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| | **Strategic Flood Risk Assessment**<br>**Detailed Site Summary Tables**<br><br>**Car Park, Beach Green** | |

| **Site details** | |
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| **Site Code** | **ADC/093/13** |
| **Address** | Car Park, Beach Green |
| **Area** | 0.8ha |
| **Current land use** | Mixed use |
| **Proposed land use** | Residential |
| **Flood Risk Vulnerability** | More vulnerable |
| **Sources of flood risk** | |
| **Location of the site within the administrative area** | The site is located to the south of Shoreham Harbour, adjacent to Beach Green, in the south of the Adur District boundary. The current site has a mixed land use and comprises of greenfield and brownfield land, including a car park. |
| **Topography** | The Environment Agency's 1m resolution 2022 Composite LiDAR shows that the topography of the site is relatively flat. The eastern half of the site is a car park that is flat. The western half of the site is greenfield with a less than a 2% gradient. A low earth embankment surrounds the site; this is approximately 2m higher than the centre of the site.<br><br>*Beach Green – Topography* |
| **Existing drainage features** | An unnamed ordinary watercourse flows to the north of the site in an easterly direction towards the River Adur.<br>As the site is a car park, it is likely that existing surface water drainage is located within the site boundary. |
| **Flood Map for Planning (Rivers and Sea)** | **Available data and mapping:** Environment Agency Flood Map for Planning for Rivers and Sea.<br><br>**Data analysis:** Details of the sites location within each Flood Zone are provided within the SFRA Site Screening Appendix.<br><br>**Flood characteristics:** The site is located within Flood Zone 3 of the Flood Map for Planning for Rivers and Sea.<br><br>• Flood Zone 3 representing an area greater than 1 in 100 (1%) chance of river flooding in a given year or greater than 1 in 200 (0.5%) chance of tidal flooding.<br><br>Surface Water flooding should be considered. It is understood that additional Surface Water datasets will be published in 2025. |
| **Tidal** | **Available data and mapping:** 2025 Arun-Adur modelling – defended scenario.<br>*Depth*<br>*Beach Green – Tidal – Present Day – 3.3%* |

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| | *Beach Green – Tidal – Present Day – 0.5%*<br>*Beach Green – Tidal – Present Day – 0.1%*<br>*<u>Hazard</u>*<br>*Beach Green – Tidal – Present Day – 3.3%*<br>*Beach Green – Tidal – Present Day – 0.5%*<br>*Beach Green – Tidal – Present Day – 0.1%*<br>*<u>Velocity</u>*<br>*Beach Green – Tidal – Present Day – 3.3%*<br>*Beach Green – Tidal – Present Day – 0.5%*<br>*Beach Green – Tidal – Present Day – 0.1%*<br><br>**Data analysis:** Details of the site's location within the 2025 Arun-Adur modelling are provided within the Level 2 SFRA Site Screening Appendix.<br><br>**Flood characteristics:** The site has not been identified to be located within an area at risk of tidal flooding during present day events. |
| **Tidal with Climate Change** | **Available data and mapping:** Arun-Adur modelling – defended. The Environment Agency guidance recommends that the Higher Central (55%) and Upper End (107%) allowance is considered.<br><br>*<u>Depth – 70th percentile (higher central)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br>*<u>Hazard - 70th percentile (higher central)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br>*<u>Velocity -70th percentile (higher central)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br>*<u>Depth – 95th percentile (upper end)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br>*<u>Hazard - 95th percentile (upper end)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br>*<u>Velocity -95th percentile (upper end)</u>*<br>*Beach Green – Tidal – Future – 3.3%*<br>*Beach Green – Tidal – Future – 0.5%*<br><br>**Data analysis:** Details of the site's location within the 2025 Arun-Adur modelling are provided within the Level 2 SFRA Site Screening Appendix..<br><br>**3.3% AEP (1 in 30 year) + Higher Central Climate Change event:**<br>Proportion – 17%<br>Max Depth – 0.29m Mean Depth – 0.06m<br>Max Velocity – 0.49m/s Mean Velocity – 0.02m/s<br>Max Hazard – 1.15 Danger to some Mean Hazard – 0.55 Caution<br><br>**3.3% AEP (1 in 30 year) + Upper End Climate Change event:**<br>Proportion – 96%<br>Max Depth – 1.54m Mean Depth – 1.15m<br>Max Velocity – 1.05m/s Mean Velocity – 0.28m/s<br>Max Hazard – 2.21 Danger to all Mean Hazard – 1.84 Danger to most |

