# South Norfolk Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

## Site details

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| **Site Code** | **VCBRO1REV (formerly SN0432REVB/VCBRO1)** |
| **Address** | Land West of Norwich Road |
| **Area** | 1.20ha |
| **Current land use** | Greenfield |
| **Proposed land use** | Residential |

## Sources of flood risk

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| **Location of the site within the catchment** | The site lies within the catchment of the River Chet. The Well Beck runs northwest to southeast 1.1km northeast of the site. An unnamed tributary of the Well Beck is located 390m from the northwest corner of the site, meeting the Well Beck 1.2km north of the site. The Well Beck is a tributary of the River Chet, the confluence between which is located 2.2km east of the site. |
| **Existing drainage features** | Local topography shows that the site is relatively flat with a slight slope down towards the northeast. This indicates the existing drainage is to the northeast of the site, following the topography towards the unnamed tributary of the Well Beck. There are no other drainage features observed within the vicinity of the site. |
| **Fluvial** | **Proportion of site at risk (Environment Agency's Flood Map for Planning):**<br>**FZ3b –** 0%<br>**FZ3a –** 0%<br>**FZ2 –** 0%<br>**FZ1 –** 100%<br><br>*The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).*<br><br>**Available data:**<br>The Environment Agency's (EA) Flood Map for Planning has been used within this assessment.<br><br>**Flood characteristics:**<br>The site is not at risk of fluvial flooding as it is not located within Flood Zones 2 and 3. |
| **Surface Water** | **Proportion of site at risk (Environment Agency's surface water datasets):**<br>**3.3% AEP** – 3%<br>Max depth- 0.3-0.6m<br>Max hazard – 'Danger for Most'<br>Max velocity- 0.25-0.5m/s<br>**1% AEP** – 4%<br>Max depth- 0.3-0.6m<br>Max hazard - 'Danger for Most'<br>Max velocity- 0.25-0.5m/s<br>**0.1% AEP** – 5% |

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| | Max depth- 0.3-0.6m<br>Max hazard – 'Danger for Most'<br>Max velocity- 0.5-1.0m/s<br><br>*The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a greater Annual Exceedance Probability (e.g. 1% AEP % includes the 3% AEP %)*<br><br>**Description of surface water flow paths:**<br><br>During the 3.3% AEP, there are two minor flow paths which flow along the northern and southern boundaries. Additionally, there is an area of ponding present in the northeastern corner of the site. At the two flow paths, maximum depths are 0.3-0.6m, maximum hazard is classified as 'Danger for Most', and maximum velocities are 0.25-0.5m/s. The area of ponding in the northeast of the site shows maximum depths of 0.15-0.3m, velocities not exceeding 0.25m/s and a maximum hazard classified as 'Danger for Some'.<br><br>Flood extents during the 1% AEP event affect similar areas with a minor increase in extent, most notably at the southern boundary. Maximum depth and hazard remain the same in all risk areas.<br><br>During the 0.1% AEP event, there is an increase in flood extent in all aforementioned areas with the greatest increase at the area of ponding in the northeast of the site. Maximum depth and hazard remain similar to the 1% AEP event. However, maximum velocity at the southern boundary increases to 0.5-1m/s. |
| **Reservoir** | The site is not shown to be at risk of reservoir flooding in the EA Reservoir Flood Maps. |
| **Groundwater** | The Environment Agency Areas Susceptible to Groundwater Flooding, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. No data was available for this site.<br><br>The JBA Groundwater Emergence Map shows the entire site to be at 'No risk'. This means that there is a negligible risk from groundwater flooding due to the nature of the local geological deposits.<br><br>The assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage. |
| **Sewers*** | The site is located within a postcode area (NR15 1) where there have been 54 recorded historic sewer flooding incidences between May 2013 and March 2024 according to information provided by Anglian Water. |
| **Flood history*** | The Environment Agency's historic flooding and recorded flood outlines datasets do not have a record of any flooding on or surrounding the site.<br><br>Norfolk County Council's historic flooding records show two incidents of external and one incident of internal flooding approximately 500m south of the site. |
| **No additional data on sewer and historic incidents was obtained for the purposes of the June 2026 update.* | |
| **Flood risk management infrastructure** | |
| **Defences** | The site is not protected by any formal flood defences. |
| **Residual risk** | The unnamed watercourse to the west of the site is culverted under Howe Lane. If this culvert were to become blocked, floodwater could back up and cause flooding. However, due to the location of the site at a topographic high point, the site is unlikely to be affected in a blockage event. |
| **Emergency planning** | |
| **Flood warning** | The site is not located in an Environment Agency Flood Warning Area. |
| **Access and egress** | Currently, site access and egress are likely to be via Norwich Road along the eastern boundary of the site.<br><br>Access and egress are not likely to be affected by fluvial flooding, now or in the future. |

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| | Access and egress are likely to remain viable via Norwich Road in the 1% AEP present day and climate change surface water events, as there is no surface water flood risk shown on the road to the immediate north or south of the site.<br><br>Safe access and egress will need to be demonstrated in the 1% AEP plus climate change surface water event and fluvial events. Raising of access routes must not impact on surface water flow routes.<br><br>If safe access and escape to the site cannot be safely demonstrated in all flood events, a Flood Warning and Evacuation Plan should be prepared for the site. |
| **Dry Island** | The site is not located on a dry island. |
| **Climate change** | |
| **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding.<br>• Climate change should also be considered for surface water events; at the site-specific stage, the 1% AEP +40% event is considered as part of surface water drainage strategies, or surface water modelling. The 1% AEP +40% Climate Change Upper uplift (for the Broadland Rivers Management Catchment peak flows) event mapping suggests that the site is not at increased risk of surface water flooding in future. The areas of ponding in the 1% AEP present day event only increase marginally in size in the climate change event and depths remain similar.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.<br>• A site-specific FRA, with the most up-to-date climate change allowances, should be undertaken to investigate the implications of climate change on the site. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br>• Geology at the site consists of:<br>  ○ Bedrock- Crag Group- Sand and Gravel.<br>  ○ Superficial- Lowestoft Formation- Diamicton.<br>• Soils at the site consist of:<br>  ○ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.<br><br>**SuDS**<br>• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.<br>• BGS data indicates that the underlying geology is sand and gravel which is likely to be free draining. This should be confirmed through infiltration testing.<br>• The entire site is located within a Groundwater Source Protection Zone 3. Infiltration techniques may not be suitable and should only be used following the granting of any required environmental permits from the Environment Agency for Zones 2, 3 and 4 although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints.<br>• The site is not located within a historic landfill site.<br>• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. 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>• The Surface Water Spatial Planning mapping indicates the presence of surface water flow paths during the 3.3%, 1% and 0.1% AEP events. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space. |

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| | • 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. |
| **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 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>• Development at this site should not increase flood risk either on or off site. 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, green/blue corridors, permeable surfaces and rainwater harvesting must be considered in the design of the site.<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 clean improve 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. |
| **NPPF and planning implications** | |
| **Exception Test requirements** | • The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines.<br>• The Exception Test is not required for this site because the entire site is not shown to be at fluvial risk within the EA's FMfP. |
| **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• At the planning application stage, a site-specific Flood Risk Assessment will be required as the proposed development site contains areas of surface water flood risk and is more than one hectare in area.<br>• All sources of flooding should be considered as part of a site-specific flood risk assessment.<br>• The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Norwich City Council's Local Plan policies, and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document.<br>• Consultation with the Local Authority and the Lead Local Flood Authority should be undertaken at an early stage.<br>• The development should be designed to ensure that mitigation measures are in place to ensure the development does not flood or that ground level space is used for less vulnerable parts of the development.<br>**Guidance for site design and making development safe:**<br>• The developer will need to demonstrate to the satisfaction of the local planning authority that the development will be safe for its lifetime taking account of the vulnerability of its users, a site-specific flood risk assessment may need to show that appropriate evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with an extreme flood event. (Para 048 Flood Risk and Coastal Change PPG).<br>• In accordance with the Sequential Approach, development should aim to be steered away from areas of surface water flood risk in the northeast of the site and along the northern and southern boundaries, preserving these spaces as green infrastructure.<br>• Safe access and escape will need to be demonstrated in the 1% AEP plus climate change rainfall event, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk. |

