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Level 2 Strategic Flood Risk Assessment - Site EM/21/0014

Hartley Breakers Yard (aka Baldwins Yard), Hartley

FINAL

Prepared for

Sevenoaks District Council

Date

July 2026

Contents

1 Background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for site EM/21/00014. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the Sevenoaks Level 1 SFRA and read the Level 2 SFRA Main Report and is therefore familiar with the terminology used in this report.

1.1 Site details

- Location: Hartley Breakers Yard (aka Baldwins Yard), Hartley, DA3 8LJ
- Site area: 0.82ha
- Existing site use: Brownfield - industrial
- Proposed site use: Employment
- Proposed use flood risk vulnerability classification: Less Vulnerable

The site currently comprises existing industrial development and is located to the north-east of New Ash Green. The site is surrounded by greenfield land to the north south, east and west, with woodland located to the north-east. The location of the site is shown in Figure 1-1.

Figure 1-1: Location of site EM/21/00014

1.2 Topography

Figure 1-2 shows the topography of the site represented by the Environment Agency (EA) 1m resolution LiDAR.

Elevations across the site are shown to fall in a north-easterly direction, with highest levels of around 94.94mAOD in the south-western corner of the site and lowest elevations of around 86.33mAOD in the north-east. The LiDAR mapping indicates the presence of two small mounds along the southern site boundary. Along Hartley Hill, elevations fall in a south-easterly direction, with the lowest topography present to the north-east of the site, at around 85.45mAOD.

