



Flood Risk Assessment and Surface Water Drainage Strategy AEG5966_PO22_Bognor Regis_07

Site Address: Land at Heath Place
Bersted
West Sussex
PO22 9SL

UK Experts in Flood Modelling, Flood Risk
Assessments, and Surface Water Drainage Strategies



Document Issue Record

Project: Flood Risk Assessment and Surface Water Drainage Strategy

Prepared for: Ponders End Investment Ltd

Reference: AEG5966_PO22_Bognor Regis_07

Site Location: Land at Heath Place, Bersted, Bognor Regis, West Sussex, PO22 9SL

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Summary

Development Description	Existing	Proposed
Development Type	Undeveloped land	Construction of 8no. residential flats with undercroft car parking
EA Vulnerability Classification	No classification	Less Vulnerable ground floor with More Vulnerable on the upper floors
External Levels	Based on surveyed levels vary between 1.50m AOD to 2.75m AOD	Lower ground floor (car parking) – 1.30m AOD Upper ground floor (residential) – 4.20m AOD
Level of Sleeping Accommodation	N/A	2.17m above the 1in1000 year fluvial/pluvial flood level. 3.13m above the defended NPPF 1in200 year (2115) tidal flood level. 0.60m above the undefended NPPF 1in200 year (2115) tidal flood level
Impermeable Surface Area	0m ²	Building area: 250m ²
Surface Water Drainage	N/A ¹	A new connection into the adjacent public sewer with flows limited to as low as practical (1l/s)
Risk to Development	Summary	Comment
EA Flood Zone	Flood Zone 1, 2 and 3	
Flood Source	Fluvial	Aldingbourne Rife
SFRA Available	Level 1 and Level 2 Strategic Flood Risk Assessment (Arun District Council, 2016)	
Management Measures	Summary	Comment
Ground floor level above extreme flood levels	Yes	All new residential use is to be located on the upper ground floor, set at 4.20m AOD, approximately 0.60m above the

		undefended NPPF 1in200 year (2115) tidal flood level.
Flood Resilient Design	Yes	All More Vulnerable development is located on the first floor, above all modelled flood levels. Ground floor will be retained for undercroft car parking.
Site Drainage Plan	N/A ¹	A new connection into the adjacent public sewer with flows limited to as low as practical (1l/s)
Safe Access/Egress	Yes	Access directly onto the topographically higher ground along Ash Grove which is located within Flood Zone 1.
Flood Warning and Evacuation Plan	Yes	Recommended to sign up to the Bognor Environment Agency flood warning service.
Offsite Impacts		Summary
Displacement of floodwater	No	The proposals are to be constructed into the existing bank so there will be no increase in land levels as a result of the development. If anything, the lowering of the bank and allowing the undercroft areas to flood could increase capacity within the floodplain.
Increase in surface run-off generation	N/A ¹	A new connection into the adjacent public sewer with flows limited to as low as practical (1l/s)
Impact on hydraulic performance of channels	None	No nearby watercourses

¹ not required for this assessment

² data not available.

1. Introduction

- 1.1. Aegaea were commissioned by Ponders End Investment Ltd. to undertake a Flood Risk Assessment (FRA) and Surface Water Drainage Strategy (SWDS) to facilitate a planning application for the proposed development. This FRA has been prepared in accordance with the requirements set out in the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance.
- 1.2. This FRA and SWDS is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

- 1.3. The site of the proposed development is Land at Heath Place, Bersted, Bognor Regis, West Sussex, PO22 9SL (Figure 1).

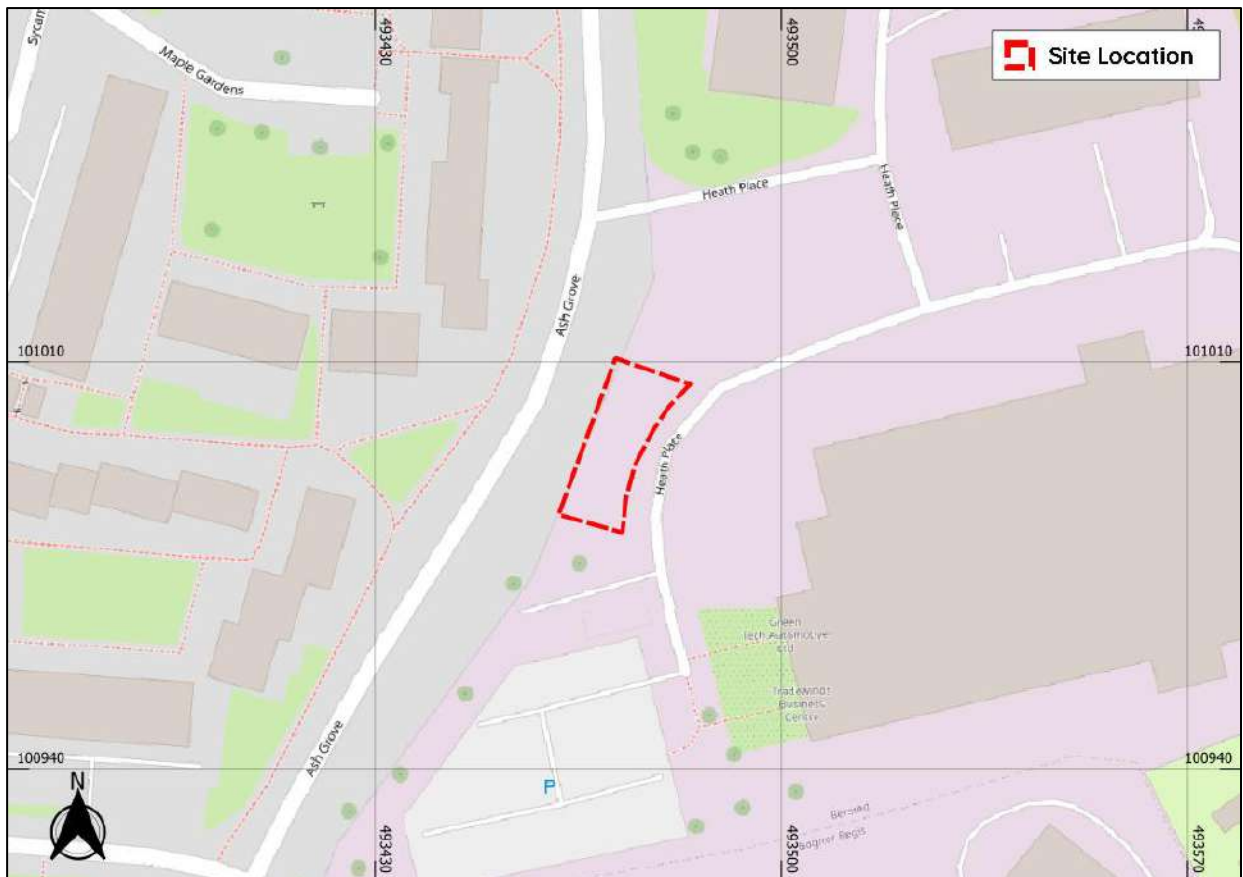


Figure 1: Site Location (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors)

- 1.4. The existing site is undeveloped land. It is understood that the proposed development is for the construction of 8no. residential units with undercroft parking at ground floor level. Plans are attached in Appendix A.
- 1.5. A topographic survey has been undertaken of the site and surrounding area (Attached in Appendix B - drg no. 25- 133). Analysis of this data shows that the site is topographically higher than Heath Place with levels adjacent to Heath Place at approximately 1.50m AOD (Above Ordnance Datum) rising to approximately 2.60m AOD. The proposals are to be constructed into the existing bank with the proposed ground floor set at 4.20m AOD. Environment Agency Light Detection and Ranging (LiDAR) data Digital Terrain Model has been used to visualise topographic levels on site (Figure 2).

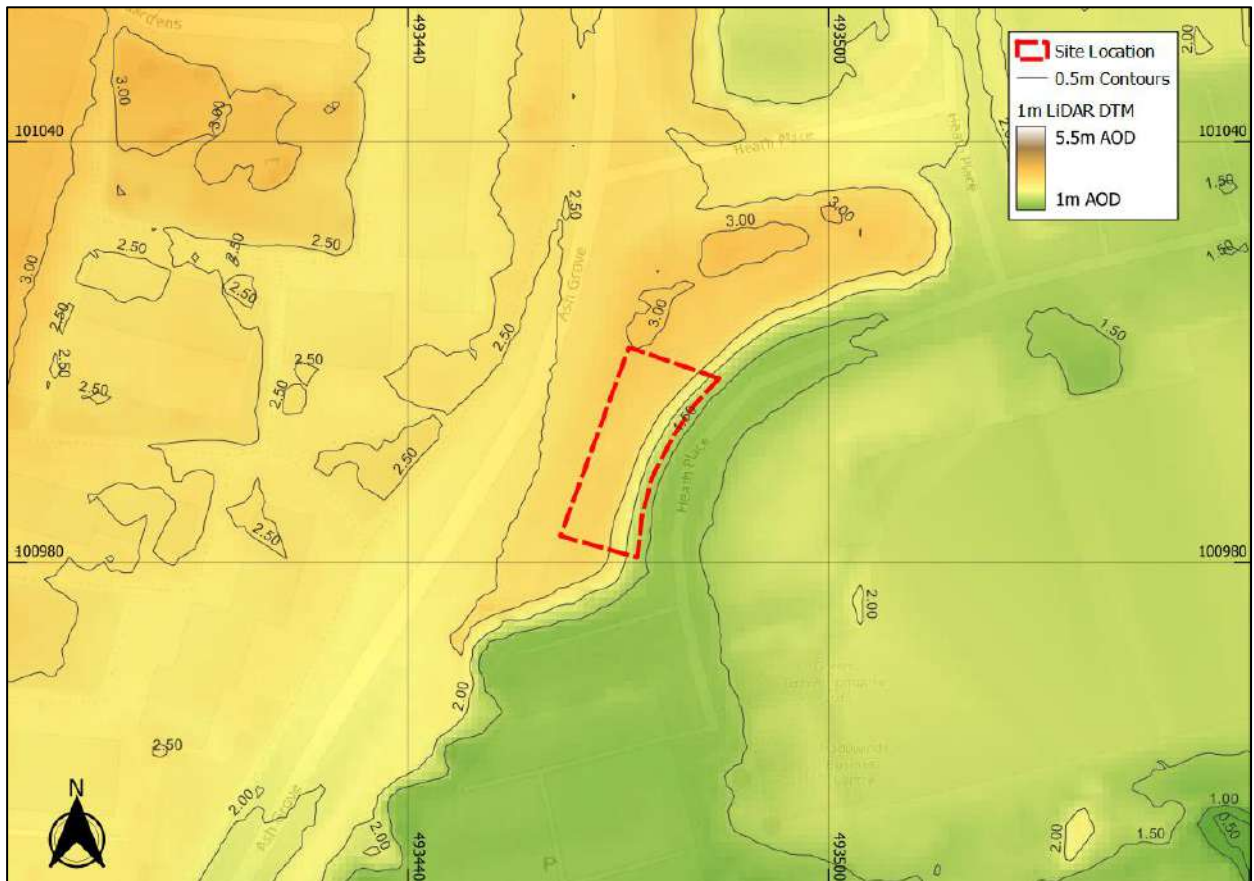


Figure 2: Site Topography (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 1.6. Arun District Council is the Local Planning Authority (LPA) for the site and West Sussex County Council is the designated Lead Local Flood Authority (LLFA). The site sits within the Environment Agency's Solent and South Downs region.

Planning Policy and Guidance

- 1.7. UK government planning guidance states¹ that an FRA is required for developments which are:

- *in flood zone 2 or 3 including minor development and change of use*
- *more than 1 hectare (ha) in flood zone 1*
- *less than 1 ha in flood zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)*
- *in an area within flood zone 1 which has critical drainage problems as notified by the Environment Agency*

- 1.8. The site is located within Flood Zone 2 and 3 and therefore an FRA is required to be submitted in accordance with the NPPF.

- 1.9. The objective of this FRA is to demonstrate that the proposals are acceptable in terms of flood risk. This report summarises the findings of the study and specifically addresses the following issues in the context of the current legislative regime:

- Fluvial/tidal flood risk
- Surface water flood risk
- Risk of flooding from other sources

¹ <https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications#when-you-need-an-assessment>

2. Planning Policy

- 2.1. Inappropriate development in a flood risk area could pose significant risk in terms of personal safety and damage to property for the occupiers of the development or for people elsewhere. The approach taken in the assessment of flood risk at the planning stage is set out in national, regional, and local planning policy and associated guidance. This section summarises the key policies and guidance relevant to the proposed development.

National Planning Policy Framework (NPPF)

- 2.2. The National Planning Policy Framework² (NPPF) (MHCLG, 2024) which includes UK Government policy on development and flood risk states:

170. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

181. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;*
- b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment;*
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;*

² <https://www.gov.uk/guidance/national-planning-policy-framework>, last updated Dec 2024

- d) *any residual risk can be safely managed; and*
- e) *safe access and escape routes are included where appropriate, as part of an agreed emergency plan.*

2.3. Flood Zones in England are defined as follows:

Table 1: Flood Zone Definitions

Flood Zone	Definition
Zone 1 Low Probability	Land having less than 1 in 1,000 annual probability of river or sea flooding (all land outside Zones 2 and 3).
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
Zone 3b The Functional Floodplain	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: 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). 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. (Not separately distinguished from Zone 3a on the Flood Map)

2.4. An FRA should be appropriate to the scale, nature, and location of the development. It should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

- 2.5. An assessment of hydrological impacts should be undertaken, including to surface water runoff and impacts to drainage networks in order to demonstrate how flood risk to others will be managed following development and taking climate change into account.

Local Plan

- 2.6. The Local Plan prepared by the Local Planning Authority, Arun District Council, sets out the policies for development in the local area.
- 2.7. Policy W DM2 Flood risk outlines the requirements for new development within the area. It states:

Development in areas at risk from flooding, identified on the latest Environment Agency flood risk maps and the Council's Strategic Flood Risk Assessment (SFRA) , will only be permitted where all of the following criteria have been satisfied:

- a. The sequential test in accordance with the National Planning Policy Guidance has been met.*
- b. A site specific Flood Risk Assessment demonstrates that the development will be safe, including access and egress, without increasing flood risk elsewhere and reduce flood risk overall.*
- c. The sustainability benefits to the wider community are clearly identified.*
- d. The scheme identifies adaptation and mitigation measures.*
- e. Appropriate flood warning and evacuation plans are in place; and*
- f. New site drainage systems are designed to take account of events which exceed the normal design standard i.e. consideration of flood flow routing and utilising temporary storage areas.*

The reports prepared as part of the criteria above must take into account contingency allowances, taking climate change into account as set out in Flood Risk Assessments: climate change allowances section of the NPPG.

In locations where strategic flood defence or resilient and resistant construction measures are necessary within the site itself, proposals will be required to demonstrate how measures have been incorporated as an intrinsic part of the

scheme in a manner which is compatible with the latest Strategic Flood Risk Assessment.

All development proposals must take account of relevant Surface Water Management Plans, Catchment Flood Management Plans and related Flood Defence Plans and strategies such as the Lower Tidal River Arun Strategy. The council may require financial contributions from development on sites where measures to address flood risk or to improve the environmental quality of watercourses have been identified by these Plans and Strategies.

- 2.8. Policy W DM3 Sustainable Urban Drainage Systems outlines the requirements for new development within the area. It states:

To increase the levels of water capture and storage and improve water quality, all development must identify opportunities to incorporate a range of Sustainable Urban Drainage Systems (SUDS), appropriate to the size of development, at an early stage of the design process.

Proposals for both major and minor development proposals must incorporate SUDS within the private areas of the development in order to provide source control features to the overall SUDS design. These features include:

- Green roofs*
- Permeable driveways and parking*
- Soakaways*
- Water harvesting and storage features including water butts.*

Proposals for major development must also integrate SUDS within public open spaces and roads, reflecting discussion with the appropriate bodies. SUDS must therefore be integrated into the overall design of a development and must:

- a. Contribute positively to the appearance of the area, integrating access to allow maintenance of existing watercourses and the system.*
- b. Effectively manage water (including its quality)*
- c. Accommodate and enhance biodiversity by making connections to existing Green Infrastructure assets and*

- d. Provide amenity for local residents (ensuring a safe environment)*
- e. Retain the existing drainage network of the site and the wider area,*
- f. Be maintained in perpetuity, supported through a Maintenance and Management Plan/Regime, including its financing, agreed with the Local Planning Authority.*

In order to ensure that SUDS discharge water from the development at the same or lesser rate, as prior to construction, developers must:

- g. Follow the hierarchy of preference for different types of surface water drainage disposal systems as set out in Approved Document H of the Building Regulations and the SUDS manual produced by CIRIA.*
- h. Undertake up to six months groundwater monitoring within the winter period.*
- i. Undertake winter percolation testing in accordance with BRE365.*
- j. The proposed drainage system must be designed to ensure that there is no flooding on a 1 in 30 year storm event.*
- k. The design must also take account of the 1 in 100 year storm event plus 30% allowance for climate change, on stored volumes, to ensure that there is no flooding of properties or the public highway or inundation of the foul sewerage system. Any excess flows must be contained within the site boundary, and within designated storage areas.*

Sequential and Exception Tests

- 2.9. The Sequential and Exception Tests are applied in specific cases defined by UK Government policy. Their purpose is to drive development to areas of low flood risk and to support developments which improve flood risk for developments in areas at risk of flooding.

