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Level 2 Strategic Flood Risk Assessment - Site REG3197

Land at Marshlands Farm, Lower Road, Minster, ME12 3RT

Final

Prepared for	Date
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1 Site background

This is a Level 2 Strategic Flood Risk Assessment (SFRA) site screening report for site REG3197. The content of this Level 2 SFRA site screening report assumes the reader has already consulted the Swale Borough Council Level 1 SFRA and read the Swale Borough Council Level 2 SFRA main report and is therefore familiar with the terminology used in this report.

1.1 Site details

- Location: Land at Marshlands Farm, Lower Road, Minster, ME12 3RT
- Site area: 5.16ha
- Existing site use: Greenfield, with small areas of existing commercial development in the northeast
- Proposed site use: Employment
- Proposed use flood risk vulnerability classification: Less Vulnerable

The site is situated south of Minster on Sea and comprises greenfield land with existing commercial buildings and unnamed road in the northeast. It is bordered by Sheppey Rugby and Football Club to the west, commercial properties to the northeast and agricultural land to the south, southeast and southwest. Lower Road runs along the northern boundary with residential areas beyond. A drainage ditch runs along the southern boundary.

1.2 Topography

Figure 1-1 shows the topography of the site represented by the Environment Agency 1m resolution LIDAR flown in 2022. The topography of the site slopes down towards the drainage ditch. The highest topography of 9.0mAOD is present along the unnamed road leading into the commercial properties in the northwest of the site. Along the drainage ditch the lowest topography is 3.2mAOD. There are also drainage ditches located just outside the western and eastern boundaries and there are localised areas of higher elevation in the east of the site reaching 8.4mAOD.