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| | • The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.<br>• Surface water should be discharged at the pre-development (greenfield) runoff rate which presents wider opportunities to improve biodiversity and amenity as well as climate change adaptation. An integrated flood risk management and sustainable drainage scheme for the site is advised.<br>• Developers should refer to Norfolk County Council's 'Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning Guidance Document' and the Level 1 SFRA for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to provide responses to planning applications. |

## Key messages

The principle of development can be supported if:

- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, with development to be steered away from the areas of surface water flood risk in the northeast corner of the site and at the northern and southern boundaries.
- A site-specific Flood Risk Assessment demonstrates that the site is not at an increased risk of flooding in the future, that the development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties and how the natural flood storage provided by the pre-developed site is preserved.
- Consideration should be given to the siting of safe access and egress routes, and these must not impede surface water flows risk. Safe access and egress can currently be demonstrated in the 1% AEP plus climate change surface water event.

## Mapping Information

The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning, Surface Water Spatial Planning dataset and Risk of Flooding from Surface Water (RoFSW).

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning – Flood Zones mapping. |
| **Fluvial depth, velocity and hazard mapping** | This site is not shown to be at risk of flooding from fluvial sources. |
| **Surface Water** | The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | The surface water depth mapping is taken from the Flood Map for Planning – Surface Water Spatial Planning Depths – Present Day and Climate Change datasets.<br>The surface water hazard and velocity mapping is taken from the Environment Agency's Risk of Flooding from Surface Water – Hazard and Speed mapping. |
| **Climate change** | In the absence of detailed modelling, the Environment Agency's Rivers and Sea undefended flood risk extents – climate change dataset has been used as an indication of fluvial flood extent during a 1% and 0.1% AEP plus climate change scenario. The Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used as an indication for the 3.3% AEP plus climate change scenario.<br>For surface water risk, a 1% AEP +40% scenario has been considered, which represents the Broadland Rivers Management Catchment for the 2070s from the Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset. This dataset contains depth data which has been used in this assessment but does not contain hazard and velocity data. |

# South Norfolk Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

## Site details

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| **Site Code** | **VCDIT1REVA** |
| **Address** | Land between Thwaite Rd/Tunneys Lane, Ditchingham, South Norfolk, 634229 291610 |
| **Area** | 2.5ha |
| **Current land use** | Greenfield |
| **Proposed land use** | Residential |
| **Internal Drainage District (IDD)** | Adjacent to the Waveney, Lower Yare and Lothingland IDD |

## Sources of flood risk

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| **Location of the site within the catchment** | The site is located in the Broome Beck Catchment, north of Ditchingham. The Broome Beck flows from its source in Bedingham, east, past Ditchingham, and joins the River Waveney at Broome. The Broome Beck is located approximately 300m to the northeast of the site. |
| **Existing drainage features** | Local topography shows the site is in an area of low topography relative to the surrounding area. The site slopes gently downhill towards the northeast which suggests existing drainage is towards Broome Beck. |
| **Fluvial** | **The proportion of site at risk (Environment Agency's Flood Map for Planning Flood Zones):**<br>**FZ3b –** 0%<br>**FZ3a –** 0%<br>**FZ2** –0%<br>**FZ1 –** 100%<br><br>*The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).*<br><br>**Available data:**<br>The Environment Agency's (EA) Flood Map for Planning has been used within this assessment.<br><br>**Flood characteristics:**<br>The EA's Flood Map for Planning shows that the extent of Flood Zone 2, Flood Zone 3a and Flood Zone 3b extend southbound from the right bank of Broome Beck to approximately 10m outside of the northern site boundary. |
| **Surface Water** | **Proportion of site at risk (Environment Agency's surface water datasets):**<br>**3.3% AEP** – 4%<br>Max depth – 0.15-0.3m<br>Max velocity – <=0.25m/s<br>Max hazard – 'Very Low Hazard/Caution'<br>**1% AEP** – 5%<br>Max depth – 0.3-0.6m<br>Max velocity – <=0.25m/s<br>Maz hazard – 'Danger for Some' |

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| | **0.1% AEP** – 8%<br>Max depth – 0.3-0.6m<br>Max velocity – <=0.25<br>Max hazard – 'Danger for Some'<br><br>*The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a greater Annual Exceedance Probability (AEP) (e.g. 1% AEP % includes the 3.3% AEP %).*<br><br>**Description of surface water flow paths:**<br><br>During the 3.3% AEP event, there is surface water ponding present in a low topographic spot in the east of the site and within the northern boundary of the site. Surface water ponding present on Waveney Road to the southeast of the site also minorly encroaches the site via the southeast boundary. Maximum depths are 0.15-0.3m, maximum velocities are up to 0.25m/s and maximum hazard is classified as 'Very Low Hazard/Caution'.<br><br>Surface water flooding in the 1% AEP affects similar areas as the 3.3% AEP with a small increase in extent. The maximum depth at the centre of ponding in the east of the site increases to 0.3-0.6m and maximum hazard increases to 'Danger for Some'. A new area of ponding emerges in the northwest of the site adjacent to the northern site boundary, to depths of less than 0.15m, velocities up to 0.25m/s and maximum hazard of 'Very Low Hazard/Caution'.<br><br>In the 0.1% AEP event, existing extents increase further but depth, velocity and hazard remain similar to in the 1% AEP. A new area of ponding emerges adjacent to the western site boundary, with depths of 0.15-0.3m, velocities up to 0.25m/s and hazard classification of 'Very Low Hazard/Caution'. |
| **Reservoir** | The site is not shown to be at risk of reservoir flooding from the EA Reservoir Flood Maps. |
| **Groundwater** | The Environment Agency Areas Susceptible to Groundwater Flooding, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The entire site has a >=75% susceptibility to groundwater flood emergence.<br><br>The JBA Groundwater Emergence Map indicates predicted groundwater levels are between 0.5m and 5m below the ground surface at the site location. This means that there is a risk of flooding to subsurface assets but surface manifestation of groundwater is unlikely.<br><br>Flow paths from the EA's surface water mapping indicate that if groundwater emerges, this would likely flow towards the topographic depression in the east of the site and northwards towards Broome Beck.<br><br>The assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage. |
| **Sewers*** | The site is located in a postcode area (NR35 2) with 42 recorded historic sewer flooding incidences between May 2013 and March 2024, according to information provided by Anglian Water. |
| **Flood history*** | The Environment Agency's historic flooding and recorded flood outlines datasets do not have a record of any flooding on or surrounding the site.<br><br>Norfolk County Council's historic flooding records also do not show any flooding on or surrounding the site. |
| **No additional data on sewer and historic incidents was obtained for the purposes of the June 2026 update.* | |
| **Flood risk management infrastructure** | |
| **Defences** | This site is not protected by any formal flood defences. |
| **Residual risk** | There is no residual risk to the site from flood risk management structures. |
| **Emergency planning** | |
| **Flood warning** | A small area of the site on the northern boundary and extending across the topographic depression in the east of the site, is within the River Waveney from Diss and the River |