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| | **Strategic Flood Risk Assessment**<br>**Detailed Site Summary Tables**<br><br>**Car Park, Beach Green** | |
| | **0.5% AEP (1 in 200 year) + Higher Central Climate Change event:**<br>Proportion – 90%<br>Max Depth – 1.04m<br>Mean Depth – 0.67m<br>Max Velocity – 0.83m/s<br>Mean Velocity – 0.22m/s<br>Max Hazard – 1.75 Danger to most<br>Mean Hazard – 1.42 Danger to most<br>**0.5% AEP (1 in 200 year) + Upper End Climate Change event:**<br>Proportion – 99%<br>Max Depth – 2.18m<br>Mean Depth – 1.73m<br>Max Velocity – 1.56m/s<br>Mean Velocity – 0.43m/s<br>Max Hazard – 3.09 Danger to all<br>Mean Hazard – 2.49 Danger to all<br><br>**Flood characteristics:** The site is shown to flood tidally in all climate change events.<br><br>During the 3.3% AEP Higher Central Climate Change event, 17% of the site is shown to flood, with the eastern and western boundary affected. On the eastern boundary, water levels overtop the earth embankment, resulting in water pooling within the site, adjacent to the embankment.<br><br>During all other climate change scenarios, the majority of the sites floods. During the 0.5% AEP Upper End Climate Change event, 99% of the site is shown to flood. The mean depth, velocity and hazard are shown to be 1.73m, 0.43m/s and 2.49 (a 'Danger to all'). As a result, access and egress will be limited and unavailable across the whole site. | |
| **Surface Water** | **Available data and mapping:** Environment Agency Risk of Surface Water flooding for the 3.3%, 1% and 0.1% AEP events. It should be noted that the data discussed below relates to the available surface water data prior to March 2025, as the newly released data does not include depth, hazard and velocity information. A comparison of the two surface water flooding datasets is discussed below and are detailed within the Site Screening document undertaken as part of the Level 2 SFRA**.**<br><br>*Beach Green – Surface Water Depth – Present Day – 3.3%*<br>*Beach Green – Surface Water Depth – Present Day – 1%*<br>*Beach Green – Surface Water Depth – Present Day – 0.1%*<br>*Beach Green– Surface Water Hazard – Present Day – 3.3%*<br>*Beach Green – Surface Water Hazard – Present Day – 1%*<br>*Beach Green – Surface Water Hazard – Present Day – 0.1%*<br>*Beach Green – Surface Water Velocity – Present Day – 3.3%*<br>*Beach Green – Surface Water Velocity – Present Day – 1%*<br>*Beach Green – Surface Water Velocity – Present Day – 0.1%*<br>*Beach Green – Surface Water – Present Day – NAFRA2*<br><br>**Data analysis:**<br>**0.1% AEP (1 in 1000 year) event:**<br>Proportion – <1%<br>Max Depth – 0.18m<br>Mean Depth – 0.17m<br>Max Velocity – 0.59m/s<br>Mean Velocity – 0.59m/s<br>Max Hazard – 0.15 Caution<br>Mean Hazard – 0.1 Caution | |