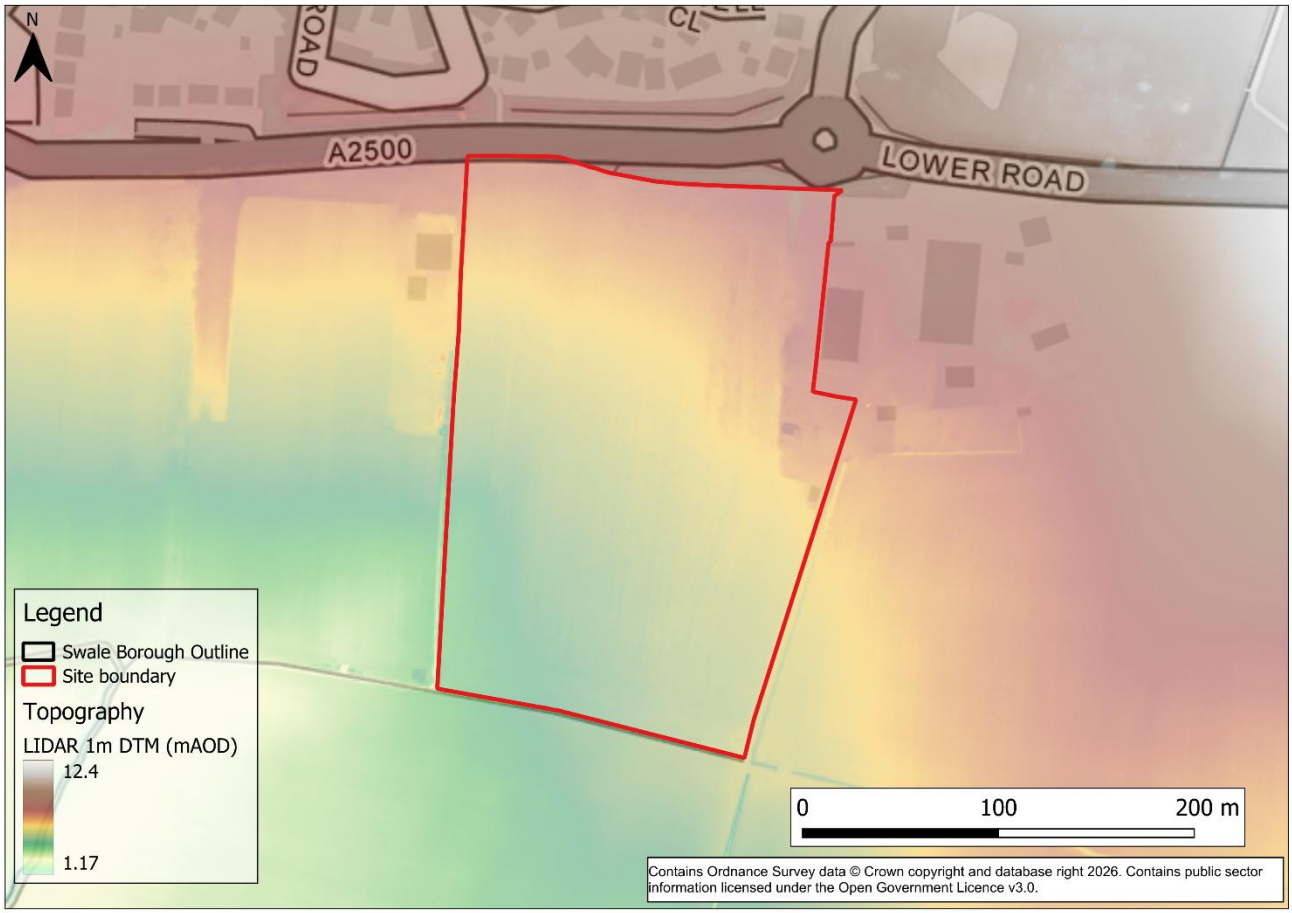


Figure 1-1: Topography of the site.

1.3 Geology and soils

Geology at the site consists of:

- Bedrock - London Clay Formation consisting of clay, silt and sand.
- Superficial - There are no underlain superficial deposits.

Soils at the site consist of:

- Slowly permeable seasonally wet slightly acid but base-rich loamy and clayey soils.

The potential influence of the site's geology and soil conditions on drainage is discussed in Section 7.

2 Sources of flood risk

2.1 Existing drainage features

There is a drainage ditch which runs along the southern boundary and flows into an unnamed ordinary watercourse 450m southeast of the site. There are also ditches just outside the western and eastern boundaries. The site's topographic layout indicates that surface water runoff generated on site will drain into the watercourse to the southeast.

The site is within the North Kent Marshes Water Level Management Board district.

2.2 Flood Zones

2.2.1 Available data

The Environment Agency's Flood Map for Planning (FMfP) has been used within this assessment to determine Flood Zones 2 and 3a. Flood Zones 2 and 3a do not consider defences.

Flood Zone 3b in this area has been defined using the Environment Agency's River and Sea 3.3% AEP defended flood risk extents – present day dataset. The mapping in this location is based on generalised modelling.

2.2.2 Description of risk to the site

The site is not within Flood Zone 3b. Flood Zones 2 and 3a cover 20% and 26% of the site respectively, covering the southwestern area and encroaching into the centre of the site.

The majority of the impacted area is due to tidal flooding. However, there is an area in the southwest which is down to fluvial risk due to the close proximity to watercourses and local ground levels.

Table 2-1: Existing fluvial and tidal flood risk based on Flood Zones

Flood Zone 1 (%)	Flood Zone 2 (%)	Flood Zone 3a (%)	Flood Zone 3b (%)
54	20	26	0

2.3 Fluvial present day defended risk

The drainage ditch along the southern boundary of the site has not been mapped in the Environment Agency's Flood Zones. The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning map has been used to inform the fluvial risk from the drainage ditch within this site summary sheet. Further information can be found in Section 2.5.

Detailed fluvial modelling of the drainage ditch may be required as part of a flood risk assessment to accurately represent the fluvial flood risk at the site.

2.4 Tidal/coastal present day defended risk

2.4.1 Available data

The North Kent Coast modelling study (2024) has been used to understand the coastal flood risk.

2.4.2 Description of risk to the site

According to the North Kent Coast model, the site is not predicted to flood during the present day defended 3.3% AEP (1 in 30-year), 0.5% AEP (1 in 200-year) or 0.1% AEP (1 in 1,000-year) events.

2.5 Surface water present day risk

2.5.1 Available data

The Environment Agency's Flood Map for Planning – Surface Water Spatial Planning map has been used within this assessment to inform the extent and depth of surface water risk. Velocity and hazard data is not currently available from the Environment Agency for this dataset.

