

Flood Risk Assessment

Crookthorn Lane, Climping, Littlehampton, BN17 5SN

Rev -

Reference: **C3428**

Date **6th May 2025**

REVISION

Revision	Status	Description	Date	Issued	Checked
-	Final v1	Issued for Approval		RH	RH

1 SITE AND DEVELOPMENT OVERVIEW

DEVELOPMENT DESCRIPTION	EXISTING (PRE-DEVELOPMENT)	PROPOSED (POST-DEVELOPMENT)
Site Use	Agricultural (report ref: existing site coverage)	Commercial
Development Use	Agricultural Use (report ref: existing site use)	Commercial and Parking (report ref: proposed site use)
Use Design Life	-	75 years (epoch 2100)
Number of Dwellings	-	0
EA Vulnerability Classification	Less Vulnerable (ref: existing site vulnerability)	Less Vulnerable (ref: proposed site vulnerability)
Development Class		Minor
County Planning Authority	West Sussex County Council (ref: Country Council)	
District Planning Authority	Arun District Council	
Local Sewer Authority	Southern Water (ref: Local Sewer Authority)	
SITE CATCHMENT CHARACTERISTICS	DESCRIPTION	SOURCE
Management Catchment	Arun and Western Streams Management Catchment (report ref: River Basin Catchment)	https://environment.data.gov.uk/catchment-planning
Nearest EA Main River	Ryebank Rife located c450m to the south (report ref: EA Main River)	https://environment.maps.arcgis.com/apps/MapSeries/
Nearest Ordinary watercourse or surface waters	Minor ditches and land-drainage associated with historic site use (report ref: local water features)	Online Mapping and topography
KEY FLOOD RISK AND DATA SOURCES	DATA TYPE	SOURCE
EA Fluvial and Tidal Planning Data	UK Government Flood Maps for Planning (ref: FMP)	https://flood-map-for-planning.service.gov.uk/
EA Surface Water Data	DEFRA Risk of Flooding from Surface Water Sources GIS Data (ref: RoFSW)	https://environment.data.gov.uk/DefraDataDownload/?Mode=rofsw
EA Long term Flood Risk	UK Government Long term Flood Risk Maps (ref: LTFRM)	https://www.gov.uk/check-long-term-flood-risk
Environment Agency Product 4/5 Data	Appendix 2 (report ref: EA Product Data)	Environment Agency
Historic Flood Risk Data	DEFRA Historic Flood Outlines GIS Data	https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&Mode=spatial
Strategic Flood Risk Assessment Data	ADC SFRA (ref SFRA)	
Local Flood Risk Assessment Data	(refer to SFRA)	
Topographic Information	DEFRA Opensource LIDAR Data	https://environment.data.gov.uk/DefraDataDownload/?Mode=survey
River or Sea Flood Risk present within site boundary	High	Refer Section 3: Table 3
Surface Water Flood Risk present within site boundary	Very Low	Refer Section 3: Table 3
DESIGNATION	FLOOD RISK DESIGNATION	NOTE
Critical Design Flood Event (DFE)	Marginal flood risk within the site	*Designation based on highest flood risk between River, Sea or Surface Water - Refer Section 3: Table 3

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2 INTRODUCTION

- 2.1 The following report is a Flood Risk Assessment (FRA) for the development at Crookthorn Lane, Climping, Littlehampton, BN17 5SN (see site location map, Figure 1).
- 2.2 This assessment is required under the National Planning Policy Framework (NPPF) and Local and District Councils planning policy given the location, scale and associated flood risks.

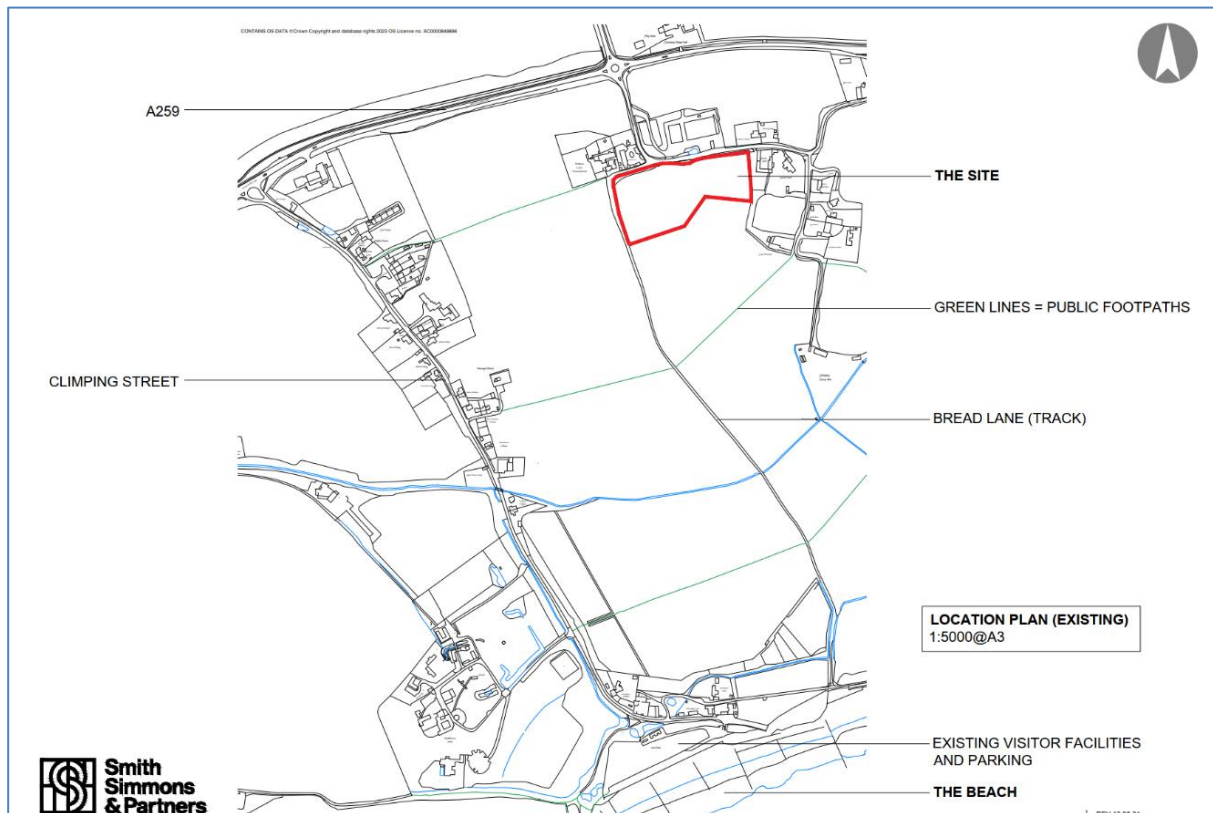


Figure 1 - Site Location Plan (site bordered red) Source: Location Map

- 2.3 This FRA has been written in general accordance with the National Planning Policy Framework (NPPF) and its Planning Practice Guidance (PPG), Environment Agency (EA) Standing Advice, LFRMS, County SFRA and associated guidance.
- 2.4 This FRA has relied upon publicly available information and data provided from the EA (where relevant and available at the time of writing). The interpretation of this data has been undertaken with the understanding of its accuracy and to a detail deemed suitable for this development type, location and relevant flood risk.
- 2.5 Where required, assumptions or extrapolation of the available data may have been undertaken to estimate (in particular) climate change impacts or extreme flood extents. This is only undertaken where up-to date climate change modelling is not available.

DEVELOPMENT PROPOSALS

- 2.6 The development proposals are for the construction of a visitors centre and parking facilities. See proposed plans in Appendix 1.

FLOOD RISK VULNERABILITY

- 2.7 This FRA has been undertaken with due regard to the statutory requirements of the NPPF and with reference to the Planning Practice Guidance (PPG) in relation to development and flood risk. This FRA has been undertaken to inform on the current flood risk to the site. Therefore, this FRA aims to ensure that the development proposals

take into account the site-specific flood risk and to **avoid** inappropriate development in areas potentially at risk of flooding.

- 2.8 Annex 3 of the NPPF Flood Risk Vulnerability Classification provides guidance on assigning development vulnerability. A summary of this information is provided in Table 1.

Table 1 – Extract from Annex 3 of the National Planning Policy Framework and Table 2: Flood risk vulnerability classification of PPG detailing Flood Risk Vulnerability Classification by use. (Existing Site Classification is Shaded Gray, Proposed Site specific classification shaded blue).

ESSENTIAL INFRASTRUCTURE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE	WATER-COMPATIBLE
Essential transport infrastructure	Police and ambulance stations; fire stations and telecom installations	Hospitals	Police, ambulance and fire stations which are not required to be operational during flooding.	Flood control infrastructure.
Essential utility infrastructure which has to be located in a flood risk area for operational reasons	Emergency dispersal points.	Residential institutions such as residential care homes, prisons and hostels.	Buildings used for commercial purposes and of a non-residential nature	Water transmission infrastructure and pumping stations.
Wind turbines.	Basement dwellings.	Buildings used for dwelling houses and sleeping, drinking establishments	Land and buildings used for agriculture and forestry.	Sewage transmission infrastructure and pumping stations.
Solar farms.	Caravans, mobile homes and park homes intended for permanent residential use.	Non-residential uses for health services, nurseries and educational uses	Waste treatment (except landfill* and hazardous waste facilities).	Sand and gravel working.
	Installations requiring hazardous substances consent.	Landfill* and sites used for waste management facilities for hazardous waste.	Minerals working and processing (except for sand and gravel working).	Docks, marinas and wharves and Navigation facilities.
		Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.	Water treatment and Sewage treatment works which do not need to remain operational during times of flood.	Ministry of Defence installations.

- 2.9 The site is currently considered 'Less Vulnerable' based on the agricultural use of the site. The proposed development will be considered 'Less Vulnerable'.

3 FLOOD RISK ASSESSMENT SCOPE

- 3.1 Flood risk as defined by the NPPF, is a combination of the probability and the potential consequences of flooding. Areas at risk of flooding are those at risk of flooding from any source, now or in the future. Sources include rivers and the sea, direct rainfall on the ground surface, rising groundwater, overwhelmed sewers and drainage systems, reservoirs, canals and lakes and other artificial sources. Flood risk also accounts for the interactions between these different sources. This term is key to the application of the presumption in favour of sustainable development in paragraph 11 of the National Planning Policy Framework (NPPF).
- 3.2 The NPPF requires flood risk to be considered on all sites, however more detailed site-specific FRA's are required when one or more of the following criteria apply to the site:
- Where a site is affected by the **Design Flood Event** (DFE) from any source (typically the 1% AEP) for all proposals of any new development (including minor development and change of use); or
 - Greater than 1 ha in size and located in Flood Zone 1; or
 - Located in Flood Zone 1 where there are critical drainage problems or within a designated Critical Drainage Area (CDA) as notified to the LPA by the Environment Agency; or
 - Subject to a change of use to a higher vulnerability classification which may be subject to other sources of flooding; or
 - A Major planning application (i.e. more than 10 residential dwellings).
- 3.3 The NPPF designates that the '**Design Flood Event**' (DFE) is used to assess the suitability of a development proposal against the criteria of the NPPF. The design flood, is a flood event of a given annual flood probability, but is generally taken as:
- River flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), typically shown as Flood Zone 3a as designated on the EA's Flood Map for Planning; or
 - Tidal flooding with a 0.5% annual probability (1 in 200 chance each year), typically shown as Flood Zone 3a as designated on the EA's Flood Map for Planning; or
 - Surface water flooding likely to occur with a 1% annual probability (a 1 in 100 chance each year), typically shown as the Medium Risk of Surface Water flooding as designated on the EA's Long Term Flood Risk mapping,
- 3.4 In addition to assessing present day risk, the DFE also must be assessed to include and appropriate allowance for climate change where possible (refer to Section 5 for climate change allowances), based on the site's geographical location, vulnerability and design life.
- 3.5 For the purpose of this FRA, the worst case DFE (whether this be from tidal, river or surface water sources), has been used to steer the recommendations of this report. Consideration of extreme events above that of the DFE have not been considered further beyond identifying these as residual risks and providing mitigation measures where appropriate.
- 3.6 Table 1 of the NPPF provides definitions of the Flood Zones, from low to high probability of river and sea flooding and also in regards to surface water flood risk. These Flood Zone Classification for the purpose of this FRA are:
- Flood Zone 1 - land assessed as having a less than a 1 in 1,000 annual probability (<0.1%);
 - Flood Zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river (1% – 0.1%), 1:100 year or greater of surface water flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%) in any year;
 - Flood Zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year. Flood Zone 3b is land have greater than 1 in 20 to 1 in 30 year annual probability of flooding.

