

Flood Risk Assessment for Planning

September 2025

Our reference:

96300-ThamesWy

Prepared for:

Speedgreen (Thames Way)
Limited

Location:

Land Adjacent to the
Sewage Works

Thames Way

Northfleet

Gravesend

DA11 8HW



Document Issue Record

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Location:	Land Adjacent to the Sewage Works, Thames Way, Northfleet, Gravesend, DA11 8HW
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1. Key Facts

Flood Risk Posed:

- Site is located within Flood Zones 1, 2 and 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea).
- Predominantly tidal flood risk originating from the River Thames (Estuary) 1160m to the northeast of the site.
- Modelled flood levels and extents have been requested from the EA for use within this report. The EA has provided modelled flood data from the Thames Estuary 2100 (TE2100) study and Thames Barrier Downriver Breach Inundation Modelling Study 2018.
- The site is partially within the 2115 modelled breach extents for the 1:200 year and 1:1000 year events.
- The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “Low” chance of flooding from surface water for the present day and “Very Low” to “Medium” chance between 2040 and 2060.
- According to the 2013 Thameside Surface Water Management Plan (SWMP) and Southern Water, 1 recorded sewer incident has occurred on Thames Way.
- The risk of flooding to the site from groundwater and reservoirs would appear to be low.
- The EA have no records of historical flooding having affected the site.

Flood Risk Mitigation:

- The proposed application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- No land raising, residential or commercial units are proposed as part of this application.
- Flood proofing of the development will be incorporated as appropriate.
- It is recommended that at the detailed design stage consideration is given to raising the height of the circuit breaker and termination.
- It is recommended that any proposed fencing for the site is of palisade design or similar, allowing water to flow through, unobstructed.
- Flood warning notices will be erected around the site to inform site users of the risk of flooding, and the flood warning and evacuation measures.
- In the event of a flood alert being issued, site users would be advised not to visit the site until the flood alert had been lifted.
- Safe escape will be provided by a flood warning and evacuation plan that will be prepared in liaison with the Council's Emergency Planners and tied in with the existing emergency plans for the area.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

2. Introduction

- 2.1. Unda Consulting Limited have been appointed by Speedgreen (Thames Way) Limited (hereinafter referred to as “the applicant”) to undertake a Flood Risk Assessment for the proposed development at Land Adjacent to the Sewage Works, Thames Way, Northfleet, Gravesend, DA11 8HW (hereinafter referred to as “the site”). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.
- 2.2. This report presents our findings based on the readily available information and data relating to the site and surrounding drainage area.
- 2.3. The site appears to be located within Flood Zones 1, 2 and 3 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required for all development or changes of use proposed:
 - In Flood Zones 2 or 3 or see flood map for planning;
 - Within Flood Zone 3b;
 - Within Flood Zone 1 with a site area of 1 hectare or more;
 - Within ‘Flood Zones plus Climate Change’, showing it is at increased risk of flooding from rivers or sea in future - see flood map for planning;
 - With Flood Zone 1 and the flood map for planning shows it is at risk of flooding from surface water;
 - In areas with critical drainage problems;
 - Within Flood Zone 1 where the LPA’s strategic flood risk assessment (SFRA) shows it will be at increased risk of flooding during its lifetime;
 - That increases the vulnerability classification and may be subject to sources of flooding other than rivers or sea.
- 2.4. The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development’s lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.
 - Whether the proposed development is likely to be affected by current or future flooding from any source;
 - Whether it will increase flood risk elsewhere;
 - Whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Site

- 3.1. The existing site is currently vacant.
- 3.2. The surrounding area is characterised by industrial infrastructure and green space.
- 3.3. Existing plans are provided in the report Appendix.



Figure 1: Aerial imagery of site and surrounding area (Source: Google Earth)

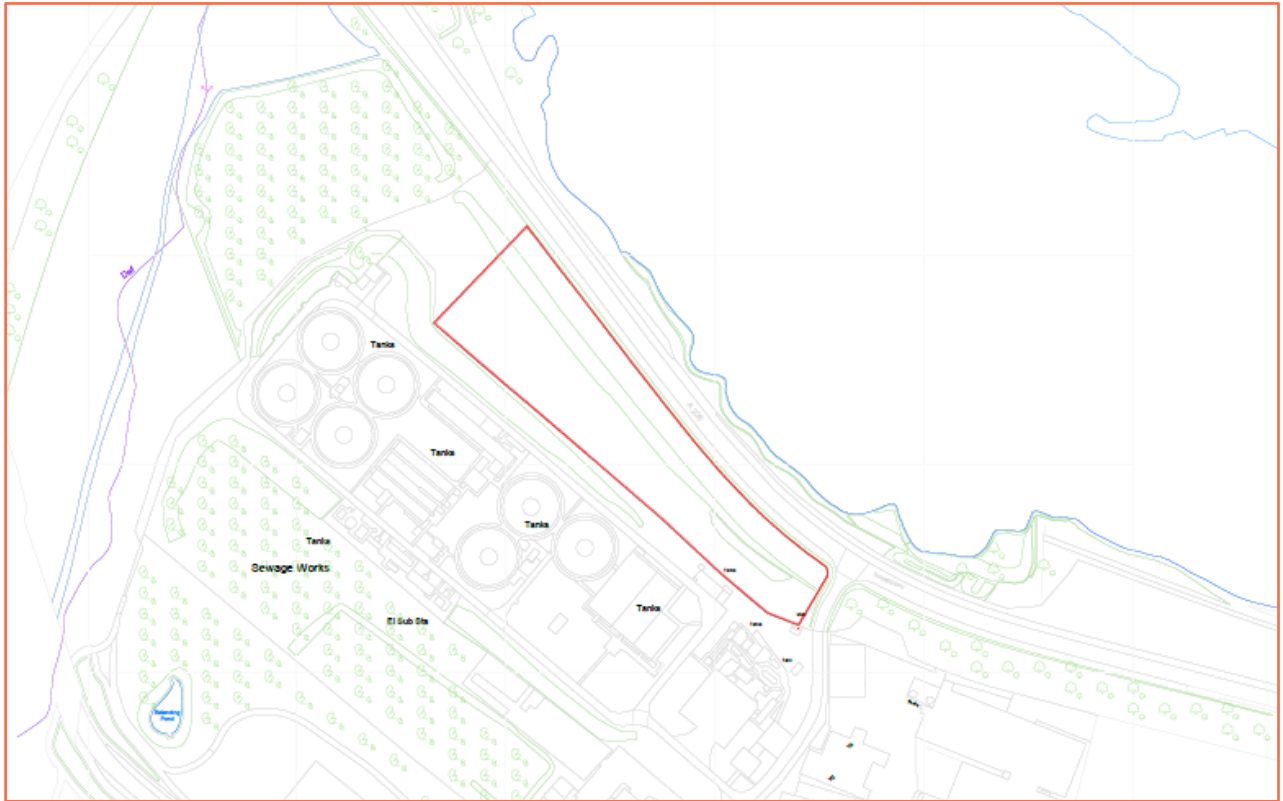


Figure 2: Site location plan (Source: Helioworks)

Site Topography:

- 3.4. Environment Agency LiDAR has been used to assess the topography across the site and wider area. Light Detection and Ranging (LiDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground surface. Up to 100,000 measurements per second are made of the ground, allowing highly detailed terrain models to be generated at high spatial resolutions. The EA's LiDAR data archive contains digital elevation data derived from surveys carried out by the EA's specialist remote sensing team. Accurate elevation data is available for over 70% of England. The LiDAR technique records an elevation accurate to +/-5cm to 15cm with spatial resolutions ranging from 25cm to 2 metres. This dataset is derived from a combination of the full dataset which has been merged and re-sampled to give the best possible coverage. The dataset can be supplied as a Digital Surface Model (DSM) produced from the signal returned to the LiDAR (which includes heights of objects, such as vehicles, buildings and vegetation, as well as the terrain surface) or as a Digital Terrain Model (DTM) produced by removing objects from the Digital Surface Model. 1.0m horizontal resolution DTM LiDAR data has been used for the purposes of this study.
- 3.5. LiDAR remotely sensed digital elevation data suggests that the ground topography on the site ranges from approximately 3.80mAOD to 8.60mAOD.

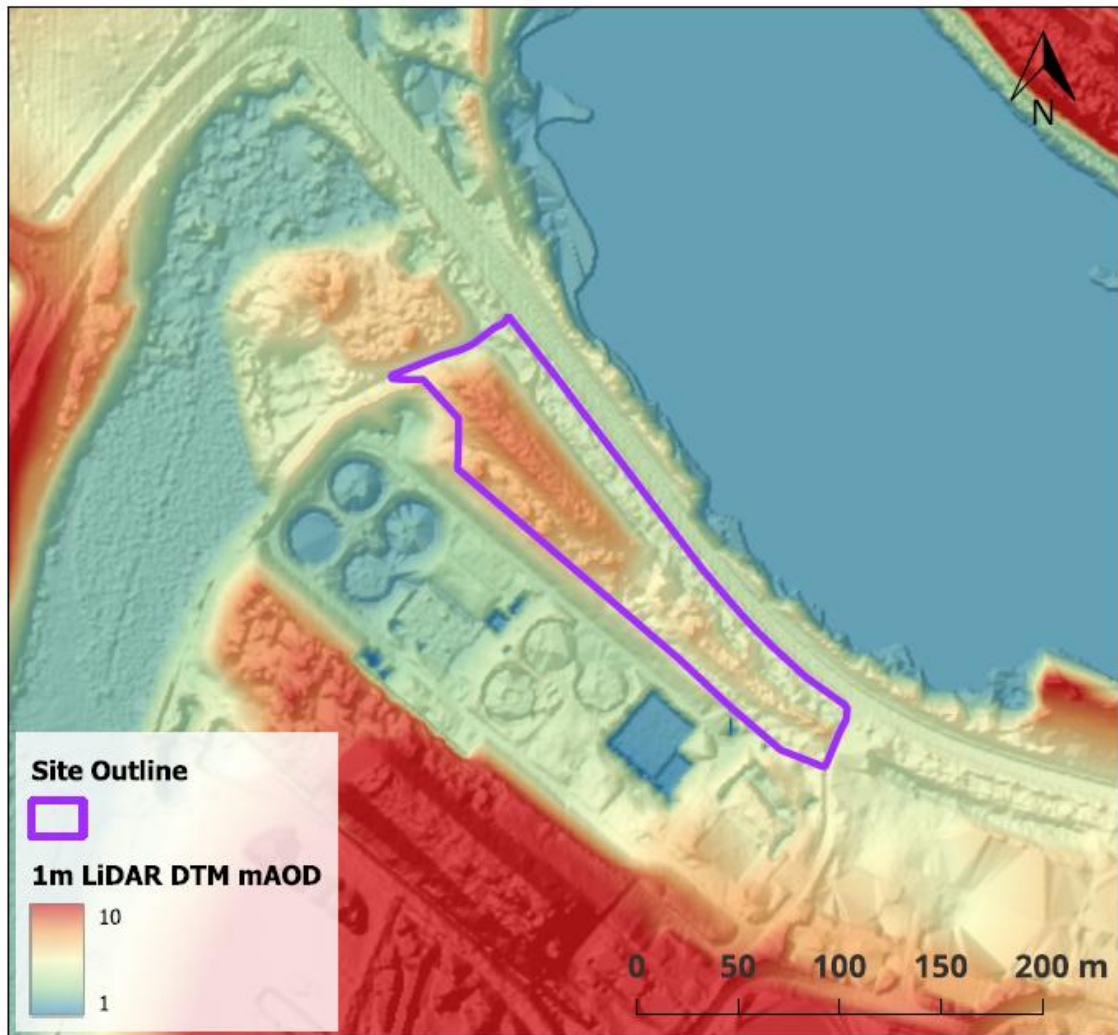


Figure 3: 1m LiDAR DTM (Source: EA, OS)

Existing Ground Conditions:

- 3.6. The 1:50,000 BGS map shows that the bedrock underlying the site is Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk formation (Undifferentiated) – Chalk.
- 3.7. The BGS mapping shows superficial deposits of Alluvium – clay, silt, sand and gravel underlying the site.
- 3.8. The soil type taken from the UKSO Soil Map Viewer, shows the site to be located upon relatively deep soils of Riverine Clay and Floodplain Sands and Gravel parent material with a soil texture of clay to sandy loam.

