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Level 2 Strategic Flood Risk Assessment

Site EA033

Prepared for: Southend-on-Sea City Council

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1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for EA033. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the Southend-on-Sea City Council Level 1 SFRA and read the Southend-on-Sea City Council Level 2 SFRA Main Report and is therefore familiar with the terminology used in this report.

1.1 Site details

- Location: The area flanking both sides of Progress Road in Eastwood, situated in the north-western part of Southend-on-Sea.
- Site area: 21.5ha
- Existing site use: Employment area with existing buildings onsite.
- Proposed site use: Employment, providing additional floorspace.

1.2 Topography

Figure 1-1 shows the topography of the site represented by the Environment Agency (EA) 1m resolution LiDAR. Higher ground is concentrated in the southern part of the site, including the area around Stephenson Road. The site reaches its maximum elevation of 47.2mAOD at the south-eastern boundary. Progress Road runs centrally through the site on an incline. Ground levels fall towards the north where Eastwood Brook flows eastwards within the site parallel to the northern site boundary. The lowest elevation occurs along the path of this watercourse, at 25.0mAOD.

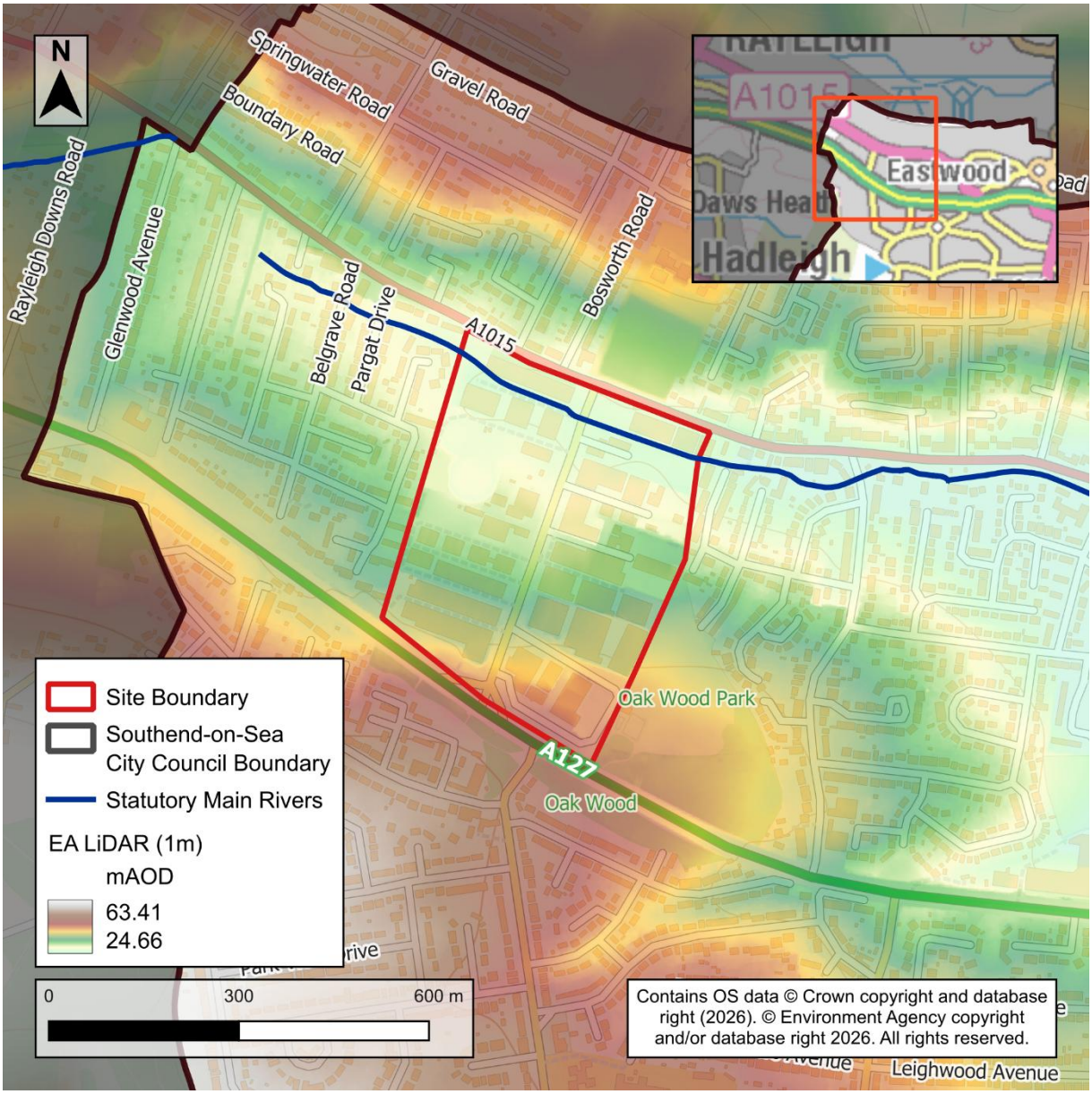


Figure 1-1: Topography of the site.

1.3 Geology and soils

Geology at the site consists of:

- Bedrock - Predominantly London Clay Formation, comprised of clay, silt and sand. The southeast of the site is underlain by Claygate Member, also comprised of clay, silt, and sand.
- Superficial - The area along the watercourse in the north of the site is underlain by alluvium, comprised of clay, silt, sand, and gravel. The superficial geology underlying the rest of the site is head, comprised of clay and silt.

Soils at the site consist of slightly acid loamy and clayey soils with impeded drainage.

The likely impact of the geology and soils on drainage within the site is discussed within Section 5.

2 Sources of flood risk

2.1 Location of site within the catchment

The site is located in the catchment of Eastwood Brook, a tributary of the tidal River Roach, within the upper reaches of the Crouch and Roach Operational Catchment. Eastwood Brook flows eastwards through the site, parallel to the northern boundary. The watercourse originates south of Brook Road in Rochford District, just over 2km west of the site. Pound Woods and Tile Wood lie upstream of the site, to the south of the watercourse, together with several areas of rural land. North of the watercourse, upstream of the site, there are residential developments along with industrial areas located near the source of the watercourse.

2.2 Existing drainage features

Eastwood Brook, a statutory main river, flows eastwards through the site, parallel to the northern boundary. This watercourse is culverted for a distance exceeding 100m within the site, passing beneath Progress Road.

2.3 Fluvial and tidal

2.3.1 EA's Flood Map for Planning

Based on the EA's Flood Map for Planning (FMfP) Flood Zones (accessed 21 April 2026) and Flood Zone 3b (functional floodplain), defined as set out in the Southend-on-Sea Level 1 SFRA, the percentage areas of the site within each Flood Zone are stated in Table 2-1 and can be viewed in Figure 2-1. The FMfP does not consider the benefits from flood defence infrastructure.

The FMfP shows that 'rivers' are the source of flooding to the site, from Eastwood Brook. The majority of the site (87%) is not at risk of fluvial flooding. 1% of the site is within Flood Zones 3b, but this flood extent remains in-channel. Flood Zone 3a shows some small areas of out of bank flood risk in the northwest, covering 2% of the site. Fluvial flood risk extends further within Flood Zone 2, encompassing approximately 13% of the site, but remaining by Eastwood Brook in the north.

Table 2-1: Present day fluvial flood risk based on the EA's FMfP.