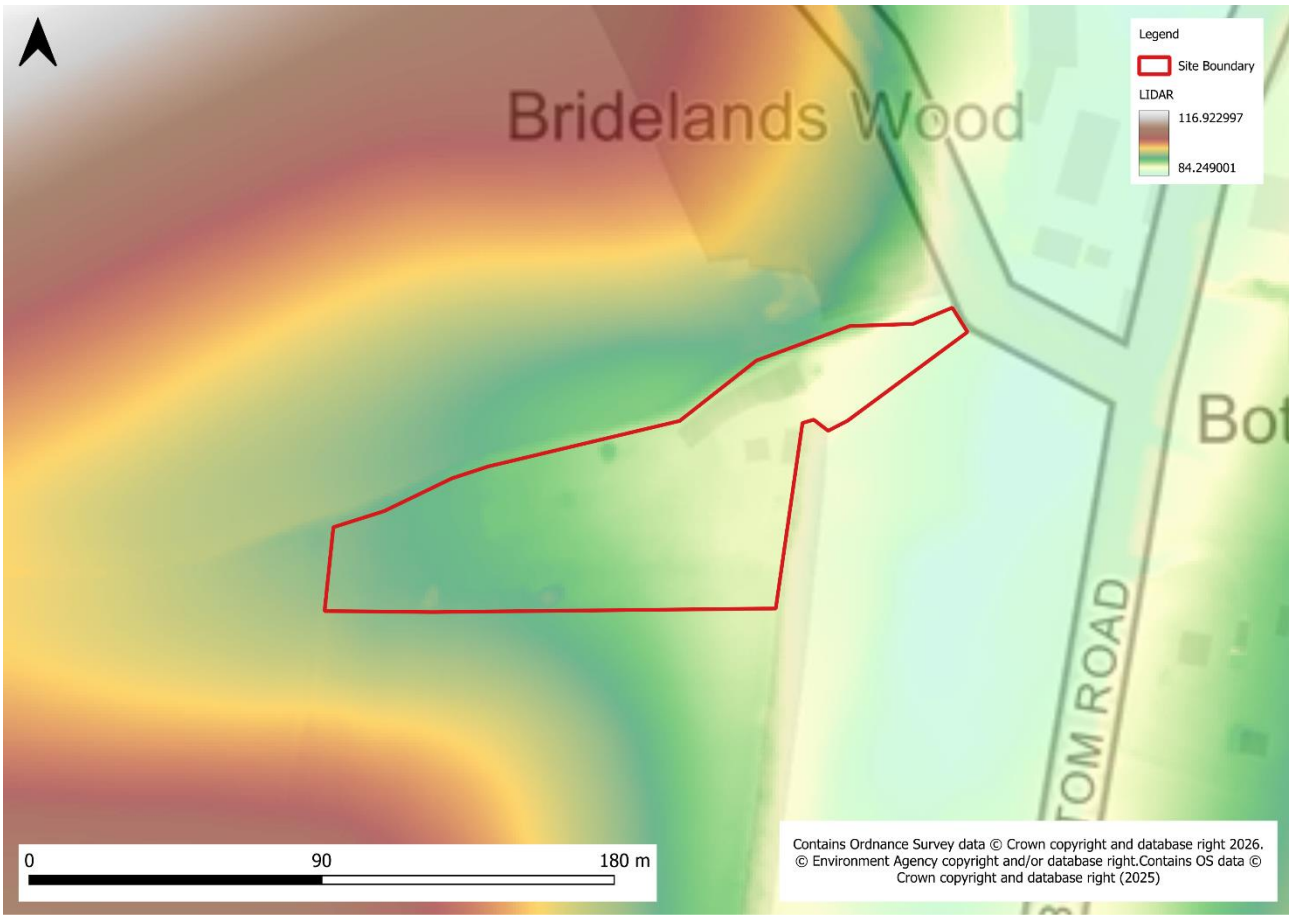

Figure 1-2: Topography of site

1.3 Geology and soils

Geology at the site consists of:

- Bedrock - Seaford Chalk Formation (Chalk)
- Superficial - The majority of the site is underlain by Head Deposits (sand, gravel, clay and silt). There is no information available on the superficial geology present in the north-eastern part of the site.

Soils at the site consist of:

- Shallow lime-rich soils over chalk or limestone

2 Sources of flood risk

2.1 Location of site within the catchment

The site is located within the catchment for the Middle and Lower Darent Water Body which is part of the Darent Operational Catchment. The Middle and Lower Darent Water Body has a catchment area of 153.50km^2 and is not described as heavily modified.

2.2 Existing drainage features

There are no identifiable drainage features within or surrounding the site. However, as there is an existing development on the site, it is expected that the development is served by a surface water drainage system, which discharges into the local sewer systems.

2.3 Fluvial

2.3.1 Available data

The EA's Flood Map for Planning (FMfP) has been used within this assessment to determine Flood Zones 3a and 2. The 3.3% AEP defended extent from the EA's Risk of Flooding from Rivers and Sea (RoFRS) mapping has been used to determine Flood Zone 3b.

2.3.2 Description of risk to the site

The site is located within Flood Zone 1 and is therefore predicted to be at very low risk of fluvial flooding, as shown in Table 2-1.

Table 2-1: Existing fluvial flood risk based on EA FMfP

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
100	0	0	0

2.4 Surface water

2.4.1 Available data