3.7 Following an assessment from the various sources of flood risk for the DFE, this site-specific FRA has applied the key principles for decision making when flood risk is a consideration and includes in order of importance:

1. **Avoid** – This is to physically locating the development proposals to areas of lowest flood risk within the site and/or determined how to vertically place the proposals to such that more vulnerable uses are positioned above the design flood level (such as raising floor levels or placing more vulnerable uses on upper levels). Developers should refer to the BS 85500:2012-Flood resistant and resilient construction. Guide to improving the flood performance of buildings for applicable strategies);
2. **Control** - Planning authorities and developers can investigate measures to control the risk of flooding affecting the site (this may be through flood defences, flood gates, flood storage or other engineered solutions such as SUDS). This is rarely applied at the site level, and is mostly address through strategic and county level flood defence strategies. At this site level, typically this will be through applying a Water Exclusion or Water Entry strategy when design a building or space.
3. **Mitigate** – Is the use of flood resistance and resilience measures to address any residual risks remaining after the use of the avoidance and control measures described above. Passive measures should be prioritised over active measures as they are likely to be more effective and more reliable. Flood Resilience is an approach to building design which aims to reduce flood damage and speed recovery and reoccupation following a flood. It uses a combination of flood resistance and recovery measures (referred to here as resilience measures), and is described in the industry-developed CIRIA Property Flood Resilience Code of Practice, which provides advice for both new-build and retrofit.
4. **Managing Residual Risk** – this will usually involve ensuring either safe access and egress is available from the safe in a DFE, Flood Warning Systems/Evacuation Plans are in place, safe refuge is on site during a DFE, the building is designed to account for flood loadings etc.
5. **Flood Risk is not increased elsewhere** – assuming all the above items can be address, it is critical that the development does not increase flood risk elsewhere as a result. Typically this is addressed by ensuring flood waters are not displaced (in surface water or river flood affected areas, the loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is **solely** tidal.) or appropriate hydraulic modelling is provided in support of an application to demonstrate that flood risk is not increased outside of a site (such as through on site flood compensation or detailed site specific hydraulic modelling).

3.8 It should be noted, where up-to date flood risk or climate change models are not available, best efforts have been made to assess these risks and extrapolate the available data where necessary. However, this approach may require further detailed modelling if deemed necessary by the reviewing authorities. Detailed 2D hydraulic modelling is deemed outside the scope of this report.

SEQUENTIAL TEST/EXCEPTION TEST

3.9 For the purpose of this assessment, the application of the Sequential Test has been broken down into three levels. Passing the Sequential Test at the strategic level is a weighting of the risks versus benefit of a development against a wider criterion (such as meeting other sustainability targets, housing needs or other strategic planning goals) than just purely avoiding flood risk issues. However, the Sequential Test can also be applied at the site level, where development is steered towards lower areas of flood risk within a site boundary, and is much more objective in its assessment. For the purpose of this FRA, the assessment 'Level' of the Sequential Test are considered to be:

Level 1 - At the high-level, this test is first implemented by local planning authorities (LPA) at the strategic planning scale. The Sequential Test is applied to steer local planning policy by directing particularly vulnerable new developments (e.g., residential, hospitals, mobile homes etc.) outside of the floodplain and for designating new land uses and future development areas.

Level 2 - At the second instance, the Sequential Test is implemented for a specific development at the request of the LPA to assess other sites within an area defined by the LPA, this type of Sequential Test is present where there is a significant conflict between a proposed development and flood risk.

Level 3 - The third instance, is where the Sequential Test is applied with the confines of the site, namely by steering development proposals to **avoid** areas of flood risk within a site itself.

3.10 Application of the first and second level of the Sequential Test is deemed outside the scope of this report.

3.11 Table 2 below presents a helpful guide in identifying the suitability of a site prior to applying Level 1 and 2 of the Sequential Tests and identifies when the Exception Test is required.

Table 2 - The Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table as specified by NPPF. Shaded cells denote the proposed re-development. Please note: ✓ means development is appropriate; x means the development should not be permitted and should be subject to a full sequential test. Refer to Table 2 for selected Flood Zone Designation

FLOOD RISK VULNERABILITY CLASSIFICATION		ESSENTIAL INFRASTRUCTURE	WATER COMPATIBLE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE
Flood Zone	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test Required	✓	✓
	Zone 3a	Exception Test Required	✓	x	Exception Test Required	✓
	Zone 3b Functional Floodplain	Exception Test Required	✓	x	x	x

3.12 Based on the principles above the proposed development is considered appropriate in its current location. Therefore, this FRA presents the findings of the Exception Test and recommendations for incorporation of flood resilient measures to improve long term flood resilience of the proposals. The following sections undertakes further analysis of the data available from the Local and District Council and EA data sets relating to flooding from a number of sources.

3.13 Table 3 summarises the sites primary flood risk classifications and the source for the DFE. This designation is based on the EA's Flood Map for Planning (extract provided in Figure 2 below) and the EA's Long Term Flood Risk Maps (LTFRM): Risk of Flooding from Surface Water (RoFSW) (extract provided in Figure 3).

3.14 Based on the EA data, the primary source of flood risk appears to be from tidal flooding but may also be affected by some minor surface water flooding along the eastern boundary). The EA mapping shows that the site is presently located in Flood Zone 1, but may experience some low-level flooding towards the year 2100 from tidal sources. The proposed building is wholly located in Flood Zone 1 from all sources, and likely to remain so for its design life. There may be some minor and isolated surface water ponding on the site, but these will be minimal and easily managed through surface water management systems. The sites access and egress is also shown to be wholly located in Flood Zone 1.

3.15 Because fluvial flood risk to the site is very low, flooding from this source is not considered further within this report.

Table 3 - Summarises the overall Flood Zone designation based on the highest rated flood risk from either rivers and sea or surface water.

FLOOD ZONE AND DFE SOURCE IDENTIFICATION SUMMARY			
	FLOOD ZONES AFFECTING THE SITE		DOMINANT SOURCE FOR THE DESIGN FLOOD EVENT (DFE)
	Flood Zone 2 (medium risk)	Flood Zone 3 (high risk)	Source
River Or Sea	Yes	Yes	Tidal
Surface Water	No	No	

**Flood Zone Designation for assessment is based on the highest flood risk from river, sea or surface water flooding taken from EA's Flood Map for Planning and EA's LTFRM:RoFSW*

3.16 Other sources of flooding have been considered in Section 0 below (such as groundwater and sewer flooding), but these are typically considered to be 'minor' sources of flood risk compared to the scale of tidal flooding in the area.

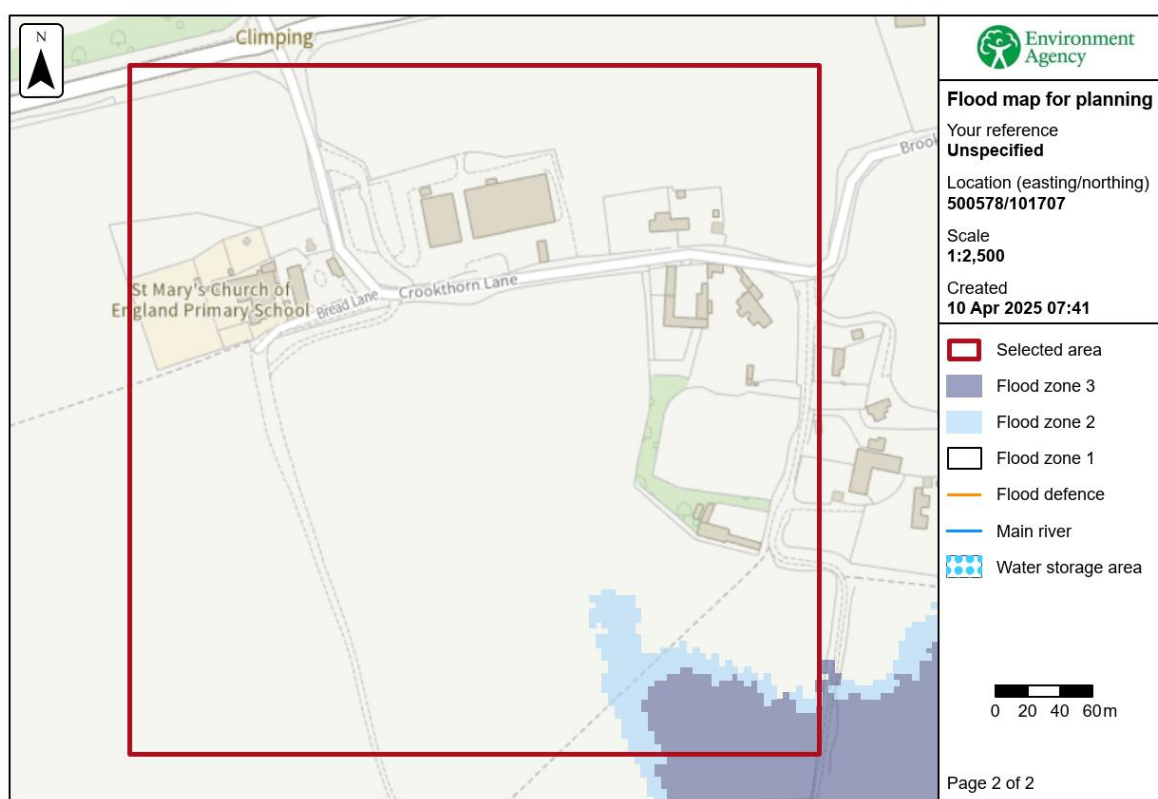


Figure 2 extract from EA Flood Maps for Planning (Source: DEFRA)



Figure 3 - extract from the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) maps for the yearly chance of flooding between 2040 and 2060

4 LOCAL FEATURES

RIVERS AND WATERCOURSES.

- 4.1 The site is located within a predominantly agricultural area. This area is largely flat and has a number of land-drainage systems criss-crossing the existing fields and surrounding area.
- 4.2 The nearest EA main rivers is the Ryebank Rife located c450m to the southeast of the site. The Ryebank Rife discharges into the River Arun 1.8km to the east.
- 4.3 The English Channel is located c.1km to the south.

TOPOGRAPHY

- 4.4 The site is relatively flat with a slight fall from north to south. The LIDAR data identifies drainage ditches running alongside the access roads that border the site and appearing to drain towards the east and south. Ground levels average 5.429m AOD, with a maximum elevation at the northwestern corner, falling to the south east. The Lowest point is identified within the ditch that forms the northern boundary running alongside the access road. This access road that forms part of the sites northern boundary is c.1-1.5m lower than the majority of the site, and forming a localised low point in the surrounding topography (which is reflected in the surface water flood mapping which shows surface water ponding within this access road – refer to Figure 3). This review is based on 1m LIDAR grid data.
- 4.5 Figure 4 below provides long and cross-sectional data through the site demonstrating an approximation of existing site levels based on the available LIDAR information.