Sequential Test

- 2.10. A Sequential Test has been undertaken alongside this FRA (ref: AEG5966_PO22_Bognor Regis_02). The following conclusions can be drawn from the Sequential Test;
- Analysis of the compiled 411 alternative sites within the search area provided by the LPA has deemed that there is no reasonable available land suitable for the proposed

development and as such it should be deemed that the preferred location for the development is within the site.

Exception Test

- 2.11. The Exception Test is applied to sites based on the Flood Zone and the nature of the development. As the proposed development consists of a residential use it would be classed as 'More Vulnerable' in line with government development use classes.
- 2.12. The Flood Risk Vulnerability Classification table³ provided below in Table 2 shows which vulnerabilities are appropriate in each Flood Zone.
- 2.13. The proposed development sits within Flood Zone 1, 2 and 3 and the proposed development is considered 'More Vulnerable' given its residential use. Table 2 shows that the proposals are generally acceptable subject to the application of the Exception Test.

Table 2: Flood risk vulnerability and flood zone 'incompatibility'

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	x	Exception Test required	✓	✓
Zone 3b	Exception Test required	x	x	x	✓

- 2.14. The Exception Test requires two additional elements to be satisfied (as set out in paragraph 178 of the NPPF) before allowing development to be allocated or permitted in situations where suitable sites at a lower risk of flooding are not available following application of the sequential test.

³ <https://www.gov.uk/guidance/flood-risk-and-coastal-change#table2>

2.15. Paragraph 178 of the NPPF states:

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

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and

b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

2.16. Regarding Part A of paragraph 178, demonstrating wider sustainability benefits is deemed to be outside the scope of the FRA.

2.17. With regards to Part B of the Exception Test, this FRA has demonstrated that, due to the location of the proposed development being on the upper floors, the residents of the development will be safe for its lifetime and the development will not increase flood risk elsewhere.

3. Consultation and Review

Documents and Online Mapping

- 3.1. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FRA, these documents have been reviewed for relevant information, and any relevant data is discussed within the appropriate sub heading of this report.
- 3.2. The following sources of information have been reviewed for this assessment:
- Flood Map for Planning on the Environment Agency website <https://flood-map-for-planning.service.gov.uk/>
 - Long Term Flood Risk Information on the Environment Agency website <https://www.gov.uk/check-long-term-flood-risk>
 - National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2024)
 - Planning Practice Guidance - Flood Risk and Coastal Change (Ministry of Housing, Communities and Local Government, 2022)
 - Geoindex Onshore (British Geological Survey, 2024)
 - Arun Local Plan (Arun District Council, 2018)⁴
 - Preliminary Flood Risk Assessment Addendum (West Sussex County Council, 2017) and West Sussex Preliminary Flood Risk Assessment (West Sussex County Council, 2011)⁵
 - Level 1 and Level 2 Strategic Flood Risk Assessment (Arun District Council, 2016)⁶

⁴ <https://www.arun.gov.uk/download.cfm?doc=docm93jjm4n12844.pdf&ver=12984>

⁵ https://assets.publishing.service.gov.uk/media/5acc9b9140f0b64ff0e694b0/PFRA_West_Sussex_County_Council_2017.pdf

⁶ [arun.gov.uk/download.cfm?doc=docm93jjm4n9414.pdf&ver=9270](https://www.arun.gov.uk/download.cfm?doc=docm93jjm4n9414.pdf&ver=9270)

- West Sussex Local Flood Risk Management Strategy (2013-2018) (West Sussex County Council, 2014)⁷
- CIRIA C753 SuDS manual⁸

Preliminary Flood Risk Assessment (PFRA)

- 3.3. The PFRA, published in 2011 and 2017, is a high-level appraisal of flood risk across Lead Local Flood Authority West Sussex County Council. The flood risk from all sources, including fluvial, surface water, groundwater, and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.
- 3.4. The PFRA summarises historical flood incidents in West Sussex County Council. The site is not recorded as having been affected by any flood event.

Strategic Flood Risk Assessment (SFRA)

- 3.5. The SFRA, published in 2016, provides the evidence base for the Local Planning Authority Arun District Council Local Plan and guidance for consideration when determining planning applications. The SFRA seeks to place new development into areas of lower flood risk taking into account current flood risk, future flood risk, and the effect a proposed development would have on the risk of flooding.
- 3.6. The SFRA mapping provided by Arun District Council has been used throughout production of this report as a source of information, particularly pertaining to historical flood incidents.

Local Flood Risk Management Strategy (LFRMS)

- 3.7. The Local Flood Risk Management Strategy sets out roles and responsibilities for flood risk management, assesses the risk of flooding in the area, where funding can be found to manage flood risk, and the policies, objectives, and actions of the Lead Local Flood Authority.

⁷ https://www.westsussex.gov.uk/media/1595/local_flood_risk_management_strategy.pdf

⁸ https://www.ciria.org/CIRIA/Memberships/The_SuDs_Manual_C753_Chapters.aspx

- 3.8. The West Sussex County Council LFRMS is used within this report to identify any flood management infrastructure and historical incidences of flooding.

CIRIA C753 SuDS manual

- 3.9. The CIRIA SuDS manual has been used throughout this SWDS in order to determine an appropriate strategy for the proposed development. This guidance covers the planning, design, construction and maintenance of Sustainable Drainage Systems (SuDS) to assist with their effective implementation within both new and existing developments. It looks at how to maximise amenity and biodiversity benefits and deliver the key objectives of managing flood risk and water quality. There is also supporting information covering topics such as materials, landscape design, maintenance, community engagement and costs and benefits.

4. Sources of Flood Risk

Fluvial/Tidal

- 4.1. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.
- 4.2. The site is located within Flood Zones 1, 2 and 3 (Figure 3). The site is also shown to be located within a 'plus climate change' area. The flood zones plus climate change dataset shows how the combined extent of flood zones 2 and 3 could increase with climate change over the next century, ignoring the benefits of any existing flood defences. This dataset uses the peak river flow 'central' allowance, based on the 50th percentile for the 2080s epoch (2070 to 2125) and for tidal flooding uses the 'upper end' allowance to account for cumulative sea level rise to 2125, based on the 95th percentile.
- 4.3. Based on the EA Flood Map for Planning, the site is shown to be located within both a fluvial and tidal flood zone.
- 4.4. The closest watercourse to the site is the Aldingbourne Rife, located 200m to the east and a small tributary of the Rife is located approximately 100m to the north. The Aldingbourne Rife and its tributary are both classified as an EA Main River at this location.
- 4.5. There may be some tidal influence at the site because under normal conditions flow from the Aldingbourne Rife is conveyed under the sea wall via two gravity outfall structures which have tidal flaps. When tidal conditions and river flows dictate, flow is pumped over the sea wall by Felpham pumping station to discharge into a stilling bay on the upper foreshore.
- 4.6. The main risk of flooding to the site is from the adjacent Aldingbourne Rife, which is considered primarily influenced by fluvial processes. Therefore, the risk of tidal flooding in isolation is considered low.

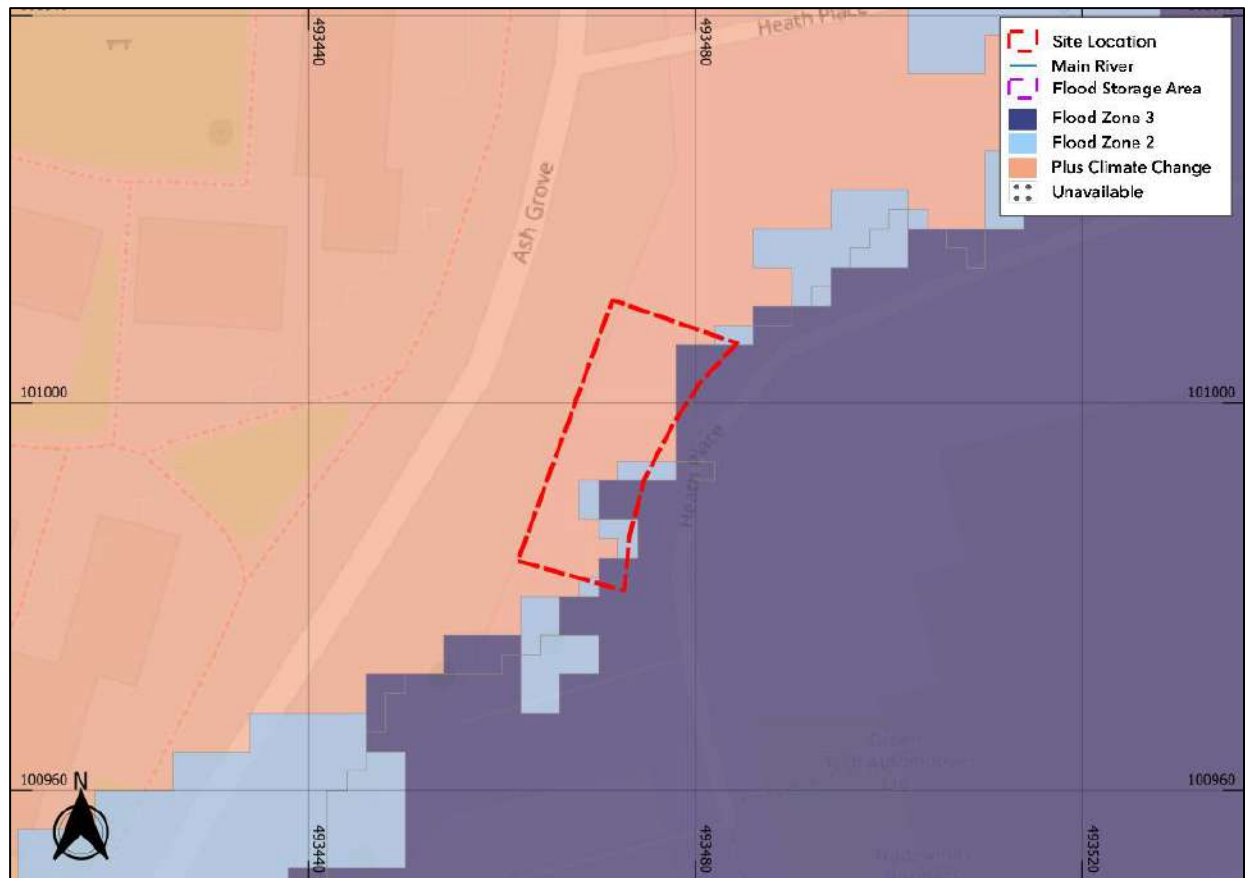


Figure 3: EA Flood Map for Planning (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.7. There are two main branches of the Aldingbourne Rife. The western branch consists of the Aldingbourne Rife and its two main tributaries, Oving Rife and Elbridge Rife. The eastern branch consists of Lidsey Rife and its three main tributaries, Barnham, Yapton and Ryebank Rifes. The Lidsey Rife meets the Aldingbourne Rife near South Bersted (494460, 100590) and the watercourse discharges into the sea at Bognor Regis (494710, 99230).
- 4.8. The EA Recorded and Historical Flood Outlines (Figure 4) shows there is no record of historical fluvial flooding on the site.

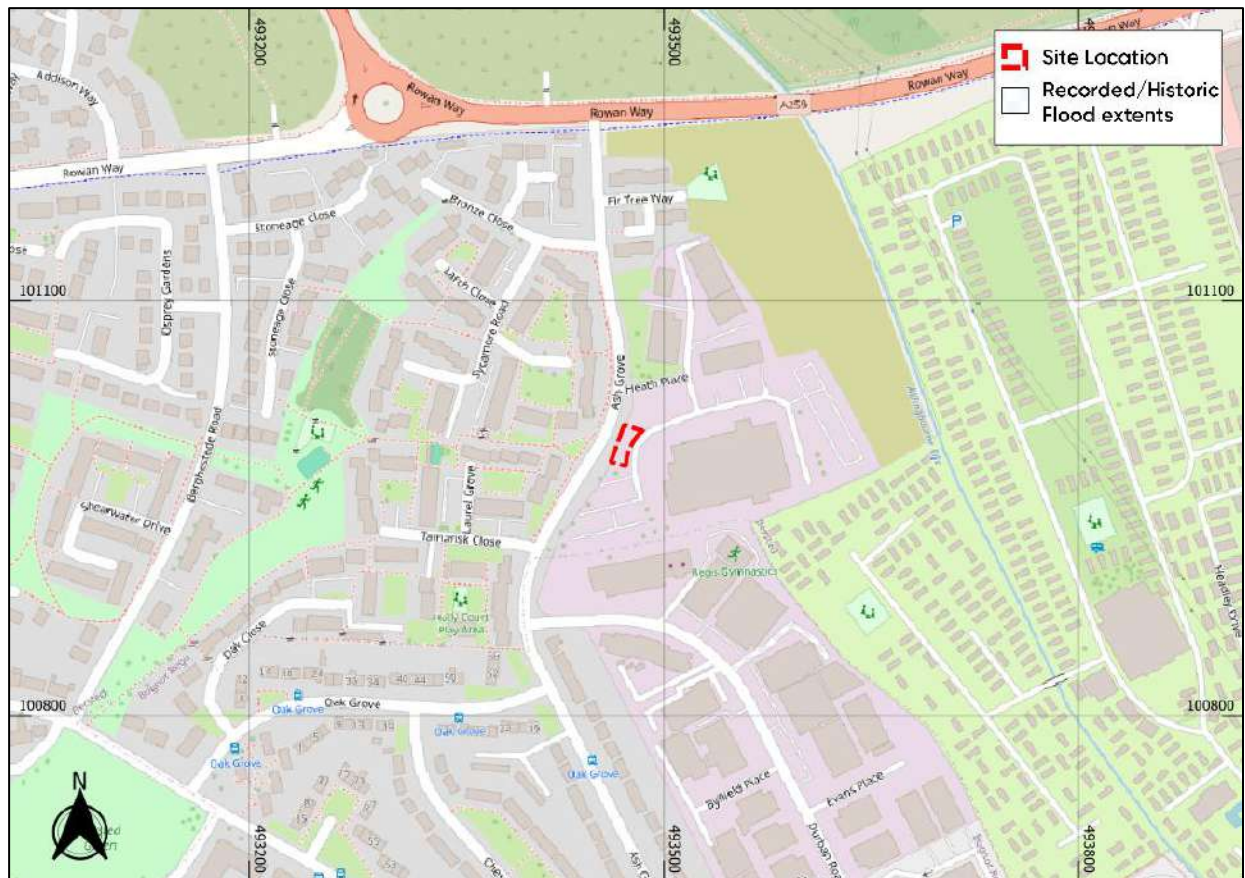


Figure 4: EA Historic Flood Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

Aldingbourne Flood Risk Mapping Study, 2015 (Fluvial Model)

- 4.9. Aegaea have provided flood model outputs from the Aldingbourne Flood Risk Mapping Study, which was completed in September 2015. Based on the Product 5 modelling report, this model is an InfoWorks ICM model that consists of two elements to understand both the fluvial flood risk from the Rife network and the combined fluvial / surface water flood risk in the catchment.
- 4.10. The model was simulated for the following events: 1 in 2 (50%), 1 in 5 (20%), 1 in 10 (10%), 1 in 20 (5%), 1 in 30 (3.3%), 1 in 50 (2%), 1 in 75 (1.3%), 1 in 100 (1%), 1 in 100 (1%) plus climate change, 1 in 200 (0.5%), 1 in 1000 (0.1%) Annual Exceedance Probability (AEP) undefended scenarios. The model was used to produce both integrated and fluvial only outputs.

Present Day Scenarios (Aldingbourne Rife)

- 4.11. Analysis of the fluvial only flood model shows that the site would remain unaffected by flooding for the 1in30 year and 1in100 year scenarios. The 1in1000 year scenario may partially affect the topographically lower parts of the site. The flood level associated with this scenario is 2.03m AOD. Comparison to the topographic survey (which shows site levels between 1.50m AOD to 2.60m AOD) the site could experience maximum depths of around 0.53m.
- 4.12. However, it should be noted that all new residential use is to be located on the upper ground floor, set at 4.20m AOD, approximately 2.17m above the 1in1000 year flood level. The undercroft car park could be partially affected in this modelled event due to it being cut into the embankment to match Heath Place levels.