The EA's FMfP Surface Water Spatial Planning mapping has been used to assess the extent and depth of surface water flooding. The EA's Risk of Flooding from Surface Water (RoFSW) mapping has been used to assess the velocity and hazard of surface water flooding.

2.4.2 Description of risk to the site

Table 2-2 and Figure 2-1 presents the surface water flood risk across the site based on the Surface Water Spatial Planning extent mapping.

During the 3.3% AEP (high risk) event, 4.71% of the site is affected by surface water flooding, characterised by localised ponding in the eastern part of the site. Furthermore, an offsite flow path is shown to slightly encroach the western site boundary. Flood depths are not predicted to exceed 0.20m, with a maximum hazard classification of Low (Caution).

During the 1% AEP (medium risk) event, the offsite flow path from the west is shown to enter the site and flow towards the eastern boundary, where it leaves the site and joins a significant flow path located directly east of the site. Overall, 16.69% of the site is impacted during this event. Flood depths are not shown to exceed 0.20m, however, maximum velocities of 2.00m/s are predicted within the centre of the site. A maximum hazard rating of Moderate (dangerous for some) is shown where fast flowing water is predicted.

In the 0.1% AEP (low risk) event, there is a significant increase in surface water flooding across the site, with 45.35% of total site area affected. Surface water mapping shows an extensive flow path across the site, which appears to flow from the west to the east, reflecting the slope in topography. Depths are relatively shallow and generally below 0.20m, with a maximum depth of 0.30m predicted in the eastern part of the site. Maximum velocities of 2.00m/s are predicted across the centre of the site, with an overall maximum hazard rating of Significant (dangerous for most people).