Nearby Watercourses / Drainage Features:

- 3.9. The nearest watercourse is the River Ebbsfleet, located approximately 95m west of the site. In addition, the River Thames (Estuary) located approximately 1160m northeast of the site.

4. Development Proposal

- 4.1. The proposed application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- 4.2. No land raising, residential or commercial units are proposed as part of this application.
- 4.3. Proposed plans are provided in the report Appendix.

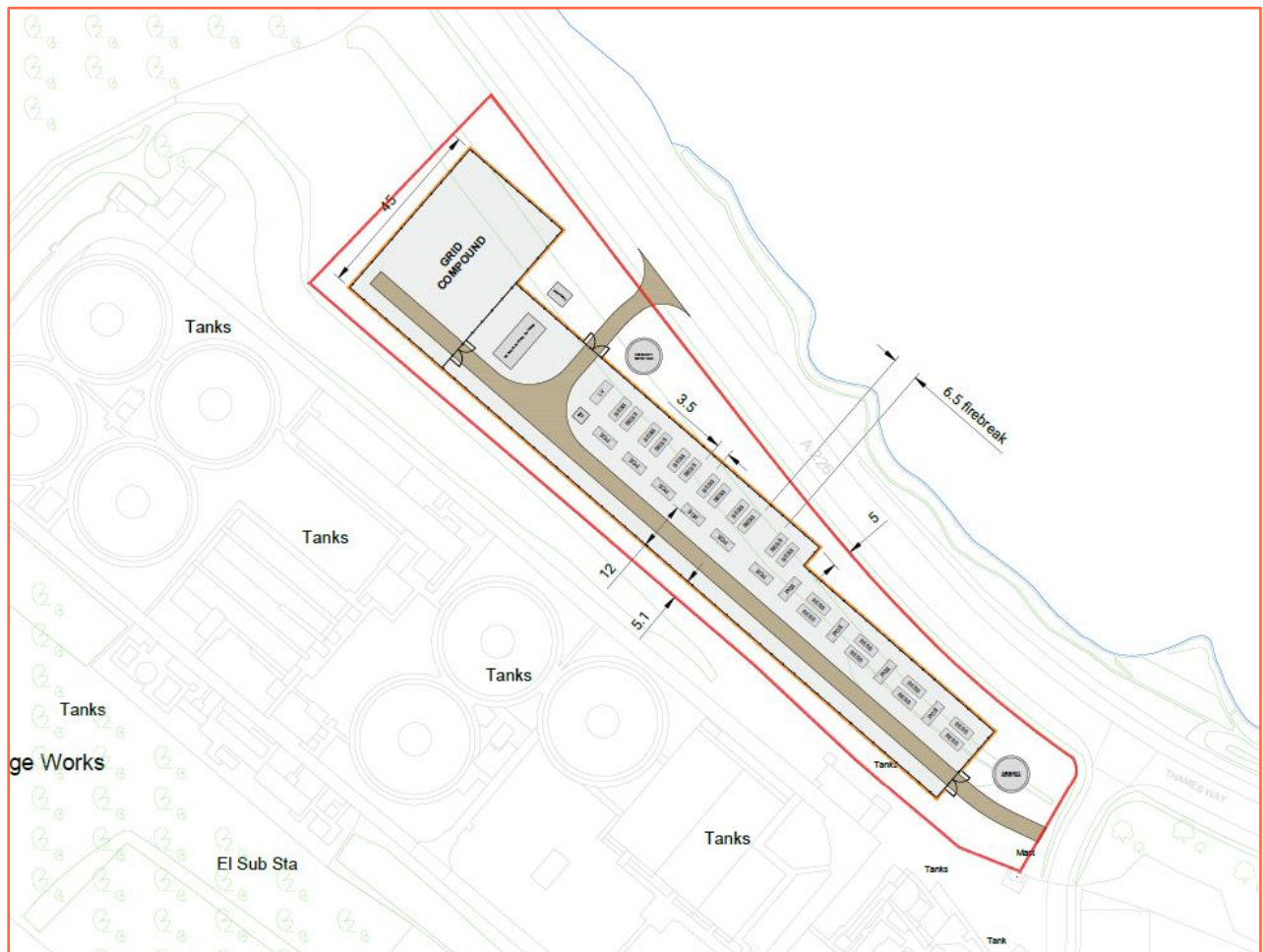


Figure 4: Proposed site plan (Source: Helioworks)

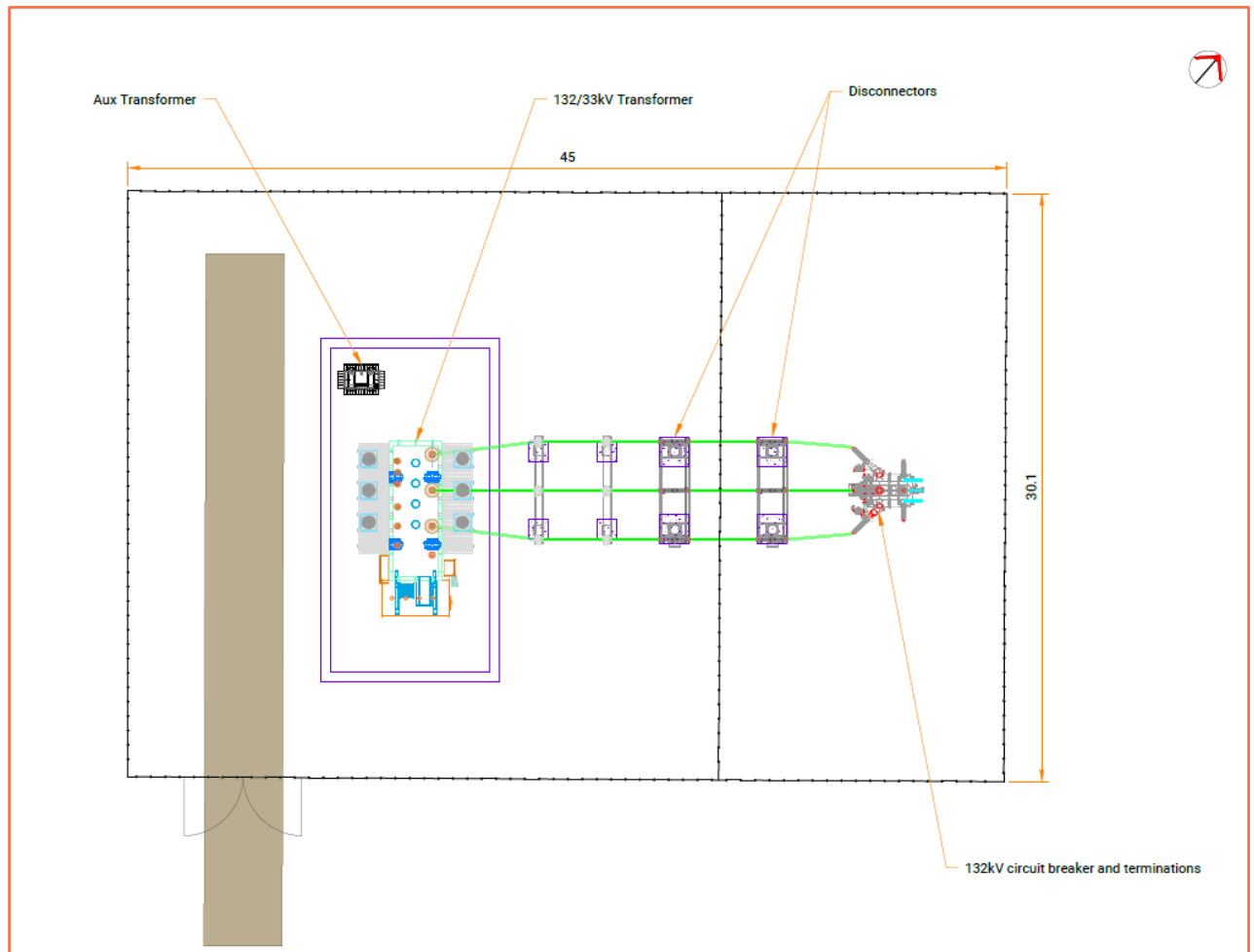


Figure 5: Proposed electrical equipment within Grid Compound (Source: Helioworks)

5. Flood Risk Assessment

EA Flood Zones:

- 5.1. Within planning, Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's Flood Map for Planning (Rivers and Sea), available on the Environment Agency's website.

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 0.1% annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map for Planning – all land outside Zones 2, 3a and 3b)
Zone 2 Medium Probability	Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1% or greater annual probability of river flooding; or Land having a 0.5% or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise: • land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or • land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding). Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

Table 1: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

- 5.2. The Flood Zones are created using local flood model outputs, recorded flood outlines and national flood model information. These are combined to generate extents of land at flood risk, with the aim of using the best available flood risk information in any one location. The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

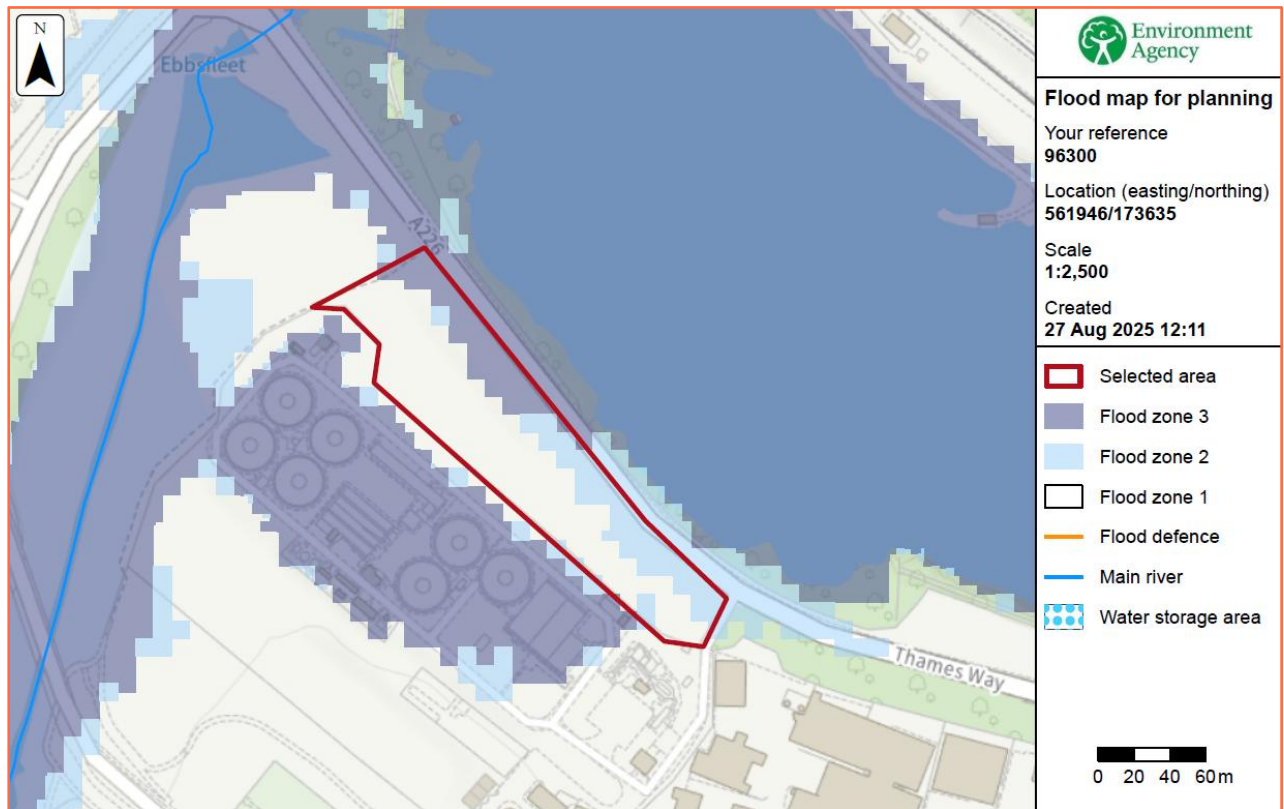


Figure 6: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

- 5.3. The site is located partially within Flood Zone 1 (Low Probability), which means it is defined as land having a less than 1 in 1,000 annual probability of river and sea flooding, Flood Zone 2 (Medium Probability), which means it is defined as land having between a 1 in 100 and 1 in 1,000 annual probability of river and sea flooding and Flood Zone 3 (High Probability), which means it is defined as land having at least a 1:100 annual probability of fluvial flooding.
- 5.4. The risk would appear to be predominantly tidal and originate from the River Thames (Estuary) which is located approximately 1160m northeast of the site.