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| | **Strategic Flood Risk Assessment**<br>**Detailed Site Summary Tables**<br><br>**Car Park, Beach Green** | |
| | **NAFRA2 - 0.1% AEP (1 in 1000 year) event:**<br>Proportion – 10%<br>**Description of surface water flow paths:** The site has not been identified to be located within an area at risk of surface water flooding during the 3.3% or 1%AEP.<br>The site is shown to flood from surface water during the 0.1% AEP event, with less than 1% coverage. Flow paths occur along the northern and eastern site boundary, along the access roads, and water pools in one localised area along the southern boundary. The event has a mean depth, velocity and hazard of 0.17m, 0.59m/s and 0.1 (a 'Caution').<br>NAFRA2 data shows an increased surface water flood extent for the 0.1%AEP compared to the superseded dataset. The distribution of flooding at the site differs significantly with increased flooding in along the earth embankment to the east of the site. | |
| **Surface Water with Climate Change** | **Available data and mapping:** Surface Water flooding for the 3.3%, 1% and 0.1% AEP events with climate change, using data available prior to March 2025. The Environment Agency guidance recommends that the Upper End allowance is considered for both the 3.3% and 1% AEPs for the 2070's epoch, unless the allowance for the 2050's epoch is higher, in which case this should be used. The recommended uplift on peak rainfall intensity for the 3.3% AEP is 40% and for the 1% AEP is 45%.<br><br>*Depth*<br>*Beach Green – Surface Water – Future – 3.3%+20CC*<br>*Beach Green – Surface Water – Future – 3.3%+40CC*<br>*Beach Green – Surface Water – Future – 1%+25CC*<br>*Beach Green – Surface Water – Future – 1%+45CC*<br>*Beach Green – Surface Water – Future – 0.1%+25CC*<br>*Beach Green – Surface Water – Future – 0.1%+45CC*<br>*Hazard*<br>*Beach Green – Surface Water – Future – 3.3%+20CC*<br>*Beach Green – Surface Water – Future – 3.3%+40CC*<br>*Beach Green – Surface Water – Future – 1%+25CC*<br>*Beach Green – Surface Water – Future – 1%+45CC*<br>*Beach Green – Surface Water – Future – 0.1%+25CC*<br>*Beach Green – Surface Water – Future – 0.1%+45CC*<br>*Velocity*<br>*Beach Green – Surface Water – Future – 3.3%+20CC*<br>*Beach Green – Surface Water – Future – 3.3%+40CC*<br>*Beach Green – Surface Water – Future – 1%+25CC*<br>*Beach Green – Surface Water – Future – 1%+45CC*<br>*Beach Green – Surface Water – Future – 0.1%+25CC*<br>*Beach Green – Surface Water – Future – 0.1%+45CC*<br><br>**Data analysis:**<br><br>**1% AEP (1 in 100 year) + 25% Climate Change event:**<br>Proportion – <1%<br>Max Depth – 0.19m Mean Depth – 0.17m<br>Max Velocity – 0.16m/s Mean Velocity – 0.11m/s<br>Max Hazard – 0.59 Caution Mean Hazard – 0.59 Caution<br><br>**1% AEP (1 in 100 year) + 45% Climate Change event:** | |