Flood Zones	Flood Zone 3b (%)	Flood Zone 3a (%)	Flood Zone 2 (%)	Flood Zone 1 (%)
Percentage of site at risk* (%)	1	2	13	87

**This shows the percentage of the site at flood risk from a particular flood zone or event, including the percentage of the site at flood risk at a higher risk zone, e.g. Flood Zone 2 includes the Flood Zone 3a and 3b percentage. Flood Zone 1 + Flood Zone 2 = 100%.*

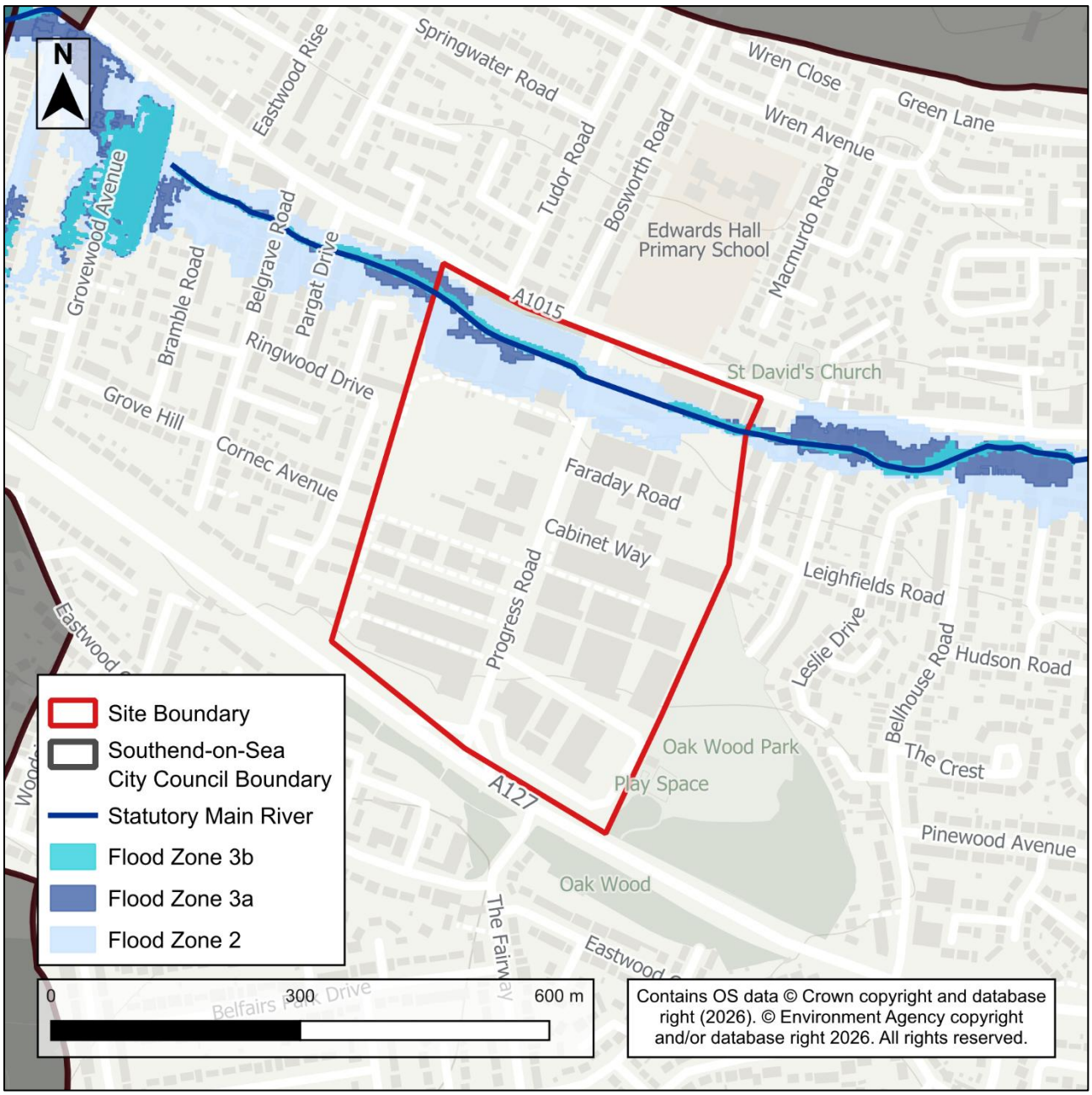


Figure 2-1: Present day fluvial flood risk, based on the EA FMfP and Rivers and Sea 3.3% AEP defended extent.

2.3.2 Fluvial - present day

The EA's 2017 Eastwood and Noblesgreen detailed hydraulic model has been used within this assessment. This model has been incorporated into the EA's FMfP.

As shown in Table 2-2, Flood Zone 3b covers 1% of the site, following the course of Eastwood Brook in the north. Modelled outputs in this location are 2D only, meaning they only show out-of-bank flooding. In the defended 3.3% AEP event (Flood Zone 3b), detailed modelling suggests the channel will remain wet in normal and flood conditions, with flood water remaining in channel within the site. As there is no out-of-bank flooding, there is no depth, hazard, or velocity information for this event.

Flood Zone 3a shows water overtopping along both banks in the northwest of the site, and north of the watercourse by the eastern border. This increases the percentage of the site at risk of flooding by 1%. Maximum depths reach between 0.15m and 0.3m south of the watercourse in the northwest, but most of the depths are below 0.15m. Velocities do not exceed 0.25m/s, except for south of the watercourse in the northwest where they exceed 0.25m/s but not 0.5m/s. Most of the area of flood risk is considered a 'Very Low Hazard', but there is one small area in the northwest that has a 'Danger for Some' hazard classification.

Flood Zone 2 sees the fluvial risk in the site increase by 11%. The risk expands across the northwest, particularly south of Eastwood Brook, travelling over Progress Road and fully covering Brunel Road. Depths increase significantly, reaching between 1.2m and 2.3m south of the watercourse near the northwestern border, and in a small area north of Brunel Road. However, most of the depths are between 0.3m and 0.6m. Maximum velocities exceed 2.0m/s by the northwestern boundary and reach 3.6m/s in an area north of the watercourse, northeast of Brunel Road. While there are a number of fast flowing areas, the majority of the velocities do not exceed 0.25m/s. Much of Flood Zone 2 within the site has a 'Danger for Most' hazard classification, with some areas, particularly south of the watercourse in the northwest, being 'Danger for All'.

Depths for the 1% and 0.1% AEP modelled events are shown in Figure 2-2 and Figure 2-3. Velocities for the 1% and 0.1% AEP modelled events are shown in Figure 2-4 and Figure 2-5. The hazard classifications for the 1% and 0.1% AEP modelled events are shown in Figure 2-6 and Figure 2-7.

Table 2-2: Present day fluvial flood risk based on the EA's FMfP/2017 Eastwood and Noblesgreen hydraulic model.

Flood Zones	Flood Zone 3b (%)	Flood Zone 3a (%)	Flood Zone 2 (%)	Flood Zone 1 (%)
Percentage of site at risk* (%)	1	2	13	87
Maximum depth (m)	n/a	0.15 to 0.3	1.2 to 2.3	n/a
Maximum velocity (m/s)	n/a	0.25 to 0.5	> 2.0	n/a
Maximum hazard classification	n/a	Danger for Some	Danger for All	n/a

**This shows the percentage of the site at flood risk from a particular flood zone or event including the percentage of the site at flood risk at a higher risk zone, e.g. Flood Zone 2 includes the Flood Zone 3a and 3b percentage. Flood Zone 1 is the remaining area outside Flood Zone 2 (Flood Zone 1 + Flood Zone 2 = 100%).*