EA Flood Zones plus Climate Change:

- 5.5. The Flood Zones plus climate change dataset shows how the combined extent of Flood Zones 2 and 3 could increase with climate change over the next century, ignoring the benefits of any existing flood defences. The EA have assumed no changes to flood defences or land-use that could occur in future. The effects of climate change on flood risk which may be seen in the future could be different to those currently considered.
- 5.6. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5.
- 5.7. The datasets shown on Flood Map for Planning are aimed at supporting planners and developers to make long-term decisions about the location and design of development and the use of land. Such decisions need to account for the full anticipated lifetime of the development being planned.
- 5.8. The EA have therefore chosen:
- the 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers
 - the 'Upper End' allowance for risk of flooding from the sea, accounting for cumulative sea level rise to 2125

- 5.9. The Flood Zones plus climate change dataset is created using local flood model outputs, recorded flood outlines and national flood model information, and by adding climate change scenarios from local and national modelling, using the maximum extents from:
- Rivers and sea with defences 3.3%, 1%/0.5% and 0.1% AEPs
 - Rivers and sea without defences 1%/0.5% and 0.1% AEPs
- 5.10. The extents are merged to create a single outline.
- 5.11. The site is shown to be within the EA Flood Zones plus climate change (2070 to 2125) extent.

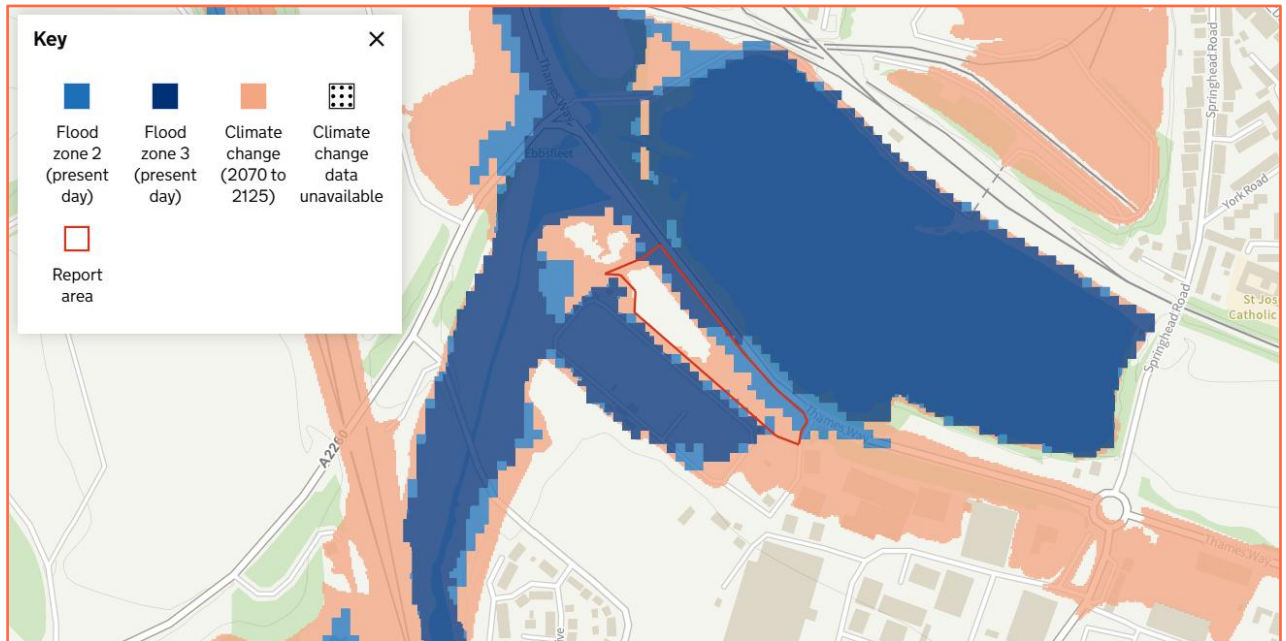


Figure 7: Environment Agency Flood Map for Planning with climate change (Rivers and Sea) (Source: EA)

Alternative Flood Zones:

- 5.12. Within their Strategic Flood Risk Assessment (SFRA), 2009 Kent Thameside differentiates Flood Zone 3a from Flood Zone 3b, the functional floodplain. Flood Zone 3b comprises land where water is required to flow or be stored in times of flood. The functional floodplain designation encompasses land which would flood with an annual probability of 1 in 30 or greater in any year; and includes areas of land required for water conveyance routes.
- 5.13. According to the 2009 Kent Thameside SFRA, the site is located within Flood Zone 3a, entirely outside of the functional floodplain.

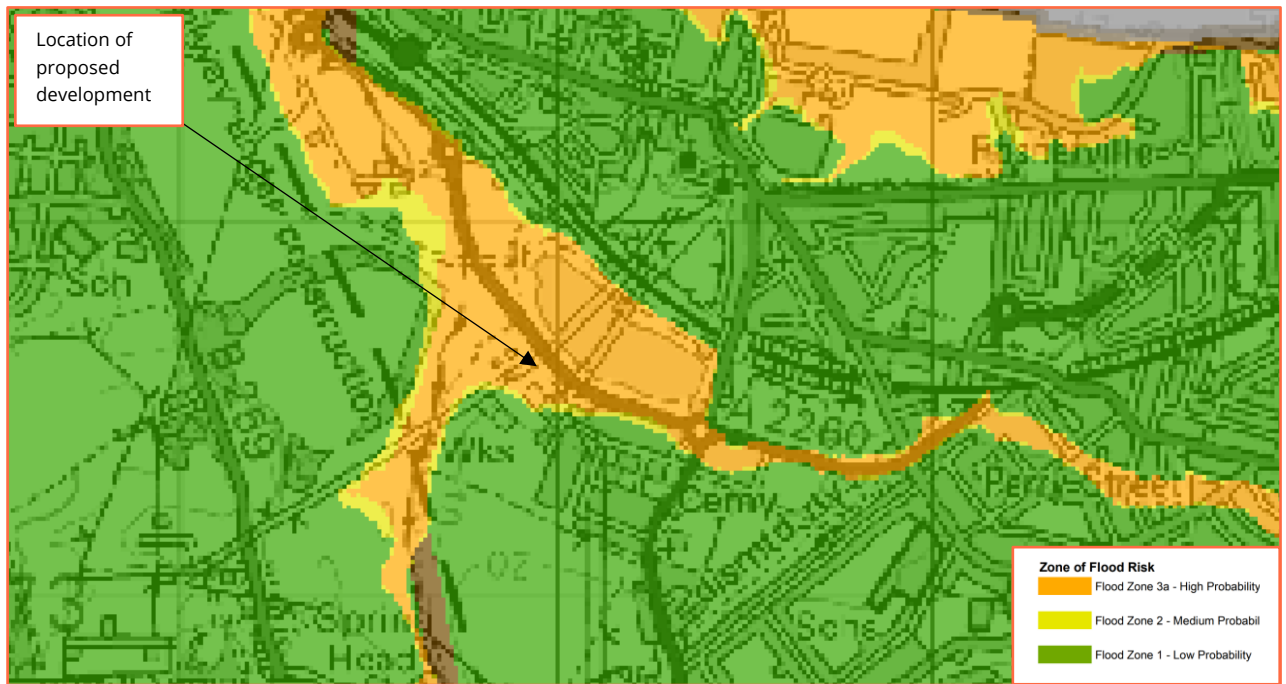


Figure 8: Flood Zones (Source: 2009 Kent Thameside SFRA)

Tidal (River Thames Estuary):

- 5.14. The River Thames flows through southern England, most notably through London. At 346 km, it is the longest river entirely in England and the second longest in the United Kingdom, after the River Severn. It also flows through Oxford (where it is called Isis), Reading, Henley-on-Thames and Windsor. The lower reaches of the river are called the Tideway, derived from its long tidal reach up to Teddington Lock. It rises at Thames Head in Gloucestershire, and flows into the North Sea via the Thames Estuary. The Thames drains the whole of Greater London. The site falls into the Thames River Basin District (RBD) (as defined by the Environment Agency) and is located in the Environment Agency Thames Region.
- 5.15. The River Thames is predominantly tidal in the vicinity of the site.

Detailed Flood Modelling:

- 5.16. In-channel modelled flood levels for use within this report have been requested from the EA. The data is from the Thames Estuary 2100 (TE2100) study completed by HR Wallingford in 2008. The TE2100 plan is now live and within it are a set of levels on which the flood risk management strategy is based. The plan is the overarching flood management strategy for the Thames Estuary and therefore any development planning should be based on the same underlying data.
- 5.17. TE2100 takes into account operation of the Thames Barrier when considering future river levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels which would normally shut the barrier will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upstream of the barrier will increase and the tidal walls will need to be heightened to match.
- 5.18. The levels upstream of the barrier are the highest levels permitted by the operation of the Thames Barrier. If levels and flows are forecast to be any higher, the Thames Barrier would shut, ensuring that the tide is blocked and the river maintained to a low level. For this reason the probability of any given water level upstream of the Barrier is controlled and therefore any associated return period becomes irrelevant. The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that

has a 0.1% annual probability. The probability of water levels upriver is ultimately controlled by the staff at the Thames Barrier.

- 5.19. In west London there is a heavy influence from upstream flows (fluvial flows). The flood defences are built to manage tidal flood risk only. With very high fluvial flows, the river levels in west London could be above the 0.1% annual probability tidal level. The climate change levels are assessed to determine the future tidal defence levels. For this reason they only account for extreme tidal events and not extreme fluvial flow events. The present day levels include extreme flows from upstream (fluvial events) as well as extreme tidal events.
- 5.20. The following maximum extreme flood levels relevant to the site have been provided by the EA:

Node / Event	Present Day (mAOD)	2100 (mAOD)
3.23	5.85	6.52

Table 2: TE2100 modelled in-channel flood levels

- 5.21. The closest node to the site is node 3.23. An extreme water level of 5.85mAOD has been provided for the present day, rising to 6.52mAOD in 2100.
- 5.22. Comparison of these modelled flood levels with topographic site levels (3.80mAOD to 8.60mAOD) has shown that the site is partially below the in-channel River Thames tidal flood levels. The River Thames is however defended to the 1:1000 year standard.

Flood Storage Areas:

- 5.23. Flood Storage Areas are areas that act as a balancing reservoir, storage basin or balancing pond. Their purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer time interval. Flood storage areas do not completely remove the chance of flooding and can be overtopped or fail in extreme weather conditions.
- 5.24. According to EA data, there are no Flood Storage Areas located in close proximity to the site.