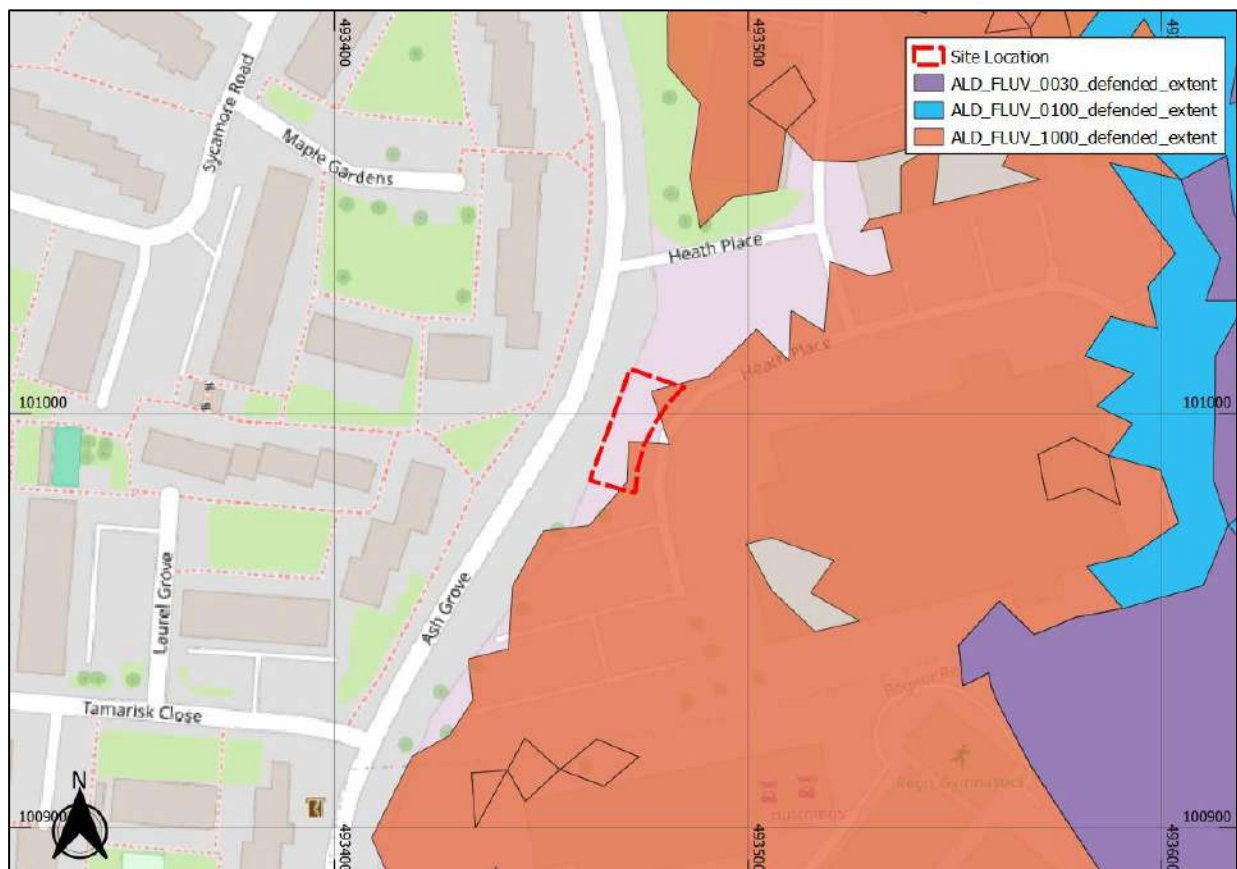


Figure 5: Modelled Present Day Flood Extents (Source: Aldingbourne Flood Risk Mapping Study, 2015)

- 4.13. Analysis of the combined flood level extents show that some parts of the site may also be affected during the combined pluvial/fluvial scenario but generally limited to the topographically lower parts of the eastern site boundary (Figure 9).

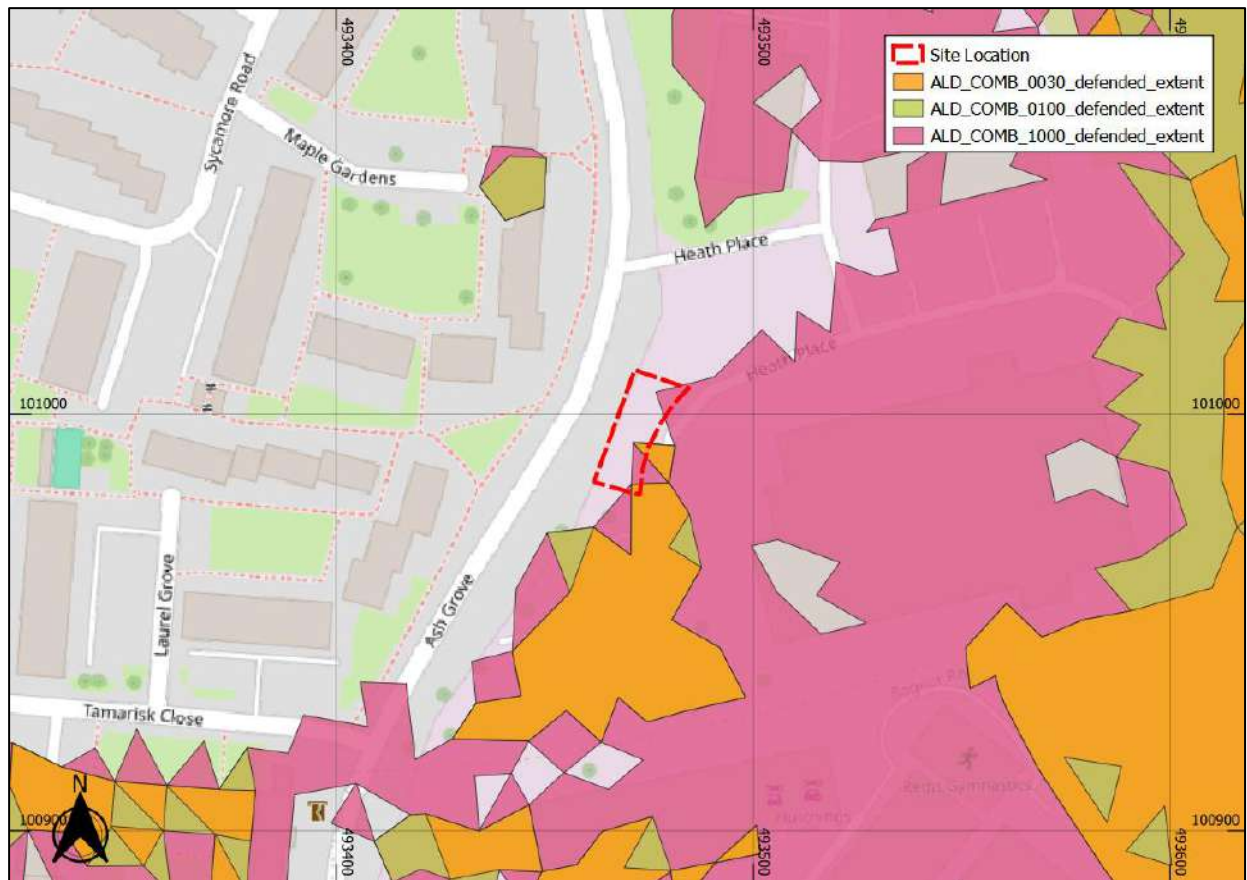


Figure 6: Modelled Present Combined Day Flood Extents (Source: Aldingbourne Flood Risk Mapping Study, 2015)

- 4.14. Analysis of the combined 1in30 year flood level extents show that some parts of the site may also be affected during the combined pluvial/fluvial scenario. Analysis of the flood level map shows levels of 0.17m AOD. Which is circa. 1.3m below the surveyed topographic levels.
- 4.15. It should also be noted that the flood depth map for the same event shows the same depths (or levels) across the site. The level map shows fluctuations in levels across the site as if it were a depth map – so it appears as though the flood level map actually corresponds to flood depths.
- 4.16. However, this means that Aegaea are unable to compare flood levels for the combined 30 year outputs to determine definitively whether the site is located within Flood Zone 3b or not. Given that the fluvial only flood levels were lower than the surveyed levels, it is also possible that there may be a similar situation with the combined outputs.
- 4.17. However, given the similarities between the other modelled fluvial only and combined flood level return periods, it has been concluded that the site is not located within Flood Zone 3b.

- 4.18. The flood levels for the combined 1in100 year and 1in1000 year scenarios are 1.59m AOD and 2.03m AOD (Table 3). Comparison with the topographic survey (which shows site levels between 1.50m AOD to 2.60m AOD) the site could experience maximum depths of 0.09m and 0.53m, respectively.

Table 3: Modelled Present Day Flood Levels. F = Fluvial Only C = Combined Model.

Event	1in30 year F	1in30 year C	1in100 year F	1in100 year C	1in1000 year F	1in1000 year C
Flood Level	n/a	0.17m AOD	n/a	1.59m AOD	2.03m AOD	2.03m AOD
Site levels (for reference)	External levels - 1.50m AOD to 2.60m AOD Upper ground floor FFL – 4.20m AOD					

Climate Change Scenarios (Aldingbourne Rife)

- 4.19. The site is located within the 'Arun and Western Streams' Management Catchment. Guidance suggests that 'More Vulnerable' developments in Flood Zone 2 or 3 should utilise the 'central' climate change allowance. The increase in peak river flow for the 2080's epoch for the 'central' allowance is +25%.
- 4.20. Data has not been provided from the Aldingbourne Flood Risk Mapping Study for the 1in100+25%CC event. However, data has been provided for the 1in100+35%CC fluvial scenario and 1in100+20% combined scenario. Given that this is the best available data, it has been used as an estimate for the 'design' scenario.
- 4.21. Analysis of the modelled 1in100+35CC fluvial scenario shows that the site would generally remain unaffected by flooding (Figure 7). During the 1in100+20%CC combined scenario some parts of the topographically lower eastern side of the site may be partially affected by flooding. The flood level associated with this event is 1.64m AOD. Comparison with minimum topographic levels on site (1.50m AOD) shows the site may experience flood depths of 0.14m.

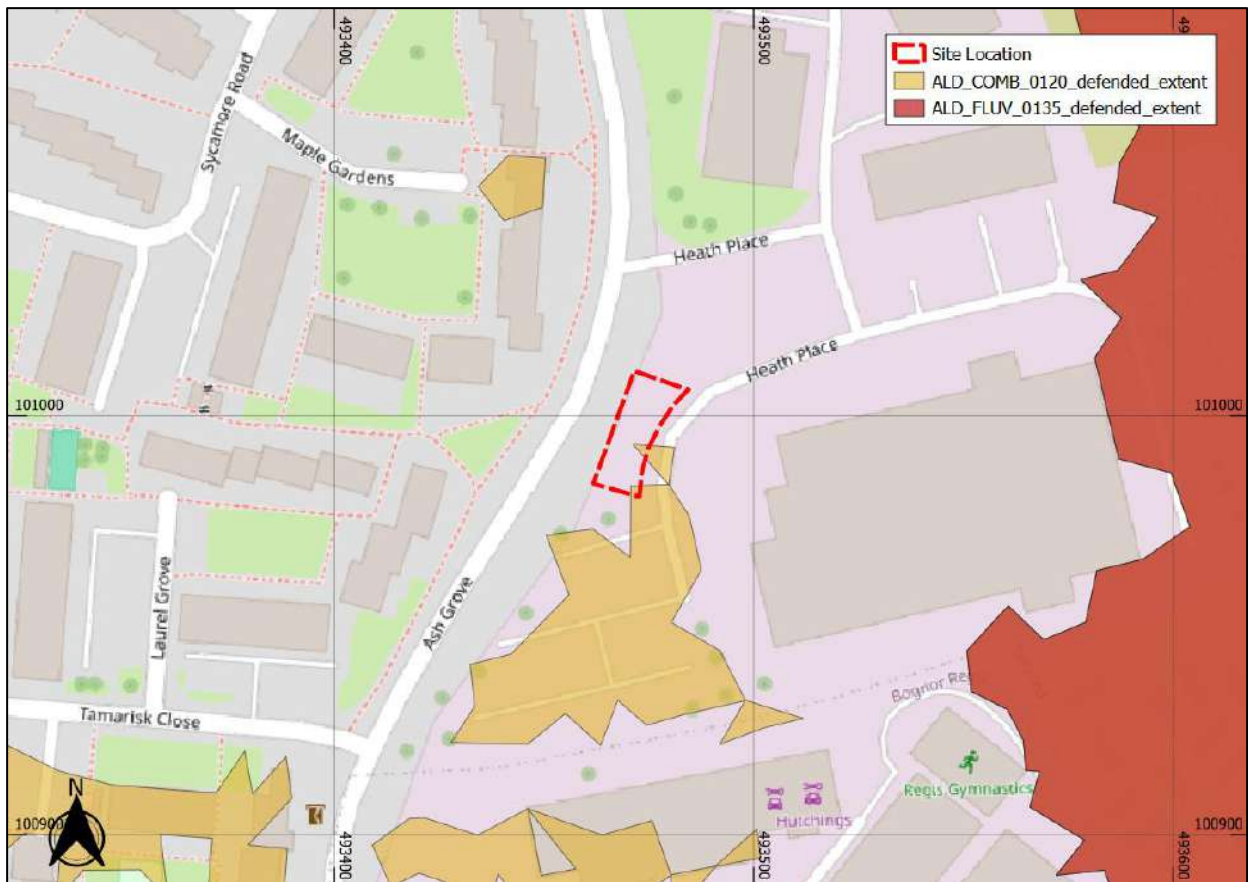


Figure 7: Modelled Climate Change Flood Extents (Source: Aldingbourne Flood Risk Mapping Study, 2015)

River Arun to East Head Coastal Modelling, 2016 (Tidal Model)

- 4.22. Aegaea have provided flood model outputs from the River Arun to East Head Coastal Modelling, which was completed in 2016. Based on the Product 5 modelling report, this model was produced to understand both the impact of wave overtopping and rising sea levels associated with climate change using both NPPF and UKCP09 guidance.
- 4.23. The model was simulated for a range of defended and undefended scenarios including the effects of wave overtopping for the 20%, 5%, 3.33%, 1.33%, 1%, 0.5%, 0.5% (2070 UKCP09), 0.5% (2115 UKCP09), 0.5% (2070 NPPF), 0.5% (2115 NPPF), 0.2% and 0.1% AEP events

Defended Scenarios

- 4.24. Analysis shows that the site isn't affected by the present day 1in200 year and 1in1000 year events or the 1in200 (2115) flood extents, as shown in Figure 8 below. The closest 1in200year+CC flood level is 1.07m AOD.

4.25. The topographic levels of the site vary between 1.50m AOD and 2.60m AOD. The proposals incorporate undercroft parking with the proposed residential first floor level built into the embankment to be set at 4.20m AOD. Which is 3.13m above the 1in200 (2115) tidal flood level.

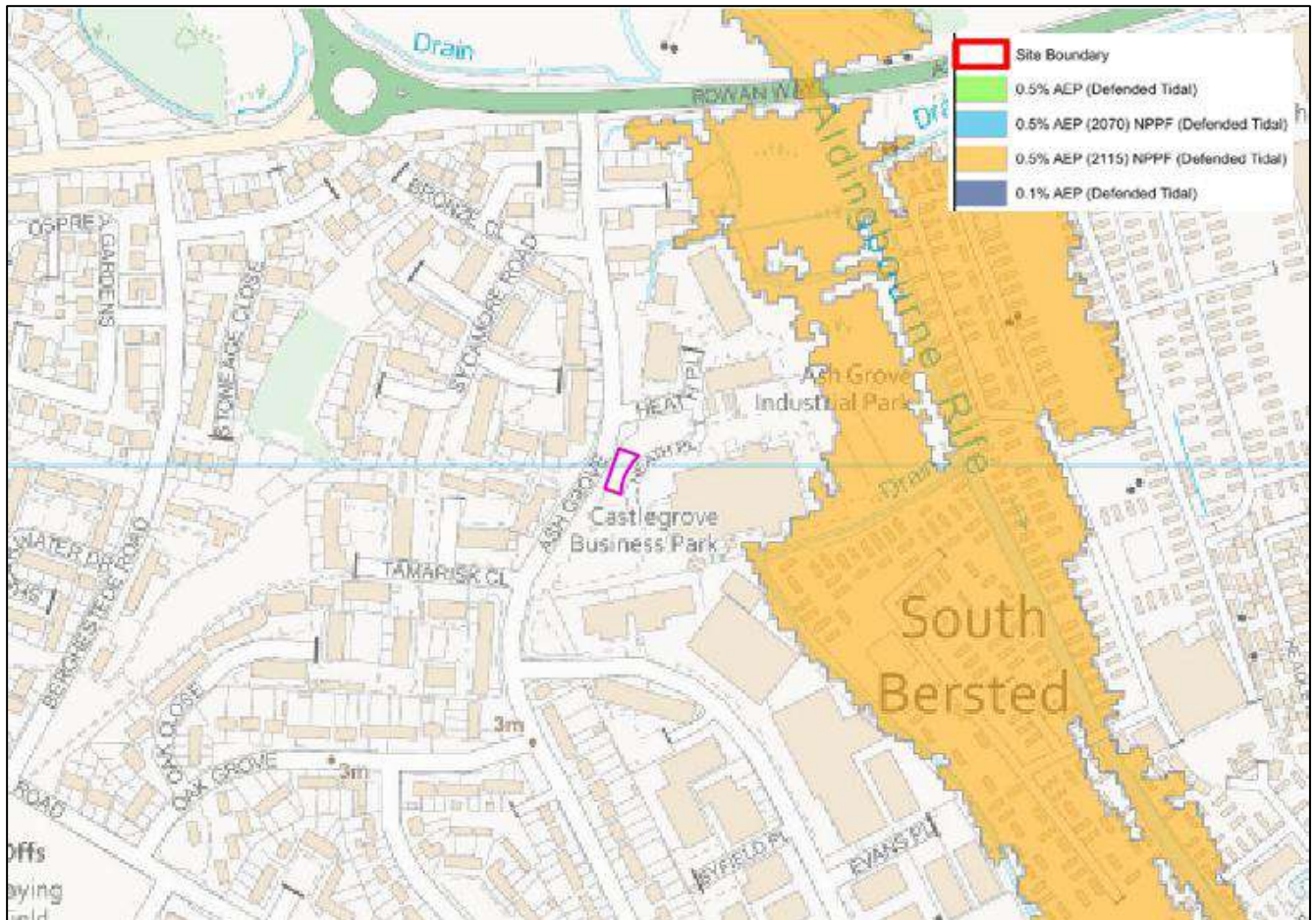


Figure 8: Modelled Defended Tidal Outlines (Source: EA Product 4 Dataset)

Undefended Scenarios

- 4.26. Analysis of the NPPF 1in200 (2115) undefended flood extents show that the site may be affected by flooding. The flood level on site associated with this event is 3.60m AOD (Figure 9).
- 4.27. As aforementioned, the proposals incorporate undercroft parking with the proposed residential first floor level built into the embankment to be set at 4.20m AOD. Which is 0.60m above the 1in200 (2115) undefended tidal flood level.
- 4.28. It should be noted that the undefended scenario is considered unlikely.