Table 2-2: Existing surface water flood risk based on the Surface Water Spatial Planning extent mapping

Event	3.3% AEP (high risk)	1% AEP (medium risk)	0.1% AEP (low risk)
Percentage of site at risk* (%)	4.71	16.69	45.35
Maximum depth (m)	0.20	0.20	0.30
Maximum velocity (m/s)	0.50	2.00	2.00
Maximum hazard classification	0.50 - Low - Caution: Flood zone with shallow flowing water or deep standing water.	0.75 - Moderate - Dangerous for Some - Danger: Flood zone with deep or fast flowing water.	1.25 - Significant - Dangerous for most people - Danger: Flood zone with deep fast flowing water

** 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., 1% AEP includes the 3.3% AEP percentage).*

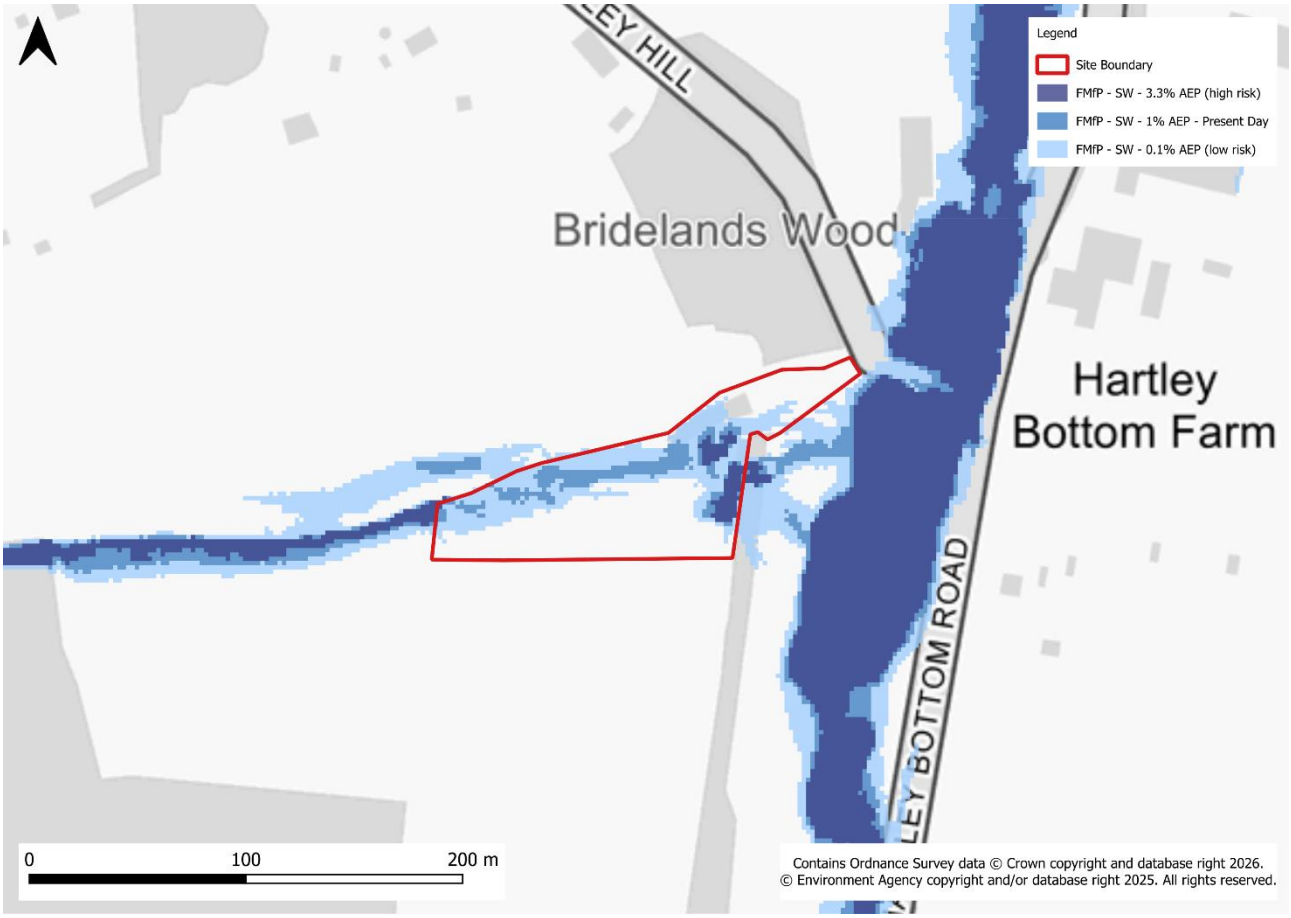

Figure 2-1: Flood Map for Planning - Surface Water Spatial Planning extents

2.5 Reservoir

The site is not shown to be at risk of reservoir flooding during the Dry Day or Wet Day scenarios in the EA Reservoir Flood Maps.

2.6 Groundwater

The JBA Groundwater Emergence Map (Figure 2-2) indicates that across the majority of the site, groundwater levels are between 0.5m and 5m below ground level during a 1% AEP groundwater flood event. There is a risk of flooding to subsurface assets and below ground development such as basements.

Within a small area in the south-eastern corner of the site, groundwater levels are between 0.025m and 0.5m below ground level. This indicates that there is a risk of flooding to subsurface assets and below ground development such as basements. An even smaller area within this location is predicted to experience groundwater depths of less than 0.025m below ground level, which could emerge at the surface and flow to and pool within topographic low spots.

Based on the surface water extents and topography of the site it is likely that any groundwater that emerges will flow towards the eastern site boundary.

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.

