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Level 2 Strategic Flood Risk Assessment

Site HEA178

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 HEA178. 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: Leigh South, London Road
- Site area: 0.15ha
- Existing site use: Brownfield, commercial with one residential property
- Proposed site use: Mixed-use, residential and commercial

1.2 Topography

Figure 1-1 shows the topography of the site represented by the Environment Agency (EA) 1m resolution LiDAR.

The topography of the site is mostly flat with a shallow west to east elevation gradient. There is a difference of approximately 0.4m between the highest ground level (29.78mAOD) at the western boundary and the lowest ground level (28.24mAOD) in the southeast corner of the site.

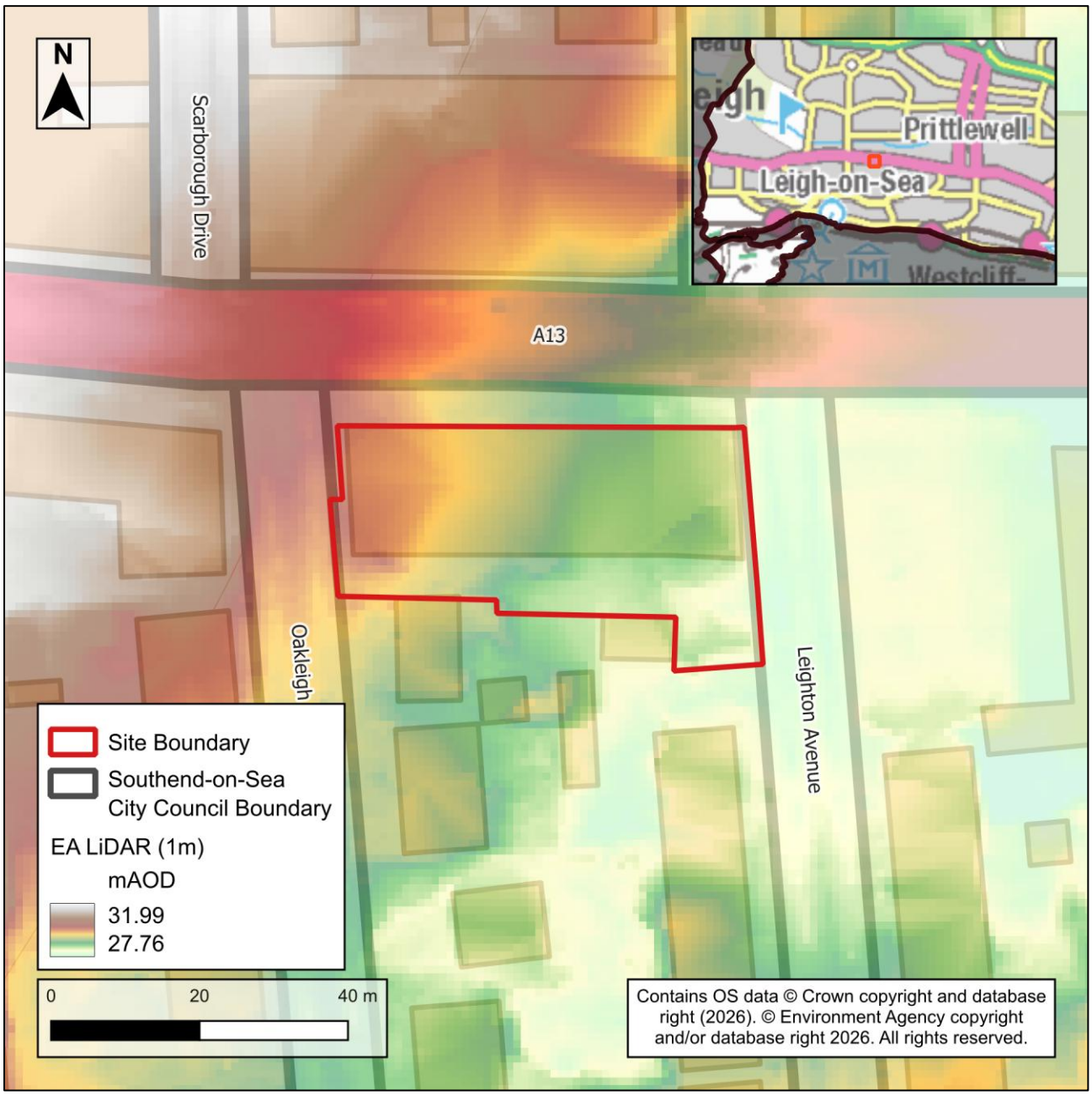


Figure 1-1: Topography of the site.