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| | Dove to Ellingham, including Bungay Flood Alert Area. The site is not located in a Flood Warning area. |
| **Access and egress** | South Norfolk Council confirmed access to the site will be from the south via Hamilton Way and Rider Haggard Way.<br><br>In all modelled fluvial events including climate change scenario, the site, Hamilton Way and Rider Haggard Way are unaffected by flooding.<br><br>During the 1% AEP climate change surface water event, minor ponding is present on Hamilton Way near the junction with Rider Haggard Way. Maximum depths of 0.3m are predicted. Larger areas of ponding are shown along Rider Haggard Way and Waveney Road which connects with Loddon Road leading to the wider area. However, predicted depths in these areas also do not exceed 0.3m. Based on the available depth mapping, access and egress to the site are unlikely to be significantly impeded. As velocity and hazard data are not available for the climate change surface water scenario, the potential flood hazard cannot be fully assessed at this stage and should be considered within a site-specific FRA.<br><br>Safe access and egress will need to be demonstrated in the 1% AEP plus climate change surface water event. Site drainage proposals should address the requirements for access routes, avoid impeding surface water flows and preserve the storage of surface water to avoid exacerbation of flood risk in the wider catchment. |
| **Dry Islands** | The site is not located on a dry island. |
| **Climate change** | |
| **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial and surface water flooding.<br><br>• The fluvial 1% AEP plus climate change scenario extent extends from the right bank of the Broome Beck towards Tunneys Lane immediately north of the site. However, the flood extent does not encroach the northern site boundary.<br><br>• Climate change should also be considered for surface water events; at the site-specific stage, the 1% AEP +40% event is considered as part of surface water drainage strategies, or surface water modelling in the Broadland Rivers Management Catchment for the 2070s. The 1% AEP +40% event mapping suggests that the site is not likely to be at significantly increased risk of surface water flooding in future. However, the risk associated with the topographic depression should be considered in site design.<br><br>• During the 1% AEP plus climate change surface water flood event, there is increased ponding adjacent to the northern site boundary which shows maximum flood depths of 0.15-0.3m. Ponding in the east of the site also increases in extent and shows maximum flood depths of 0.3-0.6m, for a small area in the centre of the ponding.<br><br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br><br>• Geology at the site consists of:<br>  ○ Bedrock- Gravel, sand, silt and clay<br>  ○ Superficial- Sand and gravel, river terrace deposits<br>• Soils at the site consist of:<br>  ○ Freely draining slightly acid sandy soils<br><br>**SuDS**<br><br>• BGS data indicates that the underlying geology is sands, gravels, silts and clays which is likely to be free draining.<br><br>• The site is considered to have moderate susceptibility to groundwater flooding. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site |

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| | investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate at this site.<br>• The site is located within a Groundwater Source Protection Zone. Infiltration techniques may not be suitable and should only be used following the granting of any required environmental permits from the Environment Agency for Source Protection Zones 2, 3 and 4 although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints.<br>• The site is not located within a historic landfill site.<br>• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA.<br>• 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. |
| **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 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>• Development at this site should not increase flood risk either on or off site. 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>• 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. Where slopes are >5%, features should follow contours or utilise check dams to slow flows. |
| **NPPF and planning implications** | |
| **Exception Test requirements** | • The Local Authority will need to confirm that the Sequential Test has been carried out. The Sequential Test will need to be passed before the Exception Test is applied. The NPPF classifies residential development as 'More Vulnerable'.<br>• The entire site lies outside of Flood Zone 2 and 3 and is not predicted to be significantly affected by surface water flooding, therefore the Exception Test is not required. |
| **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• At the planning application stage, a site-specific Flood Risk Assessment will be required as the proposed development site is at surface water flood risk, is indicated to be at groundwater flood risk and is more than one hectare in area.<br>• All sources of flooding should be considered as part of a site-specific flood risk assessment.<br>• The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, Norwich City Council's Local Plan policies, and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document.<br>• Consultation with the Local Authority, Lead Local Flood Authority, Water Company, and the Environment Agency should be undertaken at an early stage.<br>• The development should be designed to ensure that mitigation measures are in place to ensure the development does not flood.<br>**Guidance for site design and making development safe:**<br>• Safe access and egress will need to be demonstrated in the 1 % AEP plus climate change rainfall event, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes or contribute to loss of floodplain |

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| | storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk<br>• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.<br>• The proposed site should discharge surface water at the original pre-development (greenfield) runoff rate. If this is not possible, a significant reduction in the current rate of discharge should be achieved and agreed with the relevant drainage body (LLFA, IDB or Anglian Water).<br>• Developers should refer to Norfolk County Council's 'Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning Guidance Document' and the Level 1 SFRA for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to provide responses to planning applications. |

## Key messages

The development is likely to be able to proceed if:

- Safe access and egress can be demonstrated in the 1% AEP plus climate change fluvial and surface water events. This is currently demonstrated via Hamilton Way and Rider Haggard Way based on available surface water depth data, but the absence of velocity and hazard data means this should be reviewed further within a site-specific FRA.
- A site-specific FRA demonstrates that the site is not at an increased risk of flooding in the future, that the development of the site does not increase the risk of surface water flooding on the site and to neighbouring properties, and how the natural flood storage provided by the pre-developed site is preserved.
- The area of the topographic depression in the east of the site, showing surface water risk in the present day and climate change 1% AEP scenarios, should be left undeveloped. It should be considered in the drainage design stage and incorporated into the site's drainage and attenuation/SuDS features.
- If flood mitigation measures are implemented then they are tested to ensure that they will not displace water elsewhere (for example, if land is raised to permit development on one area, compensatory flood storage will be required in another).

## Mapping Information

The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning, Surface Water Spatial Planning dataset and Risk of Flooding from Surface Water (RoFSW).

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning – Flood Zones mapping. |
| **Fluvial depth, velocity and hazard mapping** | This site is not shown to be at risk of flooding from fluvial sources. |
| **Surface Water** | The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | The surface water depth mapping is taken from the Flood Map for Planning – Surface Water Spatial Planning Depths – Present Day and Climate Change datasets.<br>The surface water hazard and velocity mapping is taken from the Environment Agency's Risk of Flooding from Surface Water – Hazard and Speed mapping. |
| **Climate change** | In the absence of detailed modelling, the Environment Agency's Rivers and Sea undefended flood risk extents – climate change dataset has been used as an indication of fluvial flood extent during a 1% and 0.1% AEP plus climate change scenario. The Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used as an indication for the 3.3% AEP plus climate change scenario.<br>For surface water risk, a 1% AEP +40% scenario has been considered, which represents the Broadland Rivers Management Catchment for the 2070s from the Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset. This dataset contains depth data which has been used in this assessment but does not contain hazard and velocity data. |

# South Norfolk Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

## Site details

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| **Site Code** | **VCEAR2REV** |
| **Address** | Earsham – Land North of The Street |
| **Area** | 3.47ha |
| **Current land use** | Greenfield |
| **Proposed land use** | Residential |