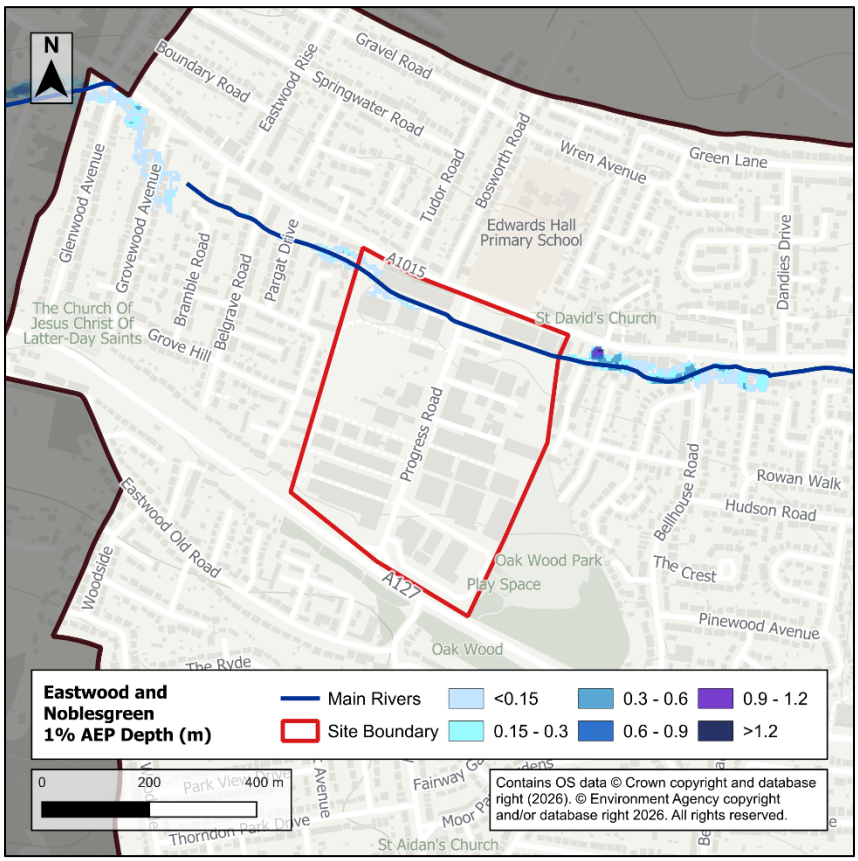


Figure 2-2: Eastwood and Noblesgreen 1% AEP depth across the site.

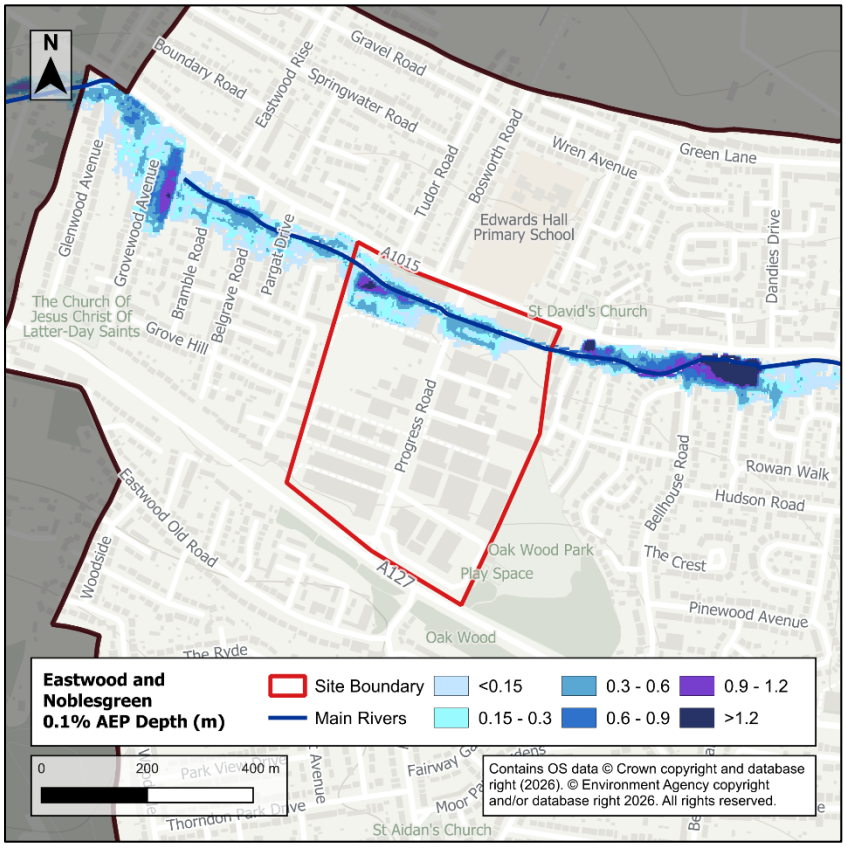


Figure 2-3: Eastwood and Noblesgreen 0.1% AEP depth across the site.

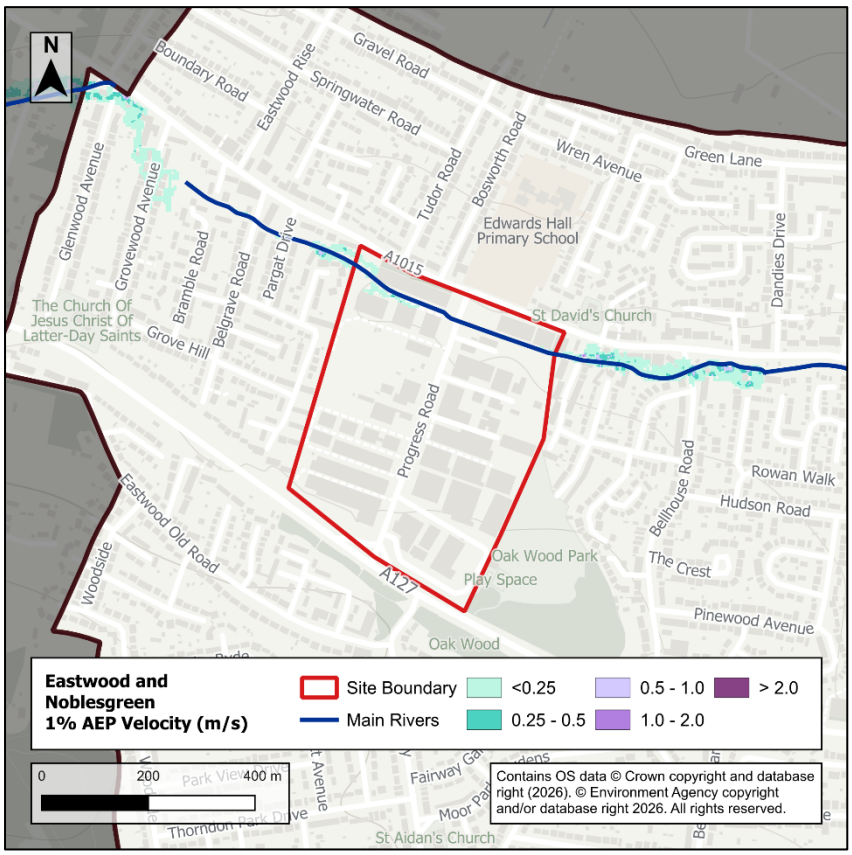


Figure 2-4: Eastwood and Noblesgreen 1% AEP velocity across the site.

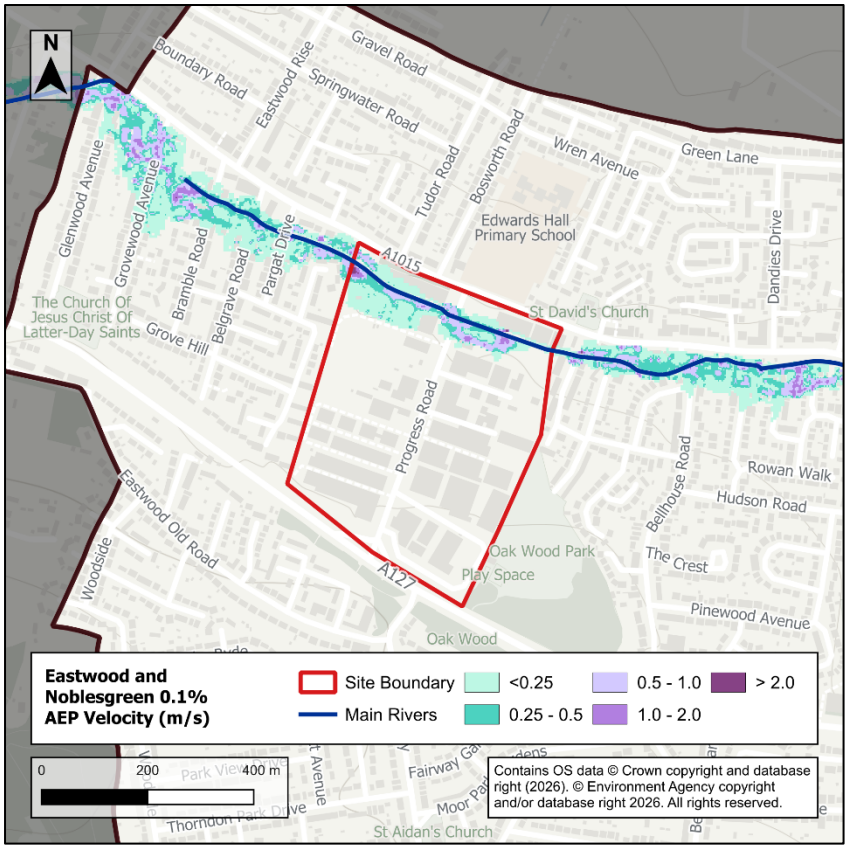


Figure 2-5: Eastwood and Noblesgreen 0.1% AEP velocity across the site.