1.3 Geology and soils

Geology at the site consists of:

- Bedrock - London Clay Formation comprised of clay, silt and sand.
- Superficial - Head comprised of clay, silt, sand and gravel.

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 Prittle Brook, a tributary of the tidal River Roach, within the middle reaches of the Crouch and Roach Operational Catchment. Prittle Brook flows in a northeasterly direction approximately 500m east of the site. This watercourse originates approximately 4km northwest of the site in West Wood in the north of Hadleigh, situated within Castle Point Borough. The catchment upstream of the site is predominantly urban and mostly comprises residential areas in west Southend. The catchment downstream of the site is comprised of more rural landcover on the banks of the Prittle Brook.

2.2 Existing drainage features

Based on online mapping, there are no existing drainage features within the site. However, as the existing land use is brownfield, there is likely to be existing drainage infrastructure present within the site.

2.3 Fluvial and tidal

The site is not shown to be at risk of fluvial or 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.

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 significant flow path which forms in the surrounding area flowing in a north-easterly direction along the southern and eastern extent of the site.

As shown in Table 2-1 and mapped in Figure 2-1, this flow path encroaches slightly along the eastern and southern site boundaries in the 3.3% AEP event, extending further into the east and south of the site within the 1% AEP and 0.1% AEP events.

Most of the flooding in all AEP events is predicted to remain below 0.30m. Although velocities are expected to exceed 2.00m/s in the 0.1% AEP event, this only impacts a very small area in the southeast extent of the site. This is where the highest velocities are found in all AEP events. Small areas in the southeast of the site are classified as 'Danger for Most' in the 0.1% AEP event. The majority of the flooding in all AEP events is classified as a 'Very Low Hazard'.

Table 2-1: 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* (%)	2	11	32
Maximum depth (m)	0.15 - 0.30	0.15 - 0.30	0.30 - 0.60
Maximum velocity (m/s)	0.25 - 0.50	0.50 - 1.00	>2.00
Maximum hazard classification	Very Low Hazard	Danger for Some	Danger for Most