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| | Proportion – 4%<br>Max Depth – 0.27m Mean Depth – 0.18m<br>Max Velocity – 0.53m/s Mean Velocity – 0.12m/s<br>Max Hazard – 1.13 Danger to some Mean Hazard – 0.6 Caution<br><br>**0.1% AEP (1 in 1000 year) + 25% Climate Change event:**<br>Proportion – 55%<br>Max Depth – 0.42m Mean Depth – 0.22m<br>Max Velocity – 0.61m/s Mean Velocity – 0.14m/s<br>Max Hazard – 1.21 Danger to some Mean Hazard – 0.75 Danger to some<br><br>**0.1% AEP (1 in 1000 year) + 45% Climate Change event:**<br>Proportion – 68%<br>Max Depth – 0.47m Mean Depth – 0.26m<br>Max Velocity – 0.9m/s Mean Velocity – 0.15m/s<br>Max Hazard – 1.24 Danger to some Mean Hazard – 0.9 Danger to some<br>**Description of surface water flow paths:** The site is shown to flood during the 1% and 0.1% climate change events.<br>During the 1% AEP climate change events, flow paths occur along the northern and eastern site boundary, along the access roads, and water pools in two localised area along the southern boundary. Water also flows from the road into the car parking area. Flood extent during these events is small at <1% or 4% and a mean hazard of 0.59 or 0.6 ('caution').<br>During the 0.1% AEP climate change events, flood coverage reaches 55%. Flow paths are shown to flow occur along the northern and eastern site boundary, along the access roads and through the site in the low areas.<br>During the 0.1% AEP + 45% Climate Change event mean depth, velocity and hazard is shown to be 0.22m, 0.14m/s and 0.75 (a 'Danger to some'). |
| **Tidally influenced Surface Water Risk Zone** | **Available data and mapping:** JBA's Tidally influenced Surface Water Risk Zones derived using the RoFSW data, the Present day 1% AEP extreme tidal level, LiDAR data and the Environment Agency's climate change sea level uplift allowance for South East England.<br><br>*Beach Green – Tidal Drainage Risk Zones*<br><br>**Flood characteristics:** The majority of the site is shown to be located within SW2 of the Surface Water Risk Zone mapping. The northern and eastern site boundary, along the access roads is located within SW3. No areas are located within SW0, SW1 or SW4.<br><br>• SW0 - Above the future tidal level.<br>• SW1 - Not at risk of SW flooding and above the current tidal level but below the future tidal level.<br>• SW2 - Not at risk of SW flooding but below the present-day tidal level OR at risk of SW flooding from climate change only and above the current day tidal level but below future tidal level.<br>• SW3 - At risk of SW flooding from climate change only and below the present-day tidal level OR At risk of SW flooding without climate change and above current day tidal level but below future tidal level. |

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| | • SW4 - At risk of SW flooding without climate change and below present-day tidal level. |
| **Groundwater** | **Available data and mapping:** The JBA Groundwater Flood Data Map (GW5) is provided as a 5m resolution grid.<br><br>*Beach Green – Groundwater Flood Risk*<br><br>**Flood characteristics:** During a 1% AEP groundwater flood event, there is low risk of groundwater flooding. |
| **Tidally influenced Groundwater Risk Zone** | **Available data and mapping:** JBA's Tidally influenced Groundwater Risk Zones derived using the JBA Groundwater data, the British Geological Society 50k bedrock mapping, the Present day 1% AEP extreme tidal level, LiDAR data and the Environment Agency's climate change sea level uplift allowance for South East England.<br>*Beach Green – Groundwater Risk Zones*<br>**Flood characteristics:** The site is located within GW2 of the Groundwater Risk Zone mapping.<br>• GW0 - Above the future tidal level.<br>• GW1 - Groundwater level more than 0.5m below the surface and region is above the current tidal level but below the future tidal level.<br>• GW2 - Groundwater level more than 0.5m below the surface and region is below the present-day tidal level OR groundwater level between 0.025m and 0.5m below the surface and region is above the current tidal level but below the future tidal level.<br>• GW3 - Groundwater level between 0.025m and 0.5m below the surface and region is below the present-day tidal level OR Groundwater level within 0.025m of the surface and region is above the current tidal level but below the future tidal level.<br>• GW4 Groundwater level within 0.025m of the surface and region is below the present day tidal level. |
| **Sewers** | **Available data and mapping:** Drainage and Wastewater Management Plan (DWMP) Overview of the Adur and Ouse River Basin Catchment and Southern Water's Sewer Incident Report Form data (SIRF) at a five digit post code level.<br>**Flood characteristics:** 39 reportable sewer incidents have occurred since 1990 within the five-digit postcode area of the proposed development site. Thes incidents have been attributed to hydraulic overload following rainfall. |
| **Flood history** | **Available data and mapping:** The Environment Agency's Recorded Flood Outlines dataset and WSCC recorded flood incidents.<br><br>*Beach Green – Historic Flooding* |