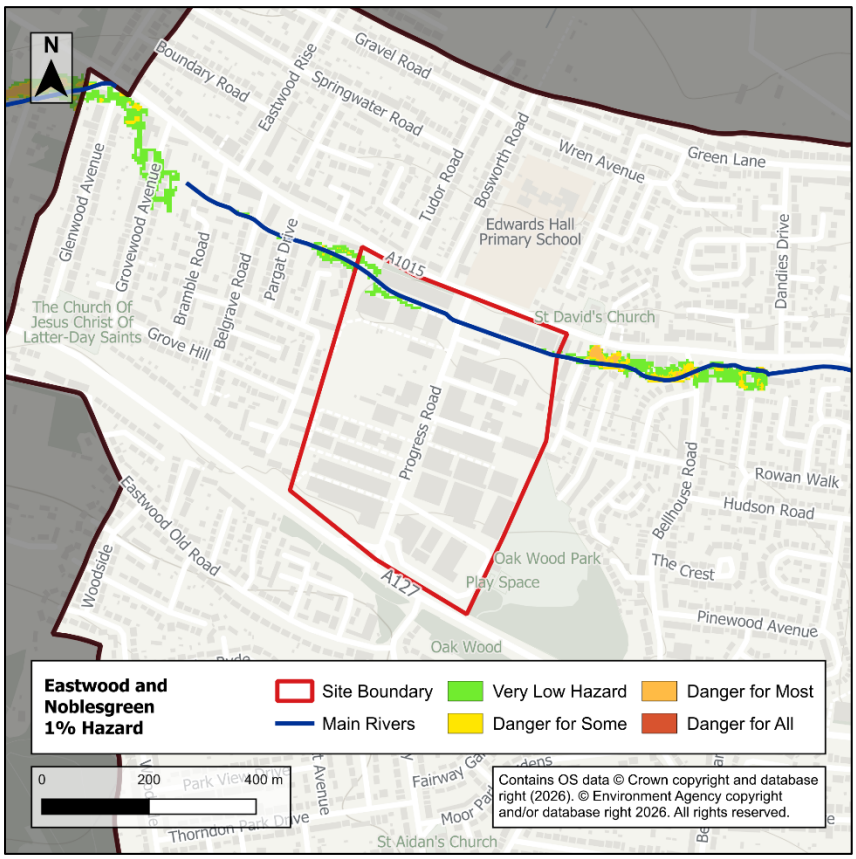


Figure 2-6: Eastwood and Noblesgreen 1% AEP hazard across the site.

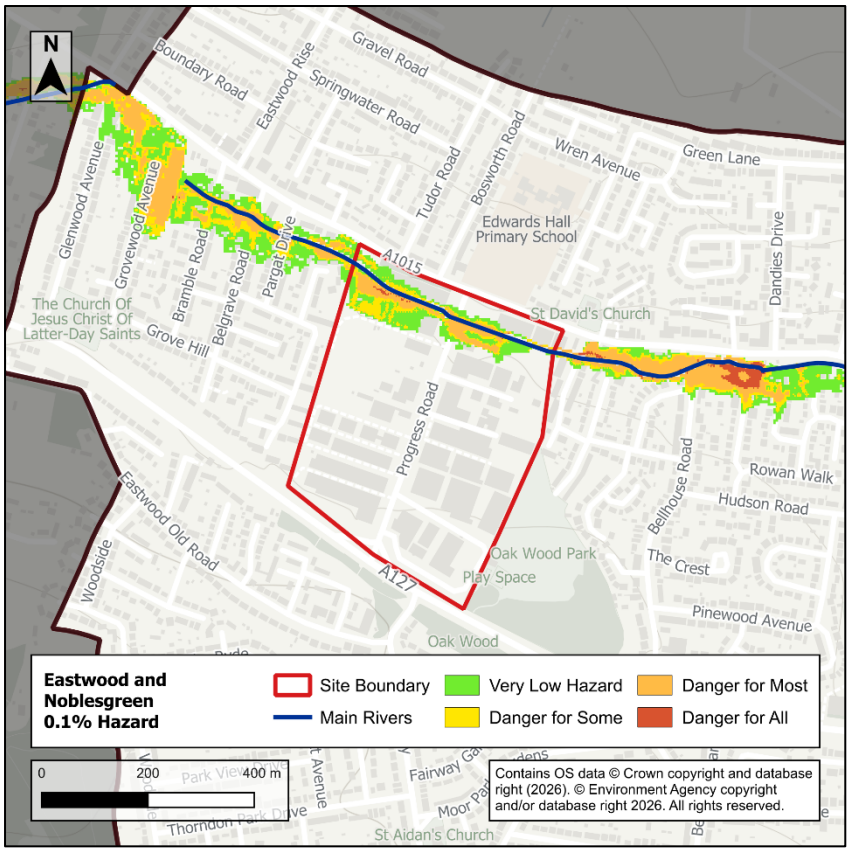


Figure 2-7: Eastwood and Noblesgreen 0.1% AEP hazard across the site.

2.3.3 Fluvial - climate change

The EA Rivers and Sea 3.3% AEP defended and 1% AEP and 0.1% AEP undefended extents plus climate change have been used to represent future Flood Zones using the Central 2080s allowance. This national mapping has been used, as there is no suitable climate change data available for the Eastwood model. There is also currently no available depth, hazard, or velocity information available for the EA datasets used, therefore, detailed hydraulic modelling is likely to be required during a site-specific Flood Risk Assessment including modelling of the latest climate change uplifts.

There is minimal change in extent in Flood Zone 3b between the present day and climate change scenarios.

Flood Zone 3a sees a considerable increase in extent in the climate change event, covering 10% more of the site. The climate change extents almost cover the entire northwest of the site that sits west of Progress Road and north of the nearest unnamed road parallel to Eastwood Brook. The climate change extents also cover parts of Progress Road, as well as the entirety of Brunel Road.

Flood Zone 2 is predicted to increase the risk across the site by 2% in the climate change scenario. The largest new area of risk is located in the northeast of the site, flanking Eastwood Brook.

2.3.4 Tidal

The site is not shown to be at risk of tidal flooding in present day or climate change scenarios based on available national and local modelling.

2.4 Surface water

2.4.1 Available data

The EA's FMfP Surface Water Spatial Planning Dataset, released in May 2026, has been used within this assessment to inform the extent and depth of the present day and future surface water risk. Climate change outputs are available for the 3.3%, 1%, and 0.1% AEP events with the Upper End climate change allowance for the 2070s epoch.

The Risk of Flooding from Surface Water (RoFSW) map has been used within this assessment to inform the velocity and hazard of the present day surface water risk. There is currently no available velocity or hazard information to use to assess future surface water risk.

Add surface water depths sentence - Descriptions refer to the maximum depth, velocity, and hazard values experienced in each area of the site within a given event.