2.5.2 Description of risk to the site

During the 3.3% (1 in 30-year) and 1% AEP (1 in 100-year) events, surface water flooding follows the drainage ditches along the western, eastern and southern boundaries and encroaches into the site. There is also predicted flooding in the northeastern corner from an offsite flow path flowing from Lower Road into the site, following the southwestern slope.

In the 0.1% AEP (1 in 1,000-year) event, a larger proportion of the site is predicted to be affected by flooding. Three overland flow paths originate from Lower Road at the northern boundary and extend southwest across the site, resulting in areas of ponding, while more extensive flooding is also anticipated in the southeastern part of the site.

The maximum flood depth and hazard classification throughout all events is predicted to be up to 0.90m in the northeast of the site and a moderate hazard in the northeast and along the southern boundary.

Table 2-2: Existing surface water flood risk based on the Flood Map for Planning map – Surface Water Spatial Planning map

Event	<0.1% AEP (1 in 1000-year) (%)	0.1% AEP (1 in 1000-year) (%)	1% AEP (1 in 100-year) (%)	3.3% AEP (1 in 30-year) (%)
Percentage of site at risk* (%)	72	28	2	1
Maximum depth (m)	N/A	0.60-0.90	0.60-0.90	0.60-0.90

** The percentage of 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 (1 in 100-year) includes the 3.3% AEP (1 in 30-year) percentage). The <0.1% AEP event shows the area of the site not predicted to be impacted by surface water flooding.*

2.6 Reservoir

The site is not shown to be at risk of reservoir flooding during the Wet Day and Dry Day scenarios within the Environment Agency's Reservoir Flood Maps.

2.7 Groundwater

The JBA Groundwater Emergence Map shows there is negligible risk from groundwater flooding during a 1% AEP (1 in 100-year) groundwater event.

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.

2.8 Sewers

Southern Water has confirmed that initial checks indicate that this site has limited network capacity and phasing of development may be needed alongside network reinforcement prior to occupation of the total number of dwellings indicated. Strategic Southern Water trunk main assets also appear to cross this site. As these assets are deemed critical sewers, it is not permissible for a developer to build over them and they would need to liaise with Southern Water in regards to a sewer diversion, if viable. These assets need to be taken into account when designing the layout of the development. An easement width of 6 metres or more, depending on pipe size and depth, would be required, which may affect site layout. This easement should be clear of all proposed buildings and substantial tree planting.

2.9 Flood history

According to the Environment Agency's Historic Flood Map, the site has had no flood incidents but the area of tidal flooding of 1978 is found 170m west.

The Kent County Council historic data was provided as point data with an easting and northing. Due to the protection of data, the eastings and northings were plotted on GIS and the number of incidents recorded within a 0.85km^2 area was calculated. According to Kent County Council's recorded flood incident records, the site is within an area that has had 4 incidents.

According to Southern Water's Sewer Incident Report Form (SIRF), there have been 85 sewer flood incidents in the ME12 3 postcode area since 2015.

3 Climate change

Increased storm intensities due to climate change may increase the extent, depth, velocity, hazard, and frequency of fluvial, tidal and surface water flooding.

Climate change allowances are determined by the management catchment in which the site is located. The site lies within the North Kent Management Catchment. Please see Section 6 of the Swale Borough Council Level 2 SFRA main report 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 Flood Zones plus climate change

3.1.1 Available data

The Environment Agency's Flood Map for Planning (FMfP) plus climate change has been used within this assessment. This shows the combined extent of Flood Zones 2 and 3 using the following climate change allowances:

- 'Central' allowance for the 2080s epoch (2070-2125) for risk of flooding from rivers
- 'Upper End' allowance for risk of flooding from the sea, accounting for cumulative sea level rise to 2125.

3.1.2 Description of risk to the site

Present day Flood Zones are included in Table 3-1 as a comparison to the Flood Zones plus climate change dataset. Present day Flood Zones cover just under half of the site and is confined to the southwestern area and pushes towards the centre. The Flood Zones plus climate change inundates nearly the entire site.