## Sources of flood risk

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| **Location of the site within the catchment** | The site is located in the middle reaches of the Waveney (Starston Brook – Ellingham Mill) Water Body Catchment, which lies in the Waveney Operational Catchment. The River Waveney is located approximately 500m south of the site, flowing eastwards. |
| **Existing drainage features** | There are no existing drainage features present within the site. Local topography shows the site slopes down gently from the southwest to the northeast, indicating drainage is likely to be towards the village of Earsham. |
| **Fluvial** | **The proportion of site at risk (Environment Agency's Flood Map for Planning)**<br>**FZ3b –** 0%<br>**FZ3a –** 0%<br>**FZ2 –** 0%<br>**FZ1 –** 100%<br><br>*The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).*<br><br>**Available data:**<br>The Environment Agency's (EA) Flood Map for Planning has been used within this assessment, which incorporates the River Waveney detailed hydraulic model.<br><br>**Flood characteristics:**<br>The site is not currently at risk of fluvial flooding. The EA's Flood Map for Planning shows the site is not located within Flood Zone 2 and 3. However, Flood Zone 2 extends near to the eastern corner of the site on The Street. Outputs from the River Waveney model for the 0.1% AEP show maximum depths here of between 0.3m and 0.6m. |
| **Surface Water** | **Proportion of site at risk (Environment Agency's surface water datasets):**<br>**3.3% AEP** – 8%<br>Max depth – 0.15-0.30m<br>Max velocity – <=0.25m/s<br>Max hazard – 'Very Low Hazard/Caution'<br><br>**1% AEP** – 11%<br>Max depth – 0.15-0.30m<br>Max velocity – <=0.25m/s<br>Max hazard – 'Danger for Some'<br><br>**0.1% AEP** – 16% |

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| | Max depth – 0.30-0.60m<br>Max velocity – 0.25-0.5m/s<br>Max hazard – 'Danger for Some'<br><br>*The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP % includes the 3.3% AEP %)*<br><br>**Description of surface water flow paths:**<br><br>During the 3.3% AEP event, an area of ponding emerges within the southeastern boundary which encroaches approximately 60m towards the centre of the site. Maximum depths are 0.15–0.30m in the centre of this ponding. Maximum flood velocity is up to 0.25m/s and maximum hazard is classified as 'Very Low Hazard'.<br><br>During the 1% AEP event, the flood extent of the existing ponding increases and a small area of ponding emerges to the north of this. This additional area of ponding shows maximum depths of 0.15-0.30m. Across the site, flood velocity remains similar to the 3.3% AEP event but hazard increases to 'Danger for Some'.<br><br>The 0.1% AEP event shows an increase in flood extent at both areas of ponding. These areas converge to form a large pond which encroaches approximately 120m towards the northern site boundary. Maximum flood depths increase to 0.30-0.60m in the centre of this ponding. For the northern extent of this ponding, the depths do not exceed 0.15m. Flood velocity does not exceed 0.25m/s and the maximum hazard classification remains at 'Danger for Some'. |
| **Reservoir** | The site is not shown to be at risk of reservoir flooding from the available EA Reservoir Flood Maps. |
| **Groundwater** | The Environment Agency Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The entire site has between a 50% and 75% susceptibility to groundwater flood emergence.<br><br>The JBA Groundwater Emergence Map shows the southwest of the site to have predicted groundwater levels between 0.025 and 0.5m below the ground surface during a 1% AEP flood event. The northeastern section of the site shows groundwater levels to be less than 0.025m below the surface. This suggests there is a risk of groundwater flooding to both surface and subsurface assets, and groundwater may emerge at the surface. If groundwater was to emerge, it would likely flow overland towards the northeast and pond within any topographic low spots.<br><br>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage. |
| **Sewers*** | The site is located in a postcode area (NR35 2) with 42 recorded historic sewer flooding incidences between May 2013 and March 2024, according to information provided by Anglian Water. |
| **Flood history*** | The Environment Agency's historic flooding and recorded flood outlines datasets do not have a record of any flooding on or surrounding the site.<br><br>Norfolk County Council's historic flooding records also do not show any flooding on or surrounding the site. |
| **No additional data on sewer and historic incidents was obtained for the purposes of the June 2026 update.* | |
| **Flood risk management infrastructure** | |
| **Defences** | The site is not protected by any formal flood defences, however engineered high ground is present on the banks of the River Waveney approximately 300m south of the site. |
| **Residual risk** | The site is not shown to be at residual risk. |
| **Emergency planning** | |
| **Flood warning** | The site is not located in an Environment Agency Flood Warning Area. |

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| **Access and egress** | Potential access and egress to the site are via The Street which runs along the southeast and southwest site boundaries, or Old Railway Road along the northwest boundary. The Street can be accessed from Earsham Town Centre approximately 200m northeast of the site, via an intersection between Old Railway Road and The Street immediately west of the site, or via Old Harleston Road to the south.<br><br>The fluvial 1% AEP climate change event does not impact access and egress to the site. The 0.1% AEP climate change event extends along The Street to within 20m of the eastern boundary and also crosses Old Railway Road approximately 300m to the northeast of the site. This may impede access and egress in these directions, however, as velocity and hazard data are not available for this scenario, the potential flood hazard cannot be fully assessed at this stage and should be considered within a site-specific FRA.<br><br>The surface water 1% AEP climate change event shows ponding on The Street to the east of the site to depths of between 0.3m and 0.6m which is likely to impede access and egress in this direction.<br><br>Safe access to the south and west of the site from The Street is likely to be possible via Old Harleston Road and Old Railway Road, which show no fluvial risk and minimal surface water ponding to maximum depths of less than 0.15m. |
| **Dry Island** | The site is not located on a dry island. |
| **Climate change** | |
| **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of fluvial and surface water flooding.<br>• The site is not shown to be at future fluvial flood risk in the 3.3%, 1% or 0.1% AEP climate change scenarios. However, surrounding access roads, in particular The Street to the northeast, are shown to be at risk in the 0.1% AEP plus climate change scenario, which may impact access and egress.<br>• The surface water dataset shows an increase in flood extent during the 1% plus climate change surface water flood event. Flood depths increase to 0.3-0.6m in eastern areas with a maximum hazard of 'Danger for Some'.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.<br>• A site-specific FRA, with the most up-do-date climate change allowances, should be undertaken to investigate the implications of climate change on the site. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br>• Geology at the site consists of:<br>  ○ Bedrock- Crag Group-Sand.<br>  ○ Superficial- River Terrace Deposits, sand and gravel.<br>• Soils at the site consist of:<br>  ○ Freely draining slightly acid sandy soils.<br>**SuDS**<br>• Groundwater levels are indicated to be at or very near (within 0.025m) ground level and there is a risk of groundwater flooding at the surface during a 1% AEP event, which may flow to and pool within topographic low spots. Detention and attenuation features should be designed to prevent groundwater ingress from impacting hydraulic capacity and structural integrity. Additional site investigation work may be required to support the detailed design of the drainage system. This may include groundwater monitoring to demonstrate that a sufficient unsaturated zone has been provided above the highest occurring groundwater level. Below ground development such as basements are not appropriate at this site<br>• BGS data indicates that the underlying geology is sand which is likely to be free draining. This should be confirmed through infiltration testing.<br>• The entire site is not located within a Groundwater Source Protection Zone. |