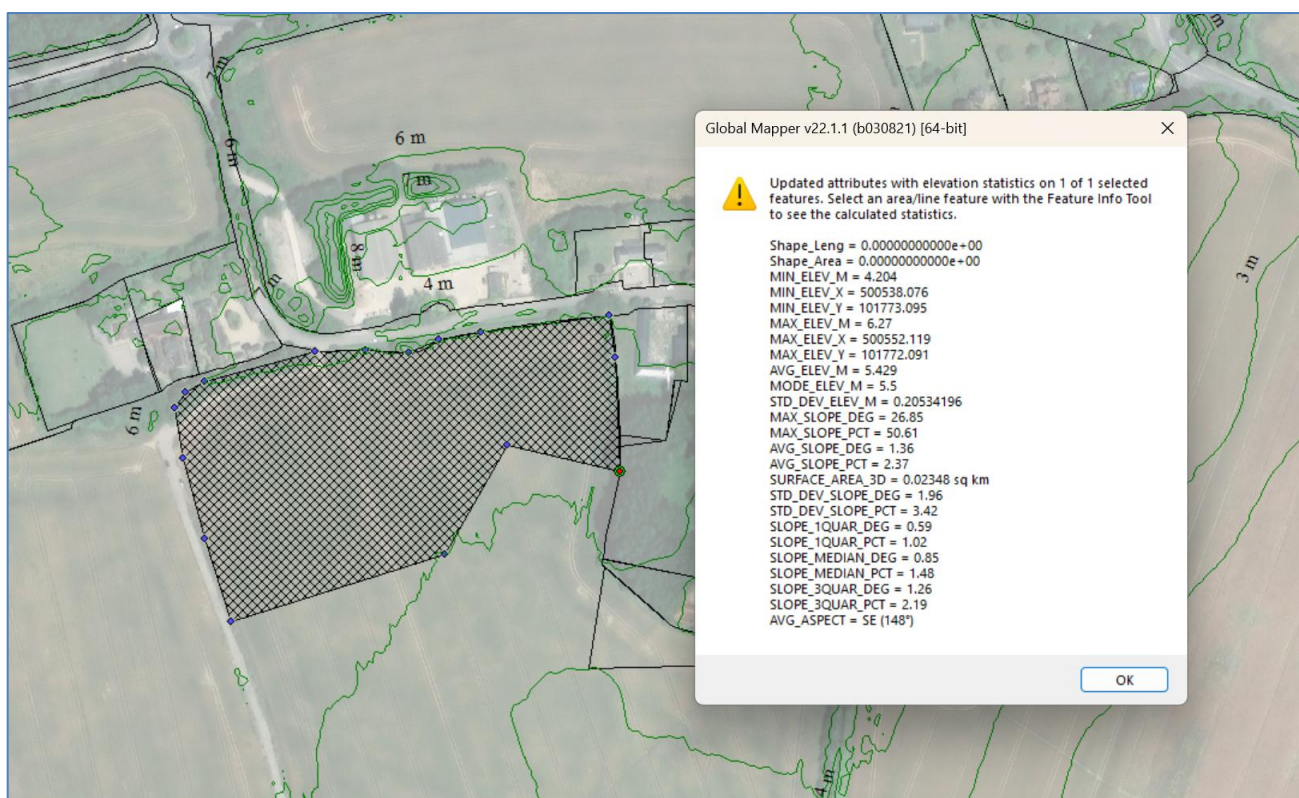


Figure 4 –Site Topography analysis (source: DEFRA Lidar Data 1m)

GEOLOGY & HYDROGEOLOGY

- 4.6 The online British Geological Survey (BGS) shows the site to be underlain by 1:50 000 scale bedrock geology description Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations - Chalk, with superficial deposits of Raised Beach Deposits, 1 - Sand and gravel recorded.

- 4.7 BGS borehole data at BGS ID: 569789 : BGS Reference: TQ00SW64 located approximately 300m to the south east of the site at an elevation slightly lower than the site, shows that groundwater was recorded at c.3.6m below ground level (c1mAOD).
- 4.8 Table 4 below present a summary of the site hydrogeological classifications and considerations.

Table 4 - Summary of Hydrogeology Classifications (source Magic Map, BGS) – applicable classification shaded Blue

HYDROGEOLOGY CLASSIFICATIONS DAF			
Groundwater Vulnerability	High	Medium	Low
Located within Source Protection Zone	Yes	No	N/A
Soluble Rock Risk	Present	Not Present	N/A

- 4.9 The design permeability should be investigated further for the purpose of surface water management on the site. It is likely that infiltration will be suitable based on the expected ground conditions and location.

FLOOD DEFENCES

- 4.10 The Environment Agency releases a range of flood asset information as Open Data through their AIMS Defence (Spatial Flood Defences) GIS mapping. They are the only comprehensive and up-to-date group of datasets in England that show flood defences currently owned, managed or inspected by the EA.
- 4.11 EA AIMS Defence data indicates that there are no formal flood defences raised in the immediate vicinity of the site. There coastal defences to the south in form of embankments and the shingle beach. There are also intermittent defences to the River Arun located to the east of the site.

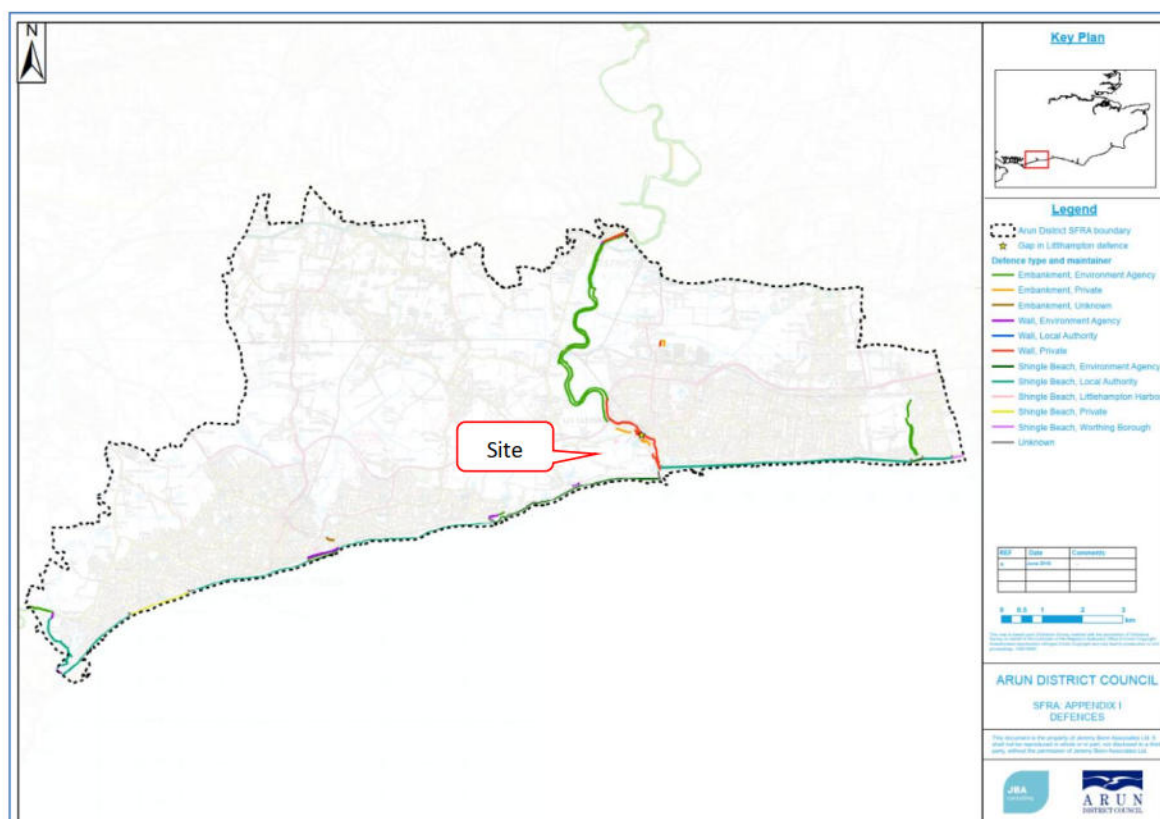


Figure 5 - extract from EA Product 4 - Flood Defence Condition and Location

5 CLIMATE CHANGE

- 5.1 In 2022, the EA issued updated guidance on the impacts of climate change on flood risk in the UKCP18 to support the NPPF. This guidance sets out that peak rainfall intensity, sea level, peak river flow; offshore wind speed and extreme wave heights are all expected to increase in the future as a result of climate change.
- 5.2 The guidance acknowledges that in relation to certain factors there is considerable uncertainty with respect to the absolute level of change that is likely to occur. As such, in these instances, the guidance provides estimates of possible changes that reflect a range of different emission scenarios (Table 5).

Table 5 - Extract from NPPF designating Flood Risk Climate Change Allowances by Flood Zone and Use. Sites required climate change probability scenario highlighted blue

FLOOD ZONE	ESSENTIAL INFRASTRUCTURE	HIGHLY VULNERABLE	MORE VULNERABLE	LESS VULNERABLE	WATER COMPATIBLE
1/2	Higher Central and Upper End	Higher Central and Upper End	Central and Higher Central	Central	None of these allowances
3a	Upper End	Development should not be permitted	Higher Central and Upper End	Central and Higher Central	Central
3b	Upper End	Development should not be permitted	Development should not be permitted	Development should not be permitted	Central

INCREASES IN SEA AND TIDAL LEVELS

- 5.3 There are a range of allowances for each river basin district and epoch for sea level rise. They are set out in *Table 1: sea level allowances by river basin district for each epoch in mm for each year (based on a 1981 to 2000 baseline)* – the total sea level rise for each epoch is in brackets of the NPPF: Flood risk assessments: climate change allowances and are based on percentiles. These allowances account for slow land movement due to ‘glacial isostatic adjustment’ from the release of pressure at the end of the last ice age. The northern part of the UK is slowly rising and the southern part is slowly sinking. This is why net sea level rise is less for the north-west and north-east than the rest of the country.
- 5.4 For flood risk assessments and strategic flood risk assessments, sites should assess both the higher central and upper end allowances for more vulnerable developments. The site has a design life of 75 years, therefore a design life to the year 2100. The ADC in their SFRA provides Flood Zone 3a extents to the year 2111. Figure 6 below shows extracts from the SFRA, and indicates that the site will likely remain unaffected by tidal flooding for its design life.
- 5.5 Furthermore, the EA has confirmed that the site is approximately 45 meters from the nearest Flood Zone 2/3 extents (which would likely be along its southern boundary).
- 5.6 As such the EA consider that the site is at low risk of flooding from tidal or fluvial sources. Therefore, flood risk from tidal and fluvial sources is considered very low and has not been considered further within this FRA.

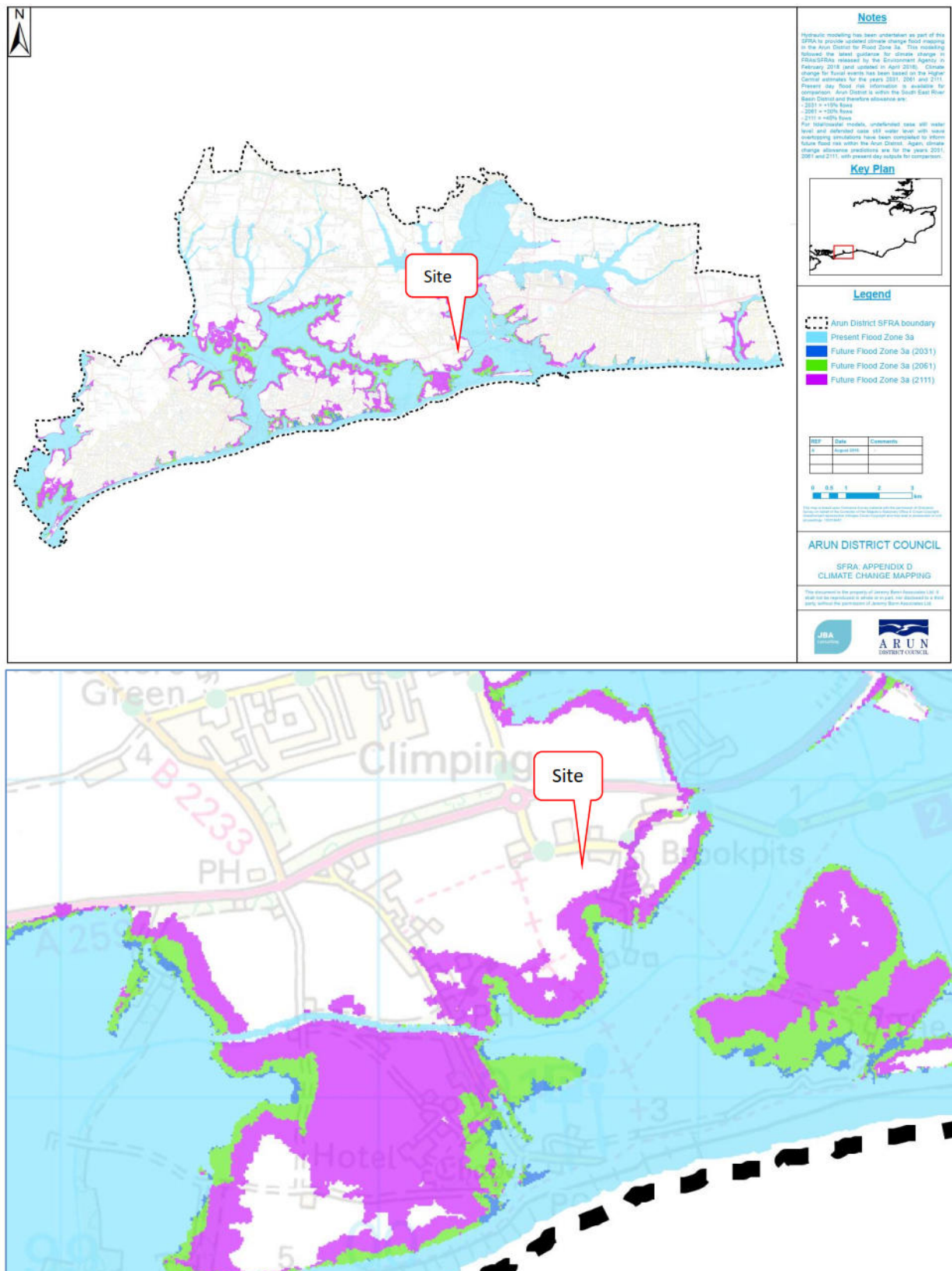


Figure 6 – mapping showing the DFL of 4.998m AOD based on the ADC Modelling 1 in 200 year 2111 undefended tidal event