Flood Defences:

- 5.25. London is defended from tidal flooding from the River Thames to a high standard. These defences include the Thames Barrier. The Thames Barrier is one of the largest movable flood barriers in the world. The EA runs and maintains the Thames Barrier as well as London's other flood defences.
- 5.26. The Thames Barrier spans 520m across the River Thames near Woolwich, and it protects 125km² of central London from flooding caused by tidal surges. It has 10 steel gates that can be raised into position across the River Thames. When raised, the main gates stand 15m high, and 61.5m wide. Each main gate weighs 3,300 tonnes.
- 5.27. The barrier is closed under storm surge conditions to protect London from flooding from the sea. It may also be closed during periods of high flow over Teddington Weir to reduce the risk of river flooding in some areas of west London including Richmond and Twickenham.
- 5.28. The Thames Barrier will then remain closed over high water until the water level downstream of the Thames Barrier has reduced to the same level as upstream. This is a managed process to provide for different circumstances, and takes approximately 5 hours. The Thames Barrier is then opened, allowing the water upstream to flow out to sea with the outward-bound tide.
- 5.29. The EA has closed the Thames Barrier 221 times since it became operational in 1982 (correct as of August 2025). Of these closures, 119 were to protect against tidal flooding and 102 were to alleviate river flooding. The frequency of closures has increased over recent decades:

- In the 1980s there were 4 closures;
- In the 1990s there were 35 closures;
- In the 2000s there were 80 closures;
- In the 2010s there were 74 closures
- In the 2020's there were 28 closures (as of August 2025).

5.30. In addition to the Thames Barrier, the site benefits from the presence of raised man-made flood defences either side of the main River Thames channel. These raised defences act to prevent direct inundation of the site and surrounding area during high tides and periods of high fluvial flow.

5.31. The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year tidal flood event. The defences are all raised, man-made and privately owned.

Residual Risk (breach or overtopping of flood defences):

5.32. Breaching of flood defences can cause rapid inundation of areas behind flood defences as flow in the river channel discharges through the breach. A breach can occur with little or no warning, although they are much more likely to occur with extreme river levels or tides when the stresses on flood defences are highest. Flood water flowing through a breach will normally discharge at a high velocity, rapidly filling up the areas behind the defences, resulting in significant damage to buildings and a high risk of loss of life. Breaches are most likely to occur in soft defences such as earth embankments although poorly maintained hard defences can also be a potential source of breach.

5.33. Overtopping of flood defences occurs when water levels exceed the protection level of raised flood defences. The worst case occurs when the fluvial or tidal levels exceed the defence level as this can lead to prolonged flooding. Less severe overtopping can occur when flood levels are below defence levels, but wave action causes cyclic overtopping, with intermittent discharge over the crest level of the defence. Flood defences are commonly designed with a freeboard to provide protection against overtopping from waves. The risk from overtopping due to exceedance of the flood defence level is much more significant than the risk posed by wave overtopping. Exceedance of the flood defence level can lead to prolonged and rapid flooding with properties immediately behind the defences at highest risk.

5.34. The EA has provided data from the Thames Barrier Downriver Breach Inundation Modelling Study 2018 completed by Atkins Ltd. in May 2018.

5.35. The EA have developed a modelling approach where all downriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates continuous tidal breaches along the entire extent of the Thames between the Thames Barrier and east of Gravesend on the south bank and east of Tilbury on the north bank. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.

5.36. Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the current year epoch, as well as 2115 epoch which include allowances for climate change.

5.37. The site is shown to be entirely outside of the 1:200 year and 1:1000 year modelled breach extents for 2005.

5.38. The site is shown to be partially within the 1:200 year and 1:1000 year modelled breach extents for 2115.

5.39. The north eastern boundary of the site is shown to be affected by the 1:200 year modelled breach extent for 2115, whilst all of the proposed infrastructure is situated outside of the extent, remaining flood free.

- 5.40. During the 1:1000 year modelled breach extent for 2115, the site's north eastern section is shown to be affected. The circuit breaker within the grid compound and emergency water tank are shown to be within the flood extent. All other proposed infrastructure is shown to be outside of the 1:1000 year modelled breach extent for 2115, remaining flood free.

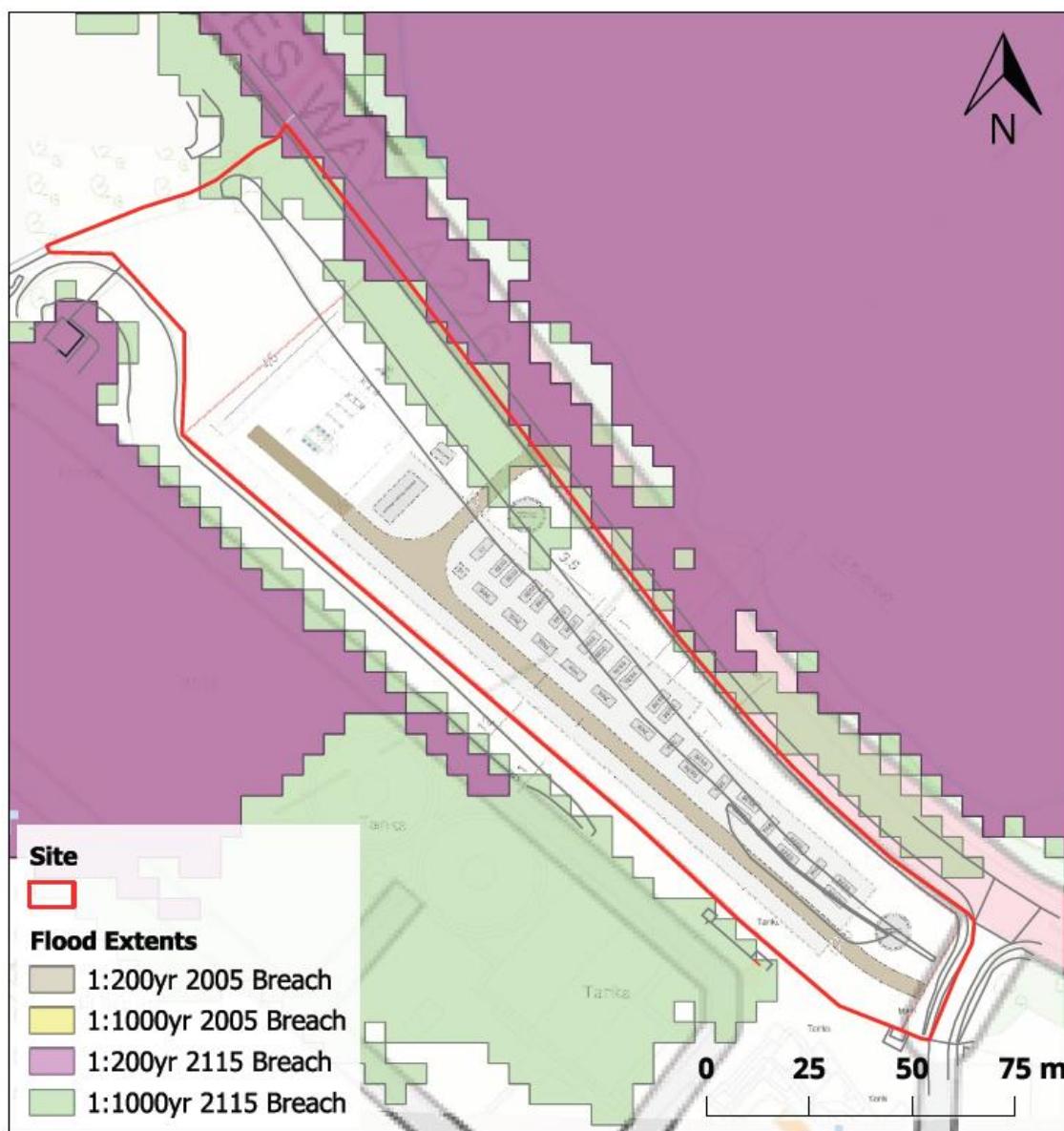


Figure 9: Environment Agency maximum breach flood extents from downriver breach inundation modelling study with site plan overlain (Source: EA, OS)

- 5.41. Modelled on-site breach flood levels have been extracted at node point locations across the site.

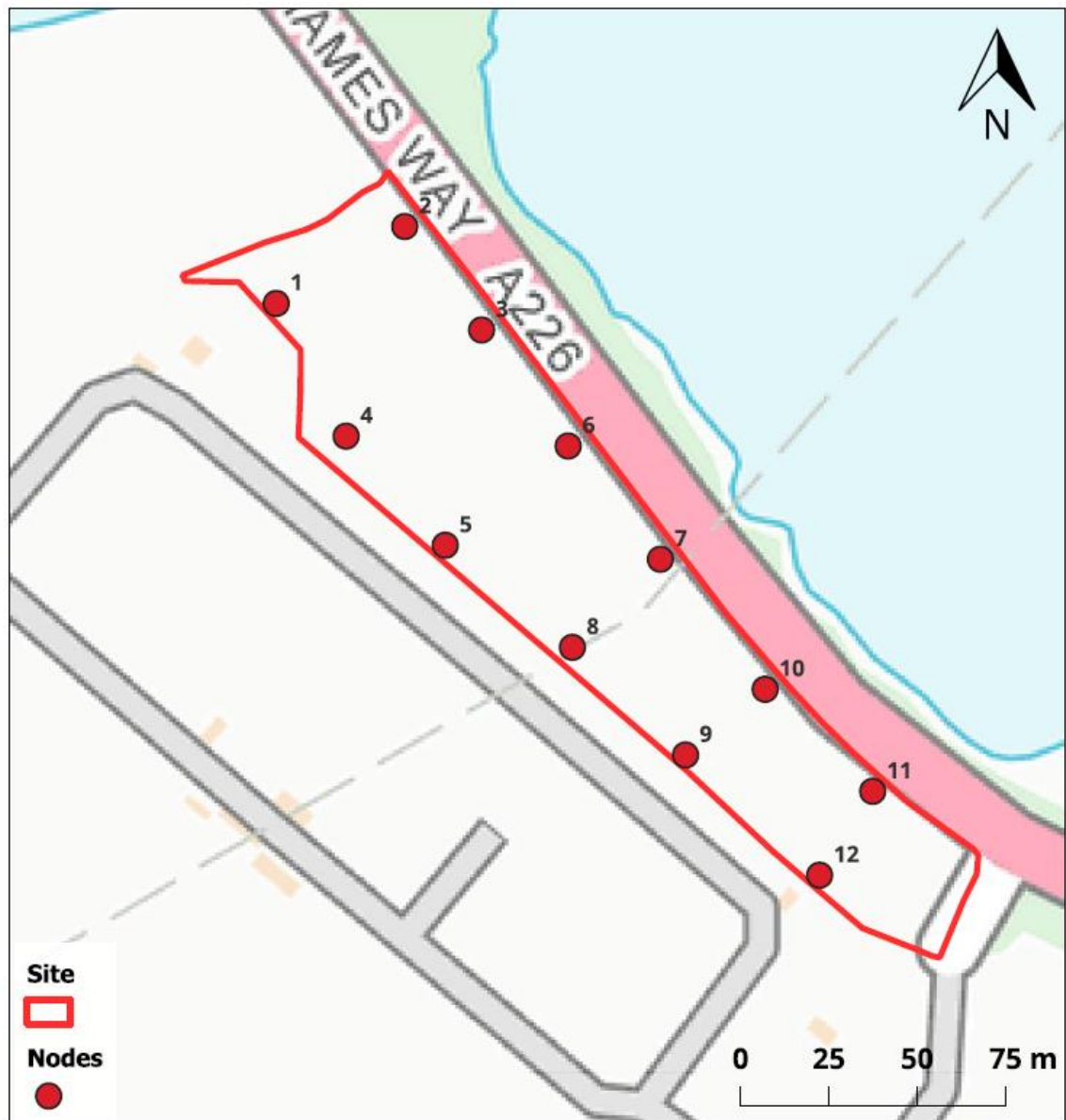


Figure 10: OS Mapping and Mastermap showing site node points where breach flood levels are extracted
(Source: OS)