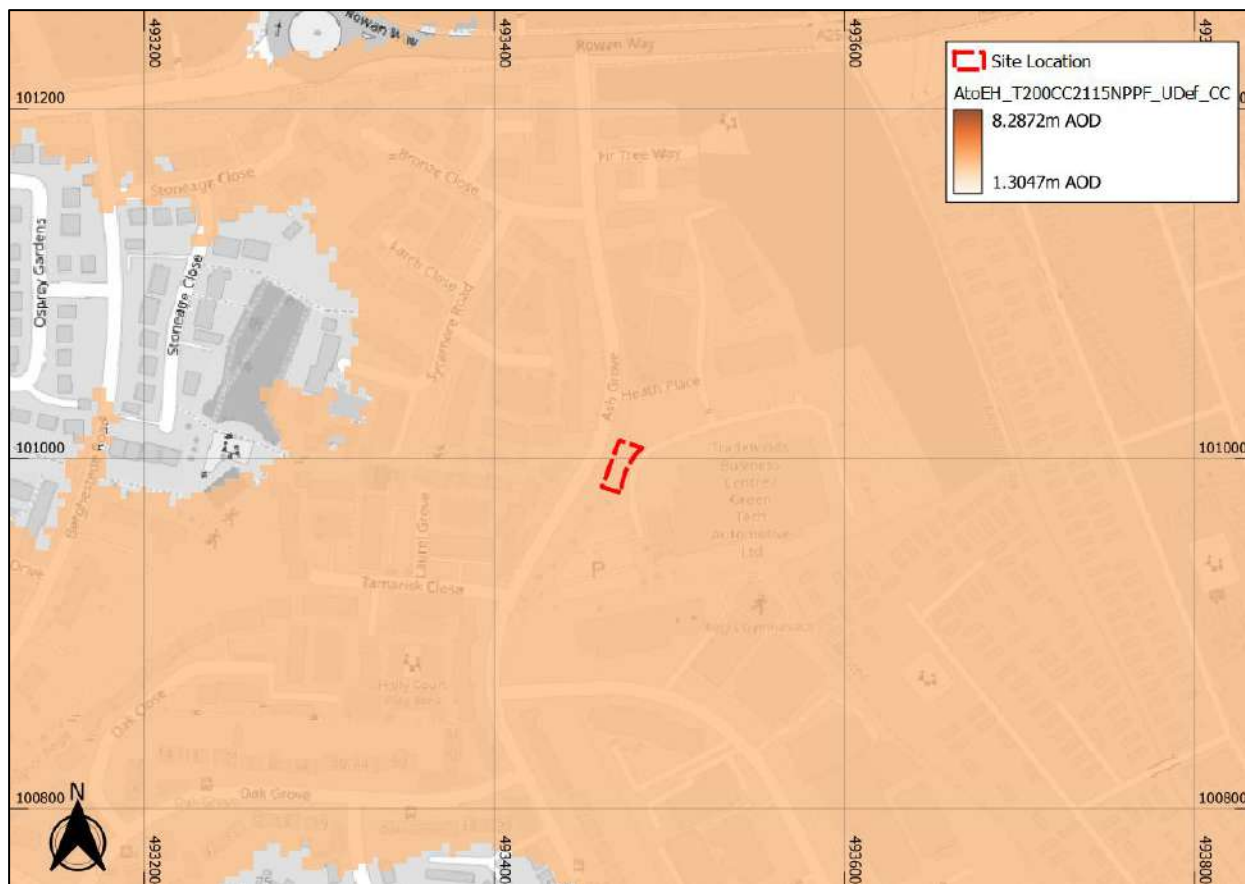


Figure 9: Modelled Undefended Tidal Outlines (Source: EA Product 4 Dataset)

- 4.29. Based on the above analysis, the risk of both solely fluvial and fluvial/pluvial combined flooding to the proposed development can be considered low.
- 4.30. The site is only affected during the tidal undefended scenarios and therefore, the risk of flooding is considered low.
- 4.31. It should be noted however that the proposed development consists of 'More Vulnerable' uses and located on the first floor (above modelled flood levels) with undercroft car parking at lower ground floor level.

Canals

- 4.32. The Canal and River Trust (CRT) generally maintains canal levels using reservoirs, feeders, and boreholes and manages water levels by transferring it within the canal system.

- 4.33. The site is not located within the vicinity of any canals as per the UK CRT Network mapping⁹.
- 4.34. The risk of flooding to this site from canals is considered to be low.

Pluvial

- 4.35. The new National Flood Risk Assessment (NaFRA2), published in Jan 2025, has updated the Risk of Flooding from Surface Water (RoFSW) products which show the chance of flooding from surface water to areas of land.
- 4.36. The RoFSW products are an assessment of where surface water flooding may occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. It includes information about flooding extents and depths including the potential impact of climate change on flood risk, based on the latest UK Climate Projections (UKCP18).
- 4.37. Risk is displayed as one of three likelihood categories:
- 'High Risk'; >3.3% AEP (annual probability greater than 1 in 30).
 - 'Medium Risk'; 1.1% to 3.3% AEP (annual probability between 1 in 100 and 1 in 30).
 - 'Low Risk'; 0.1% to 1% AEP (annual probability between 1 in 1000 and 1 in 100).
- 4.38. The new RoFSW depth mapping shows the annual chance of flooding (based on the three risk categories listed above) beyond a specific depth, for depths at the following intervals from 20cm to 120cm (i.e. 0.2m, 0.3m, 0.6m, 0.9m, and 1.20m).
- 4.39. As well as present day risk of flooding from surface water, climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 – 2060 "2050s" epoch) and central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections.

⁹ <https://canalrivertrust.org.uk/canals-and-rivers>

RoFSW Climate Change Scenario

- 4.40. Examination of the EA's Flood Risk from Surface Water with Climate Change mapping shows that the wider site is considered to be at very low risk of flooding. The main areas of risk are associated with the topographically lower road (Heath Place) to the east (Figure 10).

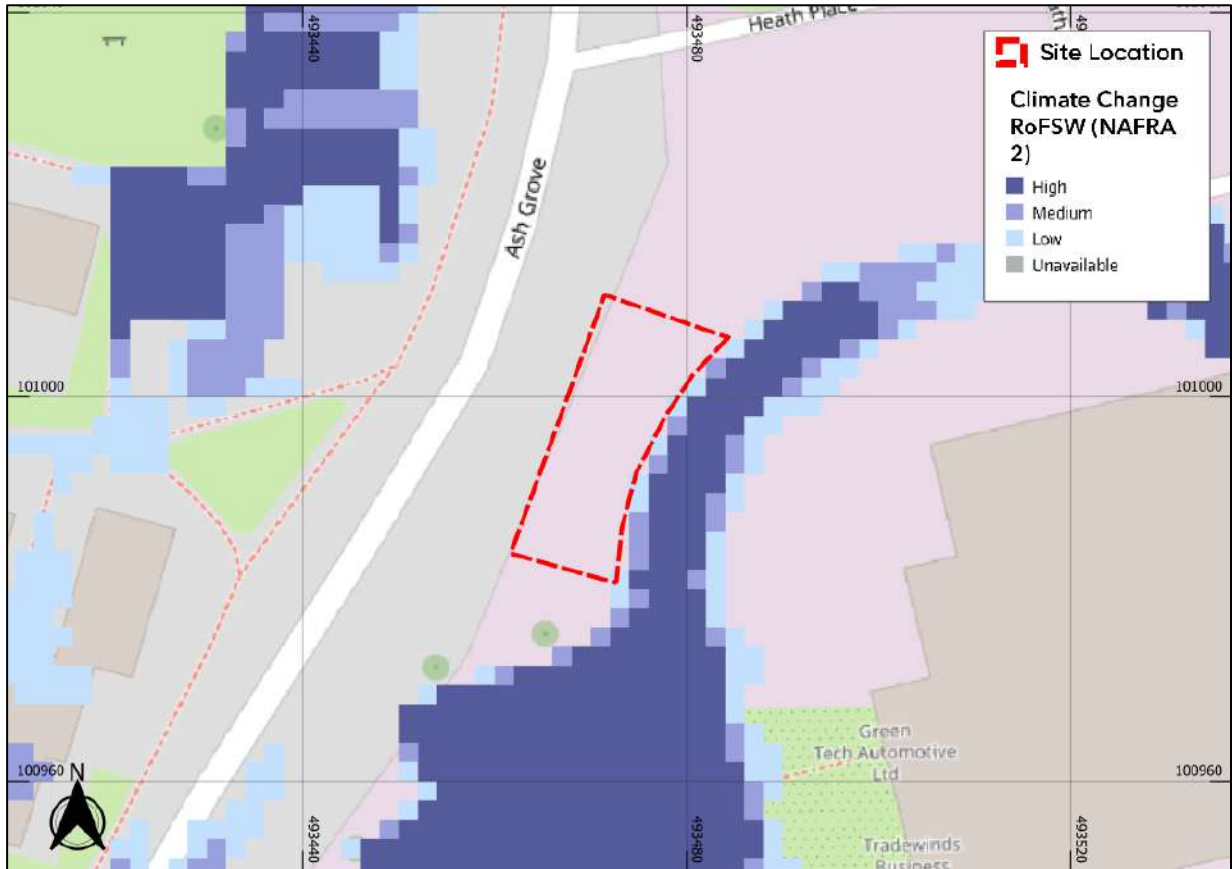


Figure 10: EA Surface Water Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.41. Analysis of the climate change RoFSW flood depth map for the likelihood of flood depths exceeding 0.3m shows that the site would not experience flood depths greater than 0.3m. Heath Place, to the east of the site, generally wouldn't experience flood depths of greater than 0.3m with the exception of a small area with a 'low' chance (Figure 11).
- 4.42. Analysis of the other flood depth intervals mapping (0.6m, 0.9m and 1.2m) shows the site is outside all likelihood categories.

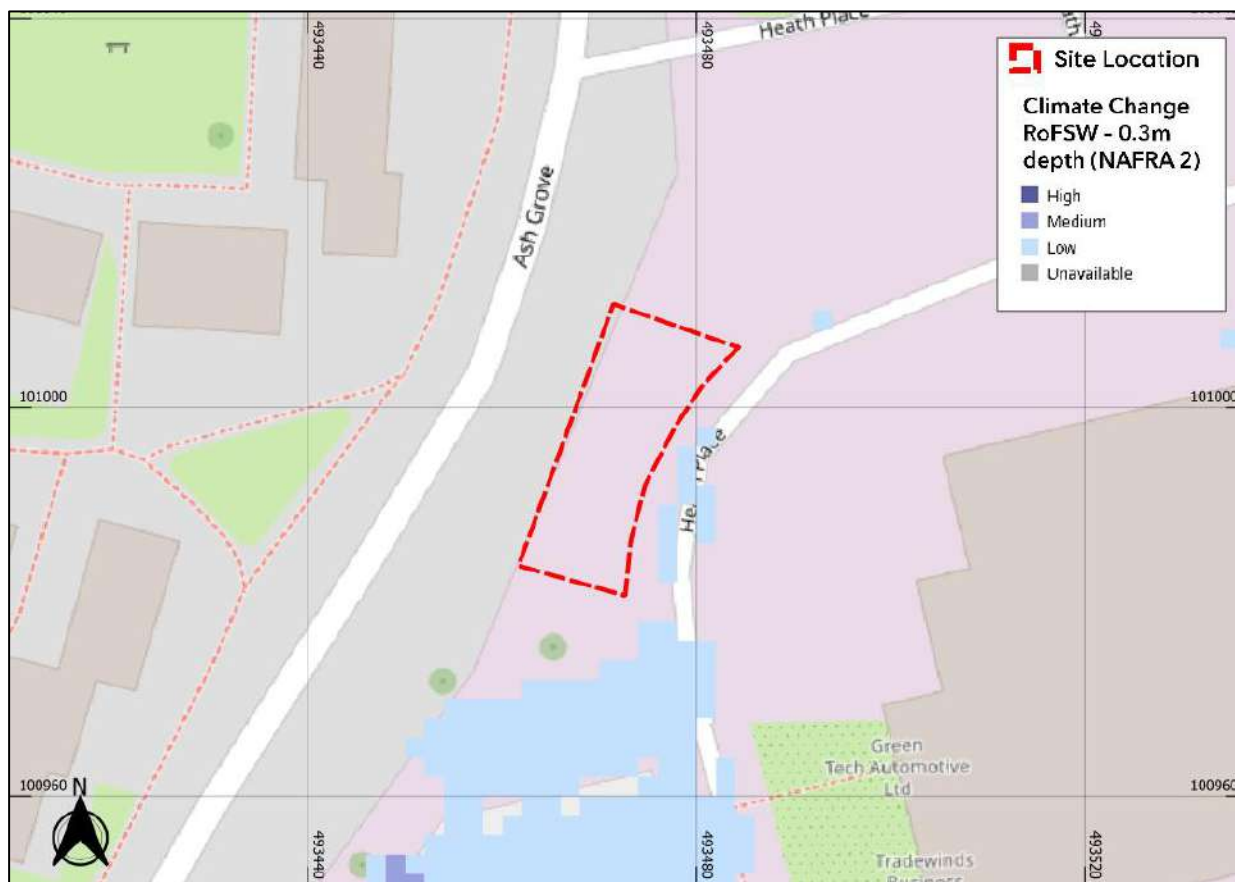


Figure 11: EA Surface Water Flood Risk – Depths Exceeding 0.3m (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.43. The SFRA provides mapping of historical surface water flood incident records kept by the local authority. No historical surface water incidents have been recorded in the vicinity of the site.
- 4.44. Overall, the risk of flooding from pluvial sources is considered to be low.

Reservoirs

- 4.45. Large waterbodies or reservoirs that have walls built above the surrounding ground level pose a risk of flooding. Walls could fail due to old age, accident, or because excess flood water has been added to the reservoir. Although a breach is unlikely the consequences would be significant, leading to rapid inundation of the downstream floodplain.

- 4.46. According to the EA's Flood Risk from Reservoirs mapping the site is not within flood extents for the 'wet day' event, however some areas of Heath Place adjacent to the site may be affected (Figure 12).
- 4.47. This 'dry day' scenario assumes that at the time of the reservoir failure, local rivers and watercourses are at their normal, non-flood levels. The 'wet day' scenario refers to the predicted area that would be inundated if a large, raised reservoir were to fail and release its water when local rivers are already experiencing an extreme natural flood.

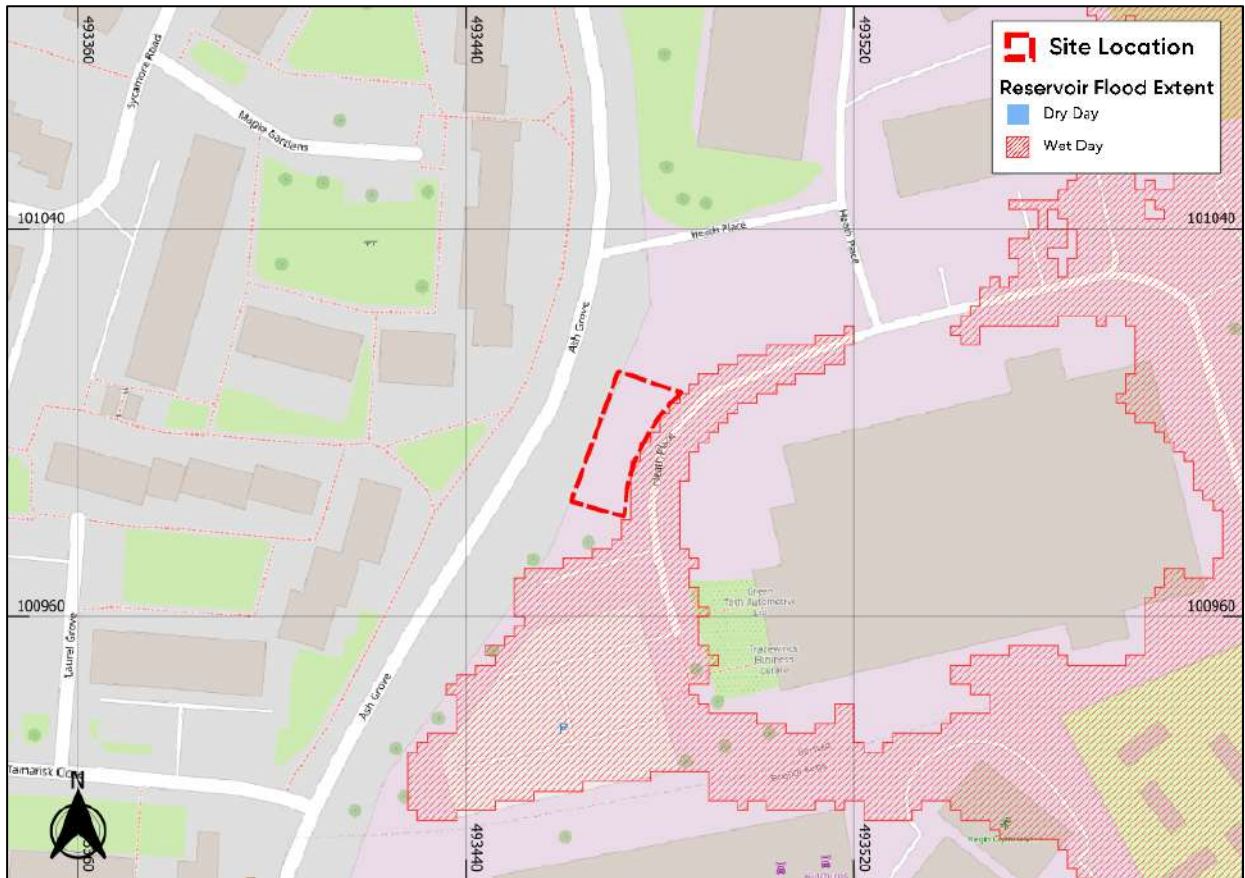


Figure 12: EA Reservoir Flood Risk Mapping (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). ©<https://www.openstreetmap.org> and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

- 4.48. All large reservoirs must be inspected and supervised by reservoir panel engineers as detailed by the Reservoirs Act 1975 in England and Wales. The EA are responsible to ensure that reservoirs are regularly inspected and essential safety work carried out. As reservoirs are highly managed the maximum flood extent provided in the EA Risk of Flooding from Reservoirs mapping is considered a worst-case scenario.