INCREASES IN SURFACE WATER FLOODING AND RAINFALL ALLOWANCES

- 5.7 When considering climate change impacts to surface water (pluvial) flooding, The DEFRA peak climate change rainfall allowances detail predicted rainfall increase due to climate change in different regions around England. For all developments with a design epoch up to (and presently beyond) 2070, the NPPF states developments should

adopt the Upper End and Central allowances. The site-specific climate change allowances based on the DEFRA data is summarised in Table 6 below, and should also be adopted for the purposes of surface water drainage design.

Table 6 - Summary of Table 2: peak rainfall intensity allowance in small catchments (less than 5km²) or urban drainage

Management Catchment peak rainfall allowances 2070's	3.3% Annual Exceedance Probability Event	1% Annual Exceedance Probability Event
Central	25%	25%
Upper End	40%	45%

- 5.8 The EA, through their RoFSW Climate Change mapping, presents the risk which takes account for climate change in the near term up to 2060 and based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5 associated with the Central Allowance. This data can be considered suitable for assessing short term developments (such as less vulnerable uses) and understanding the sensitivity of a catchment to increases in rainfall, however for developments with a design life in excess of 2060 (and in the absence of additional climate change modelling) the Low-risk event (1 in 1000 year event or 0.1% AEP) is used to assess climate change impacts.
- 5.9 Given that the proposed use will have a design life to the year 2100, the use of the RoFSW Climate Change mappings is considered appropriate for assessing flood risk from surface water sources.
- 5.10 All Councils considers the implementation of SuDS as an essential element of reducing future flood risk to both the site and its surroundings. Indeed, reducing the rate of discharge from sites is one of the most effective ways of reducing and managing flood risk. SuDS can effectively be used to minimise the potential increase of risk to the property and users in the future.

6 SOURCES OF FLOOD RISK

- 6.1 In order to assist the implementation of the Governments NPPF, the EA has undertaken national scale flood risk mapping. This mapping takes into account a range of sources including flooding from rivers, sea, surface water and reservoir breach. Furthermore, each Council produces a Strategic (county scale) Flood Risk Assessments (SFRA) that aim to specifically identify local flood risk issues (such as critical drainage areas and local groundwater flooding).
- 6.2 The following section reviews both the EA data as well as the relevant information available from the SFRA.

SURFACE WATER (PLUVIAL)

- 6.3 Surface water flooding is the term applied to flooding when intense rainfall overwhelms the ability of the land to infiltrate water, or in urban areas for the sewers and road drains to drain the water away, resulting in surface water runoff and consequent flooding. It is a particular problem in urban areas where the excess water will often travel along streets and paths, between and through buildings and across open space.
- 6.4 RoFSW is created by combining best available flood models, including locally produced detailed flood model information from LLFAs, and national flood modelling. These are used to generate the probability of flood risk for each 2m grid square of land, with the aim of using the best available flood risk information in any one location. The RoFSW maps are built off remotely sensed LiDAR data instead of site-specific topography. This LiDAR data has been edited to remove buildings, trees and other features to produce a terrain profile. As a result, this editing process results in a slightly un-even surface profile, which can result in the production of small depressions that fill with water but in reality, is not at risk of surface water flooding. As such when surface water flooding is isolated, it not considered to pose a risk to a development as these areas can be managed within the confines of the site. This should be considered where very localised areas of flooding are evident and are independent of wider surface water flood flows and routes.
- 6.5 Figure 3 shows the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) map for the yearly chance of flooding between 2040 and 2060. This mapping is 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. It is produced using national scale modelling and enhanced with compatible, locally produced modelling from lead local flood authorities (LLFAs).
- 6.6 RoFSW is a probabilistic product, meaning that it shows the overall risk, rather than the risk associated with a specific event or scenario. In externally published versions of this dataset, risk is displayed as one of four likelihood bandings:
 - ⇒ High - greater than or equal to 3.3% chance in any given year (1 in 30)
 - ⇒ Medium - less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
 - ⇒ Low - less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1000) chance in any given year
 - ⇒ Very Low - less than 0.1% (1 in 1000) chance in any given year
- 6.7 For most development (such as this), the surface water DFE is equivalent to the 1% AEP or Medium Risk event plus an allowance for climate change.
- 6.8 This dataset presents the risk which takes account for climate change in the near term up to 2060 and based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5 associated with the Central Allowance. For developments with a design life in excess of 2060 (and in the absence of additional climate change modelling) the Low-risk event (1 in 1000 year event or 0.1% AEP) is used to assess climate change impacts.
- 6.9 To assess surface water flood risk to the site and proposed use, an assessment of flood depth up to 0.6m has been assessed. Flood depths greater than this are considered 'unsafe' and as such a 0.6m flood depth is considered the threshold for this assessment.

- 6.10 For this site, given that the design life is predicted to be within the near term, the RoFSW data can be used to establish the surface water DFE.
- 6.11 Figure 7 shows surface water flood depths up to 0.2m for each of the risk bandings. As discussed above, the DFE is the Low risk event, with the other events being included for completion and context.

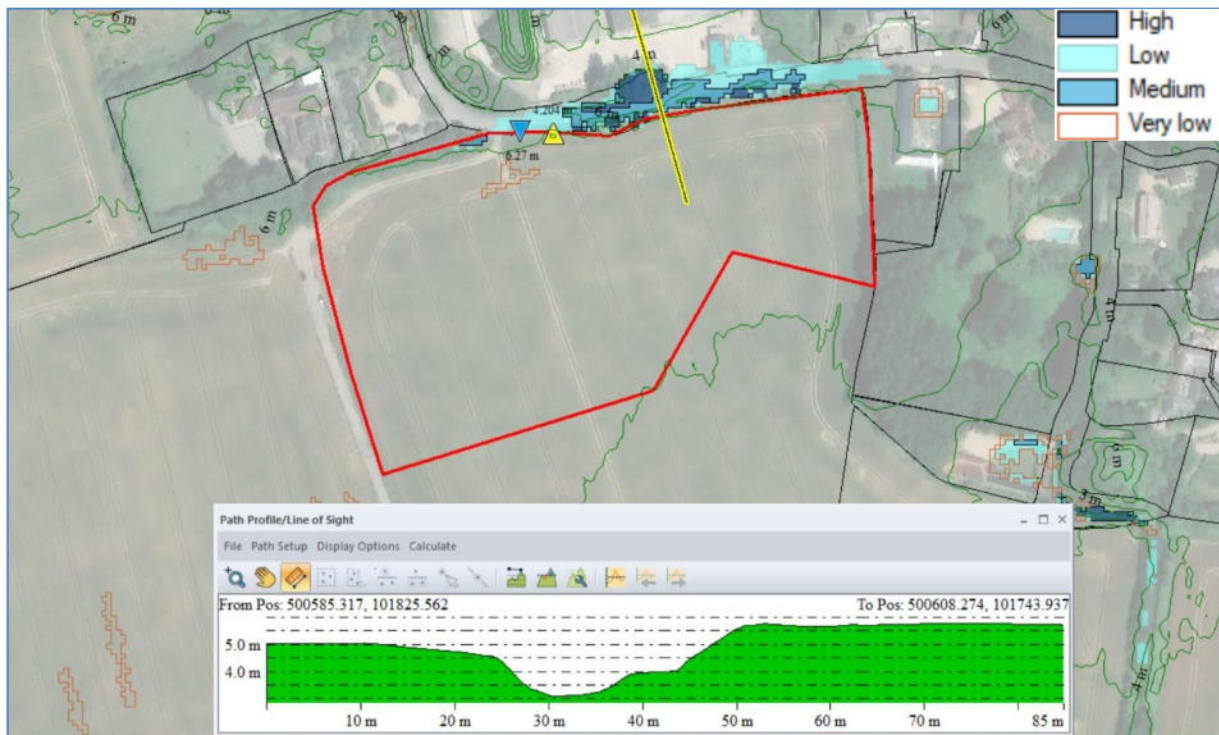


Figure 7 - extract from the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) maps for the Yearly chance of flooding between 2040 and 2060 and flood depths of less than 0.2m, site bordered red, site bordered red

- 6.12 Figure 8 shows surface water flood depths up to 0.3m for each of the risk bandings.

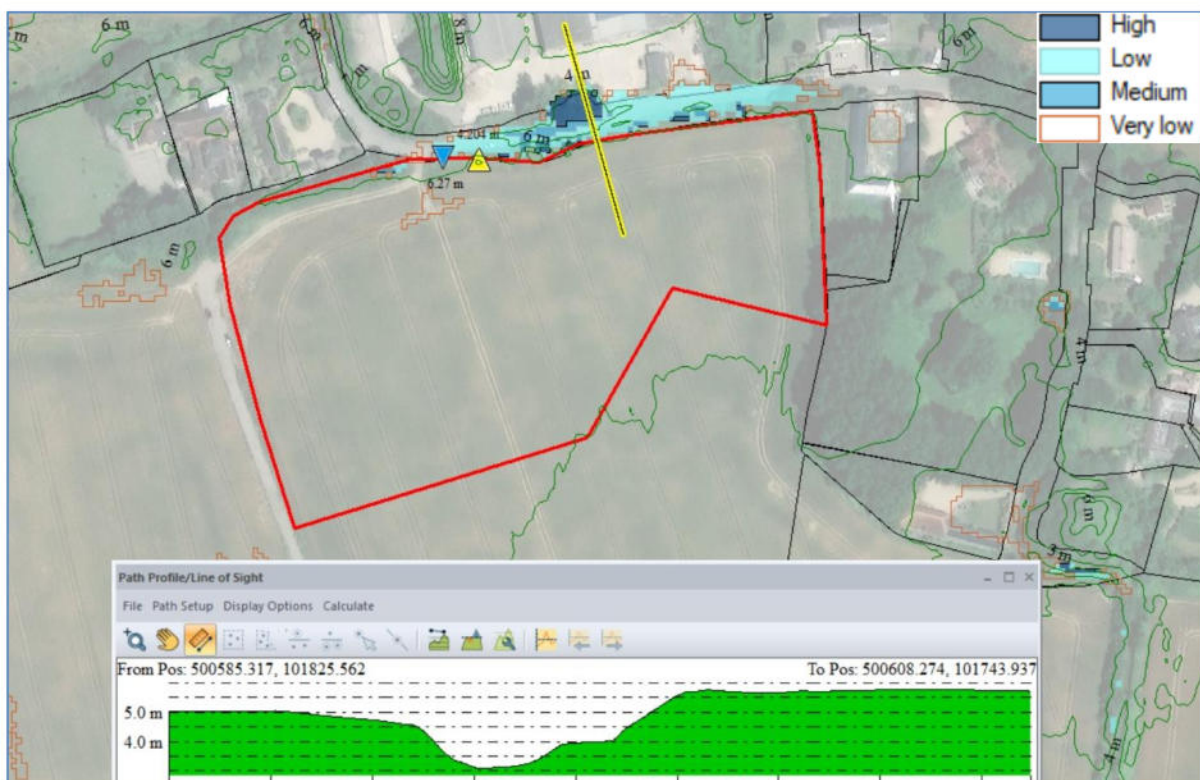


Figure 8 - extract from the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) maps for the Yearly chance of flooding between 2040 and 2060 and flood depths of less than 0.3m, site bordered red.