Table 3-1: Flood Zones compared to Flood Zones plus climate change

Event	Flood Zones	Flood Zones plus climate change
Percentage of site at risk (%)	46	93

3.2 Fluvial

The nearby drainage ditches have not been mapped in the Environment Agency's FMfP plus climate change dataset. The Environment Agency's Flood Map for Planning – Surface

Water Spatial Planning map has been used to inform the fluvial risk from the drainage ditches within this site summary sheet. Please see Section 3.4 for further information.

Fluvial modelling of the drainage ditches may be required as part of a detailed flood risk assessment to accurately represent the fluvial flood risk at the site.

3.3 Tidal

3.3.1 Available data

The North Kent Coast modelling study (2024) has been used to understand the tidal and coastal flood risk within the Local Plan area. The mapping provides information for present day and for the Upper End climate change event for the years 2100 and 2125. Only the 2100 has been assessed in this site summary sheet due to the likely lifetime of development (75-years) for employment sites.

3.3.2 Description of risk to the site

The site is not predicted to flood in the defended 0.5% AEP (1 in 200-year) present day tidal event but 39% of the site is predicted to flood in the defended 0.5% AEP (1 in 200-year) 2100 Upper End event. The extent is within the southwest and encroaches 150m into the centre of the site.

The maximum depth is 1.36m and hazard classification is a danger for most. Both reduce as the flooding encroaches further into the site.

Table 3-2: Tidal flood risk to the site of the 0.5% AEP (1 in 200-year) 2100 UE climate change events.

Event	0.5% AEP (1 in 200-year) 2100 UE
Percentage of site at risk (%)	39
Maximum depth (m)	1.36
Maximum velocity (m/s)	0.29
Maximum hazard classification	1.74 - Danger for most - Significant Danger

3.4 Surface water

3.4.1 Available data

The Environment Agency's Surface Water Spatial Planning Dataset, released in May 2026, has been used within this assessment to inform the extent and depth of surface water risk with climate change. Climate change outputs are available for the 3.3% (1 in 30-year), 1%, (1 in 100-year) and 0.1% AEP (1 in 1,000-year) events with the Upper End climate change allowance for the 2070s epoch. There is currently no available velocity or hazard information to use within this assessment.

It should be noted that the Environment Agency's Upper End allowance for the 2050s epoch for the 1% AEP (1 in 100-year) event in the North Kent and Medway Management

Catchments is greater than the 2070s epoch for the 1% AEP (1 in 100-year) event so the climate change uplift may be slightly underestimated.

3.4.2 Description of risk to the site

In the 1% AEP (1 in 100-year) plus climate change event, flooding is predicted to flow from the nearby drainage ditch and inundates more of the western area, compared to the present day 1% AEP (1 in 100-year) event. Further flow paths are predicted from Lower Road into the north of the site. Flooding is also predicted in the centre and southeast of the site.

The maximum flood depth is predicted to remain 0.90m in the northeast of the site.

Table 3-3: Comparison of surface water flood risk to the site between the 1% AEP (1 in 100-year) present day and 1% AEP (1 in 100-year) climate change events.

Event	1% AEP (1 in 100-year)	1% AEP (1 in 100-year) plus climate change
Percentage of site at risk (%)	2	12
Maximum depth (m)	0.60-0.90	0.60-0.90

4 Flood risk management infrastructure

4.1 Defences

The Environment Agency AIMS (Asset Information Management System) dataset shows that the site benefits from tidal flood defences along The Swale. The defences are engineered high ground and embankments with varying standards of protection from 10 - 1000 years, with conditions of 2-4 (rating where 1 is good and 5 is bad).

4.2 MEAS Hold the Line Benefit Area

The Medway Estuary and Swale flood and coastal risk management Strategy (MEAS) sets out the Environment Agency's plan to sustainably manage the coastline and tidal defences in the Medway estuary and Swale area. It aims to protect people, properties, designated habitat and agricultural land over the next 100 years.

The site is not within a MEAS Hold the Line Benefit Area.