** 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).*

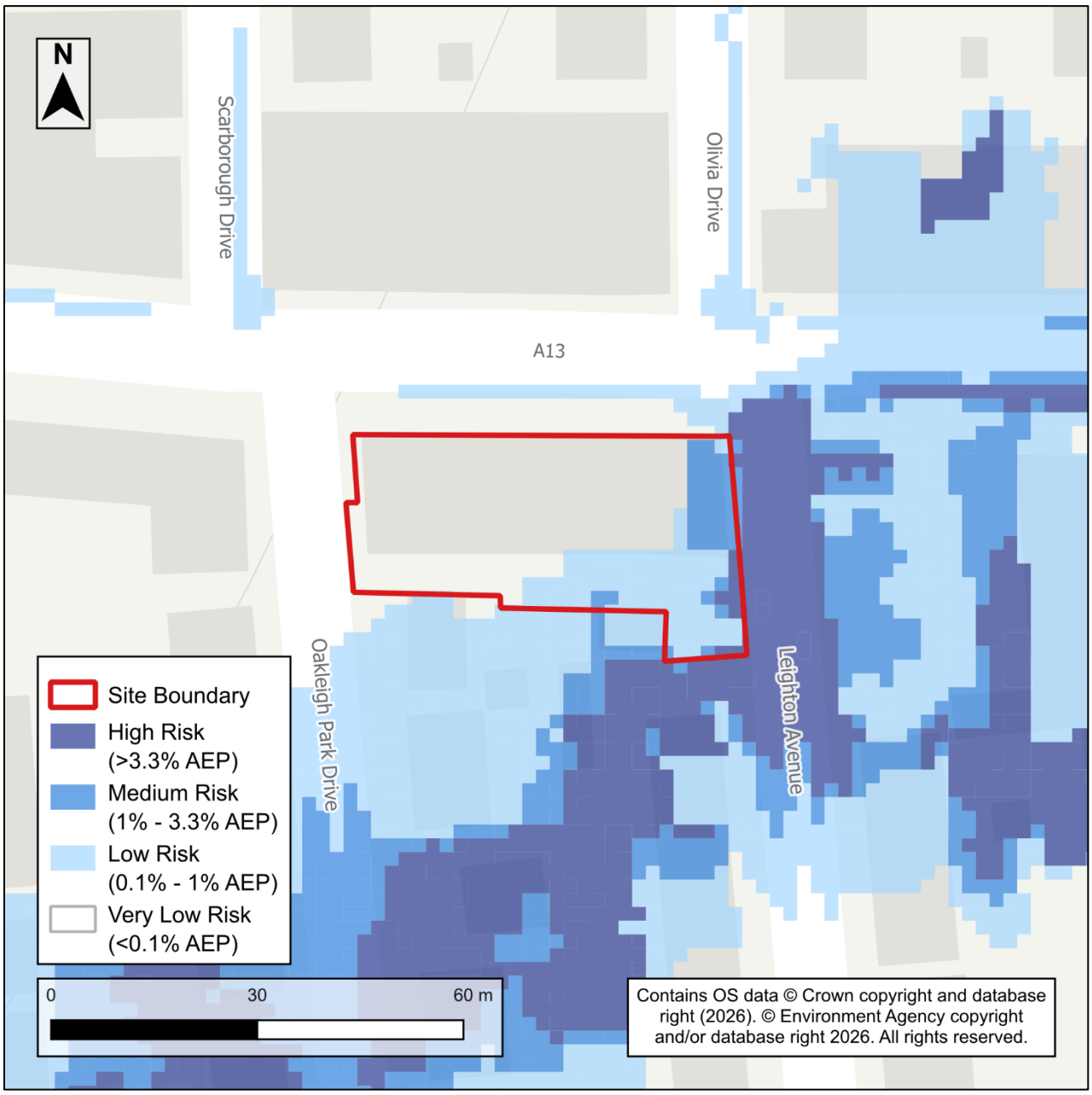


Figure 2-1: Present day surface water risk, based on the EA FMfP Surface Water Spatial Planning dataset.