6.13 Figure 9 shows surface water flood depths up to 0.6m for each of the risk bandings.

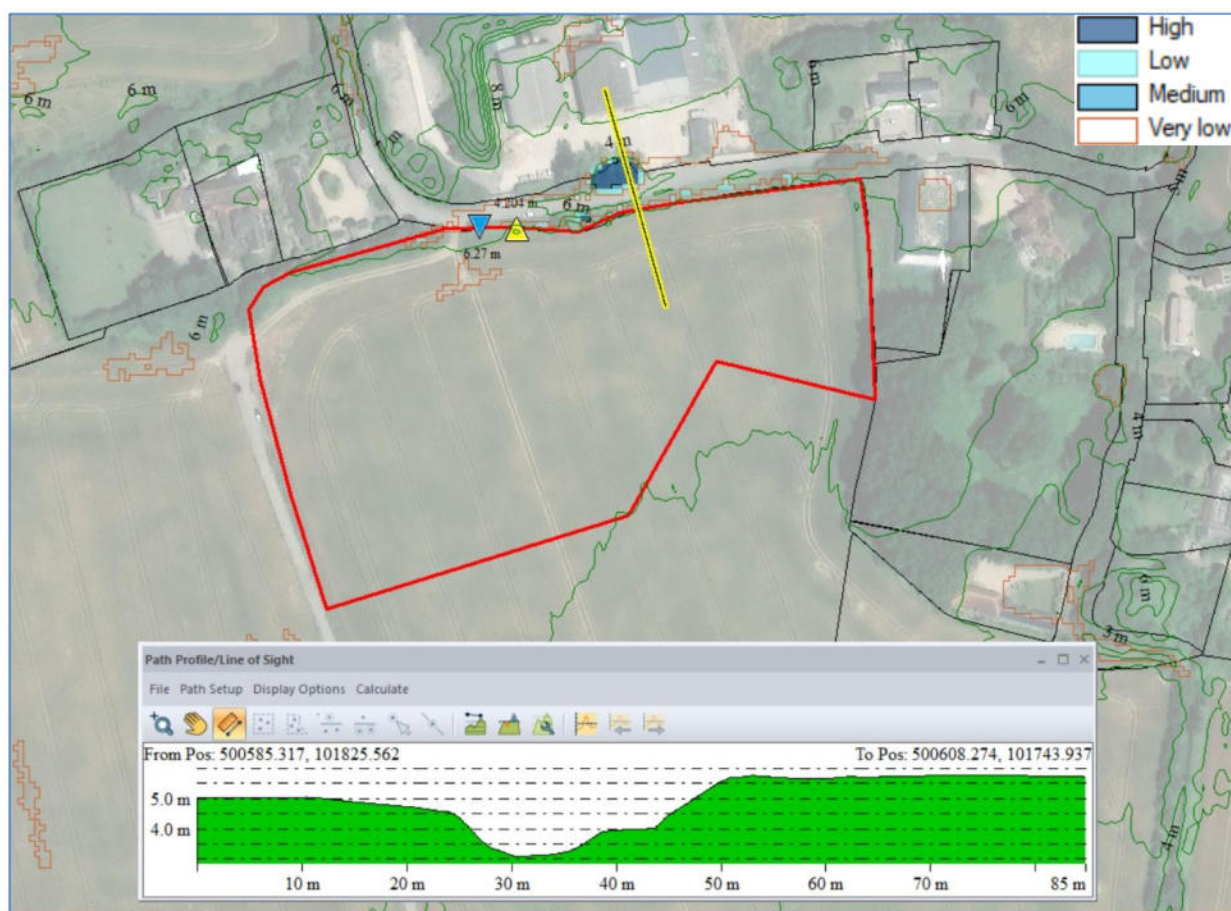


Figure 9 - extract from the EA's Long-Term Risk of Flooding from Surface Water (RoFSW) maps for the Yearly chance of flooding between 2040 and 2060 and flood depths of less than 0.6m, site bordered red

- 6.14 The figures above show that the site would be wholly unaffected by surface water flooding in the DFE. Crookthorn Lane could be affected by up to 0.3m of flooding in the DFE, given it is partially located in a depression which causes surface water to pond in a flood event. However, the proposed access point from Crookthorn Lane is shown to be located outside of these flood extents and would therefore be unaffected by flooding in the DFE. Therefore, access and egress from the site in an emergency should remain possible across all DFEs.
- 6.15 Based on the available data, surface water flood risk to the site is considered very low.

RESERVOIR FLOODING (BREACH)

- 6.16 Reservoirs with an impounded volume greater than 25,000 cubic metres are governed by the Reservoirs Act 1975 and are listed on a register held by the Environment Agency. The level and standard of inspection and maintenance required under the Act means that the risk of flooding from reservoirs is relatively low. Recent changes to legislation under the Flood and Water Management Act require the Environment Agency to designate the risk of flooding from these reservoirs. The Environment Agency is currently progressing a 'Risk Designation' process so that the risk is formally determined.
- 6.17 Reservoir flooding is very different from other forms of flooding. It may happen with little or no warning and evacuation will need to happen immediately. The likelihood of such flooding is difficult to estimate, but it is less likely than flooding from rivers or surface water. It may not be possible to seek refuge upstairs from floodwater as buildings could be unsafe or unstable due to the force of water from the reservoir breach or failure. The risk of inundation to the study area as a result of reservoir breach or failure of a number of reservoirs within the area was assessed as part of the National Inundation Reservoir Mapping (NIRIM) study.

- 6.18 Maps of the flood extent can be found on the Government's Long term flood risk information website, these maps show that the site is at very low risk of flooding from any reservoir failures.

HISTORICAL, SEWERS AND DRAINAGE

- 6.19 A common source of flooding is a result of sewer or other drainage infrastructure becoming surcharged and flooding. The SFRA does not directly present any records relating to historical flooding directly impacting the site. However, it does highlight the area and drainage can suffer from tide lock of rivers and any associated outfalls into these systems. In addition, ground water may be high and can affect how these systems can drain in a flood event or during prolonged periods of wet weather. This has been known in the past to cause flooding in a combined high tide/storm surge and rainfall event.
- 6.20 According to the ADC SFRA data, there have been no recorded flooding events at the site, but there are recorded incidents of surface water flooding in the general area.

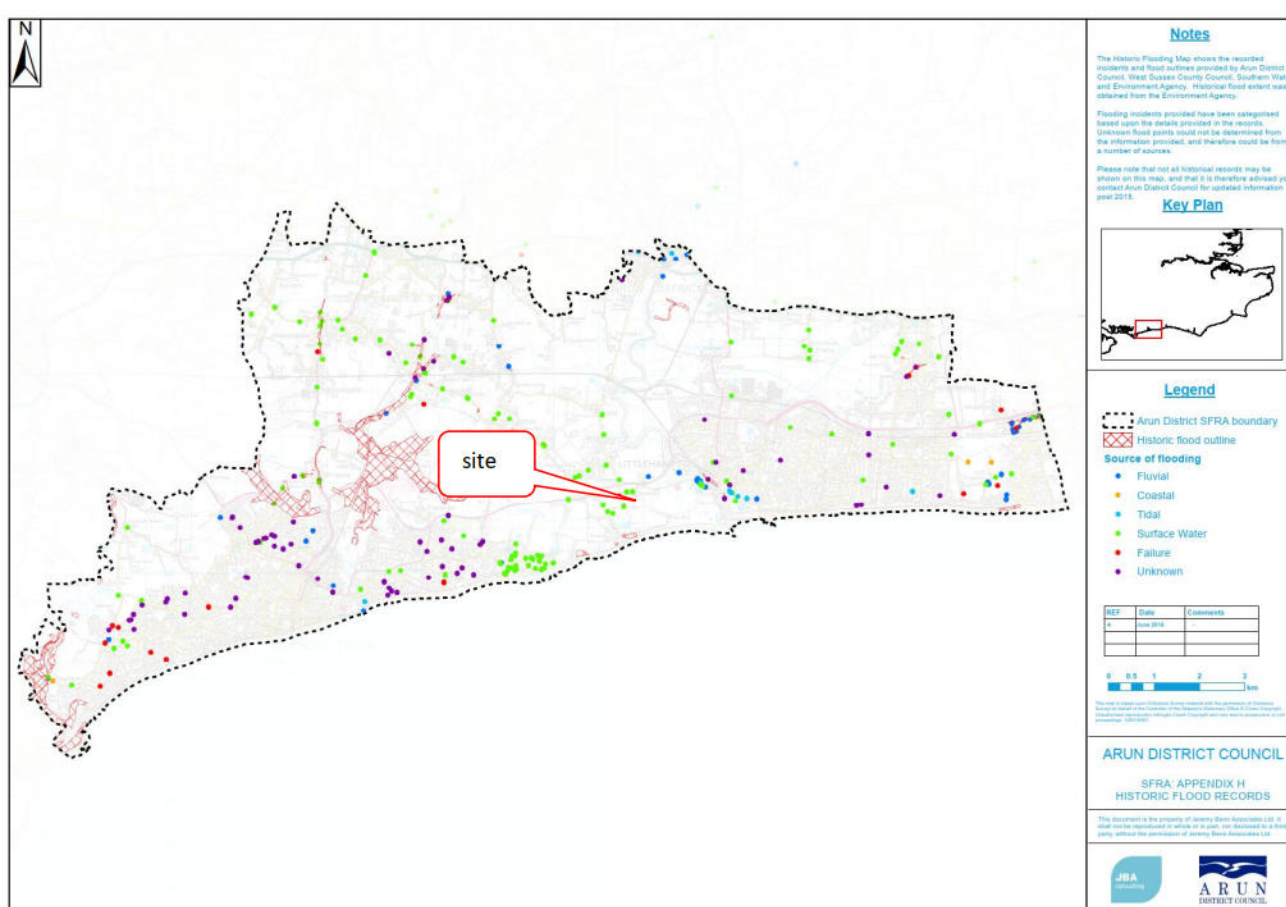


Figure 10 - extract from SFRA showing historical flood records

- 6.1 The EA data does not hold any records of the site being affected by flooding in the past based on their historical records.
- 6.2 There have been no other noted flood events specifically at the site, however this does not directly indicate that the site has not flooded in the past or may flood in the future.
- 6.3 Therefore, it is considered the risk of sewer flooding to the site is considered very low.

GROUNDWATER

- 6.4 Groundwater flooding is the emergence of groundwater at the ground surface or into subsurface voids arising as a result of:

- ⇒ abnormally high groundwater heads or flows;
- ⇒ the introduction of an obstruction to groundwater flow; or
- ⇒ the rebound of previously depressed groundwater levels.

- 6.5 Groundwater flooding usually occurs following a prolonged period of low intensity rainfall. As groundwater flow is much slower than surface flow, the flooding may not recede for long periods of time, typically weeks or even months. It is important to recognise the risk of groundwater flooding is typically highly variable and heavily dependent upon local geology, topography and weather conditions, as well as local abstraction regimes. Groundwater flooding is hard to predict and challenging to mitigate.
- 6.6 Groundwater susceptibility maps are typically designed for planners, identifying areas where groundwater flooding might be an issue. The computer models used to classify areas produces maps with a pixel size of approximately 50 metres. Because of this coarse resolution it is possible that the actual susceptibility at your property may be different due to small-scale variations in rock and soil type and local landscape. It's important to note that Susceptibility is not the same as risk. These maps show where there is the potential for groundwater flooding but do not give any indication of the probability that it will occur.
- 6.7 Appendix F of the SRFA shows that the site is in an area where groundwater emergence is between 50-75% chance of occurring (see Figure 11). The BGS data however, suggests that groundwater is likely to be more than 3m below ground level and therefore unlikely to pose a risk to the site.