4.3 Residual risk

There is a risk of the tidal defences being breached, which could cause tidal flooding. There is breach modelling available for the North Kent Coast model for the 0.5% AEP (1 in 200-year) 2075 Upper End event which shows the site would not be at risk of flooding. However, for this site, as the proposed land use is employment, the 2100 0.5% AEP (1 in 200-year) flood event should be assessed within a breach model as part of a detailed Flood Risk Assessment.

There is potential for the build-up of debris in the drainage ditches causing water levels to exceed the bank levels and flow overland which may impact the site.

5 Coastal Change Management Area

The site is located within the Coastal Change Management Area (CCMA). This has been defined by the North Kent Coast 2125 Upper End defended 3.3% AEP (1 in 30-year) flood extent zone.

The Local Plan's CCMA policy is set out under Policy C6. Development for employment will only be appropriate subject to the criteria defined in Policy C6.

A Coastal Change Vulnerability Assessment will need to accompany any planning application for the site. However, as the site is at risk of inundation only, this could largely be satisfied by the submission of a Flood Risk Assessment.

The implications of the site being located within the CCMA can be found within Appendix J of the Level 1 SFRA and Policy C6 of the Local Plan.

6 Emergency planning

6.1 Flood warnings and alerts

The site is not located in an Environment Agency Flood Warning Area but the site is within the Isle of Sheppey and coast from Kemsley to Seasalter Flood Alert Area.

6.2 Access and escape

Safe access and escape will need to be demonstrated in the 1% AEP (1 in 100-year) plus climate change fluvial and surface water events and the 0.5% AEP (1 in 200-year) plus climate change tidal 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.

6.2.1 Current and potential access to the site

Current access to the site is available via the unnamed road in the northeastern corner which leads towards the commercial properties. A further potential access route is via Lower Road along the northern boundary.

6.2.2 Fluvial

Safe access and escape via both routes is viable in all fluvial events.

6.2.3 Tidal

There is flood free access and escape via both routes during the tidal climate change event. Although, there is flooding with depths above 0.30m within the site which will inhibit access to most of the site.

6.2.4 Surface water

During the 1% AEP (1 in 100-year) plus climate change surface water event, there is flooding predicted along the unnamed road in the northeast of the site and the depths reach 0.90m. Therefore, safe access and escape via this route is not possible.

Access and escape via Lower Road to the north is possible from the east or north as the flooding is between 0.15m and 0.30m so vehicular access is possible. However, when travelling from the west, flood depths are between 0.30m and 0.60m which inhibits access.

6.3 Dry islands

A dry island is a parcel of land that is elevated above surrounding areas at risk of flooding and is not at risk of flooding itself.

The site is not located on a dry island.

7 Requirements for drainage control and impact mitigation

7.1 Assessment of possible SuDS constraints

- 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.
- British Geological Survey (BGS) data indicates that the underlying geology is clay, silt and sand and therefore permeability could be highly variable. As a result, permeability will need to be confirmed through infiltration testing. Off-site discharge may be required to discharge surface water runoff from the site. This would need to be in accordance with the SuDS hierarchy.
- 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 topography slopes downwards from northeast to southwest which will accelerate surface water runoff, increase erosion risks, and limit the space available for gravity-fed infiltration features like basins.
- The site is not located within a historic landfill site.

7.2 Recommended approach to SuDS design

- 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 Environment Agency) 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 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 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.
- Surface water discharge rates should not exceed the existing greenfield runoff rates for the site for the 50% AEP (1 in-2 year) and 1% AEP (1 in-100 year) storm events. Opportunities to further reduce discharge rates should be considered and agreed with the LLFA. It may be possible to reduce site runoff by maximising the permeable surfaces on site using a combination of permeable surfacing and soft landscaping techniques.
- If it is proposed to discharge runoff to a watercourse or sewer system, the condition and capacity of the receiving watercourse or asset should be confirmed through surveys and the discharge rate agreed with the Lead Local Flood Authority alongside confirmation with the asset owner of the available capacity.
- The site is within the North Kent Marshes Water Level Management Board (WLMB) district who may have additional requirements regarding discharge rates (directly or indirectly) into their district. The WLMB should be consulted during the detailed design of the site to establish the Board's requirements and determine whether there will be a need to apply for surface water discharge or ordinary watercourse consents.