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| | • The site is not located within a historic landfill site.<br>• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. 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>• The surface water mapping indicates the presence of surface water flow paths during all AEP events. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.<br>• 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. |
| **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 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>• Development at this site should not increase flood risk either on or off site. 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, blue/green corridors, permeable surfaces and rainwater harvesting must be considered in the design of the site.<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 clean improve 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. Where slopes are >5%, features should follow contours or utilise check dams to slow flows. |
| **NPPF and planning implications** | |
| **Exception Test requirements** | 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.<br>The entire site lies outside of Flood Zone 2 and 3 but as it is predicted to be significantly affected by surface water flooding, the Exception Test is required. |
| **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• The developer will need to demonstrate to the satisfaction of the local planning authority that the development will be safe for its lifetime taking account of the vulnerability of its users, a site-specific flood risk assessment may need to show that appropriate evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with an extreme flood event. (Para 048 Flood Risk and Coastal Change PPG).<br>• Whilst the site lies entirely outside of Flood Zones 2 and 3, a site-specific Flood Risk Assessment is required as the site is greater than one hectare and at risk of surface water flooding and groundwater emergence.<br>• The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; the Joint Core Strategy as part of the Greater Norwich Development Partnership for Broadland, Norwich and South Norfolk; and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document.<br>• Consultation with the Local Authority and the Lead Local Flood Authority should be undertaken at an early stage. |

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| | **Guidance for site design and making development safe:**<br>• Development should aim to be steered away from areas of surface water flood risk in the east of the site, preserving these spaces as green infrastructure.<br>• Safe access and egress will need to be demonstrated in the 1% AEP event plus climate change fluvial and rainfall events, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.<br>• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.<br>• Surface water should be discharged at the pre-development (greenfield) runoff rate which presents wider opportunities to improve biodiversity and amenity as well as climate change adaptation. An integrated flood risk management and sustainable drainage scheme for the site is advised. It is essential that a detailed model of surface water flooding, using the existing drainage system, topographical and asset survey is constructed at the FRA stage. This will determine the risk from surface water flooding further and help to ensure that overland flows do not overwhelm future sustainable drainage features.<br>• Developers should refer to Norfolk County Council's 'Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning Guidance Document' and the Level 1 SFRA for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to provide responses to planning applications. |

## Key messages

The development is likely to be able to proceed if:

- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, with development to be steered away from the southeastern site boundary.
- Space for surface water to be stored on the site is provided and rainwater harvesting should be considered.
- Safe access and egress routes should be demonstrated in the 1% AEP plus climate change fluvial and surface water events. This initial assessment has shown safe access and egress are likely to be possible to the south and west during both fluvial and surface water events.
- The site layout must adopt a sequential approach by steering more vulnerable aspects of the development away from the areas of surface water flood risk in the east of the site.
- Finished Floor Levels should be raised above the expected height of flooding in line with the EA's guidance and any raising of ground levels should ensure that flood risk is not increased elsewhere.
- Mapping indicates groundwater levels close to the ground surface within the site, basements are unlikely to be permitted unless supported in the FRA by further ground investigations which will ascertain the areas of highest risk of groundwater flooding across the site.

## Mapping Information

The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning, their Surface Water Spatial Planning Extents and their Risk of Flooding from Surface Water (RoFSW) dataset.

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning – Flood Zones mapping. |
| **Fluvial** | This site is not shown to be at risk of flooding from fluvial sources. |
| **Surface Water** | The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | The surface water depth mapping is taken from the Flood Map for Planning – Surface Water Spatial Planning Depths – Present Day and Climate Change datasets.<br>The surface water hazard and velocity mapping is taken from the Environment Agency's Risk of Flooding from Surface Water – Hazard and Speed mapping. |
| **Climate change** | The Environment Agency's Rivers and Sea undefended flood risk extents – climate change dataset has been used as an indication of fluvial flood extent during a 1% and 0.1% AEP |

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| | plus climate change scenario. The Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used as an indication for the 3.3% AEP plus climate change scenario.<br>For surface water risk, a 1% AEP +40% scenario has been considered, which represents the Broadland Rivers Management Catchment for the 2070s from the Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset. This dataset contains depth data which has been used in this assessment but does not contain hazard and velocity data. |

# South Norfolk Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

## Site details

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| **Site Code** | **VCPSM1REV (SN1052REV)** |
| **Address** | Norwich Road, Pulham St. Mary, South Norfolk, 20630 85491 |
| **Area** | 3.97ha |
| **Current land use** | Greenfield |
| **Proposed land use** | Residential |

## Sources of flood risk

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| **Location of the site within the catchment** | The site lies within the Starston Brook Water Body Catchment, which lies in the Waveney Operational Catchment. The site is located 420m north of the Starston Brook, a tributary of the River Waveney. The confluence between Starston Brook and the River Waveney is approximately 7.5km downstream to the east of the site. An unnamed watercourse flows 330m to the northwest of the site, towards Starston Brook, and is culverted beneath Harleston Road. The confluence between this unnamed tributary and the Starston Brook is 490m from the southwest of the site. |
| **Existing drainage features** | Local topography shows the site slopes gradually downwards towards the southeast corner. This indicates drainage is likely to be in a southeast direction, towards Starston Brook. |
| **Fluvial** | **The proportion of site at risk (Environment Agency's Flood Map for Planning):**<br>**FZ3b –** 0%<br>**FZ3a –** 0%<br>**FZ2 –** 0%<br>**FZ1 –** 100%<br><br>*The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).*<br><br>**Available data:**<br>The Environment Agency's (EA) Flood Map for Planning has been used within this assessment.<br><br>**Flood characteristics:**<br>The site is not currently at risk of fluvial flooding. The EA's Flood Map for Planning shows the site is not located within Flood Zone 2 and 3. |
| **Surface Water** | **Proportion of site at risk (Environment Agency's surface water datasets):**<br>**3.3% AEP** – 1%<br>Max depth – 0.30-0.60m<br>Max velocity – <=0.25m/s<br>Max hazard – 'Danger for Some'<br><br>**1% AEP** – 2%<br>Max depth – 0.30-0.60m<br>Max velocity – 0.25-0.5m/s<br>Max hazard – 'Danger for Most' |

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| | **0.1% AEP** – 2%<br>Max depth – 0.30-0.60m<br>Max velocity – 0.25-0.5m/s<br>Max hazard – 'Danger for Most'<br><br>*The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP % includes the 3.3% AEP %)*<br><br>**Description of surface water flow paths:**<br><br>Surface water flood risk appears along Norwich Road, which borders the south of the site, and Poppy's Lane, which borders the east of the site. The extent of these flow paths minorly encroach the site during all AEP events.<br><br>During the 3.3% AEP event, there is a surface water flow path present within the western and southern site boundaries. Two areas of ponding on Poppy's Lane minorly encroach the eastern site boundary to maximum depths of 0.15-0.3m. Maximum flood depths are 0.3-0.6m at areas of ponding within the southern site boundary and maximum velocities are up to 0.25m/s. Maximum hazard is classified as 'Danger for Some' at areas of ponding within the southwestern and eastern site boundaries.<br><br>During the 1% AEP flood event, the largest increase in flood extent is in the southwest corner of the site although it remains along the site boundary and does not encroach further onto the site. Here, predicted flood depths reach 0.3-0.6m. However, additional areas of ponding which emerge at the southern flow path show maximum depths below 0.15m. Maximum flood velocities exceed 0.5m/s but do not exceed 1m/s and the maximum hazard classification is 'Danger for Most' at the southern and eastern site boundaries.<br><br>During the 0.1% AEP flood event, the surface water flow path present in the southwest of the site increases along the boundary and increased ponding on Poppy's Lane encroaches the eastern site boundary. These additional areas of flooding show predicted flood depths to be less than 0.15m. The flow path to the south of the site on Norwich Road shows predicted flood depths of 0.3-0.6m. Maximum velocities reach 0.5m/s at areas of ponding within the western and southern site boundaries and a greater proportion of the flow path is classified as a 'Danger for Most'.<br><br>As the flow paths in all AEP events are limited in extent and remain along the site boundaries, it is not expected they would impede development when surface water is considered in the drainage strategy. |
| **Reservoir** | The site is not shown to be at risk of reservoir flooding from the available EA Reservoir Flood Maps. |
| **Groundwater** | The Environment Agency Areas Susceptible to Groundwater Flooding dataset, provided as 1km grid squares, shows the susceptibility of an area to groundwater flood emergence. The entire site has between a 25% and 50% susceptibility to groundwater flood emergence.<br><br>The JBA Groundwater Emergence Map shows the entire site at 'No risk'. This means that there is a negligible risk from groundwater flooding due to the nature of the local geological deposits.<br><br>The difference in the two datasets is likely to be due to differing spatial resolutions and modelling approaches. As the JBA mapping is more detailed and considers a wider range of factors, it is deemed more representative of groundwater risk. Therefore, groundwater flooding is unlikely to represent a constraint to development at this site.<br><br>This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage. |
| **Sewers*** | The site is located in a postcode area (IP21 4) where there are 86 records of historic sewer flooding between May 2013 and March 2024 according to information provided by Anglian Water. |
| **Flood history*** | The Environment Agency's historic flooding and recorded flood outlines datasets do not have a record of any flooding on or surrounding the site.<br><br>Norfolk County Council's historic flooding records also do not show any flooding on or surrounding the site. |