Node ID	x	y	2005 1:200yr breach flood level (mAOD)	2005 1:1000yr breach flood level (mAOD)	2115 1:200yr breach flood level (mAOD)	2115 1:1000yr breach flood level (mAOD)
1	561860	173706	Outside extent	Outside extent	Outside extent	Outside extent
2	561895	173726	Outside extent	Outside extent	Outside extent	4.32
3	561917	173696	Outside extent	Outside extent	Outside extent	4.31
4	561877	173667	Outside extent	Outside extent	Outside extent	Outside extent
5	561908	173636	Outside extent	Outside extent	Outside extent	Outside extent
6	561942	173663	Outside extent	Outside extent	Outside extent	4.31
7	561967	173633	Outside extent	Outside extent	Outside extent	Outside extent
8	561943	173608	Outside extent	Outside extent	Outside extent	Outside extent
9	561976	173577	Outside extent	Outside extent	Outside extent	Outside extent
10	561998	173595	Outside extent	Outside extent	Outside extent	Outside extent
11	562028	173566	Outside extent	Outside extent	Outside extent	Outside extent
12	562011	173543	Outside extent	Outside extent	Outside extent	Outside extent

Table 3: Selected on-site nodes for 1:200 year and 1:1000 year 2005 and 2115 breach flood levels (Source: EA)

- 5.42. Comparison of the maximum modelled breach flood levels with topographic site levels (3.80mAOD to 8.60mAOD) shows parts of the site lie up to 0.52m below, and up to 4.28m above, the 1:1000 year 2115 breach flood level.

Pluvial (Surface Water):

- 5.43. Pluvial (surface water) flooding occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.
- 5.44. The mapping below shows the Risk of Flooding from Surface Water (RoFSW). Please note that the EA do not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation. This information tells you the flood risk of the land around a building, not the building itself.
- 5.45. The RoFSW products are an assessment of where surface water flooding may occur.
- 5.46. The mapping shows the following likelihood categories, for the present day risk of flooding from surface water, and the climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk.
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
 - Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
 - Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.
- 5.47. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 – 2060 “2050s” epoch) and central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections.
- 5.48. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “Low” chance of flooding from surface water.

- 5.49. The EA Risk of Flooding from Surface Water mapping shows the site to be at “Very Low” to “Medium” chance of flooding between 2040 and 2060.



Figure 11: Extract from EA Risk of Flooding from Surface Water mapping – present day (Source: EA)



Figure 12: Extract from Environment Agency RoFSW map – between 2040 and 2060 (Source: EA)

Depth of Surface Water Flooding:

5.50. The EA have also released depth bands for the present day and with climate change 2040 – 2060. These depth bands are:

- 0.2m
- 0.3m
- 0.6m
- 0.9m
- 1.2m

5.51. The maps provide information on flood depths to show the chance that different depths of flooding could be reached or exceeded each year.

5.52. A more detailed review of the surface water flood depths at the site identified the following likelihoods of surface water flood chances.

Depth of Surface Water Flooding at Present Day

5.53. The site is partially within the “Low” chance of reaching or exceeding 0.2m of surface water at any given year.

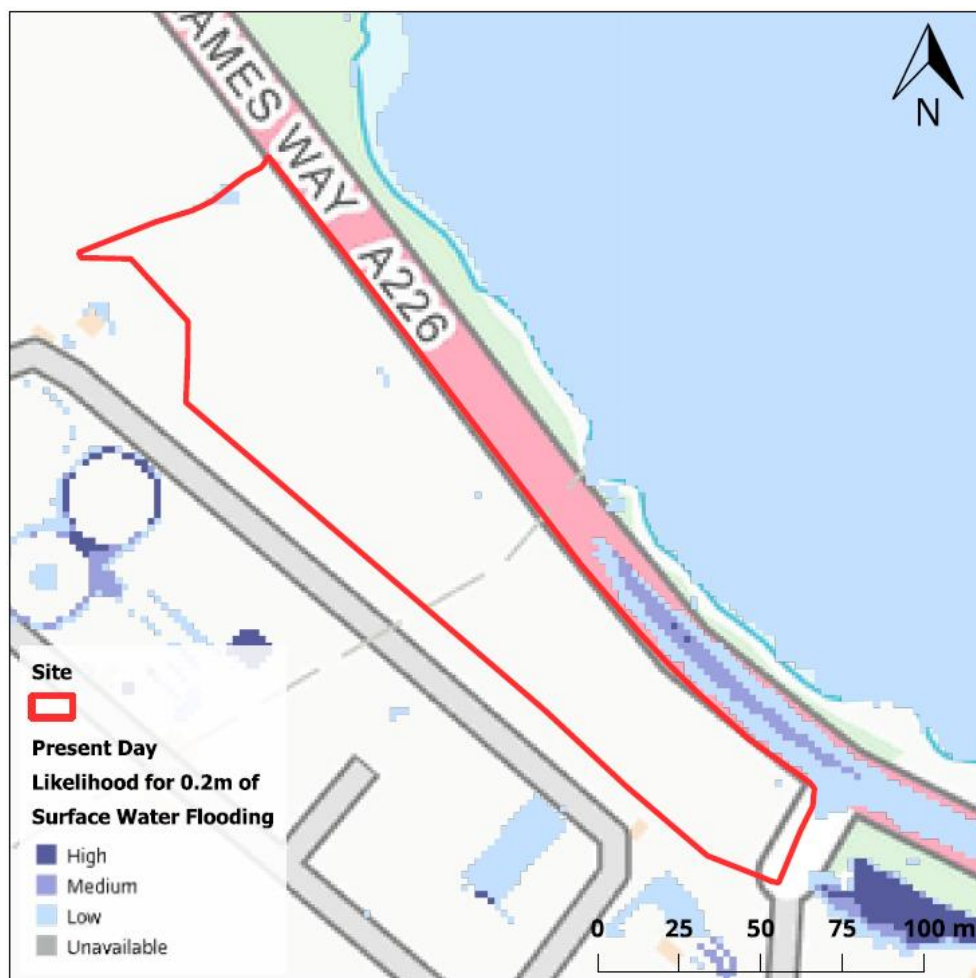


Figure 13: Likelihood for 0.2m of Surface Water Flooding at the site – Present Day (Source: EA, OS)

5.54. The site is entirely outside of the “Low” chance of reaching or exceeding 0.3m, 0.6m, 0.9m and 1.2m of surface water at any given year.

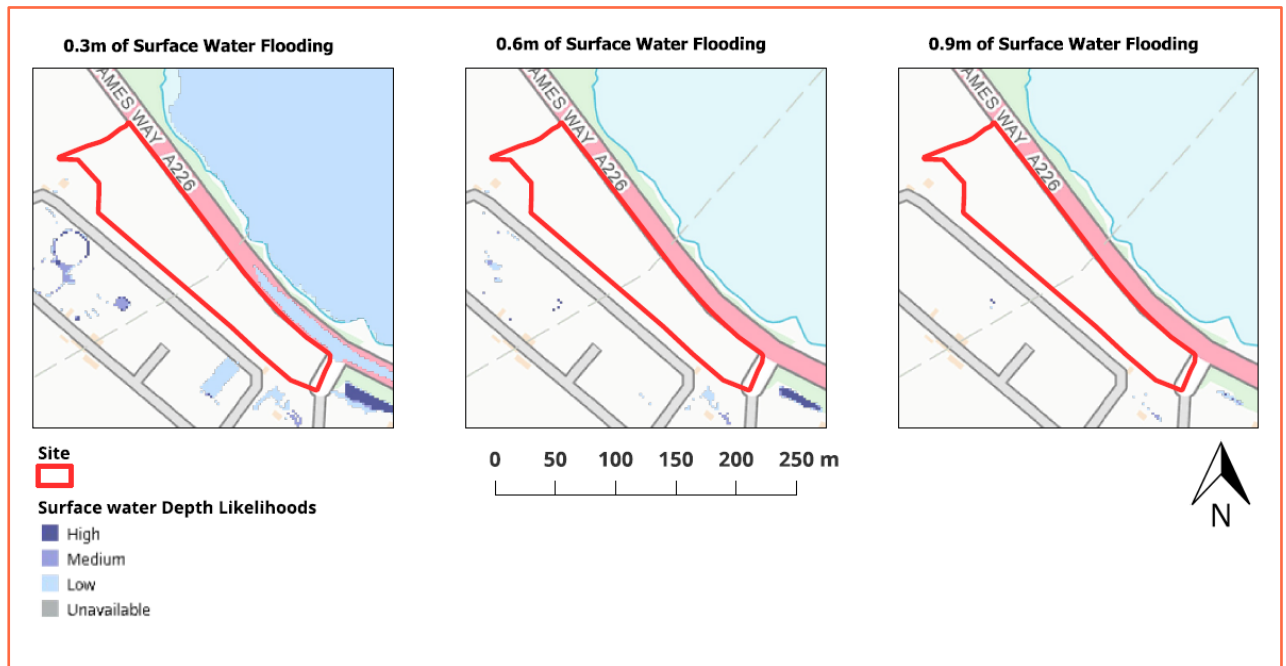


Figure 14: Likelihood for 0.3m, 0.6m and 0.9m of Surface Water Flooding at the site – Present Day (Source: EA, OS)

Depth of Surface Water Flooding Between 2040 – 2060

- 5.55. The site is partially within the “Low” to “Medium” chance of reaching or exceeding 0.2m of surface water at any given year.

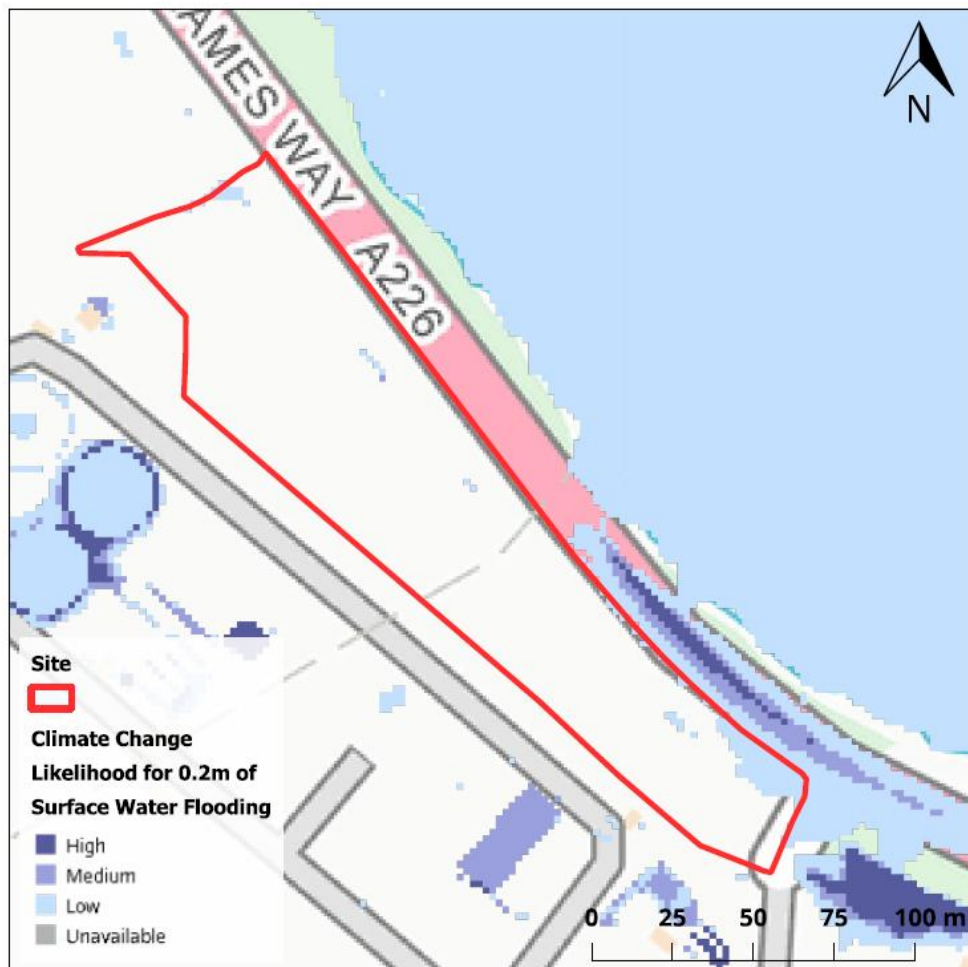


Figure 15: Likelihood for 0.2m of Surface Water Flooding at the site – Climate Change (Source: EA, OS)

5.56. The site is partially within the “Low” chance of reaching or exceeding 0.3m of surface water at any given year.



Figure 16: Likelihood for 0.3m of Surface Water Flooding at the site – Climate Change (Source: EA, OS)

- 5.57. The site is entirely outside of the “Low” chance of reaching or exceeding 0.6m, 0.9m and 1.2m of surface water at any given year.