2.4.2 Present day

There is a flow path travelling north along most of Progress Road, particularly in the 1% and 0.1% AEP events. This flow path is largely contained along the road. There are also areas of localised surface water ponding across the site in all events. Many of these areas of ponding are associated with existing building footprints.

As shown in Table 2-3, and mapped in Figure 2-8, in the 3.3% AEP event 7% of the site is at risk. A significant area of ponding occurs in the northwest, where water collects within a circular depression at a lower elevation. This location was formerly part of a gasworks site and contains two distinct circular features, corresponding to the former positions of gasholders. There is some pooling along Progress Road, on Brunel Road, and between existing buildings. The other larger areas of ponding are associated with existing building footprints.

Figure 2-9 shows the depth, velocity, and hazard across the site in each event. Many areas of ponding reach depths between 0.3m and 0.6m, but most of the flood risk is between 0.15m and 0.3m. The area of ponding in the southern half of the site on Progress Road reaches velocities that exceed 1.0m/s, but not 2.0m/s. Most of the areas of risk do not exceed 0.25m/s in velocity. Ponding just north of Cabinet Way has a hazard classification of 'Danger for Most'. Some ponding reaches 'Danger for Some', including by the former gasworks site. However, the majority of the areas of risk are considered a 'Very Low Hazard'.

The surface water risk increases to 11% of the site in the 1% AEP event, with most of the areas of ponding increasing in size. The flow path along Progress road now also extends over 300m. The depth increases to between 0.6m and 0.9m west of Progress Road in the south of the site. There is an area north of Brunel Road where depths are between 0.3m and 0.6m, as well as across a large area in the former gasworks site. The velocities are similar to the 3.3% AEP event, and there are a few more areas that reach the 'Danger for Most' classification.

In the 0.1% AEP event, the surface water risk covers 22% of the site. New areas of risk include the second circular feature in the former gasworks site, as well as covering the footprint of the southernmost building west of Progress Road. Maximum depths increase to between 0.9m and 1.2m, in a small area north of Stephenson Road. However, a lot of the ponding is between 0.3m and 0.6m. The majority of the flow path on Progress Road has depths below 0.15m. However, velocities exceed 2.0m/s along parts of Progress Road, as well as on Rutherford Close. The maximum hazard classification is 'Danger for All', but this is found by Eastwood Brook north of Brunel Road. There are several areas of ponding that are classified as 'Danger for Most'.

Table 2-3: Present day surface water flood risk based on the EA's FMfP Surface Water Spatial Planning dataset (extent, depth) and RoFSW dataset (velocity, hazard).

Event	3.3% AEP	1% AEP	0.1% AEP
Percentage of site at risk* (%)	7	11	22
Maximum depth (m)	0.30 - 0.60	0.60 - 0.90	0.90 - 1.20
Maximum velocity (m/s)	1.00 - 2.00	1.00 - 2.00	>2.00
Maximum hazard classification	Danger for Most	Danger for Most	Danger for All

** The percentage surface water extents quoted show the percentage 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. the 1% AEP includes the 3.3% AEP percentage).*

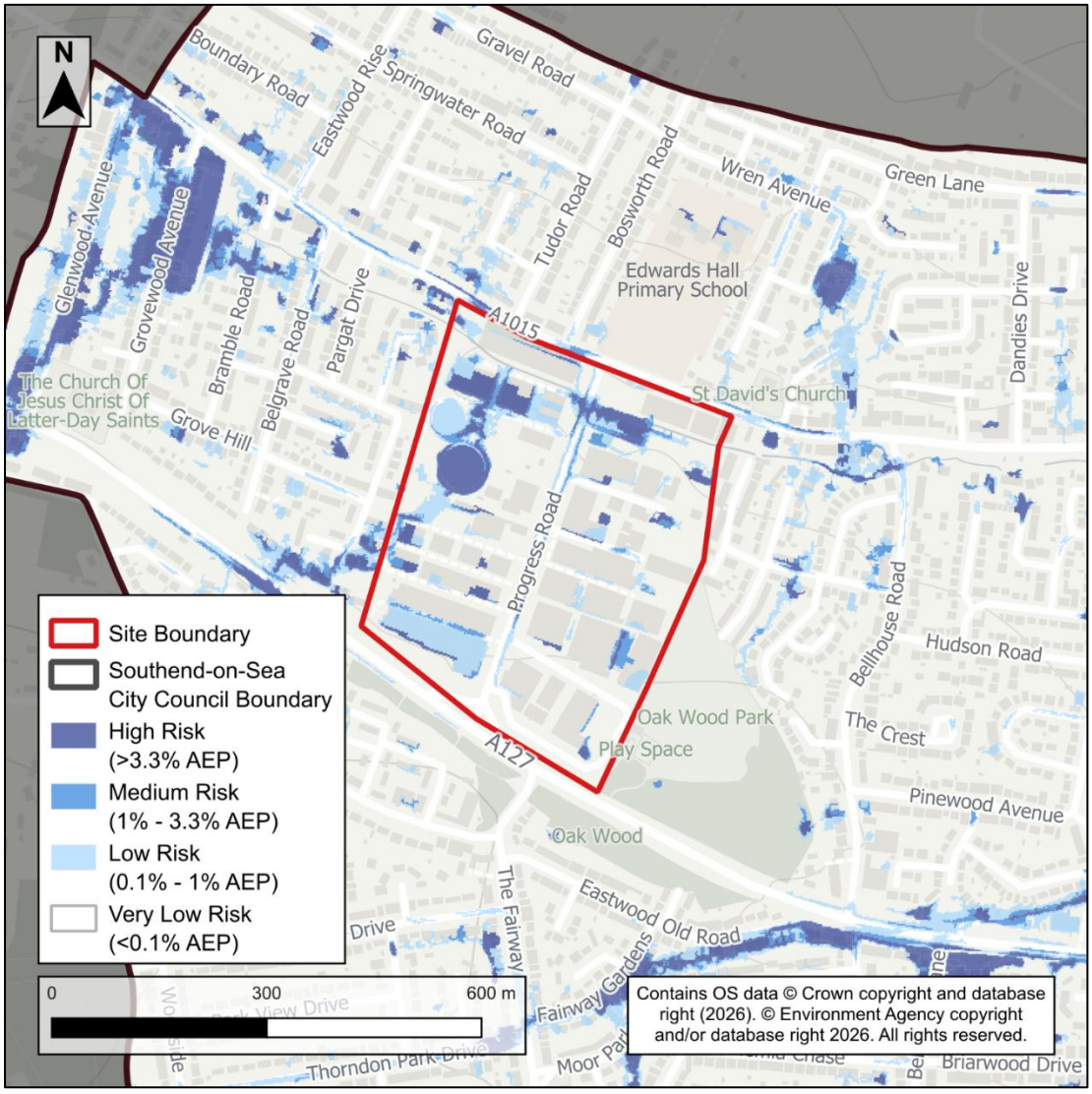


Figure 2-8: Present day surface water risk, based on the EA FMfP Surface Water Spatial Planning dataset .