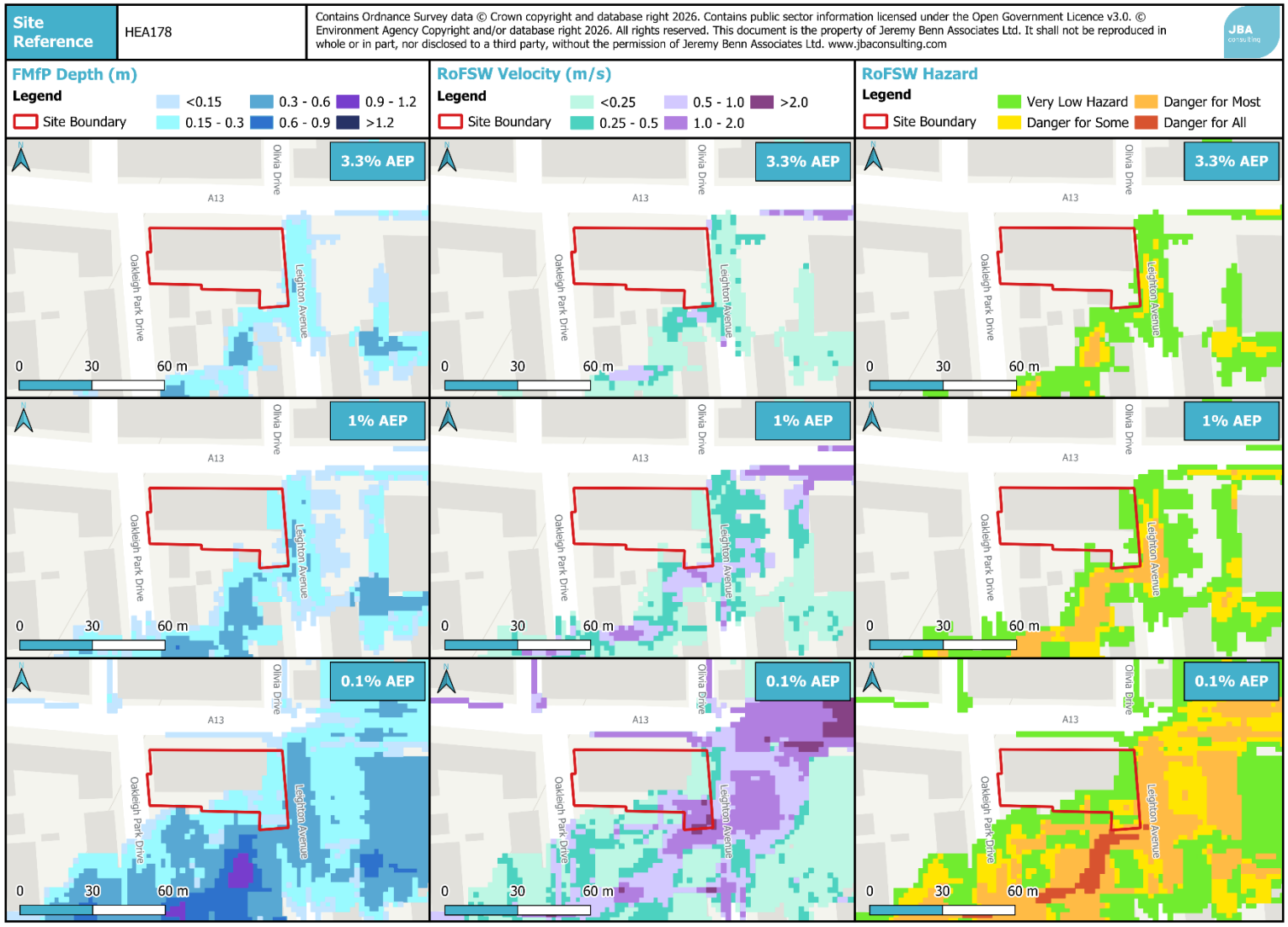


Figure 2-2: Present day surface water depth, velocity, and hazard for the 3.3%, 1%, and 0.1% AEP events.

2.4.3 Climate change - 2070s Upper End

The site is shown to be susceptible to climate change in the east and south of the site. Furthermore, during the 0.1% AEP event, surface water risk is shown to extend across the entire eastern half of the site and into the western half, with 76% of the site is shown to be at surface water risk.

Maximum depth bands do not increase. However, a much larger area of flooding is shown to exceed 0.30m in depth during the 0.1% AEP event. The site lies within the extent of a major surface water flow path. Therefore, risk is likely to have increased in velocity and hazard, but this data is currently unavailable.

Table 2-2: 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	27
Maximum depth (m)	0.15 - 0.30	0.15 - 0.30