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| | **Strategic Flood Risk Assessment**<br>**Detailed Site Summary Tables**<br><br>**Car Park, Beach Green** | |
| | **Flood characteristics:** The site is not shown to be located with the Environment Agency's Recorded Flood Outlines dataset or the WSCC recorded flood incidents dataset extents. | |
| **Flood risk management infrastructure** | | |
| **Existing Defences** | The Environment Agency's AIMS dataset identifies one formal flood defence within the vicinity of the site. The site is located 16m south of the Shoreham Houseboat Tidal Wall. | |
| **Residual risk** | **Available data and mapping:** 2025 Arun-Adur modelling – breach scenario. Breach scenario 'c'.<br><br>*Depth*<br>*Beach Green – Breach A–3.3%*<br>*Beach Green – Breach A – 0.5%*<br>*Beach Green – Breach A – 0.1%*<br>*Beach Green – Breach B–3.3%*<br>*Beach Green – Breach B – 0.5%*<br>*Beach Green – Breach B – 0.1%*<br>*Beach Green – Breach C–3.3%*<br>*Beach Green – Breach C – 0.5%*<br>*Beach Green – Breach C – 0.1%*<br>*Beach Green – Breach D –3.3%*<br>*Beach Green – Breach D – 0.5%*<br>*Beach Green – Breach D – 0.1%*<br>*Beach Green – Breach E–3.3%*<br>*Beach Green – Breach E – 0.5%*<br>*Beach Green – Breach E – 0.1%*<br>*Hazard*<br>*Beach Green – Breach A–3.3%*<br>*Beach Green – Breach A – 0.5%*<br>*Beach Green – Breach A – 0.1%*<br>*Beach Green – Breach B–3.3%*<br>*Beach Green – Breach B – 0.5%*<br>*Beach Green – Breach B – 0.1%*<br>*Beach Green – Breach C–3.3%*<br>*Beach Green – Breach C – 0.5%*<br>*Beach Green – Breach C – 0.1%*<br>*Beach Green – Breach D –3.3%*<br>*Beach Green – Breach D – 0.5%*<br>*Beach Green – Breach D – 0.1%*<br>*Beach Green – Breach E–3.3%*<br>*Beach Green – Breach E – 0.5%*<br>*Beach Green – Breach E – 0.1%*<br>*Velocity*<br>*Beach Green – Breach A–3.3%*<br>*Beach Green – Breach A – 0.5%*<br>*Beach Green – Breach A – 0.1%*<br>*Beach Green – Breach B–3.3%*<br>*Beach Green – Breach B – 0.5%*<br>*Beach Green – Breach B – 0.1%*<br>*Beach Green – Breach C–3.3%*<br>*Beach Green – Breach C – 0.5%* | |

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| | *Beach Green – Breach C – 0.1%*<br>*Beach Green – Breach D –3.3%*<br>*Beach Green – Breach D – 0.5%*<br>*Beach Green – Breach D – 0.1%*<br>*Beach Green – Breach E–3.3%*<br>*Beach Green – Breach E – 0.5%*<br>*Beach Green – Breach E – 0.1%*<br><br>**Flood characteristics:**<br><br>The site is impacted by a breach occurring at location 'c' in the 0.5% and 0.1% AEP events. Following a breach, flooding at the site occurs within 10 minutes and the entire site is inundated within 15 minutes. In the 0.5% AEP, flood depths reach 0.75m. In the 0.1%AEP, depths increase to 0.8m.<br><br>Due to the tidal nature of the River Adur, the extent of the breach impact is dependent on the tide height. |
| **Emergency planning** | |
| **Flood warning** | The site has been identified to be located within the 'Inland areas of Shoreham, Lancing and Southwick' (065WAC409) Flood Alert Area and the 'Shoreham Town and Lancing' (065FWC3002) Flood Warning Area.<br><br>*Beach Green – Flood Warning*<br><br>Future residents should be encouraged to sign up to Environment Agency flood alerts and warnings. |
| **Access and egress** | **Surface Water 1% AEP plus 45% climate change (upper end allowance)**<br><br>Access and egress are shown to be limited during the 1% AEP plus climate change surface water modelling. A flow path is present along Beach Green, with a hazard rating of 'danger to some' limiting access to the site. During the 1% AEP + 45% Climate Change event flood depths exceed 200mm at the existing northern access and 400mm at the eastern access.<br><br>**Tidal 0.5% AEP plus 55% climate change (higher central allowance)**<br><br>Access and egress across the site is unavailable during the 0.5% AEP plus climate change tidal events. This includes all surrounded access roads. In the climate change tidal events maximum hazard is either danger to most or danger to all. During the 0.5% AEP + Upper End Climate Change event flood depths exceed 2m at the existing northern and eastern access.<br><br>As a result of the affected access and egress and the severity of the hazard ratings throughout the design flood events it is necessary that a Flood Response Plan is developed in line with ADEPT Guidance. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br><br>The geology consists of Newhaven Chalk Formation comprised of chalk. The superficial deposits consist of Tidal Flat Deposits (clay, silt, sand and gravel). |