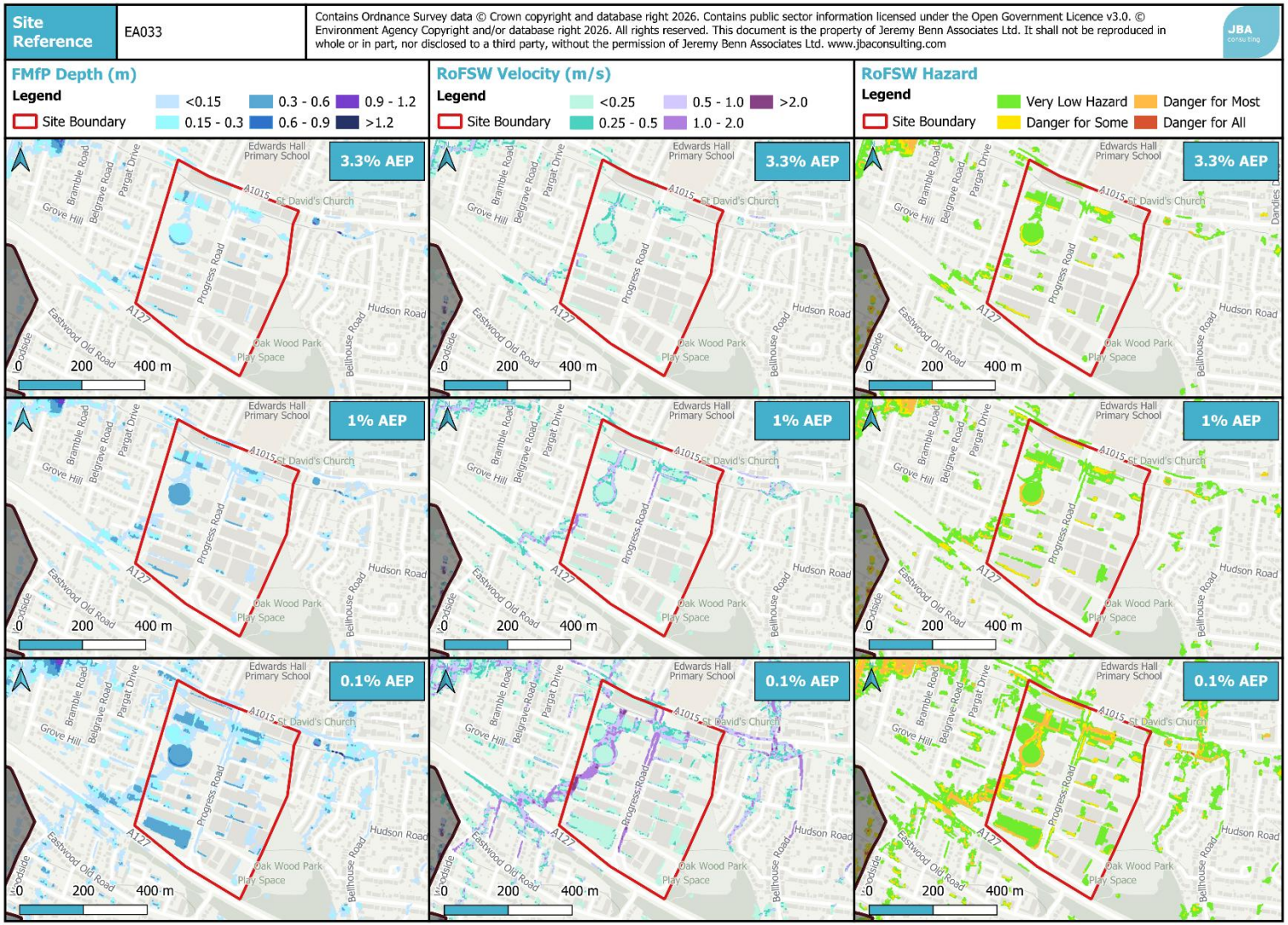


Figure 2-9: Present day surface water depth, velocity, and hazard for the 3.3%, 1%, and 0.1% AEP events .

2.4.3 Climate change - 2070s Upper End

Figure 2-10 shows the surface water extents and depths across the site in the climate change events.

In the 3.3% AEP climate change event, the percentage of the site at risk is 4% greater than in the present day scenario. The flow path along Progress Road extends much further, there a few new areas of ponding, and the risk expands around the former gasworks site and by Brunel Road. There is also ponding the entire stretch of the space between the two southernmost buildings west of Progress Road. Maximum depths increase from between 0.3m to 0.6m, to 0.6m to 0.9m, west of Progress Road in the south of the site.

In the 1% AEP climate change event, the area of the site at risk increases from 11% to 19%, as shown in Table 2-4. New areas of risk include the second circular feature in the former gasworks site, as well as covering the footprint of the southernmost building west of Progress Road. The maximum depths remain between 0.6m to 0.9m but are now also found at the former gasworks site and by Eastwood Brook north of Brunel Road.

In the 0.1% AEP climate change event, the percentage of site at risk increases significantly by 18% compared to the present day scenario. There are many new large areas of risk across the site, but the majority of them are associated with existing building footprints. Maximum depths increase from between 0.9m and 1.2m in the present day to between 1.2m to 2.3m in the climate change event. These new maximum depths are found along Eastwood Brook and beside a building by Stephenson Road.

Table 2-4: Comparison of surface water flood risk between the present day and climate change scenarios based on the EA's FMfP Surface Water Spatial Planning.

Event	1% AEP	1% AEP plus 2070s Upper End Climate Change
Percentage of sites at risk* (%)	11	19
Maximum depth (m)	0.60 to 0.90	0.60 to 0.90

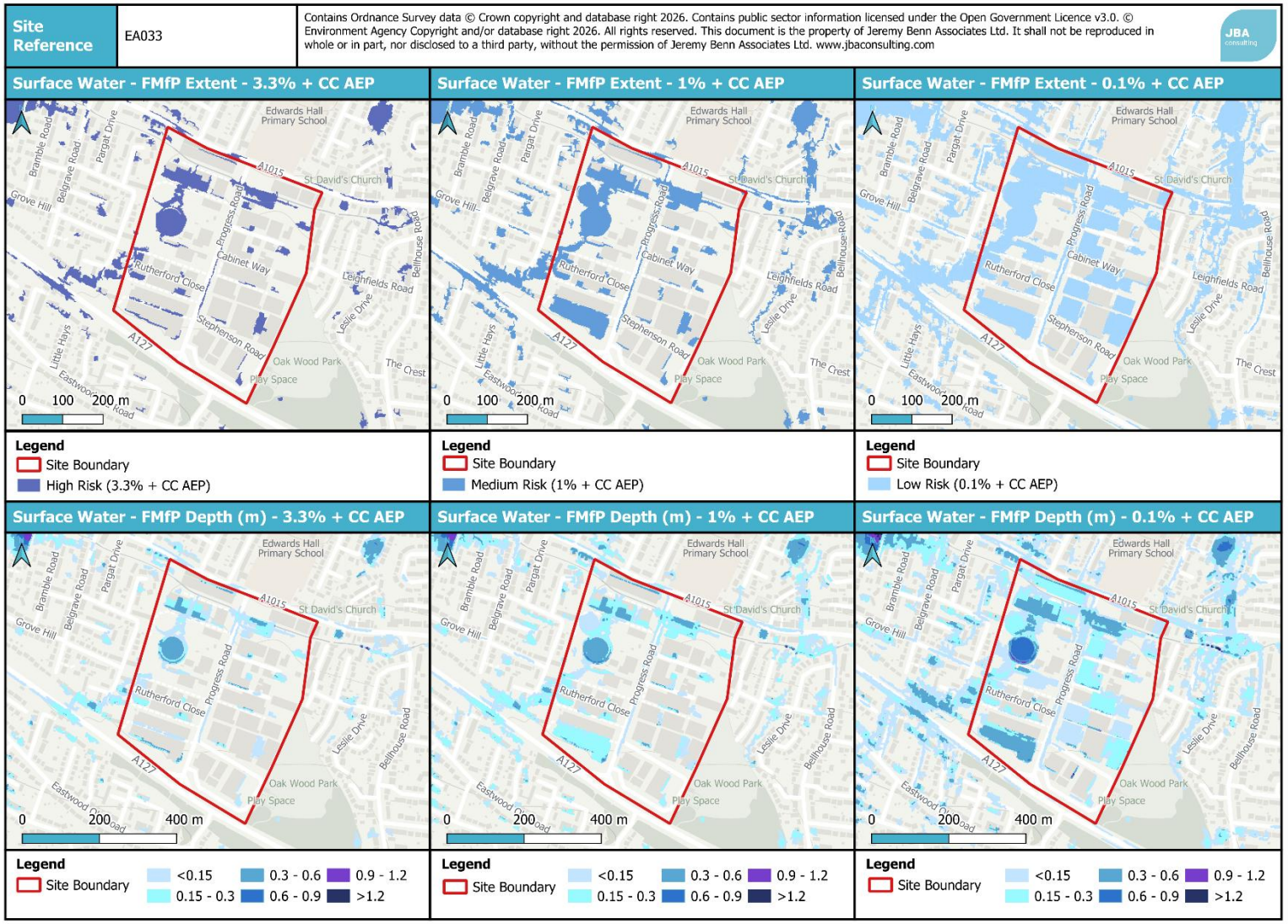


Figure 2-10: Surface water extents and depths for the 3.3%, 1%, and 0.1% AEP climate change events.