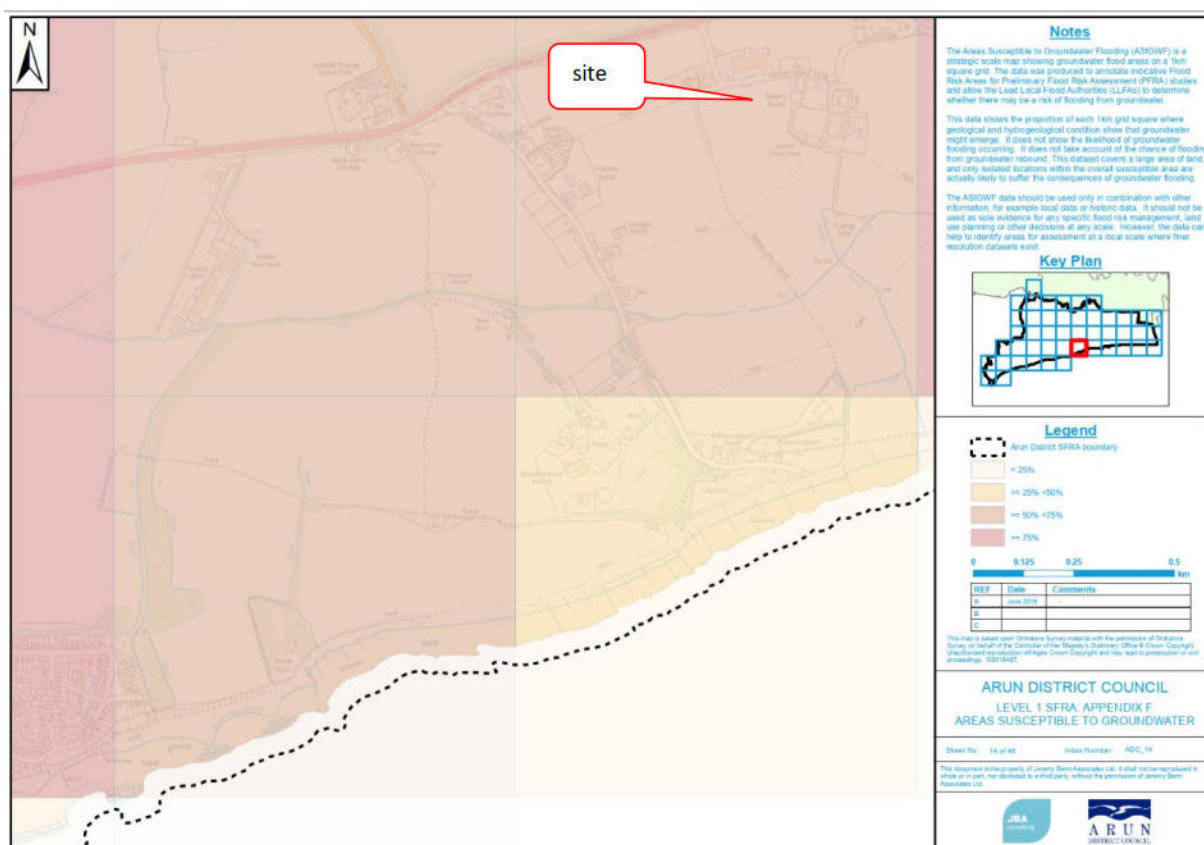


Figure 11 - extract from ADC SFRA - Groundwater Flood map

- 6.8 Although information from the maps can be used to highlight an area at risk, it is not designed to be used as a sole indicator of groundwater flooding susceptibility and risk at individual properties. The BGS and SFRA's recommend the following for assessing site specific risk:
1. Review BGS geological maps or and BGS (or site specific) borehole records for information on water strikes and groundwater levels. Where underlying geology of is sufficiently permeable, this may allow groundwater to rise more freely and frequently

2. Review the RoFSW mapping, should groundwater emerge at surface, its flow path can be estimated by looking at the RoFSW mapping. However, it should be noted that groundwater flows at surface are a lot lower than surface water runoff events, however groundwater flows may occur over a longer period. Therefore, the risk event assessed for the DFE for groundwater flooding is the high-risk surface water event (or the 1 in 30 year event).
3. Review historical records and SFRA mapping, for example, if a specific property has experienced groundwater related flood risk in the past. This is often the best indicator of site-specific risk for groundwater flooding and can carry the most weighting in assess risk.

6.9 Table 7 below provides a summary of groundwater flood risk indicators as advised by the BGS. It is considered that if any of these risk indicators are negative (or not present), then the overall risk of groundwater emergence is likely to be low.

Table 7 - Summary of groundwater flood risk indicators to the site

GROUNDWATER FLOOD RISK SUMMARY		
Data Source	Risk Indicator	Risk Present
BGS Geological Maps	Is the underlying geology permeable (such as gravels and sands) and may allow free flow of groundwater	Yes
BGS/Site Borehole Data	Is the depth to Groundwater less than 1m	No
Surface Water Flood Risk	Is there surface water flood risk present in the high-risk 1 in 30 year event (refer to Section 6)	No
Historical Records	Does the SFRA include any records of groundwater flooding occurring at the site	No
SUMMARY OF GROUNDWATER FLOOD RISK		LOW

Impacts of Climate Change

6.10 The potential effects of climate change on groundwater levels are uncertain. Greater seasonality in groundwater level fluctuation is a potential outcome under a pattern of higher winter rainfall and less summer rainfall. Broad predictions of the impacts of climate change on groundwater levels are difficult to make at the present time

RESIDUAL RISKS

6.11 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

6.12 There are no existing defences that provide protection above the DFE, therefore breach failure is not considered a residual risk.

6.13 Surface water drainage should be designed to account for the 1 in 100 year plus climate change, with external levels formed to direct site runoff around buildings and thresholds to mitigate against flooding in an extreme rainfall event.

7 SUMMARY OF RISKS

- 7.1 Table 8 below summarises the generalised risk from the various sources of flooding assessed above, and if the site is at risk of a DFE from this source.

Table 8 - Summarising sources of flooding that affect the proposed building up to the DFE. Critical DFE shaded blue

Source of Flooding	Flood Risk within the site	Are the buildings at risk of a DFE
Fluvial	Very Low	No
Tidal/Sea	Very Low	No
Surface Water	Very Low	No
Reservoir	Very Low	No
Groundwater	Very Low	No
Sewers and Drainage	Very Low	No

- 7.2 Based on Table 8, the site is shown to be unaffected by all sources of flooding. In accordance with the PPG and NPPF, Section 8 below presents the proposed measures to avoid, control, mitigate, manage residual risk and ensure flood risk is not increased elsewhere.

8 FLOOD MITIGATION MEASURES

8.1 The proposals allow the opportunity to improve flood resilience of the site by incorporating a number of flood mitigation measures, both through the incorporation of flood resilient building materials, surface water drainage improvements and signing up to the EA Flood Warning/Alert System.

8.2 Table 9 presents the key flood mitigation measures based the DFE on the NPPF and PPG decision making principles:

Table 9 - Key Decision Making principles and measures applied to avoid, control, mitigate, and manage flood risk

DECISION MAKING: ORDER OF PRIORITY	PROPOSED MEASURES
1. Avoid	The site is shown to be wholly located in Flood Zone 1, and therefore is positioned to avoid flooding from all assessed sources.
2. Control	Surface Water Drainage systems to incorporate SUDS and be designed to accommodate the 1 in 100 year plus climate change DFE.
3. Mitigate	The client and developer should adopt the recommendations within BS 85500:2025- Flood resistant and resilient construction. Refer to Section 9 for recommended Building Measures.
4. Manage residual flood risk	This FRA has assessed the undefended scenario and therefore has designed the proposals to be at very low risk from residual flood events (such as breach and over topping). Refer to Section 10 for assessment of Access and Egress (Flood Evacuation Planning).
5. Flood Risk is not increased elsewhere	Any new drainage should be designed in accordance with Building Regulations Part H, SuDS Manual and 'DCG' guidance, ensuring drainage proposals include an allowance for climate change. Any additional flows to be directed into the Local Sewer Authorities public sewers or water courses to receive confirmation of capacity and connection approvals prior to detailed design and construction.

9 BUILDING MATERIAL MITIGATIONS

9.1 The national government produced guidance for improving the flood resilience of building in the Communities and Local Government (CLG) 2007 'Improving the Flood Performance of New Buildings' publication. This publication provides recommendations on how to protect buildings in the case of a flood event, and propose two scenarios based on maximum expected flooded depths, and provides an explanation between flood resistance and resilience measures, these are summarised below:

- ⇒ **Water exclusion strategy** is when the emphasis is placed on minimising water entry whilst maintaining structural integrity, and on using materials and construction techniques to facilitate drying and cleaning. This strategy is favoured when low flood water depths are involved (not more than 0.3m). According to the definitions adopted in this Guidance, this strategy can be considered as a resistance measure but it is part of the aim to achieve overall building resilience
- ⇒ **Water entry strategy** is when the emphasis is placed on allowing water into the building, facilitating draining and consequent drying. Standard masonry buildings are at significant risk of structural damage if there is a water level difference between outside and inside of about 0.6m or more. This strategy is therefore favoured when high flood water depths are involved (greater than 0.6m) by utilising resilient materials, and construction methods.
- ⇒ **Flood resistant measures** are incorporated where it is considered feasible to prevent floodwater entering the building, and take the form of flood barriers. Many flood resistant products/barriers are only suitable to typical maximum height being 0.68m, before the risk of structural damage is incurred. As this is a historic structure with limited scope for structural reinforcement.
- ⇒ **Flood resilient measures** are incorporated where it is accepted that, in severe flood events, water may enter parts of the building so it is necessary to ensure the building will remain useable after the floodwater has receded and the area has been cleaned. Therefore, materials should be incorporated that retain their structural integrity and have good drying and cleaning properties or are waterproof, and services and sockets etc. are located as high as practical to minimise flood damage.

9.2 Some simple construction measures can greatly protect buildings during such an event without incurring large additional construction costs. The developer should review the design and construction guides at <https://assets.publishing.service.gov.uk/> and within BS 85500:2025-Flood resistant and resilient construction and adopt these measures where possible. Some measures may include:

- The route of all electrical services will run from ceilings at ground floor (where possible), down toward sockets;
- All plumbing insulation to be of closed-cell design;
- Non-return valves to be fitted to all drain and sewer outlets;

10 SITE ACCESS AND EGRESS (FLOOD EVACUATION PLANNING)

- 10.1 For an access/egress route to be acceptable under the NPPF, the combination of flood depths, velocities and debris must be analysed. As part of this investigation to assess safe access and egress, a review of depths, velocities and flood hazard has been undertaken and used to provide the safest route for emergency evacuation of the site.
- 10.2 Figure 12 shows an assessment of flood depths along the proposed access and egress route from the site to an area of Flood Zone 1. The proposed route is for occupants to evacuate onto Crookthorn Lane, then proceed north until within an area at low risk of flooding.



Figure 12 – Extent of EA Flood Zone plus Climate Change - Red arrows designate suggested evacuation route,.

- 10.3 To comply with the NPPF, all occupants should be able to make their way, unassisted by the Emergency Services, to dry land. This is known as 'safe access to dry land' and does not have to be dry, just not *hazardous* at the peak of the predicted critical DFE.
- 10.4 Table 13.1 of FD2320 shows the maximum depths/velocity combinations that are safe for 3 categories of user (occupant). The methodology for calculating "Flood Hazard" is reproduced below according to the methodology stated within the "Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1" (Figure 13).
- 10.5 For an access/egress route to be acceptable under the NPPF, the combination of flood depths, velocities and debris must be analysed.