The soils are shown to be loamy and clayey soils of coastal flats with naturally high groundwater.

The geology of the Adur District is complex; areas of chalk are often capped with small sections of clay. This can result in groundwater being trapped beneath the clay layer and surface water pooling at the surface unable to infiltrate. Groundwater may find a fissure in the clay and rise to the surface resulting in flooding that is difficult to predict in terms of location and scale.

**SuDS**

Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. Evidence should be given where multiple benefits are not provided to show that this is not possible.

Preference should be given to multi-functional sustainable drainage systems, and to solutions that allow surface water to be discharged according to the hierarchy of drainage options listed in the PPG Flood Risk and Coastal Change paragraph 056.

The layout and function of drainage systems needs to be considered at the start of the design process for new development, as integration with road networks and other infrastructure can maximise the availability of developable land.

**Suitability and considerations for sustainable drainage**

In line with Defra's National Standards for Sustainable Drainage Systems, runoff from the development shall be discharged to the following final below hierarchy:

- Priority 1: collected for non-potable use
- Priority 2: infiltrated to ground
- Priority 3: discharged to an above ground surface water body
- Priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- Priority 5: discharged to a combined sewer

SuDS measures should also follow West Sussex County Council's discharge hierarchy, and if it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner based on the National Standards for SuDS.

Surface water discharge rates should not exceed pre-development discharge rates for the site and should be designed to be as close to greenfield runoff rates as reasonably practical in consultation with the LLFA. Discharge to a watercourse or surface water sewer must be restricted to the estimated mean greenfield runoff rate (Qbar) for all design storm events. The calculations must be based on the positively drained area, rather than the entire greenfield site area

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| | It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques.<br><br>The site is not considered to be susceptible to groundwater flooding (low risk) therefore infiltration is likely to be feasible. Site investigation work and additional groundwater monitoring is recommended to determine the seasonal variability of groundwater levels, as this may affect the design of the surface water drainage system. The infiltration potential of the site should be confirmed through infiltration testing, in line with BRE 365 or similar.<br><br>Groundwater levels are shown to be influenced by tide levels. The capacity for infiltration needs to take into account the impact of future sea levels. The influence of tide levels on groundwater levels should be investigated through groundwater monitoring.<br><br>The topography of the site is unlikely to affect any proposed SuDS features. Any water not intercepted via infiltration is likely to drain towards the River Adur. It is therefore recommended that the LLFA and the EA are consulted about viable discharge locations for surface water from the site and their attenuation potential.<br><br>The whole site is located within a Nitrate Vulnerable Zone. Therefore, early engagement with the LLFA and the Environment Agency is recommended to determine requirements for the site to manage the impact to surrounding watercourses. Consideration of water quality is likely to be of high importance and demonstrated through the use of the Simple Index Approach.<br><br>The site has not been identified to be located within a historic landfill site or a groundwater Source Protection Zone. |
| **Opportunities for wider sustainability benefits and integrated flood risk management** | • Implementation of SuDS at the site could provide opportunities to deliver multiple benefits including volume control, water quality, amenity and biodiversity. This could also provide wider sustainability benefits to the site and surrounding area. Proposals to use SuDS techniques should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.<br>• The design of the surface water management proposals should take into account the impacts of future climate change over the projected lifetime of the development.<br>• Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site.<br>• SuDS are to be designed so that they are easy to maintain, and it should be set out who will maintain the system, how the maintenance will be funded and should be supported by an appropriately detailed maintenance and operation manual.<br>• SuDS should be designed with a holistic approach, combining ecology, landscape and drainage requirements specific to the site, and incorporating Biodiversity Net Gain requirements.<br>• Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas must be considered. Consideration should be made to the existing condition of receiving waterbodies and their Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve |