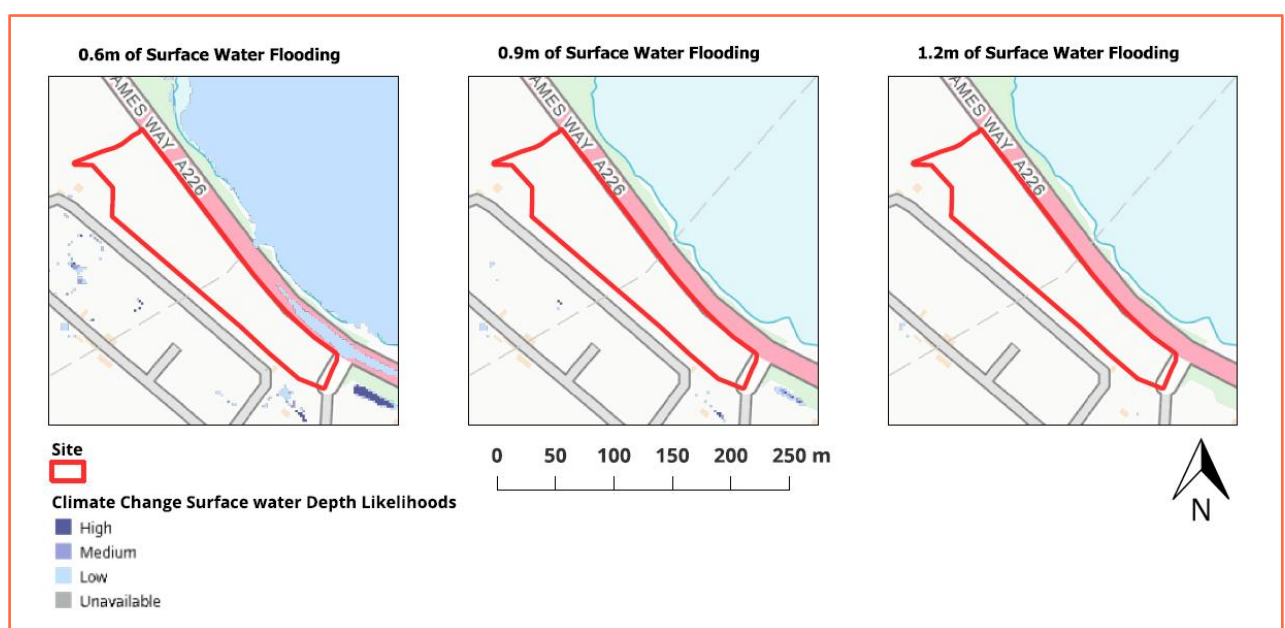


Figure 17: Likelihood for 0.6m, 0.9m and 1.2m of Surface Water Flooding at the site – Climate change (Source: EA, OS)

Groundwater:

- 5.58. Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.
- 5.59. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.
- 5.60. The EA advise that flooding from groundwater is unlikely in this area.
- 5.61. No information has been provided to suggest that the site has flooded historically due to groundwater.

Sewer:

- 5.62. Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.
- 5.63. All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.
- 5.64. According to the 2013 Thameside Surface Water Management Plan (SWMP), 1 recorded sewer incident has occurred on Thames Way.
- 5.65. No further information has been presented to suggest that the site is susceptible to sewer flooding.

Other Sources:

- 5.66. Reservoirs with an impounded volume in excess of 25,000 cubic metres (measured above natural ground level) are governed by the Reservoirs Act and are listed on a register held by the Environment Agency. The site is located outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely. There has been no loss of life in the UK from reservoir flooding since 1925. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. In accordance with the Reservoirs Act 1975 in England, these inspections are monitored and enforced by the EA themselves. The risk to the site from reservoir flooding is therefore minimal and is far lower than that relating to the potential for fluvial / tidal flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.

- 5.67. Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.
- 5.68. Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.
- 5.69. No information has been provided to suggest that the site is susceptible to flooding from other sources.



Figure 18: Extract from Environment Agency Reservoir Flood Map (Source: EA)

Historical Flood Events:

- 5.70. The EA hold records of historic flood events from rivers and the sea. The EA map flooding to land, not individual properties. Their historic flood event record outlines are an indication of the geographical extent of an observed flood event. Their historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.
- 5.71. The EA hold no records of historic flooding having affected the site or surrounding area.
- 5.72. The EA historical flood records are not comprehensive, and they advise that further enquiries locally are made with specific reference to flooding at the location.

6. Flood Risk Management

Vulnerability to Flooding:

- 6.1. The NPPF classifies property usage by vulnerability to flooding.
- 6.2. Post development, the site will become “essential infrastructure”, as the application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- 6.3. No land raising, residential or commercial units are proposed as part of this application.

EA Standing Advice for Minor Extensions:

- 6.4. EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m². It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.
- 6.5. The application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.

Physical Design Measures:

- 6.6. The proposed development is located within Flood Zones 1, 2 and 3. The site partially lies within the 1:200 year and 1:1000 year for the 2115 modelled breach extents.
- 6.7. In line with ETR 138 guidelines, it is recommended that all essential electrical infrastructure affected by tidal flooding be raised 300mm above flood level.
- 6.8. Therefore, it is recommended that at the detailed design stage consideration is given to raising the height of the circuit breaker and termination.
- 6.9. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “Low” chance of flooding from surface water for the present day and “Very Low” to “Medium” chance between 2040 and 2060.
- 6.10. It is recommended that any proposed fencing for the site is of palisade design or similar, allowing water to flow through, unobstructed.
- 6.11. To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures, in accordance with Energy Networks Association’s Engineering Technical Report 138 (ETR138) into the proposal, in consultation with the Local Authority building control department. These measures can include the following:
 - Utilising waterproof enclosures for cables;
 - Protective ducts or tunnels;
 - Remote monitoring;
 - Reinforced concrete retaining/flood walls around entire substation site or individual structures combined with flood gates and flood planks (left in place) up to 600mm above ground level;
 - Flood gates to have “gate open” alarms connected to control;
 - Raising plant/equipment at least 600mm above ground level;
 - Sealing door or site entries with flood gates or removable flood planks;

- Ensure all ducts are sealed from water ingress using RISE, ISP or other proprietary approved duct sealing system with a water pressure head rating;
- Sealing low level air brick vents;
- Toughened glass and shutters on seaward facing walls;
- Installing non-return valves on storm and foul water drainage systems in order to prevent backflow into the substation building services;
- Dry ditches/moats (possibly combined with earth bunds constructed from the arisings) around the perimeter of the substation creating a storage capacity external to the site. This could be combined with a weir or pump system with an outlet to a watercourse or to an area beyond the substation boundary;
- Temporary flood barriers up to 600mm above site level;
- Low voltage (LV) supply to pumps:
 - At grid sites – LV supply to be taken from existing Auxiliary transformer.
 - At primary sites – The secondary substation supplying LV may have to be flood resilient to the same level of the substation. Where this is considered not technically feasible an alternative option is to introduce a ring main unit (RMU) inside the flood protected area of the substation where the LV supply can be safely taken from during the flood event.

Safe Escape:

- 6.12. The site is situated in Flood Zone 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea), but is defended to a high standard.
- 6.13. The flood defences in place act to defend the site from direct inundation, however a residual risk is posed to the site via inundation and failure of the flood defences in place. The site is shown to be partially within the maximum breach extents for the 1:200 year and 1:1000 year events in 2115.
- 6.14. The proposed development is “essential infrastructure” and without residential elements.
- 6.15. Flood warning notices will be erected around the site to inform site users of the risk of flooding, and the flood warning and evacuation measures.
- 6.16. In the event of a flood alert being issued, site users would be advised not to visit the site until the flood alert had been lifted.
- 6.17. Safe escape will be provided by a flood warning and evacuation plan that will be prepared in liaison with the Emergency Planners and tied in with the existing Emergency Plans for the area.
- 6.18. Site users should follow the warning and evacuation procedure detailed in the following section.

Flood Warning:

- 6.19. The EA is responsible for issuing flood warnings. Flood warnings are issued to the emergency services and local authorities. Both private individuals and organisations can sign-up to receive warnings via phone, text or email. This system of receiving warnings is currently voluntary.
- 6.20. Advice regarding severe flood warnings will generally be given during weather forecasts on local radio and TV. In the case of extreme events, warnings can also be disseminated via door to door visits by the police or locally appointed flood wardens.
- 6.21. The applicant has agreed to subscribe to the EA's flood warning service.
- 6.22. The EA issue flood warnings/alerts to specific areas when flooding is expected. The site lies within the Gravesend and Northfleet Flood Warning Area (qdial 317050).

Flood Warning	Flood Alert	Flood Warning	Severe Flood Warning
			
What it means?	Flooding is possible. Be prepared.	Flooding is expected. Immediate action required.	Severe flooding. Danger to life.
When it's used?	Two hours to two days in advance of flooding.	Half an hour to one day in advance of flooding.	When flooding poses a significant threat to life.
What to do?	Be prepared to act on your flood plan. Prepare a flood kit of essential items. Monitor local water levels and the flood forecast on our website.	Move family, pets and valuables to a safe place. Turn off gas, electricity and water supplies if safe to do so. Put flood protection equipment in place.	Stay in a safe place with a means of escape. Be ready should you need to evacuate from your home. Co-operate with the emergency services. Call 999 if you are in immediate danger.

Table 4: EA Flood Warning Service

Flood Plan:

- 6.23. It is recommended that the applicant and future owners, occupiers and Landlords of the properties prepare a flood plan to protect life and property during a flood event:

Action	
Before a flood	• Prepare and keep a list of all your important contacts to hand or save them on your mobile phone. • Think about what items you can move now and what you would want to move to safety during a flood. • Know how to turn off electricity and water supplies to the site. • Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication.
During a flood	• Activate the evacuation plan and evacuate the site. • Remove cars from the site if there is sufficient warning and the water levels are not rising rapidly. • Switch off water and electricity for the site. • Tune into your local radio station on a battery or wind-up radio. • Listen to the advice of the emergency service and evacuate if told to do so. • Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.
After a flood	• If you have flooded, contact your insurance company as soon as possible. • Take photographs and videos of your damaged property as a record for your insurance company. • If you don't have insurance, contact your local authority for information on grants and charities that may help you. • Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask. • Have your electrics and water checked by qualified engineers before switching them back on.

