attenuation tank. The tank will measure 13.00m x 8.00m x 0.400m.
- 8.1.7 The surface water drainage system has been designed to accommodate up to a 1 in 100-year storm event, inclusive of an allowance for climate change of 45%.
- 8.1.8 The conceptual surface water drainage arrangement is demonstrated on drawing **PL500**.

8.2 Foul Water Drainage

- 8.2.1 The proposed new theatre building will drain to Southern Water's public foul water sewer network.
- 8.2.2 The conceptual foul water drainage arrangement is demonstrated on drawing **PL500**.

8.3 Climate Change

- 8.3.1 Gov.uk provides guidance for local planning authorities preparing strategic flood risk assessments and developers and their agents preparing flood risk assessments for planning applications, and development consent orders for nationally significant infrastructure projects.
- 8.3.2 Climate change allowances are predictions of anticipated change for peak river flow, peak rainfall intensity, sea level rise and offshore wind speed and extreme wave height.
- 8.3.3 Allowance for climate change shall be provided in the undertaking of site-specific flood risk assessments where new development is proposed to minimise vulnerability and provide resilience to flooding and coastal change.
- 8.3.4 The 'Peak Rainfall Allowances Map' shows anticipated changes in peak rainfall intensity.
- 8.3.5 Based on the latest allowances, for the 3.3% annual exceedance rainfall event, an increase of 40% should be applied to peak rainfall in relation to the proposed development.

- 8.3.6 For the 1% annual exceedance rainfall event, an increase of 45% should be applied to peak rainfall in relation to the proposed development.

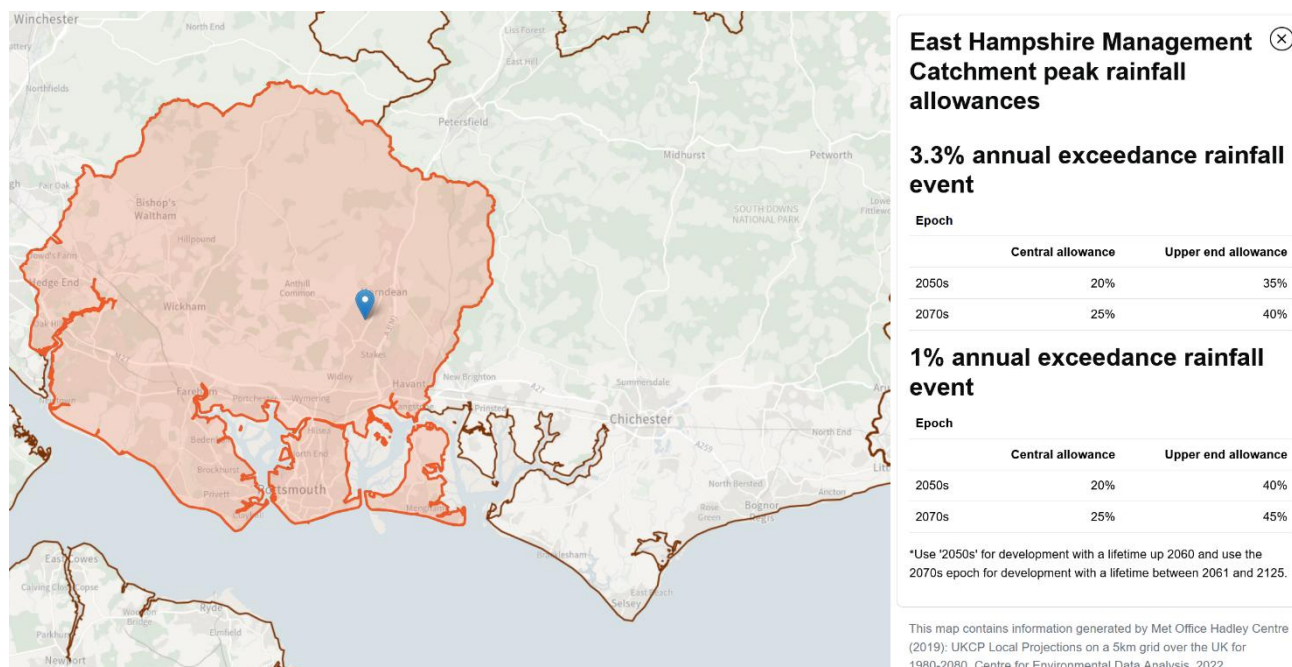


Figure 11. Climate Change Allowances – Peak Rainfall Allowances (Gov.uk)

8.4 Urban Creep

- 8.4.1 No allowance has been made in the surface water drainage calculations for the potential impacts of urban creep.
- 8.4.2 Hampshire County Council guidance states that urban creep is only applicable for residential development (excluding flats or apartments).