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| **No additional data on sewer and historic incidents was obtained for the purposes of the June 2026 update.* | |
| **Flood risk management infrastructure** | |
| **Defences** | The site is not protected by any formal flood defences. |
| **Residual risk** | The unnamed tributary to the west of the site is culverted under Harleston Road. However, this is unlikely to pose a residual risk to the site in the event of a blockage, due to the site being located at a higher elevation. |
| **Emergency planning** | |
| **Flood warning** | The site is not located in an Environment Agency Flood Warning Area. |
| **Access and egress** | Access and egress at the site are likely to be provided via Norwich Road to the south or Poppy's Lane to the east. In the immediate vicinity of the site, these two roads are not shown to be impeded by fluvial flooding in the EA's FMfP. However, approximately 330m northeast of the site, the unnamed tributary of Starston Brook may impede access along Harleston Road in this direction, as extents are shown across the road in the 1% AEP plus climate change event.<br><br>During the 1% AEP plus climate change surface water flood event, a surface water flow path is present along Poppy's Lane, which borders the east of the site, and Mill Lane, which provides access to Poppy's Lane from the south. Maximum depths along Mill Lane do not exceed 0.15m and are therefore unlikely to impede vehicular access and egress. However, access and egress could be impeded via Poppy's Lane due to predicted flood depths of up to 0.60m. |
| **Dry Island** | The site is not located on a dry island. |
| **Climate change** | |
| **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of fluvial and surface water flooding.<br>• The site is not shown to be at future fluvial flood risk.<br>• The Surface Water Spatial Planning Dataset shows a predicted increase in flood extent along the two flow paths on Poppy's Lane and Norwich Road in the 1% AEP plus climate change surface water flood event. These flow paths encroach the eastern and southern boundaries of the site and show maximum depths of 0.3–0.6m within the site. Additional areas of ponding which emerge in the southwest corner of the site show maximum flood depths of 0.15–0.3m.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA.<br>• A site-specific FRA, with the most up-do-date climate change allowances, should be undertaken to investigate the implications of climate change on the site. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br>• Geology at the site consists of:<br>  ○ Bedrock- Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsmouth Chalk Formation.<br>  ○ Superficial- Lowestoft Formation- Diamicton.<br>• Soils at the site consist of:<br>  ○ Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.<br><br>**SuDS**<br>• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through |

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| | additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.<br>• BGS data indicates that the underlying geology is chalk which is likely to be free draining. This should be confirmed through infiltration testing.<br>• The entire site is located within a Groundwater Source Protection Zone 3. Infiltration techniques may not be suitable and should only be used following the granting of any required environmental permits from the Environment Agency for Zones 2, 3 and 4 although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints.<br>• The site is not located within a historic landfill site.<br>• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. 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>• The Surface Water Spatial Planning mapping indicates the presence of surface water flow paths during the 0.1% AEP event. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.<br>• 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. |
| **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 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>• Development at this site should not increase flood risk either on or off site. 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, blue/green corridors, permeable surfaces and rainwater harvesting must be considered in the design of the site.<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 clean improve 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. Where slopes are >5%, features should follow contours or utilise check dams to slow flows. |
| **NPPF and planning implications** | |
| **Exception Test requirements** | 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.<br>The entire site lies outside of Flood Zone 2 and 3 and is not predicted to be significantly affected by surface water flooding, therefore the Exception Test is not required. |
| **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• The developer will need to demonstrate to the satisfaction of the local planning authority that the development will be safe for its lifetime taking account of the vulnerability of its users, a site-specific flood risk assessment may need to show that appropriate evacuation procedures and flood response infrastructure are in place to manage the residual risk associated with an extreme flood event. (Para 048 Flood Risk and Coastal Change PPG). |

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| | • Whilst the site lies entirely outside of Flood Zones 2 and 3, a site-specific Flood Risk Assessment is required as the site is greater than one hectare and at risk of surface water flooding.<br>• The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance; the Joint Core Strategy as part of the Greater Norwich Development Partnership for Broadland, Norwich and South Norfolk; and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document.<br>• Consultation with the Local Authority and the Lead Local Flood Authority should be undertaken at an early stage.<br>**Guidance for site design and making development safe:**<br>• Development should aim to be steered away from areas of surface water flood risk in the southwest of the site, preserving these spaces as green infrastructure.<br>• Safe access and egress will need to be demonstrated in the 1% AEP event plus climate change fluvial and rainfall events, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.<br>• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.<br>• Surface water should be discharged at the pre-development (greenfield) runoff rate which presents wider opportunities to improve biodiversity and amenity as well as climate change adaptation. An integrated flood risk management and sustainable drainage scheme for the site is advised.<br>• Developers should refer to Norfolk County Council's 'Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning Guidance Document' and the Level 1 SFRA for information on SuDS for guidance on the information required by the LLFA from applicants to enable it to provide responses to planning applications. |

## Key messages

The development is likely to be able to proceed if:

- A carefully considered and integrated flood resilient and sustainable drainage design is put forward, with development to be steered away from the southern site boundary.
- Consideration should be given to the siting of safe access and egress routes, and these must not impede surface water flows.

## Mapping Information

The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning, Surface Water Spatial Planning dataset and Risk of Flooding from Surface Water (RoFSW).