- 4.49. As reservoir flooding is unlikely and the modelled flood depths are based on the worst-case scenario, flooding from this source may be considered as a relatively low risk.

Groundwater

- 4.50. Groundwater flooding occurs in areas where underlying geology is permeable and water can rise within the strata sufficiently to breach the surface.
- 4.51. The British Geological Survey's (BGS) mapping shows superficial deposits underlying the site classified as Raised Marine Deposits consisting of clay, silt, sand and gravel. Bedrock geology underlying the site is classified as Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations consisting of chalk. There are no nearby BGS borehole records.
- 4.52. Soils online mapping describes the soil in the areas as being loamy and clayey soils of coastal flats with naturally high groundwater.
- 4.53. The SFRA presents the EA's Areas Susceptible to Groundwater Flooding mapping (Figure 13). The site is within a 1km cell of which <25% is considered susceptible to groundwater flooding.

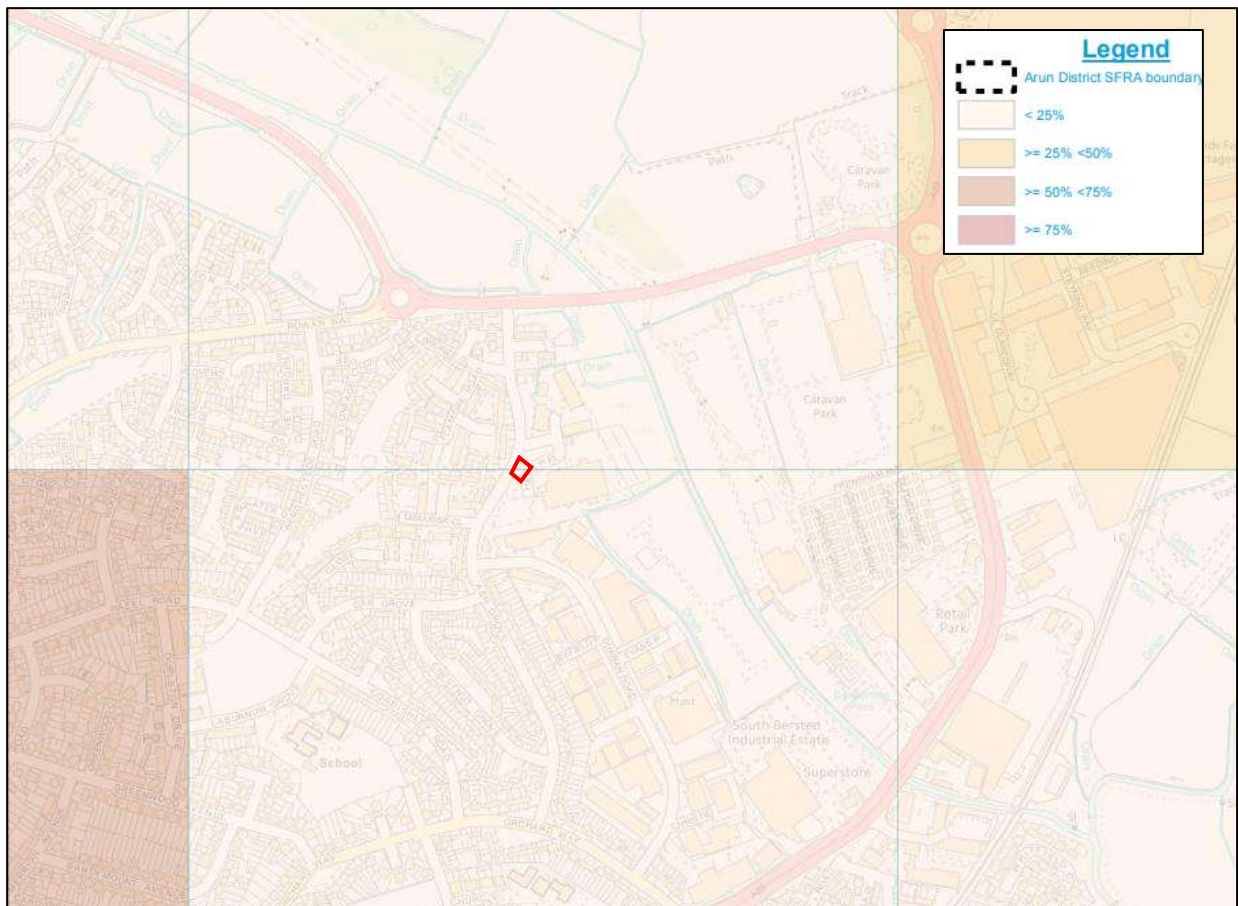


Figure 13: Areas Susceptible to Groundwater Flooding (Source: SFRA)

4.54. Overall, the risk of flooding from groundwater sources is considered to be low.

Sewers

- 4.55. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.
- 4.56. Historical incidents of flooding are detailed by Southern Water in their DG5 register. This database records incidents of flooding relating to public foul, combined or surface water sewers and identifies which properties suffered flooding. For confidentiality reasons, this data has been supplied on a postcode basis from the Sewer Incident Report Form (SIRF) hydraulic overload database. Data covers all reported incidence as of its export on 25th February 2016.

- 4.57. The DG5 register indicates a total of 315 recorded flood incidents in the Arun District. The more frequently flood postcodes are: PO22 7 (36), PO21 3 (30) and PO22 9 (28), the latter where the site is located.
- 4.58. However, given the site is currently undeveloped land, there is no formal sewer infrastructure that directly serves the site. The development is therefore considered to be at low risk of flooding from sewers.

5. Flood Risk Mitigation

Fluvial/Pluvial

- 5.1. According to national guidelines 'More Vulnerable' uses (i.e. residential) are considered appropriate for location within Flood Zones 1, 2 and 3, with the need for the application of the Exception Test.
- 5.2. It should also be noted that flood mitigation measures inherently imbedded into the overall design of the scheme, with all new built footprint located on the first floor, above modelled flood levels, with undercroft car parking located on the ground floor. All new residential use is to be located on the upper ground floor, set at 4.20m AOD, which is:
 - 2.17m above the 1in1000 year fluvial/pluvial flood level.
 - 3.13m above the defended NPPF 1in200 year (2115) tidal flood level.
 - 0.60m above the undefended NPPF 1in200 year (2115) tidal flood level.
- 5.3. Given the developed is located on the first floor, there are no specific flood mitigation measures required for the proposed development. However, the following is recommended to be incorporated:
 - Non-return valve fitted to any new sewer connections.
 - Owners of the site and/or individual tenants of the units to sign up to the EA Flood Warning System (discussed below) and formalise Flood Evacuation Plan procedures.

Tidal, Reservoirs, Canals, Groundwater and Sewers

- 5.4. Flood risk from other sources is considered to be low, therefore mitigation is not required.

Increase to Flood Risk Elsewhere

- 5.5. The scheme will retain undercroft parking at ground floor level, with 'less vulnerable' uses on the first floor. However, we acknowledge Paragraph 049 of the PPG – Flood Risk and Coastal Change, which notes that voids should not be relied upon as compensation for lost floodplain storage:

Whilst the use of stilts and voids below buildings may be an appropriate approach to mitigating flood risk to the buildings themselves, such techniques should not

normally be relied upon for compensating for any loss of floodplain storage. This is because voids do not allow water to freely flow through them, trash screens get blocked, voids get silted up, they have limited capacity, and it is difficult to stop them being used for storing belongings or other materials.

- 5.6. The proposals are to be constructed into the existing bank so there will be no increase in land levels as a result of the development. If anything, the lowering of the bank and allowing the undercroft areas to flood could increase capacity within the floodplain.
- 5.7. Given the size and design of the proposed undercroft area (as shown in the application's ground floor drawings (Appendix A), it is our view that the space allows for the free flow of floodwater from Heath Place and avoids the typical pitfalls of voids such as erosion or blockage through lack of maintenance due to the clearances available.
- 5.8. Given the extensive use of undercroft car parking at ground floor level, there is no requirement to incorporate any additional flood compensatory storage or level for level compensation across the site.

Flood Warnings

- 5.9. The site is in the Environment Agency 'Bognor' flood warning service area. This service allows site owners to register an address along with contact details so that, in the event of a flood being forecast, they are sent an alert. As a further precaution and risk reduction, the owner of the site should sign up.
- 5.10. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides site owners some notice before a flood event. The amount of time afforded before a flood occurs depends on the site-specific location (e.g. proximity to the source of flooding, topography of the surrounding area) and the flood mechanism (e.g. bank over topping versus a breach event). Flood alerts and warnings provide site managers with time to take necessary action, e.g. communication of the risk of flooding to occupants/employees etc, evacuation of occupants offsite or to a safe level, removal of valuable items out of reach of flooding and the mounting of site-specific flood defences.

6. SuDS & Surface Water Drainage

Ground Conditions

- 6.1. The British Geological Survey's (BGS) mapping shows superficial deposits underlying the site classified as River Terrace Deposits consisting of sand, silt, and clay. Bedrock geology underlying the site is classified as Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations consisting of chalk. There are no nearby BGS borehole records. The LandIS Soilscales website¹⁰ online mapping describes the soil in the areas as being loamy and clayey soils of coastal flats with naturally high groundwater.
- 6.2. Based on the West Sussex SuDS design guidance, SuDS should be lined (i.e. no infiltration) if groundwater levels are recorded to be less than 3m below the ground surface. Site specific investigations have not been undertaken on site; however, infiltration is not considered to be a suitable method of surface water disposal on site given the potential for high groundwater levels. Tests should be undertaken prior to construction to confirm groundwater levels on site.

Nearby Watercourses

- 6.3. The closest watercourse to the site is the Aldingbourne Rife, located 200m to the east and a small tributary of the Rife is located approximately 100m to the north. The Aldingbourne Rife and its tributary are both classified as an EA Main River at this location.
- 6.4. The Aldingbourne Rife is not considered to be a suitable location for the disposal of surface water given the significant distance from the site to the watercourse, which would require third party land consent in order to make a connection.

Existing Drainage Infrastructure

- 6.5. Given the site is currently undeveloped land, there is no formal sewer infrastructure that directly serves the site. An Asset Location Plan has been obtained from Southern Water (Figure 14) which shows there is existing 300mm diameter public surface water located to the east of the site along

¹⁰ <https://www.landis.org.uk/soilscales/>

Ash Grove. The nearest manhole is 4051 which has a cover level of 2.41m AOD and an invert level of 0.89m AOD. The public sewer flows north towards manhole 4054 and 4055 prior to connecting into the watercourse (a tributary of the Aldingbourne Rife). The full Asset Plan can be found within Appendix C.

Figure 14: Extract of Southern Water Asset Location Plan. Site Shown in Red

6.6. There is also existing surface water drainage infrastructure on the existing Heath Place Industrial Estate in the form of road gulleys which serve the existing access roads. However, it is unclear where any downstream connection is located. If a new connection into the public sewer is not deemed feasible, this could offer an alternative solution.

Surface Water Drainage Hierarchy

6.7. The management of surface water has been considered in respect to the SuDS hierarchy below (Table 4), as detailed in the Statutory Guidance National standards for sustainable drainage systems (SuDS) (2025).

Table 4: SuDS Drainage Hierarchy

SuDS Drainage Hierarchy				
			Suitability	Comment
	1.	Collection for non-potable use	x/✓	Given the use of the site, there may be limited potential for rainwater reuse. If there is a need for maintenance of the landscaped areas around the site, then water butts should be incorporated for non-potable uses.
	2.	Infiltration	x	Desktop information indicates the possibility of shallow groundwater. Given the site itself is only located at 1.50m AOD and the adjacent watercourses are in close proximity, it is unlikely to achieve the 3m clearance between groundwater levels and infiltration device that West Sussex requires. For the purpose of this report and based on guidance within the West Sussex SuDS document, it is considered that infiltration would not be a suitable method of surface water disposal due to the groundwater levels.
	3.	Discharge to surface waters	x	There is no direct connection into the watercourse, however the Southern Water public sewer does outfall into the Aldingbourne Rife approximately 90m north of the site.
	4.	Discharge to surface water sewer, highway drain or similar	✓	Connection into adjacent public surface water sewer is deemed to be a feasible option.
	5.	Discharge to combined sewer	-	Alternative disposal options higher on the hierarchy take preference.

Greenfield Runoff Rate

- 6.8. The greenfield runoff rate (QBAR rural) was calculated using the ICP SuDS methodology. For sites smaller than 50 ha, the IH124 method is applied to a 50 ha site and the results multiplied by a scale factor equal to the site area (in hectares) divided by 50. QBAR was calculated using the following formula (equation yields m³/s):

$$QBAR_{\text{rural}} = 0.00180 \times \text{AREA}^{0.89} \times \text{SAAR}^{1.17} \times \text{SOIL}^{2.17}$$

6.9. The greenfield runoff rate (Q_{bar}) for the proposed development area (0.025Ha) was calculated to be 0.1l/s.

InfoDrainage - Input Criteria

6.10. The proposed building was calculated to be approximately 250m². The access road (Heath Place) to remain as existing and not included within overall SuDS calculations. The following areas were used to approximate the overall attenuation requirements:

- Roof Catchment 1: 130m²
- Roof Catchment 2: 120m²

6.11. No allowance for urban creep (i.e., future expansion & increased hardstanding areas). This is because the proposed use of the building is flats and any future expansion on site will be subject to additional planning approval which will ensure adequate drainage is provided. A C_v (runoff coefficient) of 1.0 has been used for both the roof areas.

6.12. InfoDrainage Software (v2026.1) was used to calculate the existing runoff rates from the development proposals area, the criteria shown in Table 5.

Table 5: Simulation Criteria

Simulation criteria	
Rainfall Data	FEH
Year	2022
Location	GB 493597 101052 SU 93597 01052
Return Periods	2, 30, 30+35%CC, 100, 100+40%CC
Storm Durations	15, 30, 60, 120, 240, 360, 480, 960, 1140 minute
Volumetric Runoff Co	Roof areas - 1.0 for both summer and winter storm seasons.
Percentage Impervious	100%
Time of Concentration	5 minutes

6.13. The Environment Agency Peak Rainfall Climate Change Allowance guidance was reviewed and subsequently the Defra Peak Rainfall Allowances Map was assessed to determine appropriate climate change allowances to inform the surface water drainage strategy. The upper end allowance for the Arun and Western Streams Management Catchment has been used for the 3.3% and 1% exceedance probability events for the 2070s epoch, which equates to +40% and +45% respectively.

Design Considerations

- 6.14. Space is an important consideration in the total attenuation requirements for the site. The site itself is also dug in to the bank so is relatively low lying, which means any underground storage would need to be fairly shallow in order to make a gravity connection.
- 6.15. The nearest Southern Water manhole is 4051 which has a cover level of 2.41m AOD and an invert level of 0.89m AOD. This is deemed to be the most appropriate outfall location.
- 6.16. The alternative option would be to discharge to the existing surface water gulleys associated with the adjacent Heath Place Industrial Park – however, no information on invert levels has been provided. It is assumed that this drainage infrastructure is private with an outfall into the Aldingbourne Rife.
- 6.17. Above ground storage (detention basins, ponds etc.) are not deemed suitable due to the space constraints, the flood risk and shallow groundwater levels.
- 6.18. The network has been modelled with a 24mm orifice plate. Residential roof areas are generally considered to have low pollution indices (discussed later in this report) but it may be prudent to provide silt traps on rainwater downpipes in order to reduce siltation in the underground network and reduce risk of blockage in the small orifice plate.
- 6.19. Given the constraints on site, it means that discharging at the greenfield rate is not possible. Runoff has been limited to as low as possible (1l/s) while having practical attenuation volumes.