8 NPPF and planning implications

8.1 Exception Test requirements

The Local Planning Authority has confirmed that the Sequential Test has been carried out in line with national guidelines. The Sequential Test needs to be passed before the Exception Test is applied.

Annex F of the NPPF classifies employment development as "Less vulnerable".

The Exception Test is not required for this site because its proposed use (employment) is classified as being less vulnerable and within Flood Zone 3a.

8.2 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:

- in Flood Zones 2 or 3 - see flood map for planning
- 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
- within Flood Zone 1 and the flood map for planning shows it is at risk of flooding from surface water, now or in future

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

Consultation with the Local Authority, Lead Local Flood Authority, Southern Water, North Kent Marshes WLMB and the Environment Agency 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 Swale Borough Council Local Plan Policies.

The development should be designed with mitigation measures in place where required as outlined in Section 8.3.

8.3 Guidance for site design and making development safe

- Due to being located within the CCMA, planning applications will be subject to the criteria defined in Policy C6 of the Local Plan.
- A sequential approach to the location of development within the site should be undertaken. 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.
- Mitigation measures such as land raising and/or the construction of private flood defences may be required for the development to be safe for its lifetime from tidal flooding. These measures should be assessed to make sure that flooding is not increased either on or off the site.

- The residual risk at the site should be assessed including for breach modelling for the 2100 0.5% AEP (1 in 200-year) tidal event
- Assuming the site can be made safe from tidal flooding and development can be undertaken in line with the requirements of Policy C6 of the Local Plan:
    - A detailed hydraulic fluvial model of drainage ditches in the area may be required at the FRA stage to accurately represent the risk from these watercourses and set the height of any mitigation measures.
    - Where development cannot avoid areas at risk of flooding, then flood resilience and resistance measures e.g. raising of floor levels, including property flood resistance and resilience measures should be implemented, where appropriate. These measures should be assessed to make sure that flooding is not increased either on or off the site.
    - The risk from surface water flow routes should be quantified as part of a site-specific FRA, including a drainage strategy, so runoff volumes from the development are not increased by development. 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 retained as open space and SuDS or water compatible/essential infrastructure uses only.
    - Developers should consider utilising the ditch along the boundary as a green corridor or as a location for SuDS.
    - A Flood Response Plan will be required. Arrangements for safe access and escape will need to be provided for the 1% AEP (1 in 100-year) surface water and 0.5% AEP (1 in 200-year) tidal events with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate mitigation measures, to ensure the 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.

9 Conclusions

According to the FMfP, Flood Zones 2 and 3a cover 46% and 26% of the site respectively, covering the southwestern area and encroaching into the centre of the site.

The nearby drainage ditches have not been mapped in the fluvial mapping. Therefore, surface water data has been used to inform the fluvial risk from the drainage ditches within this site summary sheet.

The North Kent Coast model shows the site is not at risk of flooding during the defended present day extents. However, 39% of the site is predicted to flood in the defended 0.5% AEP (1 in 200-year) 2100 Upper End event. The extent is within the southwest and encroaches 150m into the centre of the site.

In terms of surface water flood risk, during the 3.3% (1 in 30-year) and 1% AEP (1 in 100-year) events, the surface water flooding is confined to the ditches along the western, eastern and southern boundaries and in the northeastern corner from an offsite flow path flowing from Lower Road into the site. In the 0.1% AEP (1 in 1,000-year) event, a much larger extent of the site is predicted to flood. Three flow paths from Lower Road flow from the northern boundary towards the southwest, causing pooling, and there is more extensive flooding in the southeast. In the 1% AEP (1 in 100-year) plus 40% climate change event, there is more flooding which comes from the nearby drainage ditch and inundates more of the western area, as well as further flow paths from Lower Road into the north of the site.

There have been 85 sewer flood incidents in the ME12 3 postcode area since 2015 according to Southern Water's SIRF dataset.

According to Kent County Council's historic records, the site is within an area that has had 4 flood incidents.

The site is located within the Coastal Change Management Area (CCMA). This has been defined by the North Kent Coast 2125 Upper End defended 3.3% AEP (1 in 30-year) flood extent zone.