2.5 Groundwater

The JBA Groundwater Emergence Map shows that the site has a negligible risk from groundwater flooding due to the nature of the local geological deposits.

This assessment does not negate the requirement that an appropriate assessment of the groundwater regime should be carried out at the site-specific Flood Risk Assessment (FRA) stage.

2.6 Sewers

Anglian Water provided redacted GDPR compliant version of their DG5 dataset, which identifies internal and external historic sewer flooding records between 2022 and 2026.

There are no records of flooding within the site. However, the following 11 incidents were reported in close proximity of the site:

- Four instances of external sewer flooding southwest of the site, in the residential area between Rothwell Close and Belgrave Road.
- One instance of external sewer flooding west of the site, near Bolney Drive.
- One instance of external sewer flooding west of the site, near Cornec Avenue.
- One instance of external sewer flooding east of the site, near Leighfields Road.
- Two instances of external sewer flooding northeast of the site, near The Rodings.
- One instance of external sewer flooding north of the site, near Sairard Gardens.
- One instance of external sewer flooding northwest of the site, near Rayleigh Road (A1015).

The available data should always be supplemented by direct consultation with Anglian Water to ascertain if there is any site-specific risk from a public sewer. This is because sewer flood risk information is not publicly available and would need to be considered on a site-specific basis.

2.7 Flood history

The EA's Historic Flood Map shows no records of flooding at the site.

Data provided by Essex County Fire and Rescue Service shows no records of flooding at the site.

3 Flood risk management infrastructure

3.1 Defences

The EA AIMS dataset shows that the site is not protected by any formal flood defences.

3.2 Residual risk

Eastwood Brook is culverted beneath Progress Road within the site. The modelling indicates that the culvert restricts flow, causing overtopping onto the site during the 0.1% AEP fluvial event. A blockage of this culvert could further impede flow and resulting in greater overtopping onto the site, with the potential for floodwaters to extend towards the parallel road south of the watercourse and Progress Road.

4 Emergency planning

4.1 Flood warnings and alerts

The north of the site is located in the EA's 'The Eastwood Brook and Prittlewell Brook in the Southend area' (051FWFEF7B) Flood Warning Area and the EA's 'The River Roach, Prittle Brook and Eastwood Brook' (051WAFEF7B) Flood Alert Area.

4.2 Access and escape

Safe access and escape will need to be demonstrated in the 1% AEP plus climate change fluvial and surface water events. 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 elsewhere on the site and in the wider catchment.

4.2.1 Potential access

There are two access points into the site via Progress Road, one in the north to Rayleigh Road (A1015) and one in the south to Southend Arterial Road (A127).

4.2.2 Fluvial

Access and escape are likely to be possible in all modelled events, although travel between the north and south of the site may be impeded in the 0.1% AEP event.

The fluvial risk is concentrated around Eastwood Brook in the north of the site. South of the watercourse, the route southwards via Progress Road to Southend Arterial Road (A127) remains clear, which allows for access and escape to the majority of the site.

A small section of the site is located north of the watercourse. In the 0.1% AEP event there is flood risk on Progress Road in the north that has depths that exceed 0.4m. This bisects the site and could impede access between the north and south. However, access and escape from the north of the site are still possible. Travelling east along Rayleigh Road (A1015), Eastwood Brook overtops onto the road in all events, aside from the present day Flood Zone 3b. At the stretch of Rayleigh Road between the junctions to Eastwood Park Drive, and Hylands Grove, depths exceed 0.4m in the 0.1% AEP event. However, there are many adjacent residential roads that are not at flood risk. Therefore, the north of the site can still be accessed using a number of different streets, that can either lead to Tudor Road or Bosworth Road, which are directly north of the site.

4.2.3 Surface water

Access and escape are likely to be possible in all modelled events. There is ponding on Progress Road in the 3.3% AEP event, and a flow path along the majority of the road in the 1%, 0.1%, and 1% AEP plus climate change events. However, depths remain below 0.3m in all events along Progress Road, except for in the 0.1% AEP event where depths reach between 0.3m and 0.6m near to Brunel Road. However, these depths do not cover the

entire width of the road. It should be noted that as Progress Road slopes downwards towards the north, the flow paths may be fast moving. However, there is no velocity or hazard data currently available for the 1% AEP climate change event so this will need to be assessed further within a site-specific FRA.

In the 3.3% AEP event and 1% AEP events, maximum velocities exceed 1.0m/s but not 2.0m/s, rising to exceed 2.0m/s in the 0.1% AEP event. There is some ponding on Rayleigh Road (A1015) and Arterial Road (A127), but depths are below 0.3m across the majority of these areas of risk.

4.3 Dry islands

The site is not located on a dry island.

5 Requirements for drainage control and impact mitigation

5.1 Broadscale assessment of possible SuDS

Surface water at the site should be discharged in accordance with the drainage hierarchy as set out in the National standards for SuDS (gov.uk). SuDS that provide opportunities to deliver multiple benefits including volume control, water quality, amenity, and biodiversity should be prioritised. SuDS proposals should be discussed with relevant stakeholders (Local Planning Authority (LPA), Lead Local Flood Authority (LLFA), and the EA) at an early stage to understand possible constraints.

The site is located within the Eastwood Brook Critical Drainage Area (CDA). The CDAs currently designated were identified in the Southend-on-Sea SWMP 2015 (southend.gov.uk). Any development within these CDAs will need demonstrate an adequate surface water drainage system which is maintainable for the lifetime of the development within a site specific FRA. Developers will need to provide details of the long term maintenance of the surface water drainage system. Developers should collaborate with the LLFA to identify all sources of flood risk, help reduce risk to existing communities, and explore grant funding opportunities for these wider improvements. Furthermore, growth allocations should take CDAs into account when assessing site suitability for development, ensuring that flood risk is properly managed and mitigated during planning.

Surface water discharge rates should not exceed pre-development discharge rates for the site and should be designed to be as close to greenfield runoff rates as reasonably practical in consultation with the LLFA.

Opportunities to incorporate source control techniques such as green roofs, permeable surfaces and rainwater harvesting must be considered in the design of the site.

The following factors should be considered when assessing whether infiltration is suitable at the site:

- 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.
- BGS data indicates that the underlying geology is clay, silt, and sand, which is likely to have highly variable permeability. This should be confirmed through infiltration testing. Off-site discharge in accordance with the SuDS hierarchy may be required to discharge surface water runoff from the site.
- The site is not located within a Groundwater Source Protection Zone and there are no restrictions over the use of infiltration techniques with regard to groundwater quality.
- The site encompasses land associated with a former gas works. A thorough ground investigation will be required as part of a detailed site-specific FRA, to determine potential mitigation for contamination and the impact this may have on

SuDS. As such, proposed SuDS should be discussed with the relevant stakeholders (LPA, LLFA and EA) at an early stage to understand possible constraints.

- The site is not located within a historic landfill site.

If it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity or the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the asset owner.

Eastwood Brook should be integrated into the site drainage strategy as blue-green infrastructure and public open space.

5.2 Opportunities for wider sustainability benefits and integrated flood risk management

The following are opportunities for wider sustainability benefits and integrated flood risk management at the site:

- 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.
- 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 Eastwood Brook and its Water Framework Directive objectives for water quality. The use of multistage SuDS treatment will improve water quality of surface water runoff discharged from the site and reduce the impact on receiving water bodies and can also contribute towards requirements for Biodiversity Net Gain. Eastwood Brook (GB105037028741) is considered to be of moderate ecological status.