Table 5: Flood plan**Off-Site Impacts:****Fluvial Floodplain Storage:**

- 6.24. The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.
- 6.25. In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.
- 6.26. For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.
- 6.27. The site is situated in Flood Zones 1, 2 and 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea) but is within an area of predominantly tidal flood risk, therefore there will be no unacceptable loss of floodplain storage.

Surface Water Drainage:

- 6.28. The development will utilise Sustainable drainage systems (SuDS) design in accordance with the NPPF for Planning Applications and the drainage hierarchy as follows:

1. Store rainwater for later use;
 2. Infiltration techniques;
 3. Attenuate rainwater by storing in tanks for gradual release;
 4. Discharge rainwater direct into watercourse;
 5. Discharge rainwater into surface water sewer;
 6. Discharge rainwater into a combined sewer.
- 6.29. SuDS features will be incorporated into the development where practically possible or will utilise the existing arrangement on site. As such, any change in surface water runoff from the site will likely be negligible.

7. Sequential and Exception Test

- 7.1. The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.
- 7.2. The Sequential Test is applied to developments in areas identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.
- 7.3. The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.
- 7.4. The site is situated within Flood Zones 1, 2 and 3 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at “Very Low” to “Low” chance of flooding from surface water for the present day and “Very Low” to “Medium” chance between 2040 and 2060.
- 7.5. Post development, the site will become classified as “essential infrastructure”, as the application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	X	Exception Test required	✓	✓
Zone 3b	Exception Test required	X	X	X	✓

Table 6: Flood risk vulnerability and flood zone ‘compatibility’ (Source: NPPF Table 3 Technical Guidance)

- 7.6. Using the table above, the proposed application is considered to be suitable within Flood Zones 3a subject to passing the Exceptions Test.

8. Discussion and Conclusion

- 8.1. Unda Consulting Limited have been appointed by Speedgreen (Thames Way) Limited (hereinafter referred to as “the applicant”) to undertake a Flood Risk Assessment for the proposed development at Land Adjacent to the Sewage Works, Thames Way, Northfleet, Gravesend, DA11 8HW. The purpose of the study is to support a planning application for the proposed development.
- 8.2. The existing site is currently vacant. The surrounding area is characterised by industrial infrastructure and green space.
- 8.3. The proposed application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- 8.4. No land raising, residential or commercial units are proposed as part of this application.
- 8.5. Post development, the site will become “essential infrastructure”, as the application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- 8.6. The site is located partially within Flood Zone 1 (Low Probability), which means it is defined as land having a less than 1 in 1,000 annual probability of river and sea flooding, Flood Zone 2 (Medium Probability), which means it is defined as land having between a 1 in 100 and 1 in 1,000 annual probability of river and sea flooding and Flood Zone 3 (High Probability), which means it is defined as land having at least a 1:100 annual probability of fluvial flooding.
- 8.7. According to the 2009 Kent Thameside SFRA, the site is located within Flood Zone 3a, entirely outside of the functional floodplain.
- 8.8. The risk would appear to be predominantly tidal and originate from the River Thames (Estuary) which is located approximately 1160m northeast of the site. The River Ebbsfleet is located approximately 95m west of the site.
- 8.9. In-channel modelled flood levels for use within this report have been requested from the EA. The data is from the Thames Estuary 2100 (TE2100) study completed by HR Wallingford in 2008.
- 8.10. The closest node to the site is node 3.23. An extreme water level of 5.85mAOD has been provided for the present day, rising to 6.52mAOD in 2100.
- 8.11. Comparison of these modelled flood levels with topographic site levels (3.80mAOD to 8.60mAOD) has shown that the site is partially below the in-channel River Thames tidal flood levels. The River Thames is however defended to the 1:1000 year standard.
- 8.12. In addition to the Thames Barrier, the site benefits from the presence of raised man-made flood defences either side of the main River Thames channel. These raised defences act to prevent direct inundation of the site and surrounding area during high tides and periods of high fluvial flow.
- 8.13. The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year tidal flood event. The defences are all raised, man-made and privately owned.
- 8.14. The EA has provided data from the Thames Barrier Downriver Breach Inundation Modelling Study 2018 completed by Atkins Ltd. in May 2018.
- 8.15. Based on the 2008 TE2100 in-channel levels, the 0.5% (1 in 200 year) and 0.1% (1 in 1000 year) annual probability of exceedance tidal events were modelled for all breach locations downriver of the Thames Barrier. These were modelled for the current year epoch, as well as 2115 epoch which include allowances for climate change.

- 8.16. The site is shown to be entirely outside of the 1:200 year and 1:1000 year modelled breach extents for 2005.
- 8.17. The site is shown to be partially within the 1:200 year and 1:1000 year modelled breach extents for 2115.
- 8.18. The north eastern boundary of the site is shown to be affected by the 1:200 year modelled breach extent for 2115, whilst all of the proposed infrastructure is situated outside of the extent, remaining flood free.
- 8.19. During the 1:1000 year modelled breach extent for 2115, the site's north eastern section is shown to be affected. The circuit breaker within the grid compound and emergency water tank are shown to be within the flood extent. All other proposed infrastructure is shown to be outside of the 1:1000 year modelled breach extent for 2115, remaining flood free.
- 8.20. Modelled on-site breach flood levels have been extracted at node point locations across the site.
- 8.21. Comparison of the maximum modelled breach flood levels with topographic site levels (3.80mAOD to 8.60mAOD) shows that the site is up to 0.52m below and 4.28m above the 1:1000 year 2115 breach flood level.
- 8.22. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at "Very Low" to "Low" chance of flooding from surface water for the present day and "Very Low" to "Medium" chance between 2040 and 2060.
- 8.23. In line with ETR 138 guidelines, it is recommended that all essential electrical infrastructure affected by tidal flooding be raised 300mm above flood level.
- 8.24. Therefore, it is recommended that at the detailed design stage consideration is given to raising the height of the circuit breaker and termination.
- 8.25. It is recommended that any proposed fencing for the site is of palisade design or similar, allowing water to flow through, unobstructed.
- 8.26. According to the 2013 Thameside Surface Water Management Plan (SWMP) and Southern Water, 1 recorded sewer incident has occurred on Thames Way.
- 8.27. Risk to the site from groundwater and reservoir flooding would appear to be very low. No information has been provided to suggest that the site has flooded historically from these sources.
- 8.28. The EA hold no records of historic flooding having affected the site or surrounding area.

In Summary:

- The proposed application is for the installation of electricity infrastructure including a battery energy storage system, substation and ancillary electrical infrastructure.
- No land raising, residential or commercial units are proposed as part of this application.
- Flood proofing of the development will be incorporated as appropriate.
- It is recommended that at the detailed design stage consideration is given to raising the height of the circuit breaker and termination.
- It is recommended that any proposed fencing for the site is of palisade design or similar, allowing water to flow through, unobstructed.
- Flood warning notices will be erected around the site to inform site users of the risk of flooding, and the flood warning and evacuation measures.
- In the event of a flood alert being issued, site users would be advised not to visit the site until the flood alert had been lifted.

- Safe escape will be provided by a flood warning and evacuation plan that will be prepared in liaison with the Council's Emergency Planners and tied in with the existing emergency plans for the area.
- The applicant will register with the Environment Agency Floodline Alert/Warnings Direct service.

Assuming accordance with these flood risk management measures, Unda Consulting Limited consider the proposed application to be suitable in flood risk terms.

**Unda Consulting Limited
September 2025**

Appendix

A – Development Plans:

- Site location, existing and proposed plans – Helioworks.

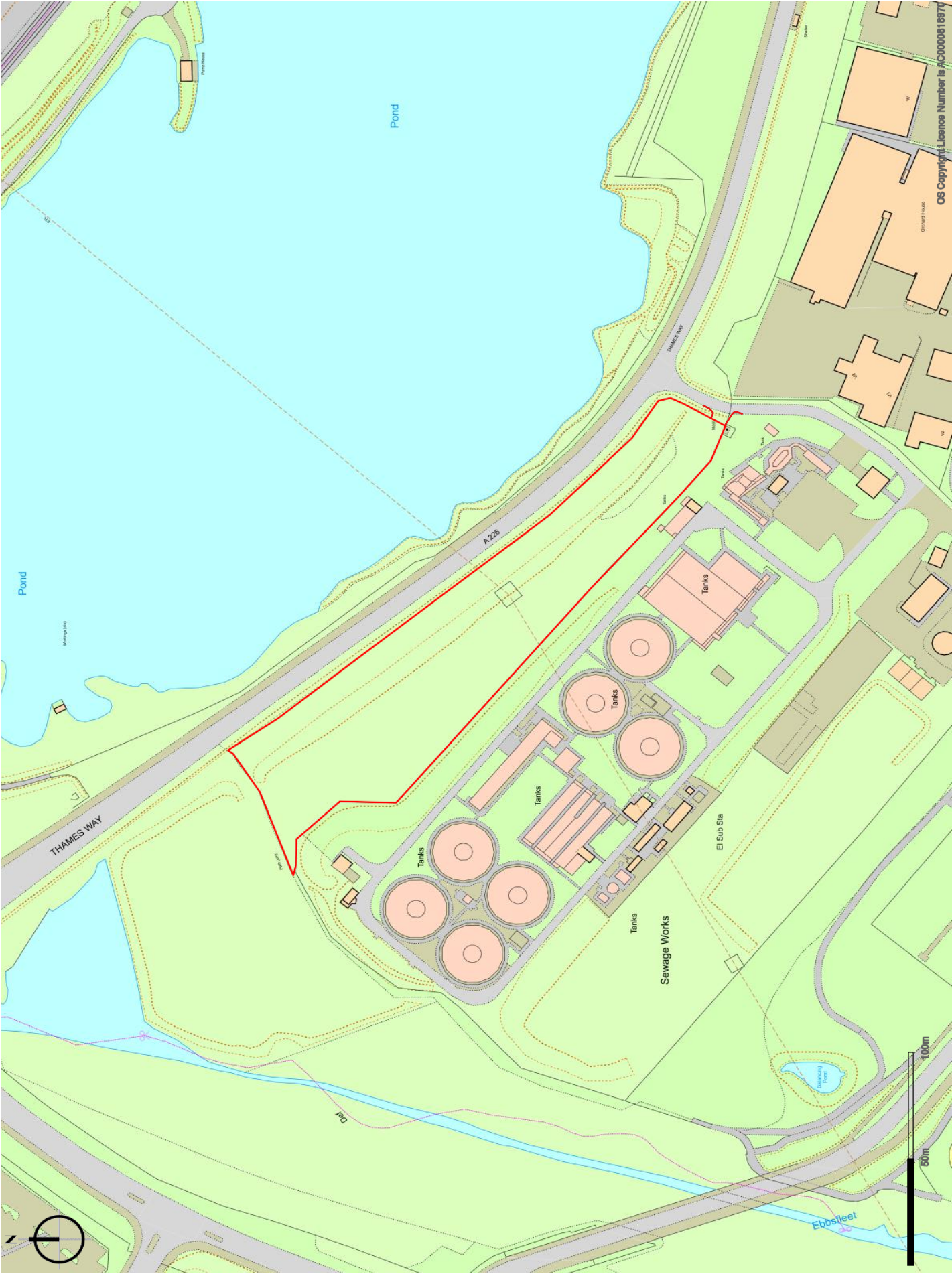
B – EA Flood Map for Planning:

- Flood Map for Planning – Environment Agency.