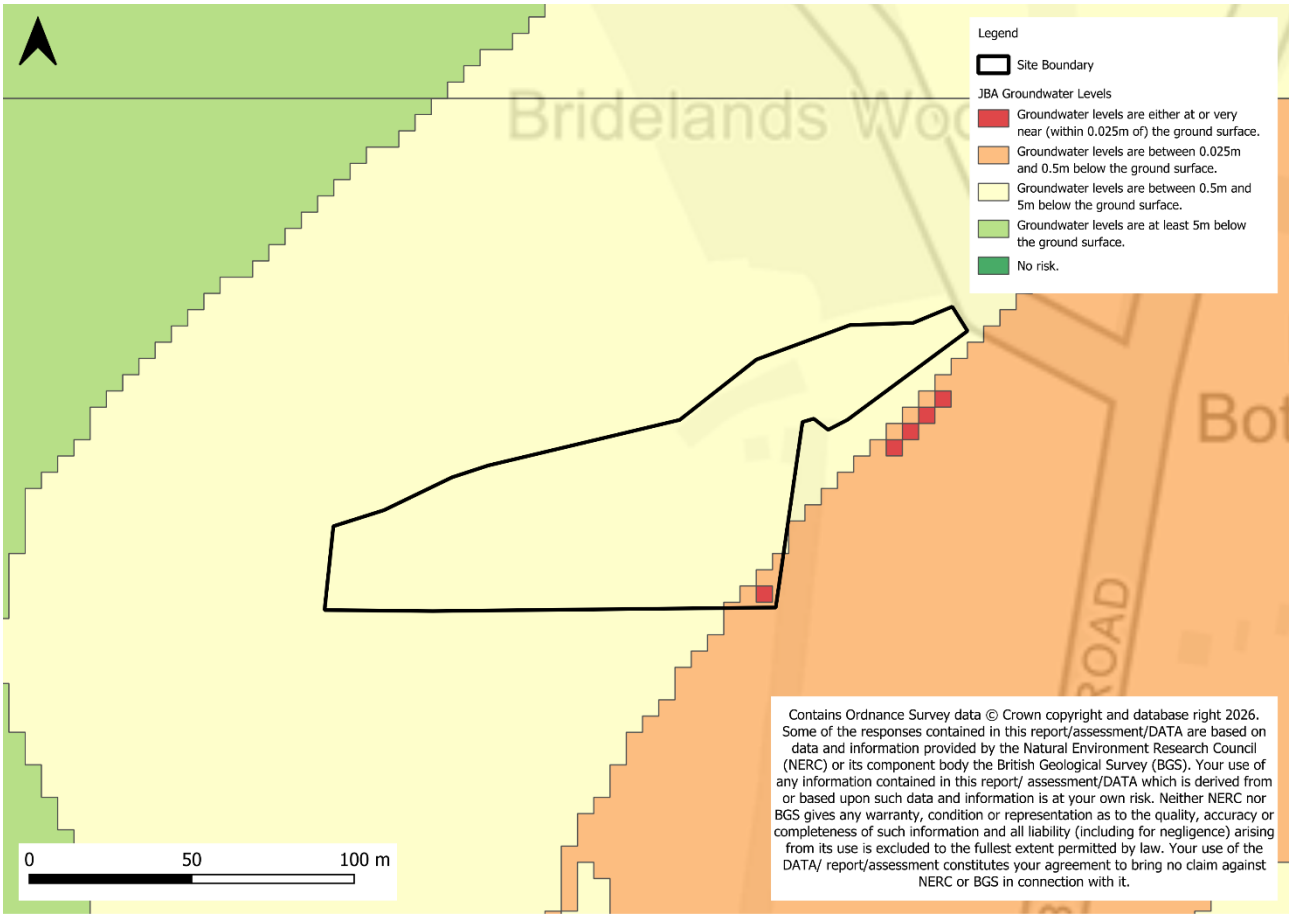

Figure 2-2: JBA Groundwater Emergence Mapping

2.7 Sewers

The site is located within postcode area DA3 8, where Thames Water sewer flooding incident data indicates 2 incidences of external sewer flooding.

2.8 Flood history

The EA's Historic Flood Map does not indicate previous flooding within the site. However, flood records held by the LLFA at Kent County Council identify an incident of blocked drains on the junction of Hartley Hill and Hartley Bottom Road in 2023, located approximately 50m east of the site.

3 Climate change

Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard, and frequency of both fluvial and surface water flooding. Please see Section 4.7 of the Sevenoaks District Level 2 SFRA for information on climate change allowances.

Development proposals at the site must address the potential changes associated with climate change and be designed to be safe for the intended lifetime. The provisions for safe access and escape must also address the potential increase in severity and frequency of flooding.

3.1 Fluvial

3.1.1 Available data

The EA RoFRS maps have been used to assess the impact of climate change on flood risk to the site. The 1% AEP plus 35% ('2080s' epoch Central allowance) climate change extents are currently available, and are based on national modelling. These are shown in shown in Table 3-1. No local detailed flood modelling is available.

3.1.2 Description of risk to the site

As shown below in Table 3-1, the site is not predicted to be impacted by fluvial flooding during the 1% AEP plus 35% climate change allowance event.

Table 3-1: Comparison of fluvial flood risk to the site between the 1% AEP and 1% AEP plus 35% climate change extents

Event	1% AEP	1% AEP plus 35% CC
Percentage of site at risk (%)	0.00	0.00

3.2 Surface water

3.2.1 Available data

The EA's FMfP Surface Water Spatial Planning mapping has been used to assess the extent and depth of surface water flooding impact of climate change on flood risk to the site in the 1% AEP plus 40% climate change event. The impact of climate change on surface water flood risk should be assessed as part of a site-specific Flood Risk Assessment, in line with the latest available climate change allowances and guidance.

3.2.2 Description of risk to the site

Table 3-2 and Figure 3-1 indicate a significant increase in flood extent across the site between the present day medium risk event and the 1% AEP plus 40% climate change

allowance. The flow path across the site is extensive during the climate change event, similar to the extent of flooding predicted during the present day 0.1% AEP event.

Maximum flood depths of 0.60m are predicted in the east of the site during the climate change scenario, however, depths within the surface flow path are generally below 0.30m.