InfoDrainage - Results

- 6.20. The full calculation outputs can be found in Appendix D of this report although the 1 in 100 year +40% climate change results have been summarised below:
- The total required attenuation to discharge surface water runoff for the 1 in 100 +CC year event is 14.46m³.
 - Rainwater will be collected from downpipes located around the proposed building and drain into the attenuation tank via silt traps, to reduce blockage risk.
 - The tank has a plan area of 20m², a crate depth of 0.8m, porosity of 95% (i.e. crate storage) and provides a total volume of 15.20m³. The maximum resident volume within the tank is 14.46m³ with a discharge rate of 1.0l/s during the 1in100+45%CC critical storm event.

- Maximum runoff rates for each critical storm duration for each modelled return period is detailed in Table 6 below.
- No flooding is observed in this event based on the InfoDrainage model.

Table 6: Proposed Runoff Results for Critical Storms

	1 in 1 year	1 in 30 year	1 in 30 Year +35%CC	1 in 100 year	1 in 100 Year +45%CC
Proposed	0.5l/s	0.7l/s	0.8l/s	0.8l/s	1.0l/s

- 6.21. As such, these results indicate that the runoff from the proposed development could be accommodated within a drainage system of the approximate size modelled.
- 6.22. Full surface water storage results can be found within Appendix D.

Future Maintenance Strategy

General Maintenance

- 6.23. The surface water drainage network will be managed throughout the lifetime by the owners of the proposed development in accordance with details set out below.
- 6.24. All drainage, whether piped or SuDS require regular maintenance. The tables below provide an overview of general maintenance tasks and frequency of which they need to be undertaken.

Table 7: General Maintenance Requirements (Source: CIRIA C753 SuDS Manual)

Maintenance Schedule	Required Action	Typical frequency
Regular Maintenance	Inspect for sediment and debris in catchpit manholes and gullies. Clean out as required	Twice Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris in catchpits, gullies, attenuation devices and inside concrete manhole rings.	As required, based on inspections.
Remedial actions	Reconstruct and/or replace components, if performance deteriorates or failure/blockage occurs.	As required

	Replacement of clogged components (flow restriction)	As required
Monitoring	Inspect silt traps/gullies/catchpits and note rate of sediment accumulation.	Monthly in the first year and then annually
	Check attenuation devices	Annually

6.25. The required maintenance for each component making up the drainage system is scheduled in the tables below, based on CIRIA report C753 – The SuDS manual.

SuDS Checklist

6.26. The following lists the SuDS components and extra features which are found on site:

- **Manholes and inspection chambers** are provided on pipe bends or junctions and will allow access and cleaning of the system as necessary.
- **Flow control** (orifice flow control manhole) are custom made, to control/manage surface water flows from site. Geocellular Tank are a modular, underground structure typically made of plastic crates (often polypropylene or high-density polyethylene) with a honeycomb or open-cell design. Excess stormwater runoff during heavy rainfall to prevent flooding, slowly releasing the water at a controlled rate into the public sewer or watercourse.
- **Below ground drainage pipes** convey water and should be free from obstruction at all times to allow free flow.

Table 8: General Maintenance Requirements for Flow Controls (Source: CIRIA C753 SuDS Manual)

Maintenance Schedule	Required Action	Typical frequency
Regular Maintenance	Remove sediment and debris from flow control chambers and upstream manholes	Monthly (for the first 12 months, then 6 monthly).
Remedial Actions	Replace or clean flow control if performance deteriorates or failure occurs.	As necessary.
Monitoring	Check flow control to ensure emptying is occurring.	Quarterly and post high intensity storm event.

Table 9: Maintenance Requirements for Geocellular Tanks (Source: CIRIA C753 SuDS Manual)

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings.	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional Maintenance	Remove sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings.	As required, based on inspections.
Remedial actions	Reconstruct tank and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of tank)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation.	Monthly in the first year and then annually
	Check tank to ensure emptying is occurring	Annually

- 6.27. Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal for large systems. If maintenance is not undertaken for long periods, deposits can become hard packed and require considerable effort to remove.

Water Quality

- 6.28. A key element of SuDS is that they have the potential to improve the quality of surface water discharged from a site. In order to assess this, the "Pollution hazard indices for different land use classifications", provided in the CIRIA SuDS Manual (C753) as table 26.2, has been reviewed. The indices use four different methods of assessing pollution potential based on the hazard level, total suspended solids (TSS), Metals, and Hydrocarbons.
- 6.29. The Pollution Hazard Indices are summarised in Table 10 below (with reference to table 26.3 in the CIRIA SuDS manual).

Table 10: Pollutant Hazard Indices

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very Low	0.2	0.2	0.05

- 6.30. Runoff from residential roofs is generally considered low contamination risk and does not usually warrant any significant treatment. However, to prevent potential sediment from impacting the SuDS system, sediment traps should be provided on downpipes storage structure to prevent sedimentation in the below ground network, with rodding access provided either side for cleaning and maintenance.
- 6.31. It is important that a regular maintenance schedule is provided on the proprietary treatment systems to ensure efficiency with pollutant removal.

7. Conclusions

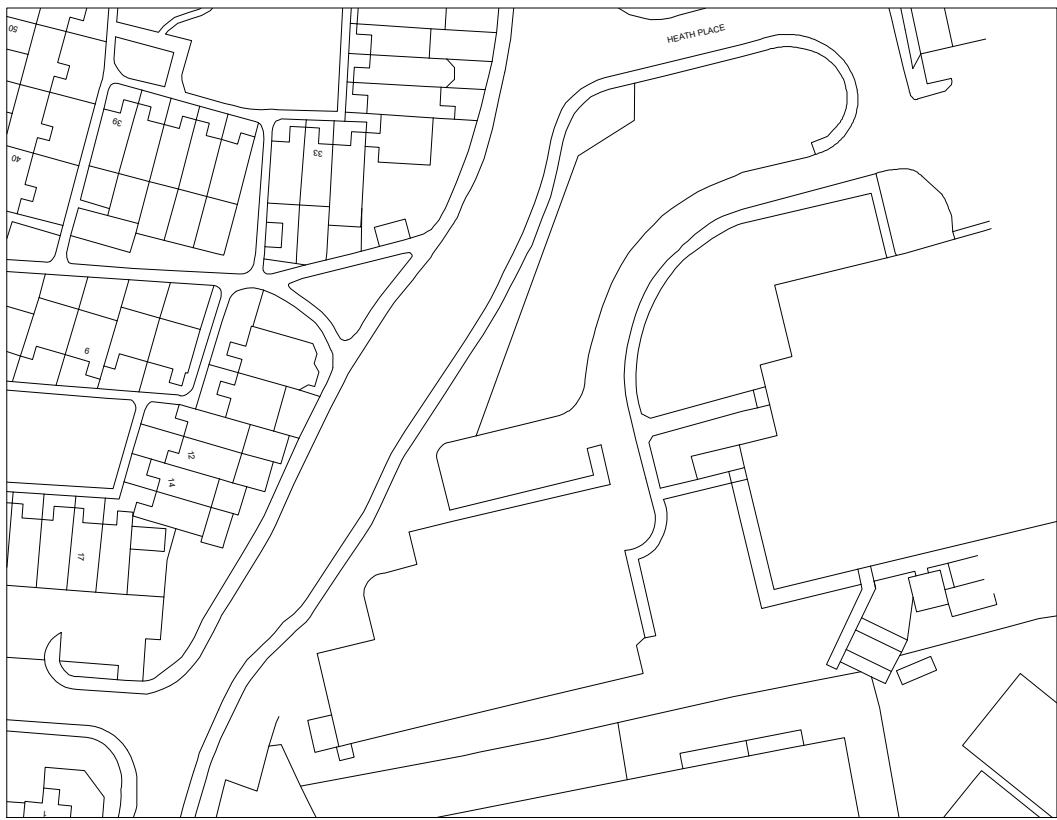
- 7.1. This FRA and SWDS has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Land at Heath Place, Bersted, West Sussex, PO22 9SL. It has been written to support a planning application and prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.
- 7.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

Source of Flooding	Flood Risk Summary
Fluvial	The site is located within Flood Zones 1, 2 and 3. The site is also shown to be located within a 'plus climate change' area. Analysis of the <u>fluvial only</u> flood model shows that the site would remain unaffected by flooding for the 1in30 year and 1in100 year scenarios. The 1in1000 year scenario may partially affect the topographically lower parts of the site. The flood level associated with this scenario is 2.03m AOD. Comparison to the topographic survey (which shows site levels between 1.50m AOD to 2.60m AOD) the site could experience maximum depths of around 0.53m. 4The flood levels for the combined 1in100 year and 1in1000 year scenarios are 1.59m AOD and 2.03m AOD. Comparison with the topographic survey (which shows site levels between 1.50m AOD to 2.60m AOD) the site could experience maximum depths of 0.09m and 0.53m, respectively. Analysis of the modelled 1in100+35CC fluvial scenario shows that the site would generally remain unaffected by flooding. During the 1in100+20%CC combined scenario some parts of the topographically lower eastern side of the site may be partially affected by flooding. The flood level associated with this event is 1.64m AOD. Comparison with minimum topographic levels on site (1.50m AOD) shows the site may experience flood depths of 0.14m. Based on the above analysis, the risk of fluvial flooding to the site can be considered low.
Pluvial	Examination of the EA's Flood Risk from Surface Water with Climate Change mapping shows that the wider site is considered to not be at risk of flooding. The

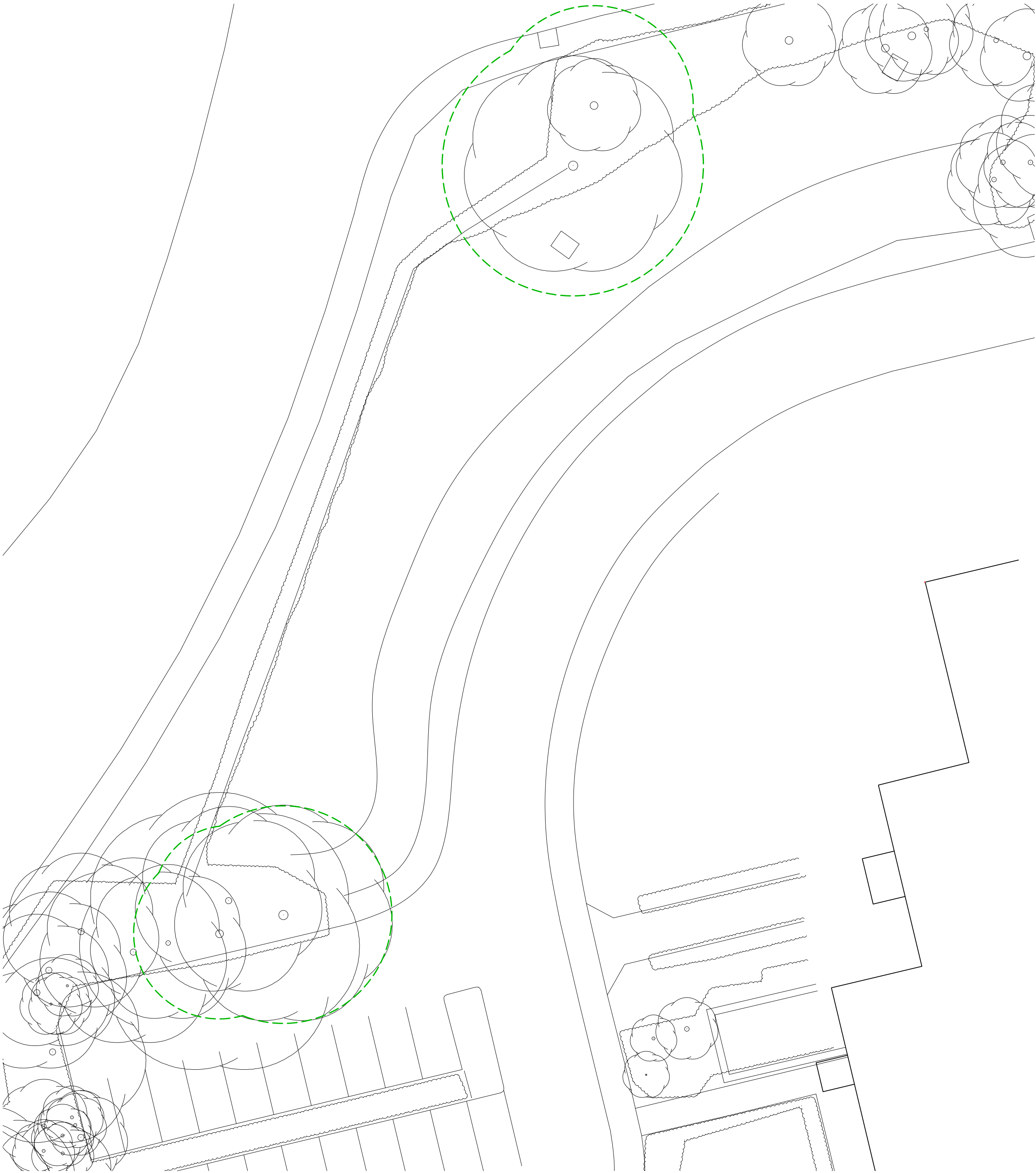
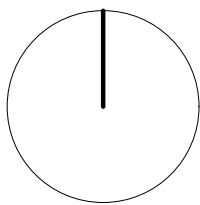
	main areas of risk are associated with the topographically lower road (Heath Place) to the east Analysis of the climate change RoFSW flood depth map for the likelihood of flood depths exceeding 0.3m shows that the site would not experience flood depths greater than 0.3m. Heath Place, to the east of the site, generally wouldn't experience flood depths of greater than 0.3m with the exception of a small area with a 'low' chance Analysis of the other flood depth intervals mapping (0.6m, 0.9m and 1.2m) shows the site is outside all likelihood categories. Overall, the risk of flooding from pluvial sources is considered to be low.
Tidal Reservoirs Groundwater Sewers Canals	The site is considered to be at low risk from other sources.

- 7.3. The FRA and SWDS supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.
- 7.4. This Flood Risk Assessment and Surface Water Drainage Strategy should be submitted as part of the planning application to satisfy the requirements under NPPF.

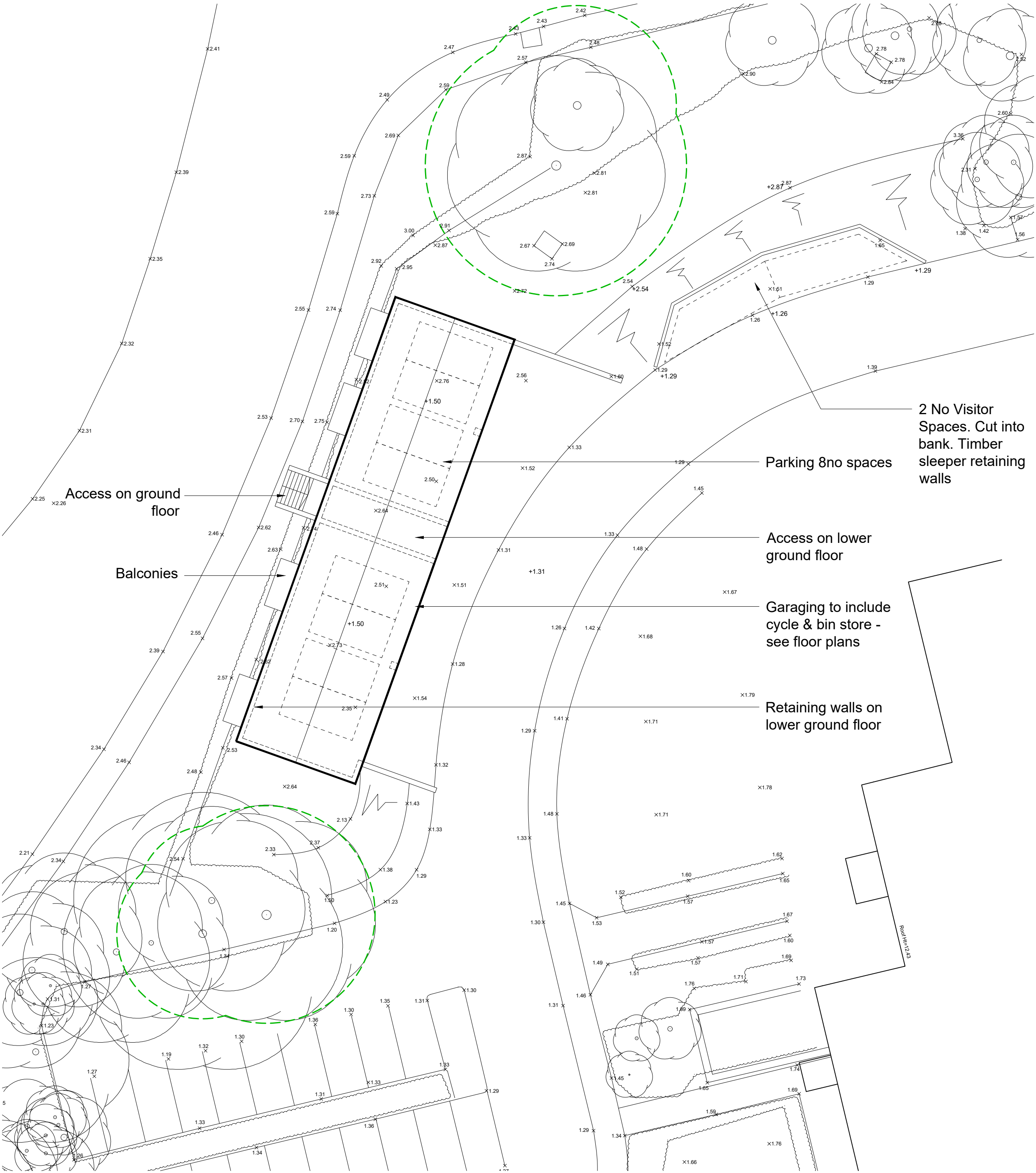
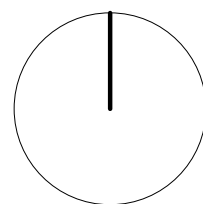
Appendix A - Development Proposals



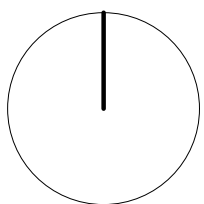
Location Plan
1:1250



Existing Site Plan
1:200



Proposed Site Plan
1:200



P L A N N I N G

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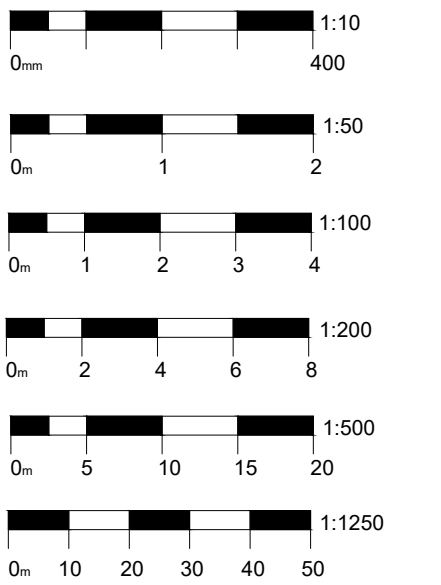
All dimensions to be checked on site and any discrepancies reported to the Architect immediately. All structural and specialist elements/components/details, including glazing, are to be approved by the Structural Engineer or Specialist Contractor.