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning – Flood Zones mapping. |
| **Fluvial depth, velocity and hazard mapping** | This site is not shown to be at risk of flooding from fluvial sources. |
| **Surface Water** | The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | The surface water depth mapping is taken from the Flood Map for Planning – Surface Water Spatial Planning Depths – Present Day and Climate Change datasets.<br>The surface water hazard and velocity mapping is taken from the Environment Agency's Risk of Flooding from Surface Water – Hazard and Speed mapping. |
| **Climate change** | In the absence of detailed modelling, the Environment Agency's Rivers and Sea undefended flood risk extents – climate change dataset has been used as an indication of fluvial flood extent during a 1% and 0.1% AEP plus climate change scenario. The Rivers |

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| | and Sea 3.3% defended flood risk extents - climate change dataset has been used as an indication for the 3.3% AEP plus climate change scenario.<br>For surface water risk, a 1% AEP +40% scenario has been considered, which represents the Broadland Rivers Management Catchment for the 2070s from the Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset. This dataset contains depth data which has been used in this assessment but does not contain hazard and velocity data. |

# South Norfolk Council Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables

## Site details

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| **Site Code** | **VC SPO1REVA** |
| **Address** | Land at Spooner Row |
| **Area** | 3.57ha |
| **Current land use** | Greenfield |
| **Proposed land use** | Residential |

## Sources of flood risk

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| **Location of the site within the catchment** | The site is located in the middle reaches of the Tiffey (u/s Wymondham STW) Catchment, which lies in the Yare operational catchment, in Spooner Row. Bays River, a tributary of the River Tiffey, has an unnamed tributary which borders the east of the site. The River Tiffey flows from its source near Hethel, through Wymondham, Kimberley, Carleton Forehoe, Wramplingham and Barford where it joins the River Yare before it reaches the sea at Great Yarmouth. |
| **Existing drainage features** | Local topography shows that the site slopes from maximum elevations of 46.77 mAOD in the southwest gently downhill towards topographic low spots, showing elevations of 41.63 mAOD on the left bank of the unnamed tributary of Bays River, located immediately east of the site. This watercourse is culverted immediately east of the site beneath Bunwell Road and approximately 60m north of the site beneath Queen Street. |
| **Fluvial** | **The proportion of site at risk (Environment Agency's Flood Map for Planning Flood Zones):**<br>**FZ3b – 4**%<br>**FZ3a**- **5%**<br>**FZ2 –12**%<br>**FZ1 – 88%**<br><br>*The % Flood Zones quoted show the % of the site at flood risk from that particular Flood Zone/event, including the percentage of the site at flood risk at a higher risk zone, e.g. FZ2 includes the FZ3 %. FZ1 is the remaining area outside FZ2 (FZ2 + FZ1 = 100%).*<br><br>**Available data:**<br>The Environment Agency's (EA) Flood Map for Planning has been used within this assessment.<br><br>**Flood characteristics:**<br>The extent of Flood Zone 3b covers the northeast corner of the site and part of the eastern border. The Flood Zone 3a extent covers similar areas to Flood Zone 3b with a marginal increase further into the site. The extent of Flood Zone 2 further increases, encroaching approximately 70m towards the centre of the site from the northeastern corner. |
| **Surface Water** | **Proportion of site at risk (Environment Agency's surface water dataset):**<br>**3.3% AEP** – <1%<br>Max depth – 0.15-0.3m<br>Max velocity – 0.5-1.0m/s<br>Max hazard – 'Very Low Hazard/Caution'<br>**1% AEP** – <1% |

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| | Max depth – 0.15-0.3m<br>Max velocity – 0.5-1.0m/s<br>Max hazard – 'Danger for Some'<br>**0.1% AEP** – <1%<br>Max depth – 0.15-0.3m<br>Max velocity – 0.5-1.0m/s<br>Max hazard – 'Danger for Some'<br><br>*The % SW extents quoted show the % of the site at surface water risk from that particular event, including the percentage of the site at flood risk at a higher risk zone (e.g. 1% AEP % at risk includes the 3.3% AEP % at risk)*<br><br>**Description of surface water flow paths:**<br><br>A surface water flow path flows along Bunwell Road, situated immediately adjacent to the eastern site boundary.<br><br>During the 3.3% AEP, the extent of this flow path minorly encroaches the site via the eastern boundary, with most of the ponding remaining on Bunwell Road. Maximum flood depths do not exceed 0.3m, maximum velocities are up to 1.0m/s and maximum hazard is classified as 'Very Low Hazard/Caution'.<br><br>The flood extent during the 1% AEP event affects similar areas with a marginal increase in extent. Flood depth and velocity remain similar to in the 3.3% AEP event. However, hazard classification increases to 'Danger for Some' at the eastern boundary.<br><br>During the 0.1% AEP, the flow path encroaches the site in an additional small area along the northeastern boundary as well as in the southern corner. Flood velocities are up to 1.0m/s and hazard remains 'Danger for Some' on Bunwell Road at the eastern boundary. Additional areas of ponding at the southern boundary show flood depths up to 0.3m, velocities up to 0.25m/s, and maximum hazard of 'Danger for Some'. |
| **Reservoir** | The site is not shown to be at risk of reservoir flooding during the 'dry day' or 'wet day' scenario from the EA reservoir flood maps. |
| **Groundwater** | The JBA Groundwater Emergence map shows the entire site to be at negligible risk of groundwater flooding due to the nature of the local geological deposits.<br><br>The assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific FRA stage. |
| **Sewers*** | The site is located in a postcode (NR18 9) with 43 recorded historic sewer flooding between May 2013 and March 2024 according to information provided by Anglian Water. |
| **Flood history*** | The Environment Agency's Historic Flood Map and recorded flood outlines datasets do not have a record of any flooding on or surrounding the site.<br><br>Norfolk County Council's historic flooding records also do not show any flooding to the site itself. |
| **No additional data on sewer and historic incidents was obtained for the purposes of the June 2026 update.* | |
| **Flood risk management infrastructure** | |
| **Defences** | This site is not protected by any formal flood defences. |
| **Residual risk** | The unnamed tributary of Bays River is culverted immediately east of the site beneath Bunwell Road. This creates a potential blockage risk where water could back up and enter the site via the eastern boundary, exacerbating existing surface water ponding here.<br><br>The tributary is also culverted north of the site beneath Queen Street. This creates a blockage risk on Queen Street and an associated increased risk of ponding with water backing up into the northern boundary of the site.<br><br>The residual risk of blockage associated with these culverts should be investigated in a site-specific FRA. |

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| **Emergency planning** | |
| **Flood warning** | The site is not located in an Environment Agency Flood Alert or Flood Warning Area. |
| **Access and egress** | The site can currently be accessed via Bunwell Road along the eastern site boundary. There is also potential for access and egress routes via Queen Street to the northwest of the site.<br><br>During the 3.3%, 1% and 0.1% AEP climate change fluvial events, access and egress via the northern section of Bunwell Road is likely to be impeded by fluvial flooding. The nearby road intersection also lies within this flood extent which could restrict access to Bunwell Road from the northwest. There is currently no available depth, hazard, or velocity information available within the EA Flood Map for Planning, therefore, detailed hydraulic modelling, including culvert blockage scenarios, is likely to be required during a site-specific Flood Risk Assessment to confirm the level of risk to access and egress routes.<br><br>Access to Bunwell Road from the south is shown to be unaffected by fluvial flooding, making access and egress viable in this direction. Queen Street to the west of the site is also not shown to be at fluvial flood risk.<br><br>Bunwell Road is shown to be impacted during the 1% AEP climate change surface water flood event. Access from the northeast corner of the site onto Bunwell Road is unlikely to be impeded with minimal risk shown. However, the flow path along Bunwell Road to the immediate east of the site is likely to impede access and egress as depths are predicted to reach up to 0.6m. Additionally, a major flow path on Queen Street shows maximum depths of 0.9-1.2m which would likely restrict vehicular access in this direction.<br><br>Safe access and egress will need to be demonstrated in the 1% AEP plus climate change surface water event and fluvial events. Raising of access routes must not impact on flow routes.<br><br>Consideration should be given to the siting of access points with respect to areas of flood risk. A Flood Warning and Evacuation plan should be in place for the site. Alternatively, risk could be managed by inclusion of a higher refuge and a flood response plan that meets the requirements of the Local Council and their Emergency Planner, considering the likely warning time and duration of flooding. |
| **Dry Islands** | The site is not located on a dry island. |
| **Climate change** | |
| **Implications for the site** | • Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard and frequency of both fluvial, tidal and surface water flooding.<br>• The fluvial 1% AEP plus climate change layer has been used in this assessment. The flood extent covers the eastern corner of the site, where the unnamed tributary of Bays River intersects the eastern boundary.<br>• There is currently no available depth, hazard, or velocity information available within the EA Flood Map for Planning. Therefore, detailed hydraulic modelling, including culvert blockage scenarios, is likely to be required during a site-specific Flood Risk Assessment including fluvial modelling of the latest climate change uplifts.<br>• Climate change should also be considered for surface water events; at the site-specific stage, the 1% AEP +40% event is considered as part of surface water drainage strategies, or surface water modelling. The mapping suggests that the site is not likely to be at increased risk of surface water flooding in the 1% AEP climate change scenario, as the extent only marginally increases from present day, remaining along the site boundary.<br>• Developers should consider SuDS strategies to reduce the impacts of climate change from surface water in a detailed site-specific FRA and drainage strategy. |
| **Requirements for drainage control and impact mitigation** | |
| **Broad-scale assessment of possible SuDS** | **Geology & Soils**<br>• Geology at the site consists of: |