Table 3-2: Comparison of surface water flood risk to the site between the 1% AEP and 1% AEP plus 40% climate change extents

Event	1% AEP	1% AEP plus 40% CC
Percentage of site at risk (%)	16.69	40.71
Maximum depth (m)	0.20	0.60

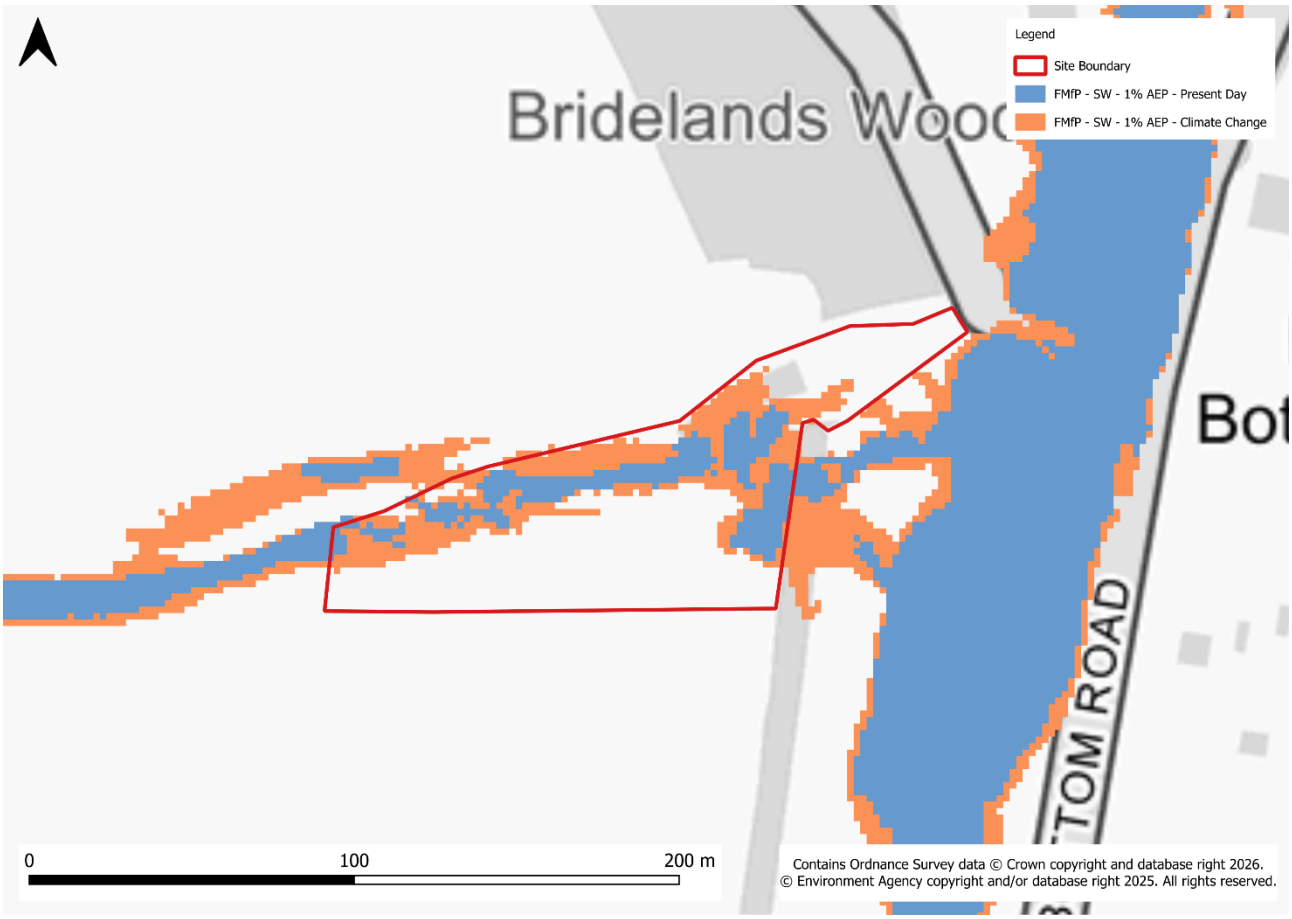

Figure 3-1: Comparison of surface water flood risk to the site between the 1% AEP and 1% AEP plus 40% climate change extents

4 Flood risk management infrastructure

4.1 Defences

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

4.2 Residual risk

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

5 Emergency planning

5.1 Flood warnings and alerts

The site is not located in an EA Flood Warning or Flood Alert Area.

5.2 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.

5.2.1 Potential access

Current access to the site is available via Hartley Hill, heading in a north-westerly direction towards Church Road, or heading in a south-easterly direction towards Hartley Bottom Road.