6 NPPF and planning implications

6.1 Exception Test requirements

The Local Planning 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.

The NPPF classifies employment development as 'Less Vulnerable'.

The Exception Test is not required for 'Less Vulnerable' development, however, 'Less Vulnerable' development is not permitted in Flood Zone 3b.

6.2 Requirements and guidance for site-specific Flood Risk Assessment

At the planning application stage, a site-specific FRA will be required as the proposed development site is:

- greater than one hectare
- in Flood Zones 2, 3a, and 3b
- within the Flood Zones plus Climate Change extent
- in an area identified as having critical drainage problems
- at risk of flooding from surface water
- identified as being at increased flood risk in the future.

All sources of flooding should be considered as part of a site-specific FRA.

Consultation with the LPA, LLFA, Anglian Water, and the EA should be undertaken at an early stage.

Any FRA should be carried out in line with latest guidance including the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change Planning Practice Guidance (PPG), and Southend-on-Sea City Council Local Plan Policies.

The development should be designed with mitigation measures in place where required.

6.3 Guidance for site design and making development safe

The site layout must adopt a sequential approach by steering more vulnerable aspects of the development outside of the fluvial risk by Eastwood Brook in the north of the site. Developers should consider utilising this area as a green corridor or as a location for SuDS.

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.

A buffer of at least 8 metres should be maintained between Eastwood Brook and any built development.

The Eastwood Brook hydraulic model has been used to assess the fluvial risk to the site. The hydrology for this model was completed in 2016 and may not be appropriate for site-

specific flood risk assessment, although in agreement with the EA this has informed the SFRA. For a site-specific FRA, the developer should undertake a review of the model hydrology compared with hydrological estimates based on latest data and methodologies. Should the hydrological inputs to the model be found to be under representative of current estimates, updates to the modelling with new hydrology may be required. Any updates to the modelling should also include latest climate change allowances and blockage scenarios for the culvert north of the site.

The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any surface water flow routes. A drainage strategy should help inform site layout and design to ensure runoff rates are as close as possible to pre-development greenfield rates, with areas of surface water ponding used as open space and SuDS or water compatible/essential infrastructure uses only.

Further assessment of the surface water risk should be undertaken as part of an FRA to quantify the volume of surface water risk and ensure that any modification of ground levels required as part of the site design will not displace surface water and increase flood risk off the site.

Arrangements for safe access and escape will need to be provided for the 1% AEP fluvial and surface events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate measures, so development and occupants are safe.

Provisions for safe access and escape should 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.

7 Conclusions

Summary of the key areas of flood risk across the site:

- **Fluvial:** Eastwood Brook, a statutory main river, flows eastwards through the site, parallel to the northern boundary. The fluvial risk is concentrated around this watercourse in the north of the site. The majority of the site (87%) is not at risk of fluvial flooding. However, a small percentage of the site is within Flood Zones 3b, and 3a. Flood Zone 2 encompasses approximately 13% of the site. Flood Zone 3a sees a considerable increase in extent in the climate change event, covering 10% more of the site
- **Surface water:** There is a fast-moving flow path travelling north along most of Progress Road, particularly in the 1% and 0.1% AEP events. There are also several areas of surface water ponding across the site in all events. However, many of these areas of ponding are associated with existing building footprints and are not entirely representative of the underlying topography.
- **Residual:** Eastwood Brook is culverted beneath Progress Road. This culvert could pose a risk in the event of a blockage, which could cause water to back up and overtop, potentially flowing onto the parallel road south of the watercourse and onto Progress Road.

The following points should be considered in development of this site:

- The Exception Test is not required for 'Less Vulnerable' development. However, 'Less Vulnerable' development is not permitted in Flood Zone 3b.
- A site-specific FRA should be undertaken, which assesses all sources of flood risk. This may require updates to the Eastwood Brook hydraulic model and detailed surface water modelling. This may also require further assessment of the surface water risk to quantify the volume of surface water risk.
- The site layout must adopt a sequential approach. A buffer of at least 8 metres should be maintained between Eastwood Brook and any built development, with more vulnerable aspects of the development steered away from the area of highest risk in the north 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.
- Safe access and escape routes should be demonstrated in the 1% AEP plus climate change surface water and fluvial events. This initial assessment has shown that access and escape will likely be possible. However, Eastwood Brook bisects the site, and consideration should be given to the connectivity between the northern and southern sections of the site in the event that overtopping from the watercourse leads to flooding along Progress Road.
- A carefully considered and integrated flood resilient and sustainable drainage design should be put forward, including a site-specific Surface Water Drainage

Strategy, and SuDS maintenance and management plan and supported by detailed modelling.

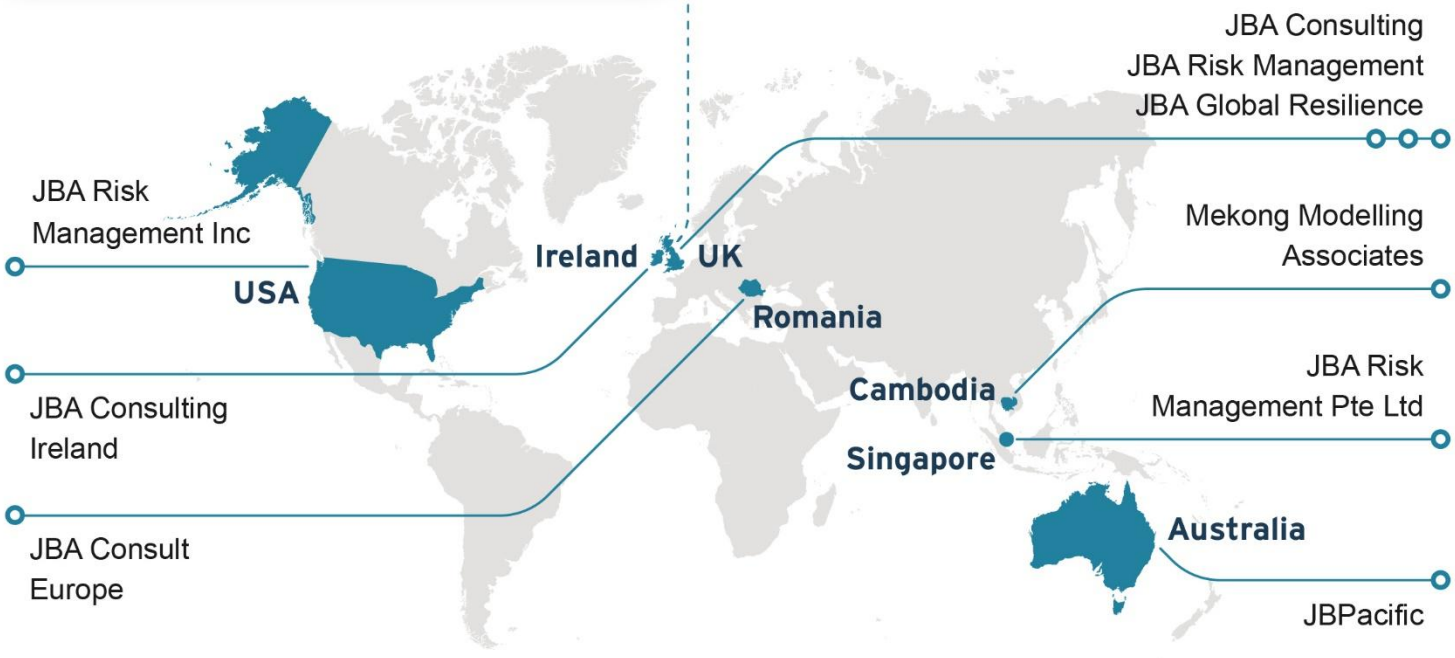
- Anglian Water should be consulted at an early stage on drainage proposals for the site to identify any potential constraints or existing sewer flooding issues that may not have been identified through this high level assessment.

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