HR	Depth of flooding - d (m)												
	DF = 0.5				DF = 1								
velocity v (m/s)	0.05	0.10	0.20	0.25	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.0	0.03+0.5= 0.53	0.05+0.5= 0.55	0.10+0.5= 0.60	0.13+0.5= 0.63	0.15+1.0= 1.15	0.20+1.0= 1.20	0.25+1.0= 1.25	0.30+1.0= 1.30	0.40+1.0= 1.40	0.50+1.0= 1.50	0.75+1.0= 1.75	1.00+1.0= 2.00	1.25+1.0= 2.25
0.1	0.03+0.5= 0.53	0.06+0.5= 0.56	0.12+0.5= 0.62	0.15+0.5= 0.65	0.18+1.0= 1.18	0.24+1.0= 1.24	0.30+1.0= 1.30	0.36+1.0= 1.36	0.48+1.0= 1.48	0.60+1.0= 1.60	0.90+1.0= 1.90	1.20+1.0= 2.20	1.50+1.0= 2.50
0.3	0.04+0.5= 0.54	0.08+0.5= 0.58	0.15+0.5= 0.65	0.19+0.5= 0.69	0.23+1.0= 1.23	0.30+1.0= 1.30	0.38+1.0= 1.38	0.45+1.0= 1.45	0.60+1.0= 1.60	0.75+1.0= 1.75	1.13+1.0= 2.13	1.50+1.0= 2.50	1.88+1.0= 2.88
0.5	0.05+0.5= 0.55	0.10+0.5= 0.60	0.20+0.5= 0.70	0.25+0.5= 0.75	0.30+1.0= 1.30	0.40+1.0= 1.40	0.50+1.0= 1.50	0.60+1.0= 1.60	0.80+1.0= 1.80	1.00+1.0= 2.00	1.50+1.0= 2.50	2.00+1.0= 3.00	2.50+1.0= 3.50
1.0	0.08+0.5= 0.58	0.15+0.5= 0.65	0.30+0.5= 0.80	0.38+0.5= 0.88	0.45+1.0= 1.45	0.60+1.0= 1.60	0.75+1.0= 1.75	0.90+1.0= 1.90	1.20+1.0= 2.20	1.50+1.0= 2.50	2.25+1.0= 3.25	3.00+1.0= 4.00	3.75+1.0= 4.75
1.5	0.10+0.5= 0.60	0.20+0.5= 0.70	0.40+0.5= 0.90	0.50+0.5= 1.00	0.60+1.0= 1.60	0.80+1.0= 1.80	1.00+1.0= 2.00	1.20+1.0= 2.20	1.60+1.0= 2.60	2.00+1.0= 3.00	3.00+1.0= 4.00	4.00+1.0= 5.00	5.00+1.0= 6.00
2.0	0.13+0.5= 0.63	0.25+0.5= 0.75	0.50+0.5= 1.00	0.63+0.5= 1.13	0.75+1.0= 1.75	1.00+1.0= 2.00	1.25+1.0= 2.25	1.50+1.0= 2.50	2.00+1.0= 3.00	3.50	4.75	6.00	7.25
2.5	0.15+0.5= 0.65	0.30+0.5= 0.80	0.60+0.5= 1.10	0.75+0.5= 1.25	0.90+1.0= 1.90	1.20+1.0= 2.20	1.50+1.0= 2.50	1.80+1.0= 2.80	3.40	4.00	5.50	7.00	8.50
3.0	0.18+0.5= 0.68	0.35+0.5= 0.85	0.70+0.5= 1.20	0.88+0.5= 1.38	1.05+1.0= 2.05	1.40+1.0= 2.40	1.75+1.0= 2.75	3.10	3.80	4.50	6.25	8.00	9.75
3.5	0.20+0.5= 0.70	0.40+0.5= 0.90	0.80+0.5= 1.30	1.00+0.5= 1.50	1.20+1.0= 2.20	1.60+1.0= 2.60	3.00	3.40	4.20	5.00	7.00	9.00	11.00
4.0	0.23+0.5= 0.73	0.45+0.5= 0.95	0.90+0.5= 1.40	1.13+0.5= 1.63	1.35+1.0= 2.35	1.80+1.0= 2.80	3.25	3.70	4.60	5.50	7.75	10.00	12.25
4.5	0.25+0.5= 0.75	0.50+0.5= 1.00	1.00+0.5= 1.50	1.25+0.5= 1.75	1.50+1.0= 2.50	2.00+1.0= 3.00	3.50	4.00	5.00	6.00	8.50	11.00	13.50
5.0	0.28+0.5= 0.78	0.60+0.5= 1.10	1.10+0.5= 1.60	1.38+0.5= 1.88	1.65+1.0= 2.65	3.20	3.75	4.30	5.40	6.50	9.25	12.00	14.75
Flood Hazard Rating (HR)		Colour Code		Hazard to People Classification									
Less than 0.75				Very low hazard - Caution									
0.75 to 1.25				Danger for some – includes children, the elderly and the infirm									
1.25 to 2.0				Danger for most – includes the general public									
More than 2.0				Danger for all – includes the emergency services									

Figure 13: Extracts from the Supplementary Note to FD2320/TR2 and FD2321/TR1 describing the methodology for calculating 'Flood Hazard' under the NPPF (Source: EA)

- 10.6 Based on Figure 12, emergency access to and from the site along Crookthorn Lane and to the north will likely be within safe limits across all DFes.
- 10.7 Further information on how to respond in a flood event can be found on www.environment-agency.gov.uk/floodline, but some general advice includes:

On receipt of a FLOOD ALERT, the individual property owners and occupiers should:

- ⇒ Monitor the situation via local media;
- ⇒ Make themselves aware of forecast local weather conditions;
- ⇒ Alert both current visitors, and those scheduled to arrive, of the situation;
- ⇒ Prepare to evacuate if necessary.

On receipt of a FLOOD WARNING, the individual property owners and occupiers should:

- ⇒ Follow advice to "go in, stay in, and tune in";
- ⇒ Move all vehicles to an area outside of the potential flood extent, if safe to do so;
- ⇒ Alert scheduled visitors that they should seek alternative accommodation;
- ⇒ Be prepared to follow instruction from the Emergency Services.

On receipt of a SEVERE FLOOD WARNING, the individual property owners and occupiers should:

- ⇒ Follow advice to "go in, stay in, and tune in";

⇒ Remain attentive to local media forecasts and news bulletins;

⇒ Do not evacuate unless instructed to do so by the Emergency Services;

10.8 If flood waters along the proposed evacuation route have exceed 25cm, site users are advised to seek advice from emergency services.

11 CONCLUSION

- 11.1 The following report is a Flood Risk Assessment (FRA) for the development at Crookthorn Lane, Climping, Littlehampton, BN17 5SN (see site location map, Figure 1).
- 11.2 The development proposals are for the construction of a proposed visitors centre and parking facilities. See proposed plans in Appendix 1.
- 11.3 The site is currently considered 'Less Vulnerable' based on the agricultural use of the site. The proposed visitor centre and car park maintains the 'Less Vulnerable' use.
- 11.4 Table 3 summarises the sites primary flood risk classifications and the source for the DFE. This designation is based on the EA's Flood Map for Planning (extract provided in Figure 2 below) and the EA's Long Term Flood Risk Maps (LTFRM): Risk of Flooding from Surface Water (RoFSW) (extract provided in Figure 3). Based on this information, the site is at low risk of flooding from all assessed sources, including tidal, fluvial and surface water flooding.
- 11.5 Access and egress from the site should remain flood free in the DFE.
- 11.6 Any new drainage should be designed in accordance with Building Regulations Part H, SuDS Manual and 'DCG' guidance, ensuring drainage proposals include an allowance for climate change.
- 11.7 Table 9 summarises how this FRA has applied the PPG's key decision making principles to avoid, control, mitigate, manage residual risk and to ensure the development proposals do not increase flood risk post development. Based on the PPG and NPPF, and assuming the recommendations of this FRA are followed, it is considered that a residential development on this site should be considered appropriate.

APPENDIX 1 – SUPPORTING INFORMATION



St Mary's
C of E
Primary School

Amberley Court

Sadlers Cottage

Kent's
Yard

FOOTPATH LINK TO THE
SCHOOL (PROPOSED
PARKING TO PROVIDE
TERM TIME PARKING FOR
SCHOOL)

TO THE BEACH

1. EXISTING TREES RETAINED. REFER TO LANDSCAPE DESIGN INFORMATION
2. EXISTING ACCESS FORMALISED: NEW GATE
3. PROPOSED VISITOR FACILITIES (REFER TO DP1042, 103 & 104)
4. EXISTING TRACK TO SOUTH OF TREE BAND REMOVED
5. OUTDOOR SEATING TO CAFE
6. SECURE CYCLE PARKING
7. ACCESSIBLE PARKING
8. BBQ AREA
9. FOOTPATH AND CYCLE LINK TO THE VILLAGE, SCHOOL AND BEACH
10. DROP OFF ZONE
11. 130 PARKING SPACES (REFER TO DP108)
12. OVERFLOW PARKING ON GRASS
13. NEW TREE PLANTING - REFER TO LANDSCAPE DESIGN INFORMATION
14. ECOLOGY BUFFER - REFER TO LANDSCAPE DESIGN INFORMATION
15. BIN STORAGE
16. ACCESSIBLE EV CHARGING SPACES
17. CAR PARK SIGNAGE (REFER TO DP110)
18. HEIGHT RESTRICTION BARRIER (REFER TO DP108)
19. REFUSE/FIRE/DELIVERIES TURNING ZONE

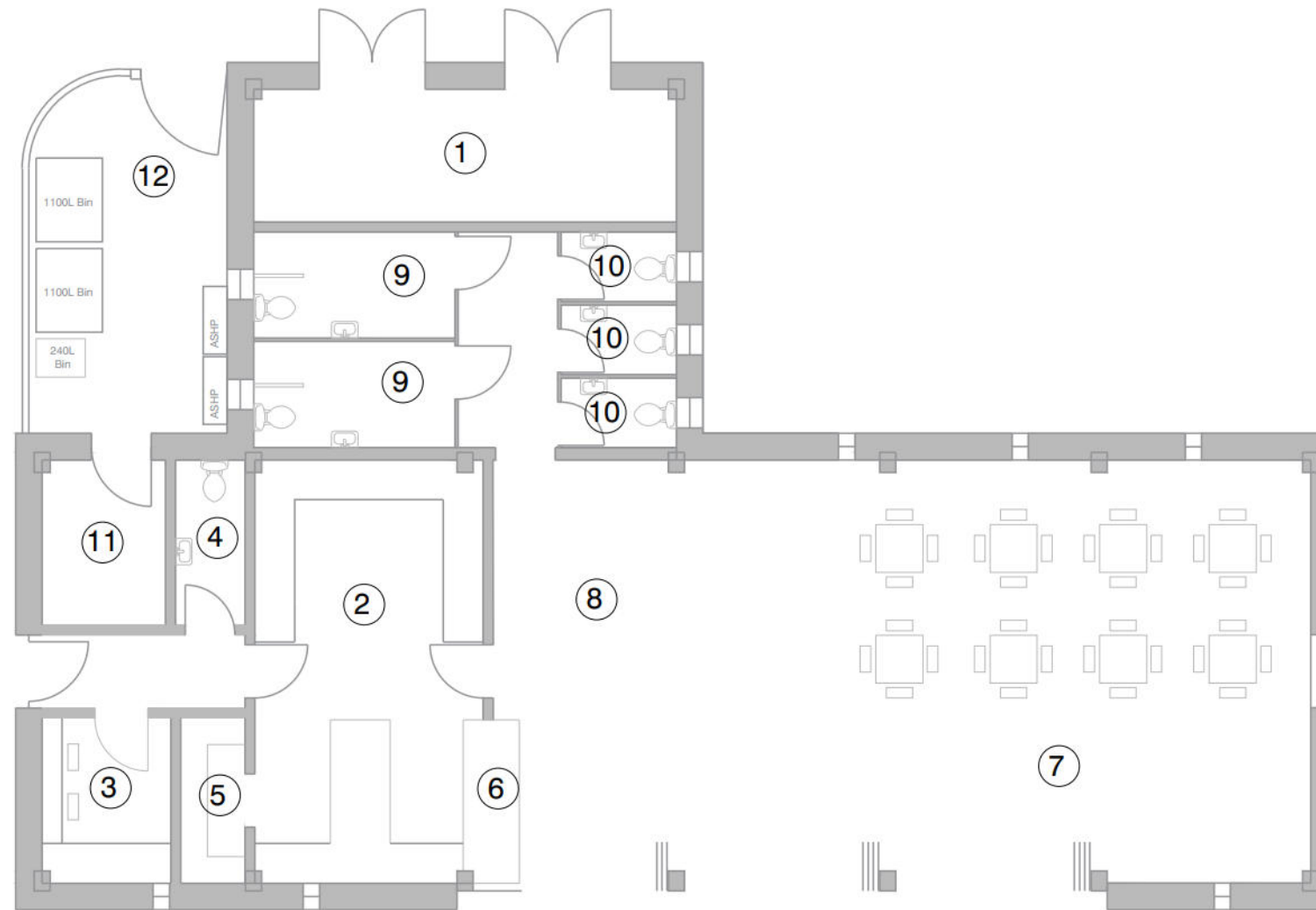
PROPOSED SITE PLAN
1:1000@A3

0 10 20 50m

Scale 1:1000 @ A3

REV 01





1. GENERAL STORE FOR SITE - 12.7 sqm
2. KITCHEN - 20 sqm
3. STAFF COATS/WELFARE - 4.3 sqm
4. STAFF WC - 2.6 sqm
5. KITCHEN STORE - 3 sqm
6. SERVERY - (sqm incorporated within kitchen)
7. CAFE SEATING - 78 sqm
8. LOBBY/VISITOR INFORMATION (sqm incorporated within cafe)
9. ACCESSIBLE WC - WC area total 20.7 sqm
10. WC - WC area total 20.7 sqm
11. PLANT ROOM - 4.6 sqm
12. 2 X 1100L BINS WITHIN LOW LEVEL ENCLOSURE WITH TIMBER GATE & CLADDING - 4 sqm