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| | water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies.<br>• The potential to utilise conveyance features such as swales to intercept and convey surface water runoff should be considered. Conveyance features should be located on common land or public open space to facilitate ease of access.<br>• SuDS should be designed in line with the National Standards for Sustainable Drainage Systems. |
| **NPPF and planning implications** | |
| **Exception Test requirements**<br><br>**(Local Authority considerations)** | The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test will need to be passed before the Exception Test is applied. In addition, once the sequential test has been passed, a sequential approach to development should still be undertaken.<br><br>The site is located within Flood Zone 3 according to the Environment Agency's Flood Map for Planning and also shown to be at future tidal risk in the 2025 Arun-Adur detailed modelling and surface water flood risk. The NPPF classifies the usage as "More Vulnerable". The Exception Test is therefore required for this site due to the severity of flooding.<br><br>A site specific FRA will be required for this site. |
| **Requirements and guidance for site-specific Flood Risk Assessment**<br><br>**(Developer considerations)** | **Flood Risk Assessment:**<br><br>The Level 1 SFRA has more guidance on this section and any relevant policies and information applicable to development within Adur District.<br>• All sources of flooding should be included as part of the site specific FRA.<br>• The most recent risk of Flooding from Surface Water dataset should be used.<br>• Consultation with Adur and Worthing Councils, West Sussex County Council, and where relevant the Environment Agency and Southern Water should be undertaken at an early stage.<br>• Development within 16m of a tidal main river, a tidal river flood defence or culvert or a sea defence is likely to require a flood risk activities permit: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits. If development is within 20m of a main river, flood defence or flow control structure the developer will need to check with the Environment Agency if a separate permit or consent is needed.<br>• Development plans should consider the Level 1 and 2 SFRA for Adur, as well as the Local Flood Risk Management Strategies to identify cumulative flood risk issues. The Cumulative Impact Assessment (CIA) completed as part of the Level 1 SFRA, highlights that the West Adur catchment, is at a high risk of cumulative impacts. The risk of cumulative impacts of this development and others in the local area on flood risk should be considered within the site-specific flood risk assessment. It should also promote an integrated approach to water management.<br>• Applicants are expected to provide fully detailed plans of the site's existing surface water drainage arrangements, including |

impermeable areas, gullies, outfalls, pipes & diameters, manholes, etc., to prove the extent of the existing positively drained areas and their associated points of discharge.

**Guidance for site design and making development safe:**

- The developer will need to show, through an FRA, that future users of the development will not be placed in danger from flood hazards throughout its lifetime. It is for the applicant to show that the development meets the objectives of the NPPF's policy on flood risk. For example, how the operation of any mitigation measures can be safeguarded and maintained effectively through the lifetime of the development. (Para 048 Flood Risk and Coastal Change PPG).
- The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes (temporary/seasonal surface water flow paths).
- Development design should prioritise avoiding development within surface water flow paths, including off-site flow paths. Any loss in surface water flood storage will require on-site level for level compensatory storage, to ensure that any displaced volumes of water do not increase surface water flood risk within the site or elsewhere.
- Development design should prioritise avoiding development within surface water flow paths, including off-site flow paths. Any loss in surface water flood storage will require on-site level for level compensatory storage, so that any displaced volumes of water do not increase surface water flood risk within the site or elsewhere.
- The site is located within a surface water risk zone and therefore surface water drainage systems are likely to be influenced by tide levels. The drainage strategy should consider the risk of tide locking.
- A drainage strategy should be prepared to understand infiltration capacity at the site given the underlying chalk geology and risk of groundwater emergence.
- Following groundwater monitoring, development should be directed away from areas of high groundwater risk.
- Arrangements for safe access and egress are unlikely to be possible due to the severity of flooding and will need to be considered further within a site-specific FRA for the tidal and surface water events with an appropriate allowance for climate change, using the depth, velocity, and hazard outputs. This will need to accompany a Flood Response Plan for the site and its users.
- The Flood Response Plan should consider arrangements for safe use, access and egress of the site in a breach event due to the speed of onset and maximum flood depths recorded.
- The design and layout of development at the site will need to consider the impact of tidal and surface water flow paths. A sequential approach to development should be undertaken with development located in the areas of lowest risk within the site