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| | ○ Bedrock- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated).<br>○ Superficial- Lowestoft Formation- Diamicton. There is a band of alluvium comprised of clay, silt, sand and gravel along the northeastern site boundary.<br>• Soils at the site consist of:<br>○ Slightly acid loamy and clayey soils with impeded drainage.<br>**SuDS**<br>• The site is not considered to be susceptible to groundwater flooding, due to the nature of the local geological conditions. This should be confirmed through additional site investigation work. Below ground development such as basements may still be susceptible to groundwater flooding.<br>• BGS data indicates that the underlying geology is chalk which is likely to be free draining. This should be confirmed through infiltration testing.<br>• The entire site is located within a Groundwater Source Protection Zone 3. Infiltration techniques may not be suitable and should only be used following the granting of any required environmental permits from the Environment Agency for Zones 2, 3 and 4 although it is possible that infiltration may not be permitted. Proposed SuDS should be discussed with relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible opportunities and constraints.<br>• The site is not located within a historic landfill site.<br>• Surface water discharge rates should not exceed the existing greenfield runoff rates for the site. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. 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>• 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. |
| **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 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>• Development at this site should not increase flood risk either on or off site. 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, blue/green corridors, permeable surfaces and rainwater harvesting must be considered in the design of the site.<br>• Opportunities to incorporate filtration techniques such as filter strips, filter drains and bioretention areas, along the northern site boundary, must be considered.<br>• 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 clean improve 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. Where slopes are >5%, features should follow contours or utilise check dams to slow flows. |
| **NPPF and planning implications** | |
| **Exception Test requirements** | • The Local Authority will need to confirm that the Sequential Test has been carried out in line with national guidelines. The Sequential Test needs to be passed before the Exception Test is applied. The NPPF classifies residential development as 'More Vulnerable'.<br>• The Exception Test is not required for this site as South Norfolk Council confirmed no development is proposed within the area of Flood Zone 3a located in the north- |

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| | eastern corner of the site. The Exception Test would only be necessary if 'More Vulnerable' development were proposed within this area. 'More Vulnerable' development is not permitted in the area of the site within Flood Zone 3b. |
| **Requirements and guidance for site-specific Flood Risk Assessment** | **Flood Risk Assessment:**<br>• At the planning application stage, a site-specific Flood Risk Assessment will be required as the proposed development site is:<br>  ○ in Flood Zones 2 and 3<br>  ○ Greater than 1 hectare<br>• All sources of flooding, particularly the fluvial risk and risk from surface water should be considered as part of a site-specific flood risk assessment.<br>• The site-specific FRA should be carried out in line with the National Planning Policy Framework; Flood Risk and Coastal Change Planning Practice Guidance, South Norfolk Council's Local Plan policies, and the Norfolk County Council Lead Local Flood Authority's Statutory Consultee for Planning Guidance Document.<br>• Consultation with the Local Authority, Lead Local Flood Authority and the Environment Agency should be undertaken at an early stage.<br>• The development should be designed to ensure that mitigation measures are in place to ensure the development does not flood.<br>**Guidance for site design and making development safe:**<br>• Safe access and egress will need to be demonstrated in the 1 % AEP plus climate change fluvial and rainfall events, using the depth, velocity and hazard outputs. Raising of access routes must not impact on surface water flow routes or contribute to loss of floodplain storage. Consideration should be given to the siting of access points with respect to areas of surface water flood risk.<br>• The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, to ensure that runoff from the development is not increased by development across any ephemeral surface water flow routes. A drainage strategy should help inform site layout and design to ensure there is no increase in runoff beyond current greenfield rates.<br>• Areas at risk from surface water flooding should ideally be integrated into green infrastructure, which presents wider opportunities to improve biodiversity and amenity as well as climate change adaptation. Integrated flood risk management and sustainable drainage scheme for the site is advised.<br>• The proposed site should discharge surface water at the original pre-development (greenfield) runoff rate. If this is not possible, a significant reduction in the current rate of discharge should be achieved and agreed with the relevant drainage body (LLFA, IDB or Anglian Water). |

## Key messages

The development is likely to be able to proceed if:

- Safe access and egress routes are demonstrated in the 1% AEP plus climate change fluvial and surface water events. This initial assessment has shown safe access and egress are likely to be impeded and mitigation measures may be required.
- A buffer of at least 8m should be maintained between the watercourse within the site and any built development.
- A detailed hydraulic model of the unnamed tributary of River Bays present at the site, may be required at FRA stage to accurately represent the risk from this watercourse, including the appropriate allowances for climate change. This should include assessment of the residual risk to the site from blockage of the culverts present beneath Bunwell Road and Queen Street.
- The site layout should adopt a sequential approach by steering the most vulnerable aspects of the development outside of Flood Zone 2 and 3 in the northeast corner of the site. Development should also steer away from areas at risk of surface water flooding along the eastern boundary of the site.
- The Exception Test will not be required for this site unless 'More Vulnerable' development is proposed in Flood Zone 3a which covers the northeast of the site.

## Mapping Information

The key datasets used to make planning recommendations regarding this site were the Environment Agency's Flood Map for Planning, Surface Water Spatial Planning dataset and Risk of Flooding from Surface Water (RoFSW).

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| **Flood Zones** | Flood Zones 2 and 3 have been taken from the Environment Agency's Flood Map for Planning – Flood Zones mapping. |
| **Fluvial depth, velocity and hazard mapping** | There is no depth, velocity or hazard information available for fluvial flood risk at the site. |
| **Surface Water** | The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day dataset has been used to define areas at risk from surface water flooding. |
| **Surface water depth, velocity and hazard mapping** | The surface water depth mapping is taken from the Flood Map for Planning – Surface Water Spatial Planning Depths – Present Day and Climate Change datasets.<br>The surface water hazard and velocity mapping is taken from the Environment Agency's Risk of Flooding from Surface Water – Hazard and Speed mapping. |
| **Climate change** | In the absence of detailed modelling, the Environment Agency's Rivers and Sea undefended flood risk extents – climate change dataset has been used as an indication of fluvial flood extent during a 1% and 0.1% AEP plus climate change scenario. The Rivers and Sea 3.3% defended flood risk extents - climate change dataset has been used as an indication for the 3.3% AEP plus climate change scenario.<br>For surface water risk, a 1% AEP +40% scenario has been considered, which represents the Broadland Rivers Management Catchment for the 2070s from the Flood Map for Planning – Surface Water Spatial Planning Extents – Climate Change dataset. This dataset contains depth data which has been used in this assessment but does not contain hazard and velocity data. |