5.2.2 Fluvial

Safe access and escape from the site can be achieved during fluvial flood events.

5.2.3 Surface water

During the 1% AEP plus 40% climate change allowance event, safe access and egress is achievable via Hartley Hill to the north-east of the site, heading in a north-westerly direction towards Church Street, as no surface water flooding predicted along these access roads. However, safe access and escape from within the site is likely to be impeded, due to a significant flow path predicted to cross the centre of the site from the western boundary to the eastern boundary, with depths of up to 0.60m. Safe access and escape is also impeded via Hartley Bottom Road to the east of the site, due to a significant flow path predicted during the climate change scenario, with flood depths of up to 0.60m.

A site Specific Flood-Risk Assessment (FRA) must show that the development can be designed to be safe and that there is adequate planning provision.

5.3 Dry islands

The site is not located on a dry island.

6 Requirements for drainage control and impact mitigation

6.1 Broadscale assessment of possible SuDS

- BGS data indicates that the underlying geology is chalk, which is likely to be free draining, however groundwater levels are indicated to be between 0.025 and 5m below ground level. The viability of managing surface water runoff via infiltration should be confirmed through site investigations and infiltration testing, in line with Kent County Council LLFA guidance. Off-site discharge in accordance with the SuDS hierarchy is likely to be required to discharge surface water runoff from the site.
- 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 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.
- The site is not located within a historic landfill site.

6.2 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 (Local Planning Authority, Lead Local Flood Authority, and the EA) at an early stage to understand possible constraints.
- 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.
- 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 site lies within the Middle and Lower Darent Water Body, which has good ecological status. 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.
- 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 Surface Water Spatial Planning extent mapping indicates the presence of surface water flow paths during the medium and low risk events. Existing flow paths should be retained and integrated with blue-green infrastructure and public open space.
- 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.

7 NPPF and planning implications

7.1 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 development proposed for employment as Less Vulnerable.

The Exception Test is not required for this site because it comprises Less Vulnerable land use within Flood Zone 1.

While the Exception Test is not explicitly required for sites at risk from other sources of flooding, the LPA should follow a similar principle, as the proposed site is at risk of surface water flooding. This includes ensuring that site users can be kept safe through the lifetime of the development and ensuring that residual risk can be safely managed.

7.2 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 within Flood Zone 1 and the flood map for planning shows it is at increased risk of flooding from surface water, now or in the future.

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

Consultation with the Local Authority, Lead Local Flood Authority, Thames 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 Sevenoaks District Council Local Plan Policies.

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

7.3 Guidance for site design and making development safe

- The site layout should adopt a sequential approach by steering the most vulnerable aspects of the development outside of areas at risk of surface water flooding.
- Developers should utilise SuDS with multiple benefits throughout the site, particularly in areas at risk of surface water ponding.
- The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff magnitudes from the development are not increased by development across any ephemeral surface water flow routes. 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.
- The site is located within a catchment identified as highly sensitive to the cumulative impacts of development on flood risk. The site-specific FRA and surface water drainage strategy should consider the recommendations outlined for catchments of high sensitivity in the Sevenoaks District Level 1 SFRA Cumulative Impacts Assessment.
- 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.
- Flood resilience and resistance measures should be implemented where appropriate, e.g. raising of floor levels. These measures should be assessed to make sure that flooding is not increased elsewhere. If the floor levels cannot be raised to meet the minimum requirements, developers will need to:
    - raise them as much as possible.
    - consider moving vulnerable uses to upper floors.
    - include extra flood resistance and resilience measures.
- Other examples of flood resistance and resilience measures include:
    - using flood resistant materials that have low permeability to at least 600mm above the estimated flood level.
    - making sure any doors, windows or other openings are flood resistant to at least 600mm above the estimated flood level.
    - by raising all sensitive electrical equipment, wiring and sockets to at least 600mm above the estimated flood level.

8 Conclusions

The site is located within Flood Zone 1 and is therefore at very low risk of fluvial flooding, due to this, the Exception Test is not required.