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

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

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

THESE DRAWINGS ARE FOR PLANNING PURPOSES ONLY.



REV	COMMENT	DATE
A	Visitor Parking added	05.02.2026

Project: Heath Place, Bersted, Bognor Regis, PO22 9SL
Client: Ponders End Ltd
Drawing Title: Location & Site Plans
Job No: 251002
Drawn: DW | NH
Date: 05.02.2026
Scale: As Indicated @ A1
Drawing No: PL01
Rev: A

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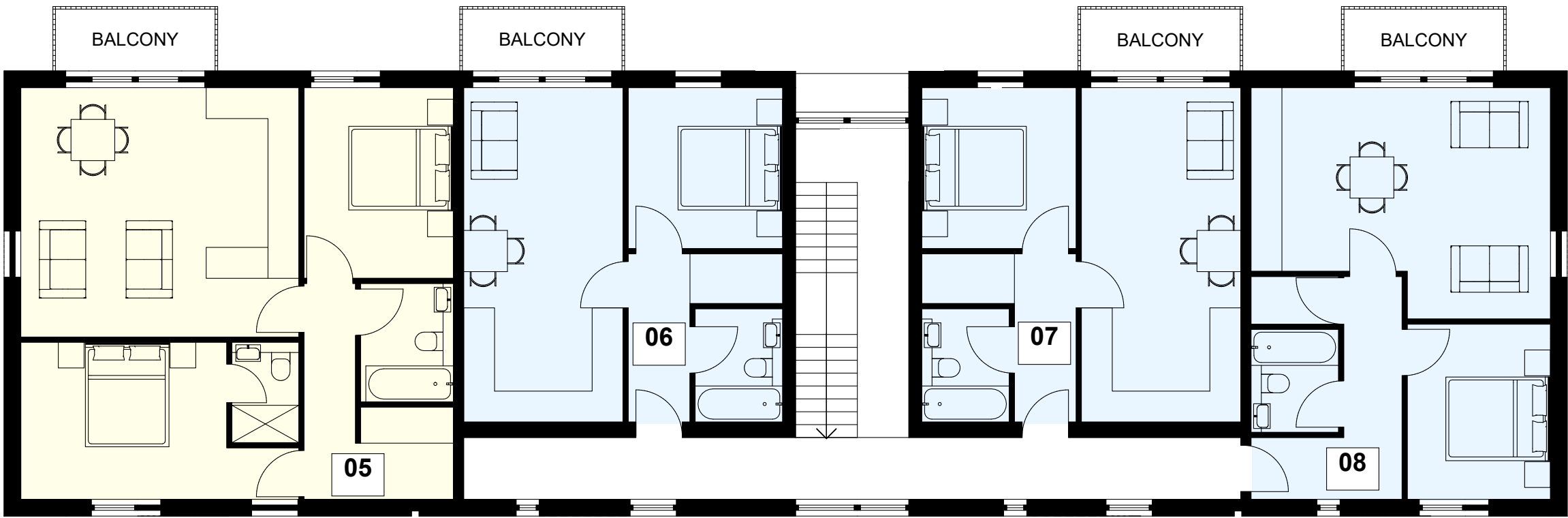
DESIGNERS RISK ASSESSMENT:
HEALTH AND SAFETY
THE CONSTRUCTION (DESIGN AND
MANAGEMENT) REGULATIONS 2007

Building Products and Construction Execution Hazards

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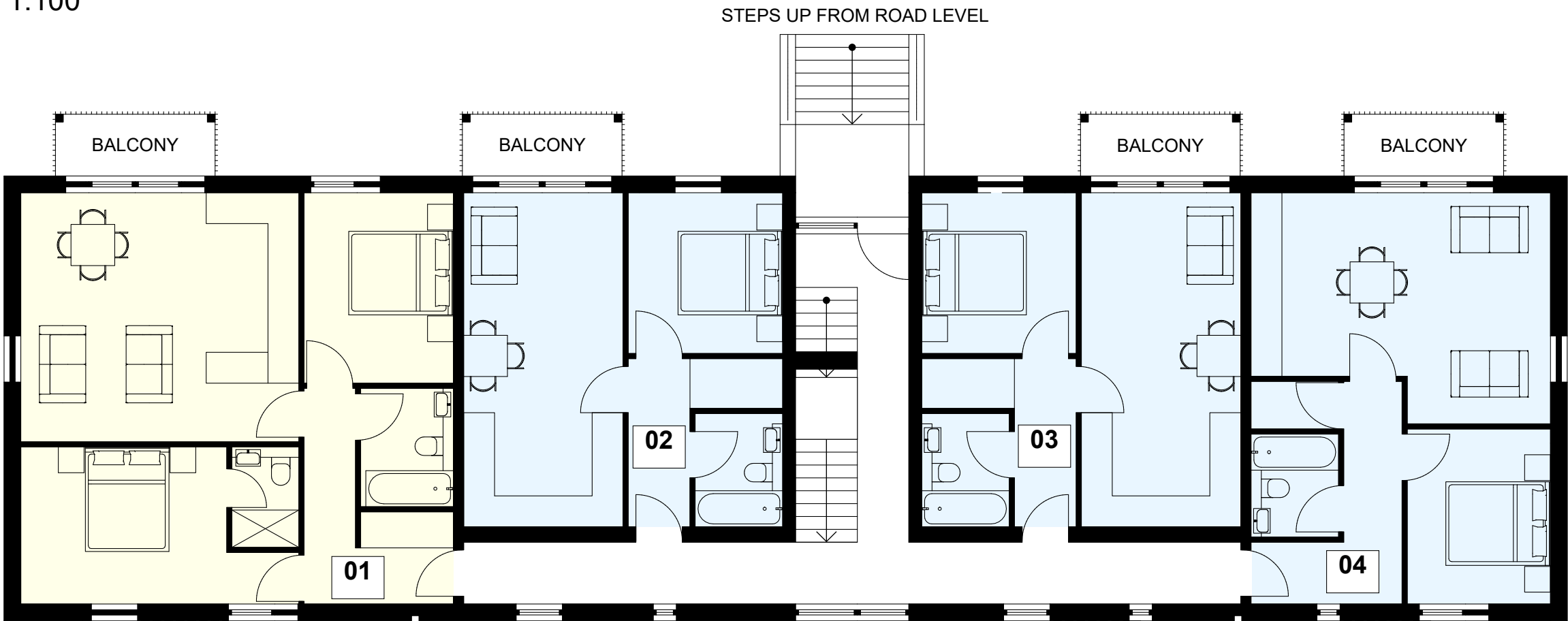
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- 5. 2 Bed 67.1 m2
- 6. 1 Bed 40.2 m2
- 7. 1 Bed 40.2 m2
- 8. 1 Bed 46.5 m2

PROPOSED First Floor Plan

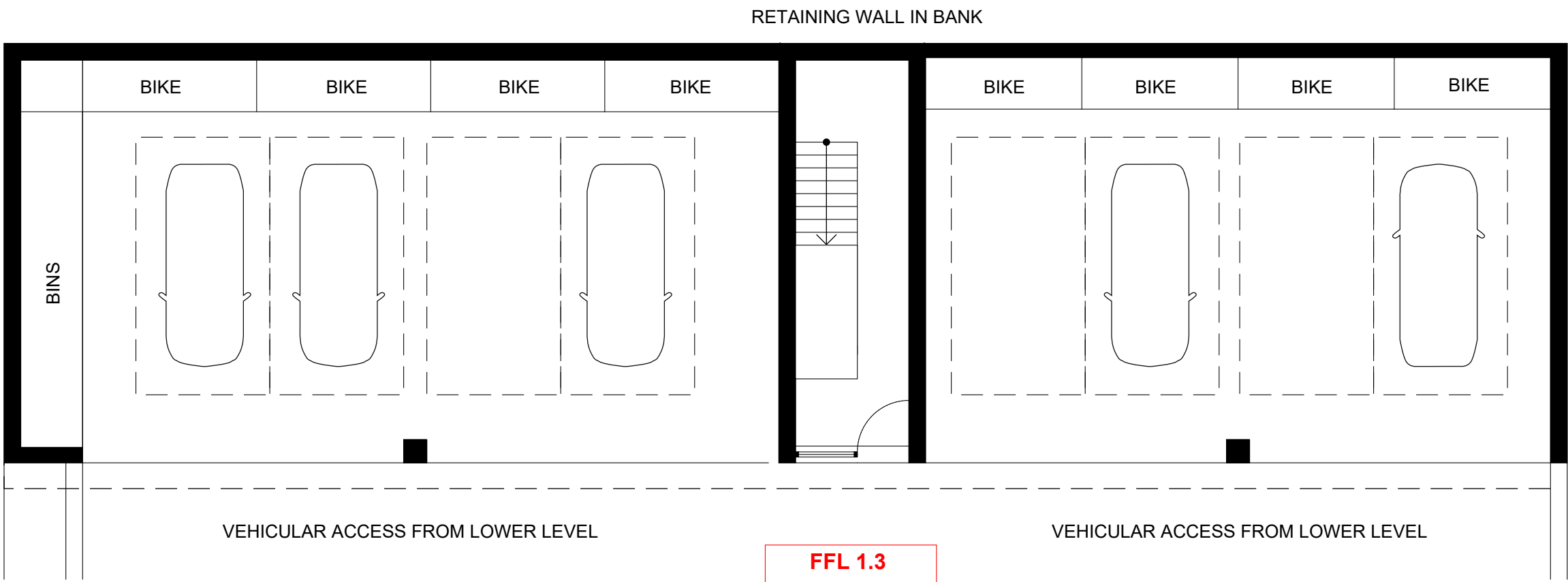
1:100



- 1. 2 Bed 67.1 m2
- 2. 1 Bed 40.2 m2
- 3. 1 Bed 40.2 m2
- 4. 1 Bed 46.5 m2

PROPOSED Ground Floor Plan

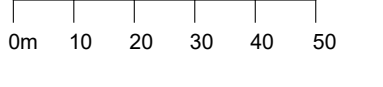
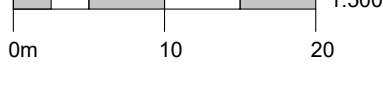
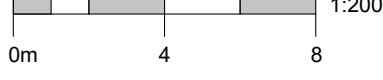
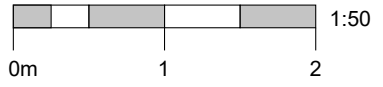
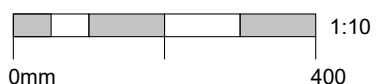
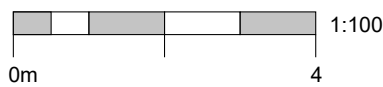
1:100



PROPOSED Lower Ground Floor Plan

1:100

REV	COMMENT	DATE
A	FFL Levels on upper floors increased 250mm	05.02.26



Project: Heath Place
Bersted
Bognor Regis
PO22 9SL

Client: Ponders End Ltd
Drawing Title: Proposed Plans and Elevations

Job No: 251002
Drawn: DWJ/NH
Date: 05.02.2026
Scale: As Indicated @ A1

Drawing No: PL02
Rev: A

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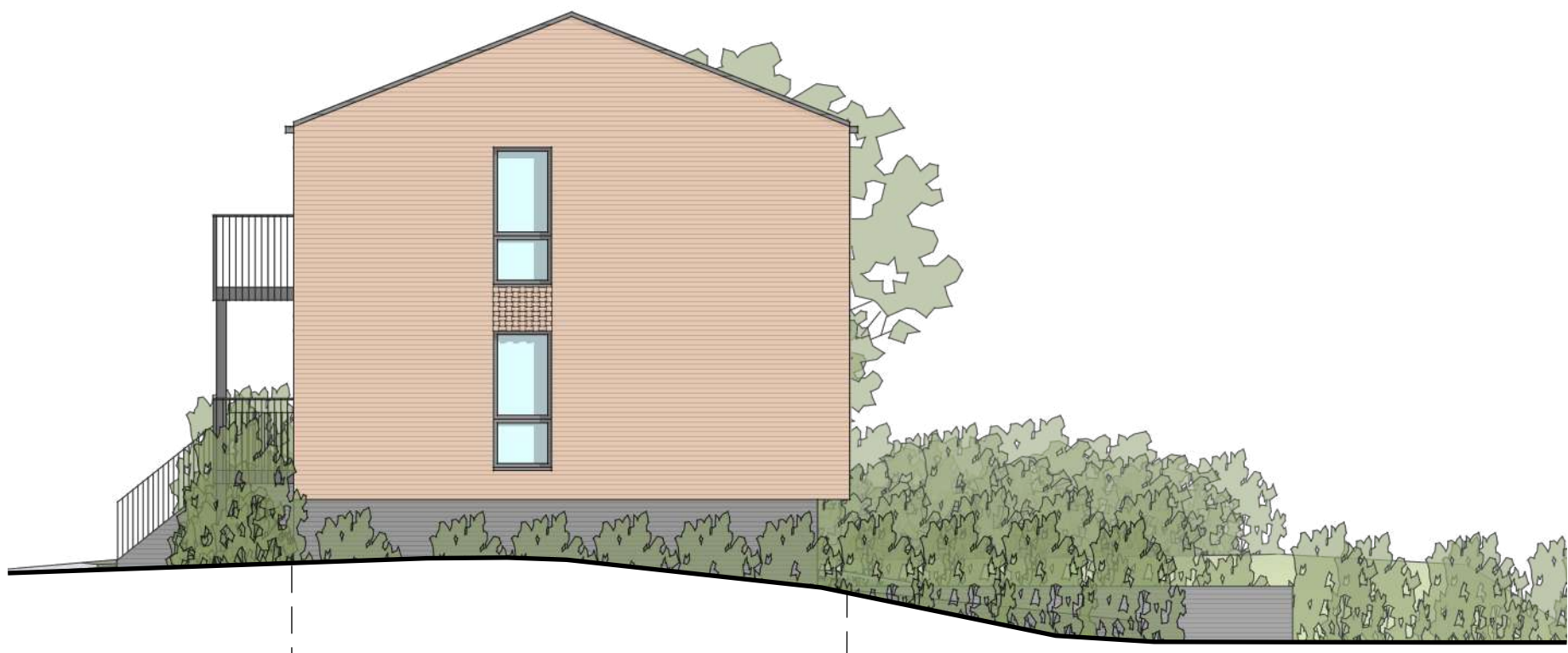
PROPOSED North West Elevation
1:100



PROPOSED South West Elevation
1:100



PROPOSED South East Elevation
1:100



PROPOSED North East Elevation
1:100



PROPOSED Street Scene from Ash Grove
1:200

PLANNING

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DESIGNERS RISK ASSESSMENT: HEALTH AND SAFETY THE CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS 2007

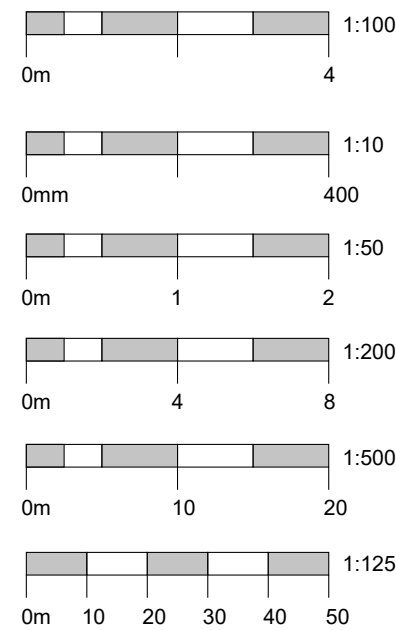
Building Products and Construction Execution Hazards