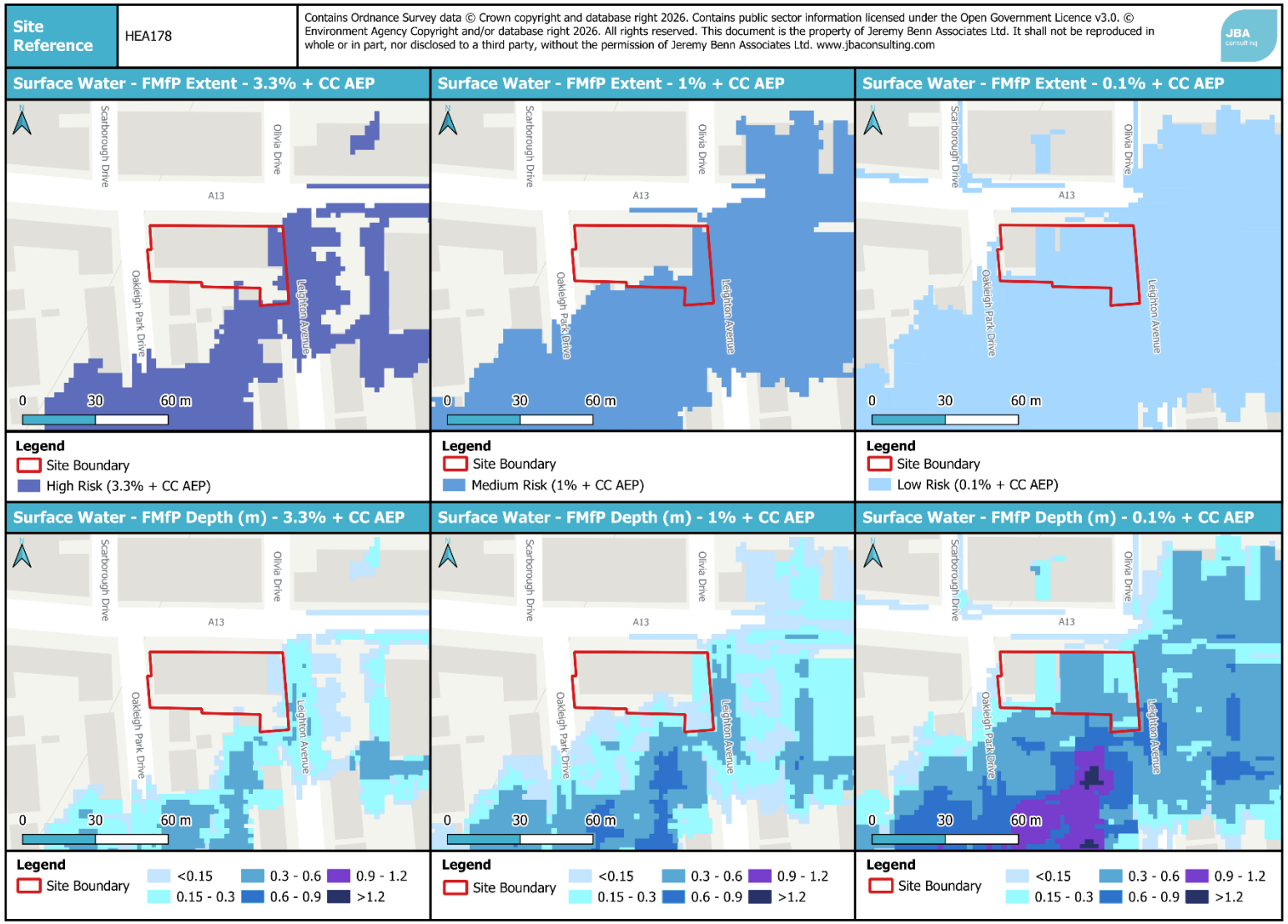


Figure 2-3: Surface water extents and depths for the 3.3%, 1%, and 0.1% AEP climate change events.

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 a redacted GDPR compliant version of their DG5 dataset for the study area, which identifies internal and external historic sewer flooding records between 2022 and 2026.

There is one recorded incident within close proximity to the site (approximately 55m north). The incident occurred in 2023 as it reported to have been an external flooding incident and did not impact any properties internally.

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

There is no residual risk to the site from flood risk management structures.

4 Emergency planning

4.1 Flood warnings and alerts

The site is not located in an EA Flood Warning or 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 and the 0.5% AEP plus climate change tidal 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 elsewhere on the site and in the wider catchment.

4.2.1 Potential access

Access to the site is via the A13 to the north, Leighton Avenue to the east and Oakleigh Park Drive to the west.

4.2.2 Fluvial and tidal

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

4.2.3 Surface water

Access and escape via the A13 and Oakleigh Park Drive from the north and west are not shown to be at risk of flooding from surface water in the 1% AEP climate change event. Therefore, access and escape should be maintained.

Access and escape via Leighton Avenue and the A13 from the east is impacted by the large surface water flow path. In the 1% AEP climate change event maximum depths along both roads are between 0.30m and 0.60m which is likely to impede vehicular access. Furthermore, as this risk results from a large flow path, it is likely to be associated with fast-flowing water which may also impede access and escape.

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.

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.

The site is located within the Prittle Brook Critical Drainage Area. 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.

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 is not located within a historic landfill site.

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

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.

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 mixed use development as 'More Vulnerable'.

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.