boundary. The site layout should make space for water and seek to avoid obstructing offsite flow paths and avoid off site detriment.

- To allow for maintenance, 3m easements will be required from the top of both banks along the ordinary watercourses.
- As outlined in the PPG, the Finished Floor Levels of the development should be raised to a minimum of whichever is higher of 600mm above the:
  - Average ground level of the site
  - Adjacent road level to the building
  - Estimated river or sea flood level
- It is suggested that flood resilient design is adopted in the construction of development. The PPG sets out that flood resistant material that have low permeability should be used to at least 600mm above the estimated flood level; flood resilient materials to at least 600mm above the estimated flood level and raising of electrical equipment at least 600mm above the estimated flood level.

## Key messages

The Flood Map for Planning indicates the site is in Flood Zone 3. According to the 2025 Arun-Adur modelling, the majority of the site, 99%, is at risk of tidal flooding in the design event (0.5% AEP plus 55% climate change allowance). The site is at low risk of surface water flooding.

Access and egress is unavailable with both the site and surrounding roads highlighted as danger to most or danger to all for design flood event.

Development at the site is unlikely to be able to progress unless:

- The Exception Test is satisfied.
- A site-specific Flood Risk Assessment, including detailed modelling, is undertaken to assess the risk of tidal and surface water flooding in relation to the proposed development, the risk of breach and the access and egress arrangements.
- A detailed Flood Response Plan is prepared in line with ADEPT guidance that considers not only the risk at the site but also the access and egress arrangements. The Arun-Adur modelling indicates that access and egress is not available in the design flood event. The flood response plan would need to demonstrate that:
  - Flood warnings are available for the site
  - Evacuation of the site can take place prior to flooding
  - Areas of suitable safe refuge at the site are available, with access to power and water uninterrupted.
- A sequential approach to development is undertaken. Layout and design should aim to avoid developing in the areas of greatest flood risk. This includes raising finished floor levels.
- Finished floor levels are raised to a minimum of whichever is higher of 600mm above the average ground level of the site, the adjacent road level to the building or the estimated river or sea flood level. The flood level is for the design event (tidal flood level plus higher central climate change allowance, surface water flood level plus upper end).
- Mitigation measures are incorporated to reduce the risk of flooding to the development. Early consultation should be held with the Environment Agency to discuss this.

- Infiltration rates and groundwater levels are assessed on site as part of a drainage strategy, including consideration of the impact of tide levels on infiltration.

## Sources of information

National Planning Policy Framework (NPPF)

https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf

Planning Practice Guidance (PPG), Flood Risk and Coastal Change

https://www.gov.uk/guidance/flood-risk-and-coastal-change

Flood Map for Planning (NaFRA2 2025)

https://www.data.gov.uk/dataset/104434b0-5263-4c90-9b1e-e43b1d57c750/flood-map-for-planning-flood-zones1

Long Term Flood Risk

Where do you want to check? - Check your long term flood risk - GOV.UK

British Geological Survey (BGS) Geology Viewer

https://geologyviewer.bgs.ac.uk/

Southern Water's Drainage and Wastewater Management Plan

https://www.southernwater.co.uk/about-us/our-plans/drainage-and-wastewater-management-plans/

National standards for sustainable drainage systems (SuDS)

https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds

Flood Warning sign up

https://www.gov.uk/sign-up-for-flood-warnings