Ground floor total GIA - 157 sqm

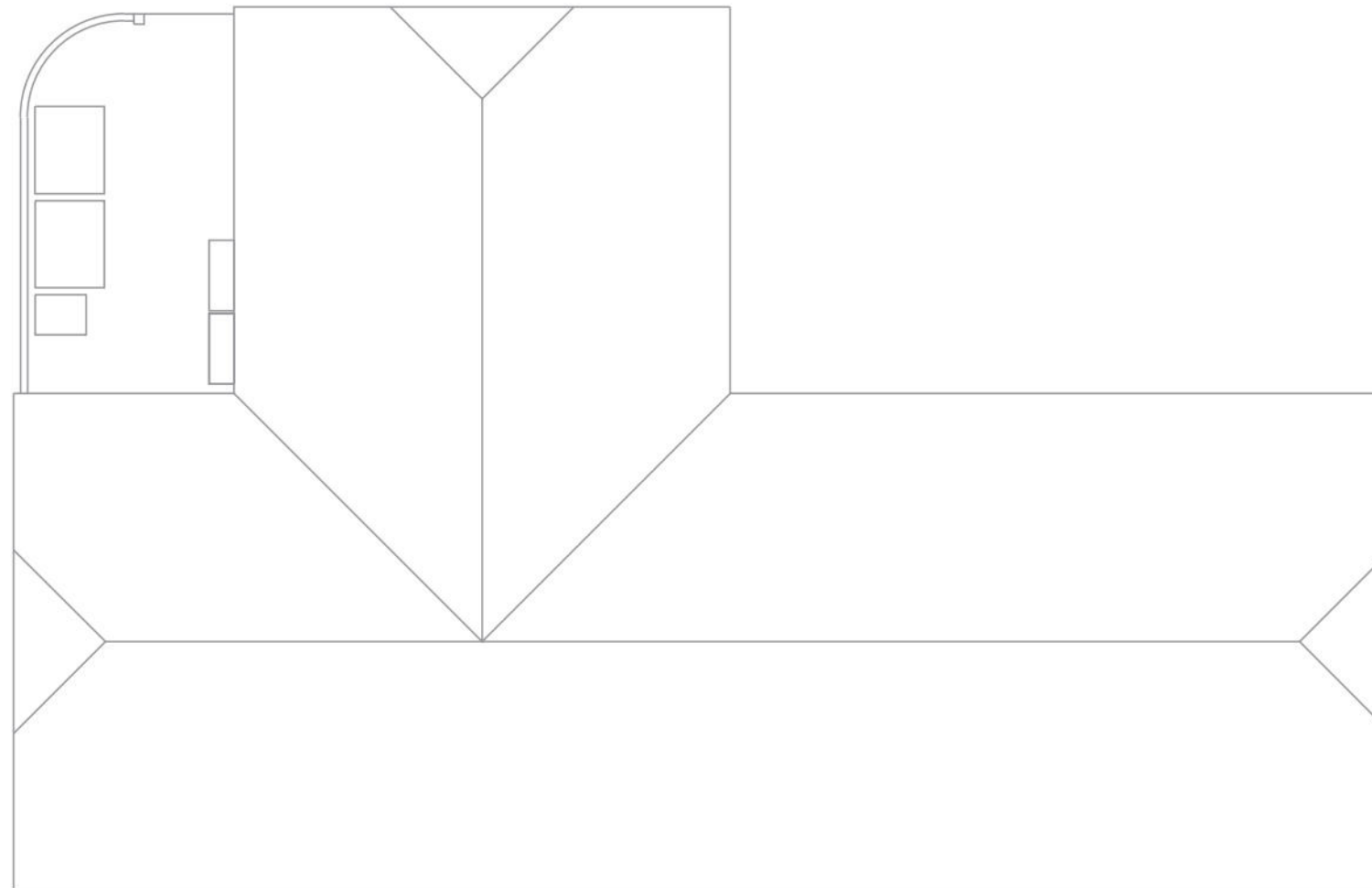
Proposed Floor Plans

Ground Floor Plan

0 1 2 5 m

Scale 1:100 @ A3

- PLANNING -



Proposed Roof Plan

0 1 2 5 m

Scale 1:100 @ A3

- PLANNING -



1. Proposed South Elevation



2. Proposed East Elevation

Proposed Elevations
 South & East
 0 1 2 5 m
 Scale 1:100 @ A3

- PLANNING -



1. Proposed North Elevation



2. Proposed West Elevation

Proposed Elevations

North & West



Scale 1:100 @ A3

- PLANNING -

APPENDIX 2 – EA DATA

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
485178/97635

Created
9 April 2025 02:00

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

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

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

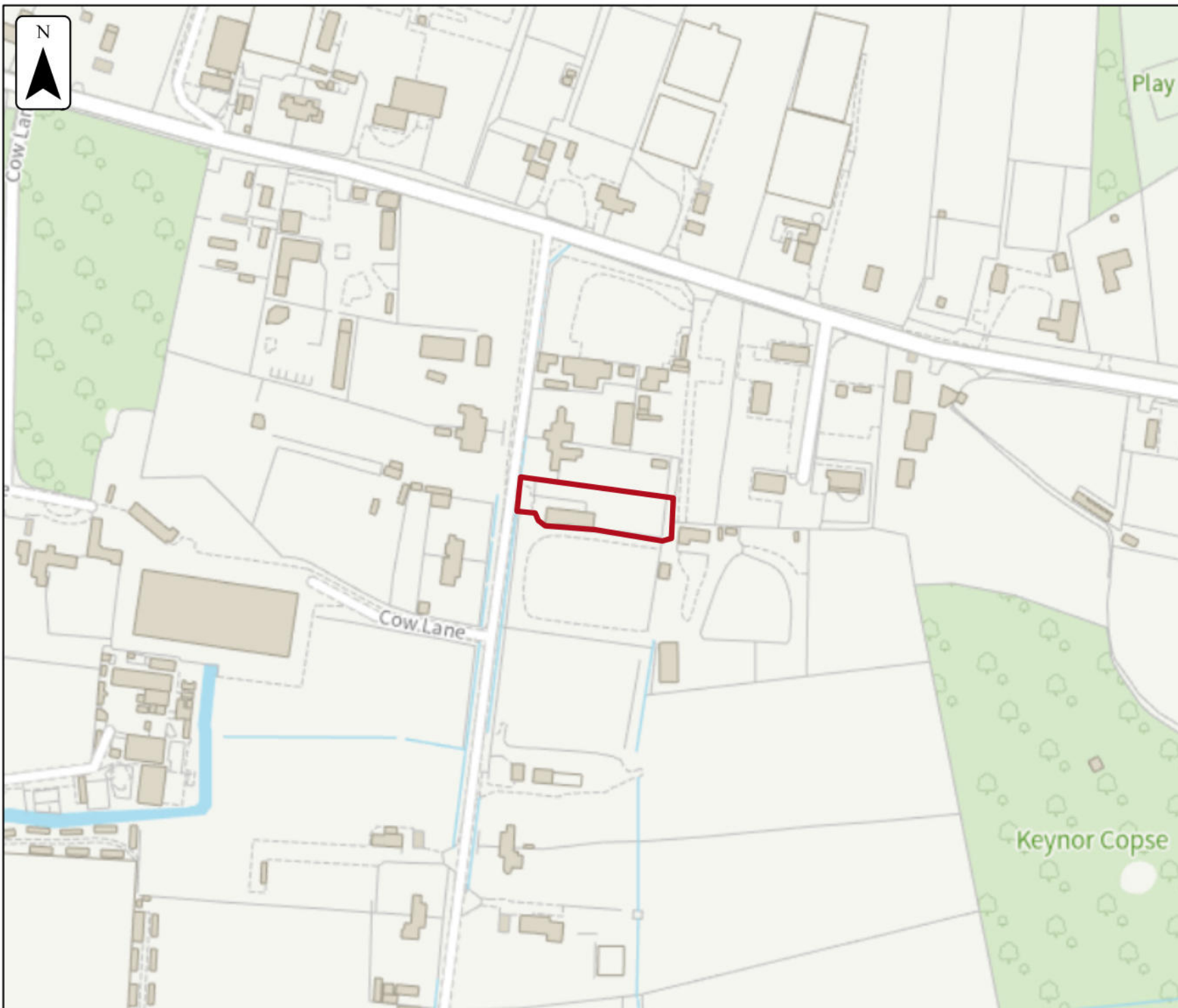
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)
485178/97635

Scale
1:2,500

Created
9 Apr 2025 02:00

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


0 20 40 60m

Our reference: **SSD381218**

Date: **25/10/2024**

Dear Ryan,

Thank you for your request of 21 October 2024 to use Environment Agency Product 4 data for the site at **Crookthorn Lane, Climping, Littlehampton, BN17 5SN**.

Response to your request

The Environment Agency's records indicate that the above site is located in Flood Zone 1 (land assessed as having less than 0.1% (1 in 1,000) chance of flooding in any given year from **rivers or the sea**). Therefore, the likelihood of flooding from rivers and sea in this area is estimated as 'very low'.

Proximity to Flood Zones 2 or 3

The above site is approximately 45 metres away from Flood Zone 2/3. We are therefore unable to provide data from our detailed fluvial or tidal models which is relevant to your site.

More information on Flood Zones can be found on the GOV.UK website:

<http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-1-flood-zones/>

Surface water flooding

Our mapping indicates that this site is at **Very Low Risk** of surface water flooding.

For information on flooding from all other sources, such as surface water, please contact the Lead Local Flood Authority, which in this case is **West Sussex County Council**. A link to their information available online is shown below:

<https://www.westsussex.gov.uk/fire-emergencies-and-crime/dealing-with-extreme-weather/dealing-with-flooding/flood-risk-management/local-flood-risk-management-strategy/>

Please note that the above is a link to an external website which the Environment Agency does not control or maintain. Therefore, the link may not be the most up-to-date at the date of this letter. If the link does not work, and you are unable to find the information about surface water flooding on the relevant website, please contact the authority named above directly.

Where you can find further information

- Detailed long-term flood information and maps can be found on the GOV.UK website:
<https://flood-warning-information.service.gov.uk/long-term-flood-risk/>
- Flood maps for planning can be found on the GOV.UK website:
<https://flood-map-for-planning.service.gov.uk/>
- Please be aware that in February 2016 the Environment Agency updated its guidance on climate change allowances. The standard allowance of adding 20% to peak flows – as per previous guidance in the National Planning Policy Framework, may not be applicable for the purposes of informing development proposals. It is possible that our current modelling has under estimated flood risk when taking climate change into consideration. This does not however have an effect on Flood Zones 2 or 3. For further information please visit:
<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>
- Further details about the Environment Agency information supplied can be found on the GOV.UK website:
<https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather>
- If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency information for Flood Risk Assessments:
<https://www.gov.uk/planning-applications-assessing-flood-risk>
<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

If you have any queries or would like to discuss the content of this letter further please call us on 03708 506 506, or reply to the email sent to you with this letter attached.

Please get in touch if you have any further queries or contact us within two (2) months if you would like us to review the information we have sent.

For information on what you can expect from us and our full service commitment to you, please click on this link:

<https://www.gov.uk/government/publications/environment-agency-customer-service-commitment--2/environment-agency-customer-service-commitment>

Yours sincerely,

Amy O'Donnell

Partnership and Strategic Overview West Sussex, Solent and South Downs
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