C – NPPF Annex 3:

- NPPF Annex 3: Flood risk vulnerability classification table

Appendix A





Address: Land at, Springhead Lane, Northfleet, Gravesham, DA11 8HN

Scale: 1496

Grid Reference: 561950E 173628N

Local Authority: Gravesham Borough Council



1:1496 18.10.2024

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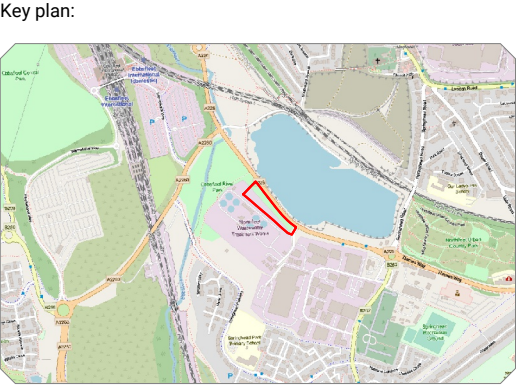


Notes:

1. All details are indicative only.
2. Dimensions are in metres unless stated otherwise.

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LEGEND

- PREMISES
- PERIMETER FENCE
- ACOUSTIC FENCE BARRIER
- PROPOSED ACCESS TRACKS

REVISIONS				
E	27.08.25	Blue line hidden	SS	GH
D	22.07.25	Blue line edit	SS	GH
C	21.07.25	RLB reduced to 0.99Ha / scalebar fix	SS	GH
B	17.07.25	Acoustic fence barrier added	SS	GH
A	19.06.25	Layout changes, OS mapping	SS	GH
-	17.06.25	First issue	SS	GH
REV	DATE	COMMENTS	BY	CHKD

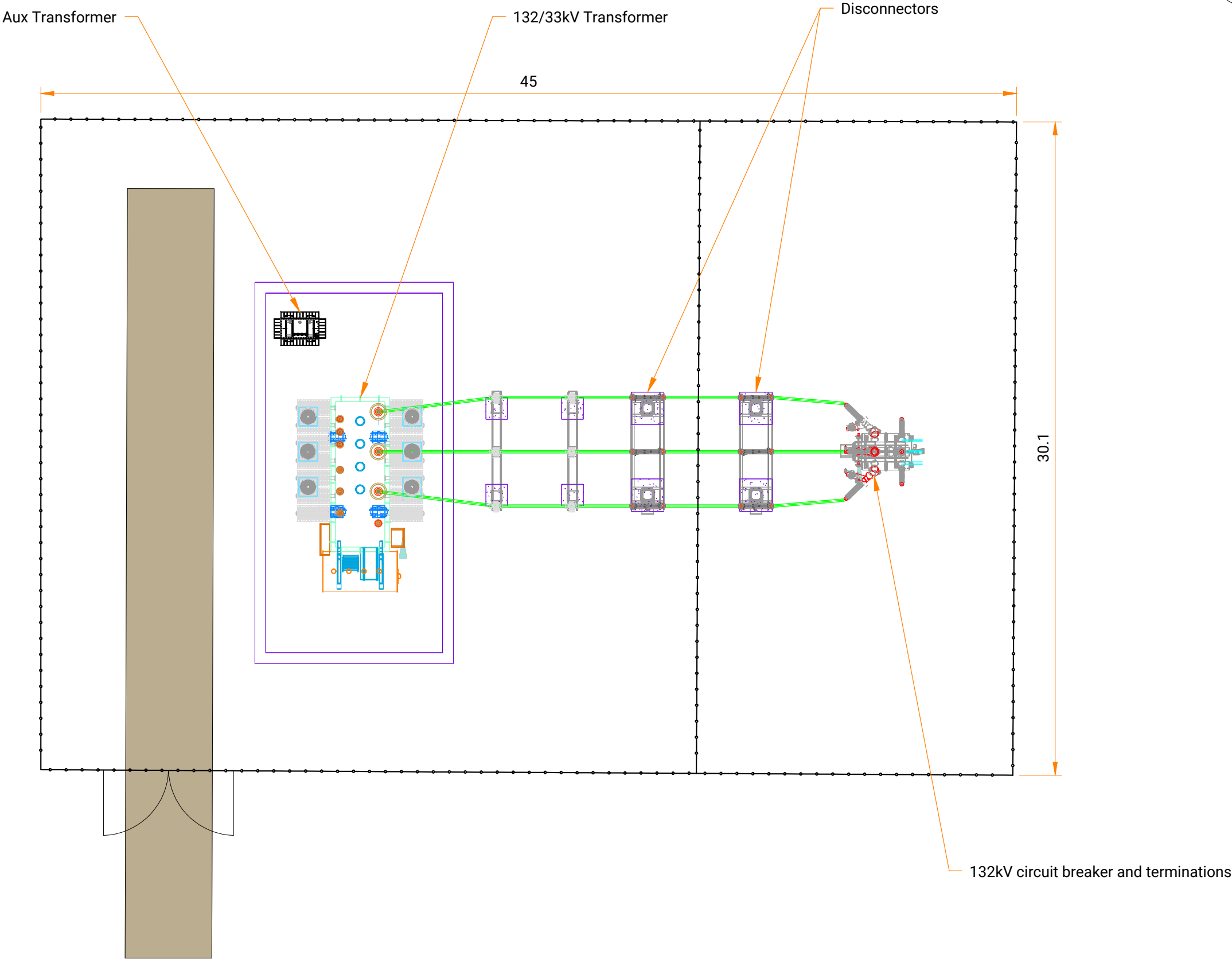


CLIENT	SpeedGreen Ltd			
PROJECT	Gravesend BESS			
LOCATION	Northfleet, Gravesend DA11 8HL			
TITLE	Proposed Site Layout			
DWG NO	SG-GRAVESEND-CIV-PLN-100	REV	E	



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- Notes:
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 - 2. Dimensions are in metres unless stated otherwise.
 - 3. Please refer to **SG-GRAVESEND-ARC-DRG-208** for HV grid compound elevation.



REVISIONS					
A	10.09.25	Labelling	SS	DC	
-	09.09.25	First issue	SS	GH	
REV	DATE	COMMENTS	BY	CHKD	

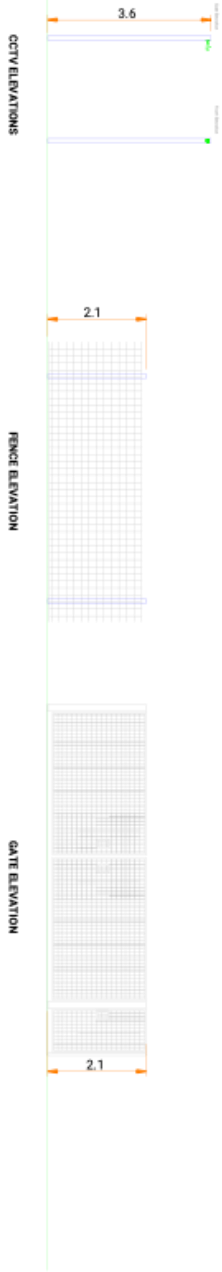


CLIENT	Speed Green				
PROJECT	Gravesend BESS				
LOCATION	Northfleet, Gravesend DA11 8HL				
TITLE	Proposed HV Compound Plan				
DWG NO	SG-GRAVESEND-ARC-DRG-220		REV	A	



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REVISIONS		
REV	DATE	COMMENTS
-	01.07.25	Final Issue
SS	OH	
BT	CHS	



CLIENT	Speed Green
PROJECT	Gravesend BESS
LOCATION	Northfleet, Gravesend DA11 8HL
TITLE	Proposed CCTV & Fence Elevation
DWG NO	SG-GRAVESEND-ARC-DRG-207
REV	-



Appendix B

Flood map for planning

Your reference
96300

Location (easting/northing)
561946/173635

Created
27 August 2025 12:11

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

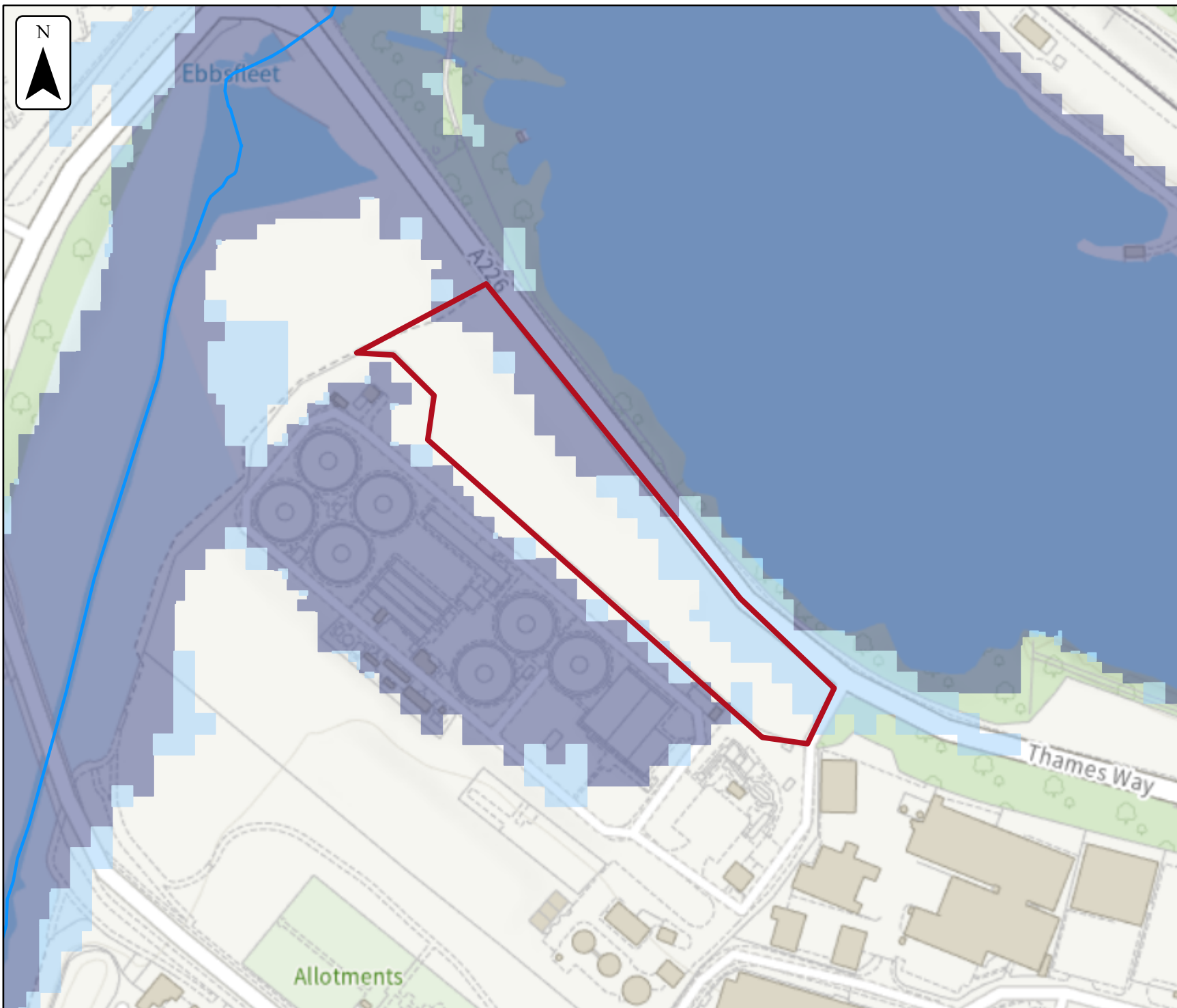
Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

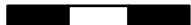
Your reference
96300

Location (easting/northing)
561946/173635

Scale
1:2,500

Created
27 Aug 2025 12:11

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area


0 20 40 60m

Appendix C

Annex 3: Flood Risk Vulnerability Classification	
Essential Infrastructure:	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms.
Highly Vulnerable:	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)
More Vulnerable: * Landfill is as defined in Schedule 10 of the Environmental Permitting (England and Wales) Regulations 2010	• Hospitals. • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable:	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. • Car parks.
Water-Compatible Development:	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

National Planning Policy Framework Annex 3: Flood risk vulnerability classification