The EA's Flood Map for Planning – Surface Water Spatial Planning extents indicate that a significant overland flow path is predicted to affect approximately 45.35% of the site during the low-risk event. During the 1% AEP plus 40% climate change event, a similar pattern of flooding is observed, with 40.71% of the site affected.

The JBA Groundwater Emergence Map indicates that, across the majority of the site, groundwater levels are expected to be between 0.5m and 5m below ground level during a 1% AEP groundwater flood event. Within a small area in the south-eastern corner of the site, groundwater levels are predicted to be between 0.025m and 0.5m below ground level, with an even smaller area anticipated to experience groundwater depths of less than 0.025m below ground level.

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

- A site specific Flood Risk Assessment is required which demonstrates that site users will be safe during events up to and including the 1% and 0.1% AEP rainfall events, with an appropriate allowance for climate change. This will need to show that the site is not at an increased risk of flooding in the future and that development of the site does not increase the risk of surface water flooding either on or off the site.
- The site layout should adopt a sequential approach by steering the most vulnerable aspects of the development outside of areas at risk of surface water flooding.
- Arrangements for safe access and escape will need to be provided for the 1% AEP surface water 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.

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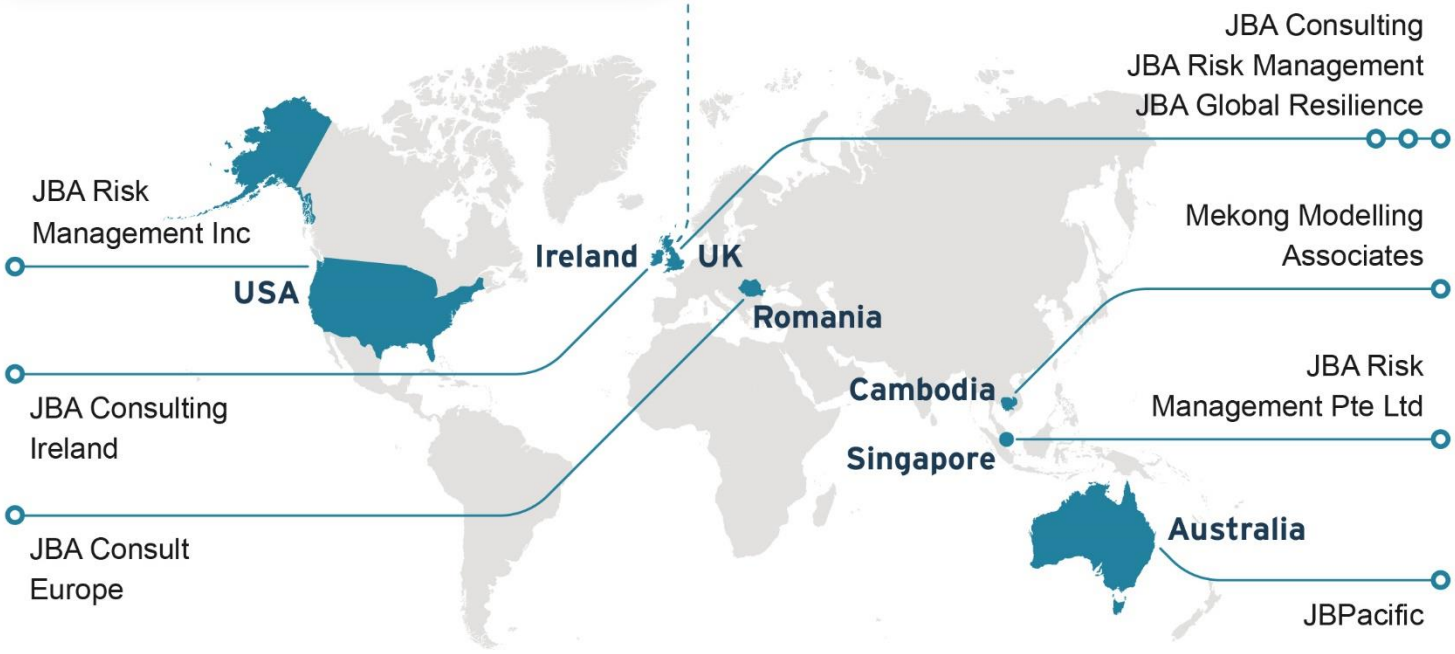

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