9 RESIDUAL RISK AND MITIGATION

9.1 Residual Risk

9.1.1 The following residual risks have been identified in relation to the proposed development:

- i. Surface water flooding of the proposed building
- ii. Extreme rainfall events that exceed the capacity of the proposed drainage and the associated design criteria, resulting in surface water flooding
- iii. Blockage and/or failure of the proposed drainage system causing flooding on site

9.2 Mitigation

9.2.1 Consideration has been taken to the residual risks stated in Section 9.1, and the following mitigation measures are proposed:

- i. Commentary in relation to the potential risks of surface water flooding has been provided in Section 5.2 and Section 5.5. The proposed new theatre building has been positioned outside of the extents identified as being at risk of surface water flooding, whilst this corridor is to be honoured/retained to allow potential flows to follow this route if required. Levels shall be designed to ensure falls prevail in a direction away from access points to the proposed building, whilst threshold drainage is also to be considered. Additional intercepting features within the existing car park are also to be considered, whilst it is encouraged that the school engages with Hampshire County Council Highways to ensure that any run-off from the public highway is intercepted before it is able to convey into and/or through the site.
- ii. The surface water drainage system has been designed to accommodate a 1 in 100-year storm event, inclusive of an allowance of 45% for the potential impacts of climate change. Should an event occur that exceeds this, flooding would likely occur. In exceedance events, run-off would follow the natural topography of the site and the wider area, as existing. No changes are proposed in terms of the trends in wider topography.
- iii. Maintenance plays a vital role in managing and reducing flood risk. Should blockage occur, and/or failure, the risk of flooding is increased. Basic maintenance requirements are detailed within Section 11 of this report, whilst it is recommended that ongoing, regular maintenance tasks are listed within the school's existing maintenance programmes.

10 FLOOD RISK MANAGEMENT

10.1 Safe Access and Egress

- 10.1.1 Site access and egress will be unaffected by the proposed works, with existing routes to and from the site retained. As such there is no increase in flood risk associated with the proposed development in respect of safe access and egress.

10.2 Flood Warning

- 10.2.1 There is no requirement for a flood warning system.

11 MAINTENANCE

11.1 Proposed Maintenance Regime

11.1.1 Maintenance is required to ensure the long-term operational performance of the proposed surface water drainage system.

11.1.2 The drainage system has been designed to minimise maintenance requirements; however a number of key tasks will need to be undertaken so that the system remains in optimal condition. These operations are summarised in the table below, along with the required frequency of works.

Drainage System feature	Proposed maintenance / remedial works	Required frequency of works
Pipework	Jetting to clear blockages	As required
Catch pits, gully sumps and drains	Inspection and additional cleansing as required.	Every 6 month
	Desilting	Year 1, Year 3, then every 5 years
Flow Control Chamber	Clean out chamber/sump	Monthly for first 3 months then twice annually
	Inspect flow control unit and remove debris	

11.1.3 The school will be responsible for maintaining the on-site surface water drainage system.

Future Alterations to the Development

11.1.4 Any future alterations to the foul and/or surface water drainage systems should confirmed by a specialist.

12 OFFSITE IMPACTS

- 12.1.1 Surface water will discharge to Southern Water's public surface water sewer network, with flows restricted to 1.00 l/s.
- 12.1.2 Foul water will discharge to Southern Water's public foul water sewer network, subject to a S106 application and subsequent approval.

13 SUMMARY

- 13.1.1 The proposed development will involve the erection of a school theatre building and changing rooms to serve adjacent sports facilities with associated landscaping, planting and ancillary works. The architectural development proposals are contained within **Appendix A**.
- 13.1.2 The site measures 7,778m² (0.78Ha) and is located to the south-west of the existing car park and adjacent to the existing sports court.
- 13.1.3 The site topographic survey identifies levels in the range of 46.40m AOD and 47.50m AOD.
- 13.1.4 The area where the proposed new theatre building is to be located is not served by any formal drainage infrastructure and drains naturally.
- 13.1.5 Southern Water's public sewer records identify both public foul and surface water sewers within the vicinity of the proposed building.
- 13.1.6 The site is located in Flood Zone 1 and the proposed building has been positioned to avoid the areas of the site identified as being at risk of surface water flooding.
- 13.1.7 Surface water will drain to Southern Water's public surface water sewer network, with flows restricted to 1.00 l/s.
- 13.1.8 230m² of green roof is proposed – 32% of the overall roof area.
- 13.1.9 Attenuation will be provided in the form of an attenuation tank. The tank will measure 13.00m x 8.00m x 0.400m.
- 13.1.10 The surface water drainage system has been designed to accommodate a 1 in 100-year storm event, inclusive of a 45% allowance for the potential impacts of climate change.
- 13.1.11 It is proposed that foul water generated by the proposed development will drain to Southern Water's public foul water sewer network, subject to a S106 application and approval from Southern Water.
- 13.1.12 The proposed development will not increase flood risk on or off of there site and is therefore considered appropriate from a flood risk and drainage perspective.