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THESE DRAWINGS ARE PRELIMINARY ONLY AND
THE INTENDED DETAILS ARE NOT COMPLETE!
THESE ARE NOT FOR CONSTRUCTION
PURPOSES

REV	COMMENT	DATE
A	FFL Levels on upper floors increased 250mm	05.02.26



Project:	Heath Place Bersford Bognor Regis PO22 9SL
Client:	Ponders End Ltd
Drawing Title:	Proposed Plans and Elevations
Job No:	251002
Drawn:	DW NH
Date:	05.02.2026
Scale:	As Indicated @ A1
Drawing No:	PL03
Rev:	A

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Appendix B - Topographic Survey

Appendix C - Southern Water Asset Plan

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	F	4.22	1.91	
0002	F	4.52	0.59	
0003	F	4.18	0.86	
0004	F	4.25	0.97	
0005	F	4.38	1.09	
0006	F	4.68	1.64	
0007	F	4.77	2.07	
0008	F	4.28	2.28	
0101	F	3.57	1.39	
0102	F	2.68	-0.15	
0104	F	0.00	0.00	
0105	F	0.00	0.00	
0106	F	0.00	0.00	
0201	F	1.99	-2.04	
0202	F	1.68	-1.49	
0203	F	1.86	-0.21	
0205	F	2.11	0.74	
0601	F	3.69	1.84	
0701	F	2.92	1.04	
0702	F	3.38	1.07	
0801	F	4.17	1.27	
0802	F	3.78	1.15	
0803	F	3.16	1.90	
0804	F	3.71	2.16	
0805	F	3.33	2.08	
0901	F	0.00	0.00	
1101	F	4.15	0.31	
1102	F	2.80	-0.20	
1103	F	2.89	-0.35	
1601	F	3.28	1.41	
1701	F	2.80	0.76	
1702	F	2.74	0.57	
1801	F	2.65	1.67	
1802	F	3.16	2.23	
1803	F	0.00	0.00	
1804	F	0.00	0.00	
1805	F	0.00	0.00	
1901	F	3.98	2.81	
1902	F	3.36	2.64	
1903	F	3.15	2.48	
1904	F	3.15	2.40	
1905	F	0.00	0.00	
1906	F	0.00	0.00	
2001	F	4.03	1.11	
2002	F	3.93	1.75	
2003	F	3.72	2.30	
2101	F	3.75	0.76	
2102	F	3.45	1.05	
2103	F	3.87	0.08	
2104	F	3.51	-0.63	
2105	F	3.79	-0.61	
2106	F	2.89	-0.45	
2201	F	2.41	-0.43	
2601	F	4.33	2.07	
2701	F	3.52	1.35	
2801	F	2.55	0.44	
2802	F	2.58	0.29	
2803	F	0.00	0.00	
2804	F	0.00	0.00	
2805	F	0.00	0.00	
2806	F	0.00	0.00	
2807	F	0.00	0.00	
2808	F	0.00	0.00	
2809	F	0.00	0.00	
2810	F	0.00	0.00	
2901	F	2.04	-0.01	
2902	F	2.34	-0.32	
2903	F	0.00	0.00	
2904	F	0.00	0.00	
3001	F	3.57	-0.69	
3002	F	3.11	-0.70	
3003	F	2.70	-0.92	
3101	F	2.18	1.42	
3102	F	2.32	1.63	
3103	F	2.01	0.67	
3104	F	1.94	0.39	
3105	F	2.11	0.75	
3106	F	0.00	0.00	
3201	F	0.00	0.00	
3202	F	0.00	0.00	
3203	F	0.00	0.00	
3204	F	0.00	0.00	
3701	F	3.32	1.63	
3702	F	3.86	1.86	
3703	F	4.14	2.13	
3704	F	4.45	2.36	
3801	F	2.92	0.01	
3802	F	2.95	-0.07	
3803	F	2.83	-0.20	
3804	F	0.00	0.00	
3805	F	0.00	0.00	
3806	F	0.00	0.00	
3901	F	2.26	-0.88	
3902	F	2.45	-0.57	
3903	F	2.50	-0.43	
3904	F	0.00	0.00	
3905	F	0.00	0.00	
3906	F	0.00	0.00	
4002	F	2.94	-0.84	
4101	F	2.49	1.95	
4102	F	2.40	1.89	
4601	F	4.97	2.98	
4701	F	3.57	1.69	
4702	F	0.00	0.00	
4801	F	2.55	-0.33	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
4802	F	2.27	-0.44	
4804	F	2.21	-0.62	
4901	F	1.94	-1.16	
4902	F	2.16	-1.07	
4903	F	2.34	-1.02	
4904	F	1.36	-1.32	
4905	F	0.00	0.00	
4906	F	0.00	0.00	
4907	F	0.00	0.00	
4908	F	0.00	0.00	
4909	F	0.00	0.00	
4910	F	0.00	0.00	
4911	F	0.00	0.00	
5602	F	2.76	1.13	
5701	F	2.12	-1.01	
5702	F	2.11	-0.98	
5703	F	2.08	-0.94	
5704	F	2.57	1.32	
5801	F	2.10	0.00	
5802	F	2.09	-0.81	
5901	F	1.61	-1.42	
5902	F	0.92	-1.42	
6601	F	2.15	-1.21	
6602	F	2.30	0.26	
6603	F	2.18	0.12	
6701	F	2.08	-1.07	
6702	F	1.92	-0.58	
6703	F	1.55	-0.08	
6704	F	1.35	0.27	
6705	F	0.82	-1.72	
6801	F	0.95	-1.58	
7601	F	1.13	-2.03	
7701	F	0.96	-1.86	
8701	F	1.30	0.13	
8702	F	1.35	0.26	
8801	F	1.53	0.35	
9004	F	3.70	1.45	
9005	F	4.02	1.93	
9006	F	0.00	0.00	
9102	F	2.97	0.71	
9103	F	3.28	0.99	
9104	F	2.53	0.18	
9105	F	2.18	-2.27	
9108	F	0.00	0.00	
9109	F	0.00	0.00	
9201	F	1.51	-1.07	
9204	F	1.74	0.00	
9206	F	0.00	0.00	
9601	F	4.14	2.27	
9602	F	1.22	0.12	
9701	F	3.75	2.69	
9701	F	1.21	-0.61	
9702	F	4.19	1.89	
9702	F	1.28	-0.11	
9703	F	1.27	0.01	
9801	F	4.32	1.40	
9901	F	4.83	2.64	
9902	F	4.48	3.50	
9903	F	4.46	2.99	
0051	S	4.25	2.38	
0052	S	4.51	3.02	
0053	S	4.57	3.17	
0151	S	3.54	1.94	
0152	S	4.01	2.66	
0251	S	1.70	0.46	
0252	S	1.85	0.69	
0253	S	2.02	0.85	
0255	S	2.21	1.24	
0651	S	3.63	2.54	
0751	S	3.84	1.53	
0752	S	3.89	1.60	
0753	S	3.97	2.17	
0851	S	3.35	1.43	
0852	S	3.49	1.44	
0853	S	3.11	2.18	
0854	S	3.84	2.31	
0855	S	3.87	2.43	
0856	S	4.07	2.71	
0857	S	4.13	2.75	
0858	S	4.03	1.75	
1051	S	4.36	2.41	
1052	S	4.66	1.87	
1053	S	3.93	1.60	
1151	S	4.32	2.27	
1152	S	3.92	1.43	
1153	S	3.96	1.34	
1651	S	3.31	2.27	
1653	S	0.00	0.00	
1654	S	0.00	0.00	
1751	S	2.79	1.39	
1752	S	2.75	1.28	
1753	S	2.70	1.66	
1754	S	2.84	1.17	
1851	S	2.55	0.91	
1852	S	2.76	1.03	
1853	S	2.78	1.00	
1854	S	2.67	1.36	
1855	S	2.19	0.37	
1856	S	3.04	1.41	
1952	S	2.76	1.46	
1953	S	3.22	1.92	
2051	S	4.09	1.86	
2052	S	4.07	2.53	
2053	S	3.76	2.50	
2054	S	3.97	2.74	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
2151	S	3.75	1.34	
2152	S	3.84	1.20	
2153	S	3.69	1.11	
2154	S	2.78	1.15	
2155	S	3.20	2.00	
2156	S	2.64	1.62	
2157	S	2.80	1.19	
2158	S	2.68	1.24	
2159	S	2.69	1.73	
2160	S	0.00	0.00	
2251	S	2.70	1.33	
2252	S	2.38	0.19	
2651	S	4.61	2.78	
2751	S	3.73	2.14	
2752	S	2.59	1.23	
2851	S	2.57	1.15	
2951	S	2.18	0.33	
2952	S	2.43	0.23	
3051	S	3.32	1.57	
3052	S	3.17	1.36	
3053	S	3.05	1.13	
3054	S	2.83	0.95	
3151	S	1.96	0.77	
3152	S	3.02	1.31	
3153	S	2.17	0.69	
3154	S	2.38	1.20	
3155	S	1.98	1.32	
3251	S	2.47	1.68	
3252	S	2.49	1.88	
3651	S	4.46	3.50	
3751	S	3.30	1.88	
3752	S	3.89	2.54	
3753	S	4.14	3.24	
3851	S	2.97	0.99	
3852	S	2.97	0.92	
3853	S	2.82	0.89	
3854	S	2.26	1.01	
3951	S	2.32	0.10	
3952	S	2.50	0.17	
4051	S	2.43	0.89	
4052	S	2.85	1.43	
4053	S	2.67	1.55	
4054	S	2.40	0.35	
4055	S	1.99	0.17	
4151	S	2.26	0.54	
4152	S	2.09	1.16	
4153	S	2.02	0.43	
4154	S	2.13	0.77	
4155	S	2.38	1.39	
4251	S	2.48	1.42	
4252	S	2.45	1.48	
4652	S	3.84	3.10	
4751	S	3.72	2.81	
4752	S	3.47	2.28	
4753	S	3.09	1.69	
4851	S	2.67	0.99	
4852	S	2.34	0.74	
4853	S	2.39	0.63	
4854	S	2.26	0.84	
4855	S	2.12	0.88	
4951	S	1.91	-0.02	
4952	S	2.04	1.19	
4953	S	1.61	-0.17	
5652	S	2.78	1.71	
5751	S	2.08	0.99	
5752	S	2.12	1.05	
5753	S	2.58	1.57	
5851	S	2.09	1.05	
5852	S	2.11	1.28	
5951	S	1.08	-0.33	
6651	S	2.14	0.68	
6751	S	1.86	0.83	
6752	S	1.62	0.61	
6753	S	1.49	0.50	
6754	S	1.40	0.41	
6755	S	1.29	0.34	
8651	S	1.10	-0.26	
8652	S	0.99	-0.37	
8653	S	0.98	-0.38	
8654	S	1.00	0.00	
9054	S	3.95	2.54	
9055	S	3.65	1.81	
9152	S	2.99	1.29	
9153	S	2.17	1.17	
9154	S	2.59	1.62	
9155	S	2.10	0.00	
9158	S	0.00	0.00	
9159	S	0.00	0.00	
9251	S	1.54	0.15	
9254	S	1.71	0.42	
9651	S	4.03	3.17	
9652	S	4.17	2.67	
9851	S	4.36	3.11	
9951	S	4.86	2.80	
9952	S	4.50	3.24	
9953	S	4.56	2.30	

Appendix D - InfoDrainage Calculations

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network	Date: 28/10/2025			 water, civils and environment
Report Details: Type: Inflows Storm Phase: Phase	Designed by: OH	Checked by: JA	Approved By: NDD	
Company Address: Aegaea				



Roof Area 2

Type : Catchment Area

Area (ha)	0.013
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Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Roof Area 1

Type : Catchment Area

Area (ha)	0.012
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network	Date: 28/10/2025			
Report Details: Type: Stormwater Controls Storm Phase: Phase	Designed by: OH	Checked by: JA	Approved By: NDD	
Company Address: Aegaea				



Tank

Type : Tank

Dimensions

Exceedance Level (m)	2.750
Depth (m)	1.600
Base Level (m)	1.150
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	16.000

Depth (m)	Area (m²)	Volume (m³)
0.000	20.00	0.000
0.800	20.00	15.200

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Roof Area 1
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	Roof Area 2
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	1.001
Outlet Type	Orifice
Diameter (m)	0.024
Coefficient of Discharge	0.600
Invert Level (m)	1.150

Advanced

Perimeter	Circular
Length (m)	7.132

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network			Date: 28/10/2025			
Report Details: Type: Inflow Summary Storm Phase: Phase			Designed by: OH	Checked by: JA	Approved By: NDD	
			Company Address: Aegaea			

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Roof Area 1	Tank		Time of Concentration	0.012	100	0	100	0.012
Roof Area 2	Tank		Time of Concentration	0.013	100	0	100	0.013
TOTAL		0.0		0.025				0.025

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network	Date: 28/10/2025			
Report Title: Rainfall Analysis Criteria	Designed by: OH	Checked by: JA	Approved By: NDD	
Company Address: Aegaea				

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall		
FEH		Type: FEH
Site Location	GB 493597 101052 SU 93597 01052	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
30.0	40.000
100.0	0.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		 water, civils and environment	
Report Title: UK and Ireland Rural Runoff Calculator		Designed by: OH	Checked by: JA		Approved By: NDD
		Company Address: Aegaea			

ICP SUDS / IH 124

Details

Method	ICP SUDS
Area (ha)	0.025
SAAR (mm)	720.0
Soil	0.47
Region	Region 7
Urban	0
Return Period (years)	0

Results

Region	QBAR Rural (L/s)	QBAR Urban (L/s)	Q 1 (years) (L/s)	Q 30 (years) (L/s)	Q 100 (years) (L/s)
Region 7	0.1	0.1	0.1	0.3	0.4

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD
		Company Address: Aegaea		



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FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH1	FEH: 2 years: +0 %: 240 mins: Summer	2.750	1.050	1.068	0.018	0.5	0.009	0.000	0.5	6.418	OK
TW MH 4051	FEH: 2 years: +0 %: 240 mins: Summer	2.430	0.890	0.908	0.018	0.5	0.000	0.000	0.5	6.418	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD
		Company Address: Aegaea		



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FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH1	FEH: 30 years: +0 %: 120 mins: Summer	2.750	1.050	1.072	0.022	0.7	0.011	0.000	0.7	7.136	OK
TW MH 4051	FEH: 30 years: +0 %: 120 mins: Summer	2.430	0.890	0.912	0.022	0.7	0.000	0.000	0.7	7.136	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD
		Company Address: Aegaea		



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FEH: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH1	FEH: 30 years: +40 %: 120 mins: Winter	2.750	1.050	1.075	0.025	0.8	0.012	0.000	0.8	8.919	OK
TW MH 4051	FEH: 30 years: +40 %: 120 mins: Winter	2.430	0.890	0.914	0.024	0.8	0.000	0.000	0.8	8.919	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD	
		Company Address: Aegaea			



FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH1	FEH: 100 years: +0 %: 120 mins: Winter	2.750	1.050	1.074	0.024	0.8	0.012	0.000	0.8	8.301	OK
TW MH 4051	FEH: 100 years: +0 %: 120 mins: Winter	2.430	0.890	0.913	0.023	0.8	0.000	0.000	0.8	8.301	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD	
		Company Address: Aegaea			



FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWMH1	FEH: 100 years: +45 %: 120 mins: Winter	2.750	1.050	1.077	0.027	1.0	0.013	0.000	1.0	10.523	OK
TW MH 4051	FEH: 100 years: +45 %: 120 mins: Winter	2.430	0.890	0.916	0.026	1.0	0.000	0.000	1.0	10.523	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025			
		Designed by: OH	Checked by: JA	Approved By: NDD	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Aegaea			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Lost Volume (m³)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 2 years: +0 %: 240 mins: Summer	1.336	1.336	0.186	0.186	1.7	3.530	0.000	0.5	0.000	6.425	77.935	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
		Designed by: OH	Checked by: JA	Approved By: NDD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: Aegaea		



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FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Lost Volume (m³)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 30 years: +0 %: 120 mins: Summer	1.539	1.539	0.389	0.389	4.9	7.390	0.000	0.7	0.000	7.176	53.811	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD
		Company Address: Aegaea		



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FEH: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Lost Volume (m³)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 30 years: +40 %: 120 mins: Winter	1.717	1.717	0.567	0.567	5.0	10.778	0.000	0.8	0.000	8.965	32.638	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network		Date: 28/10/2025		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Designed by: OH	Checked by: JA	Approved By: NDD
		Company Address: Aegaea		



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FEH: 100 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Lost Volume (m³)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 100 years: +0 %: 120 mins: Winter	1.651	1.651	0.501	0.501	4.4	9.514	0.000	0.8	0.000	8.346	40.537	OK

Project: AEG5966 Land at Heath Place, Bersted, PO22 9SL Proposed Network	Date: 28/10/2025		
	Designed by: OH	Checked by: JA	Approved By: NDD
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address: Aegaea		



FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Lost Volume (m³)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Tank	FEH: 100 years: +45 %: 120 mins: Winter	1.911	1.911	0.761	0.761	6.4	14.457	0.000	1.0	0.000	10.575	9.645	OK

Appendix E - SuDS Layout