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:

- at risk of surface water flooding
- in an area identified as having critical drainage problems

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

Where possible, the site layout should adopt a sequential approach by steering more vulnerable aspects of the development outside of the southeast extent of the site which is at the highest risk of surface water flooding. Where this is not possible, given the small size 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.

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.

Arrangements for safe access and escape will need to be provided for the 1% AEP surface event 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:

- **Surface water:** Surface water risk to the site is the result of a large surface water flow path in the wider surroundings which impacts the east and south of the site and covers 27% of the site area in the 1% AEP climate change event. The east of the site is shown to be particularly susceptible to climate change.

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

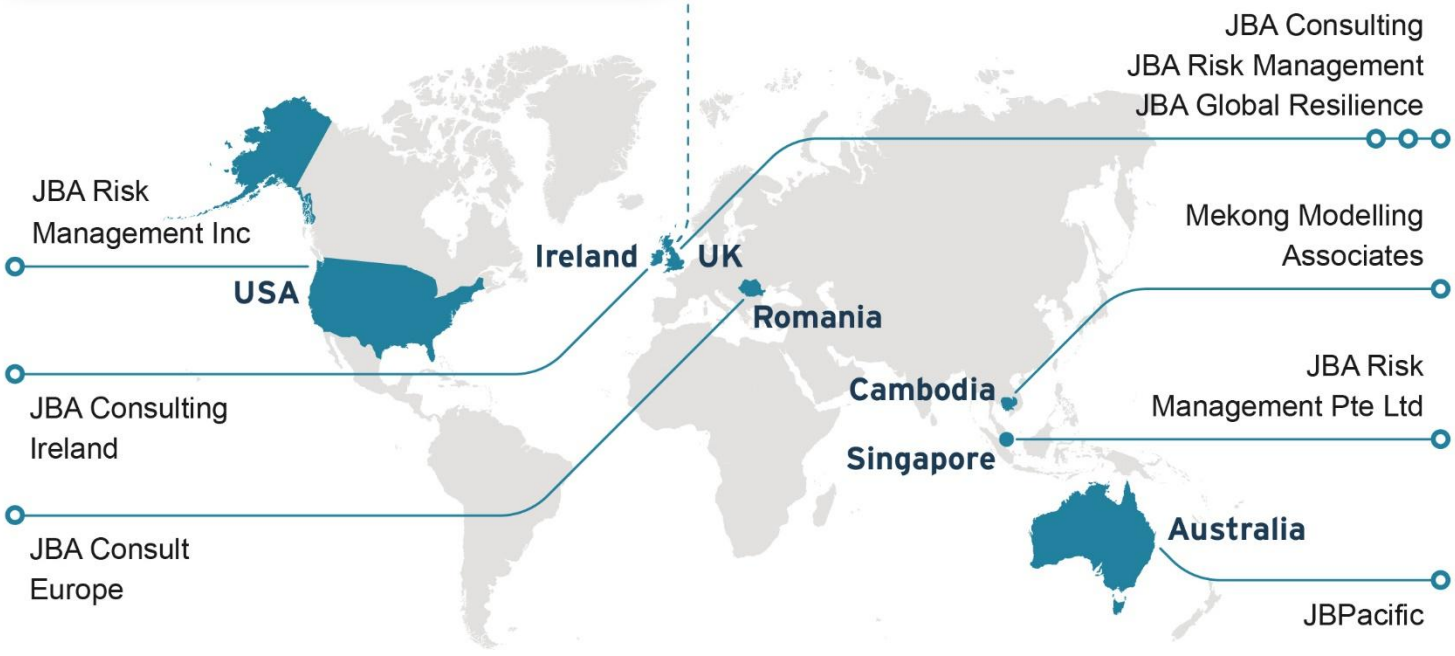
- The Exception Test is not required for this site because the entire site is not shown to be at fluvial risk within the EA's FMfP.
- A site-specific FRA should be undertaken, which assesses all sources of flood risk. This may require detailed surface water modelling to assess the velocity and hazard of this risk and test any raising of ground levels and mitigation measures to ensure flood risk is not increased elsewhere.
- Safe access and escape routes should be demonstrated in the 1% AEP plus climate change surface water event. This initial assessment has shown that access and escape will likely be possible via the A13 and Oakleigh Park Drive to the west but impeded from the east.
- 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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