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

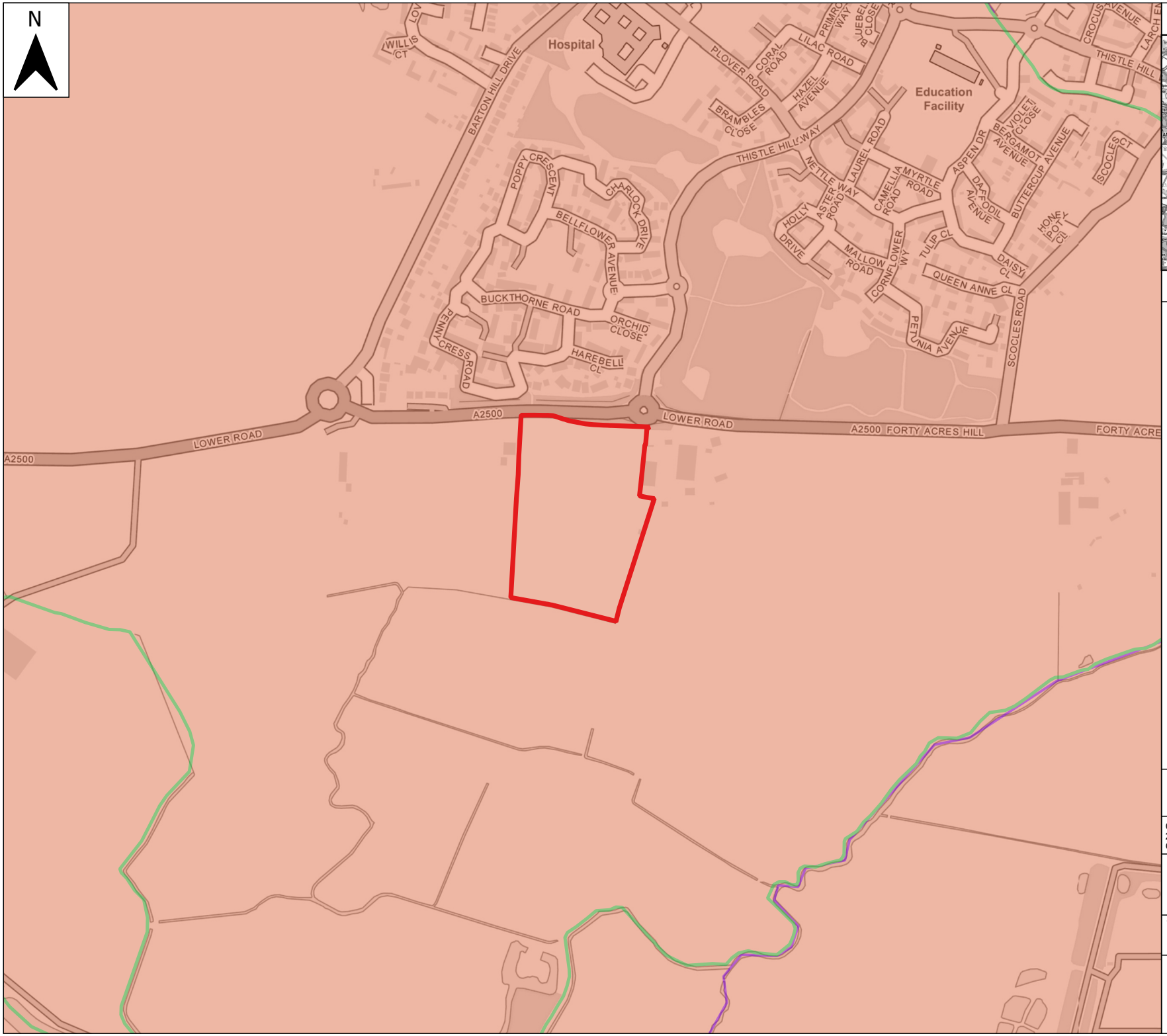
- Due to being located within the CCMA, planning applications will be subject to the criteria defined in Policy C6 of the Local Plan.
- A site-specific Flood Risk Assessment will be required which demonstrates that development can be safely accommodated on the site for its lifetime. A sequential approach should be applied within the site, locating development in the areas of lowest flood risk where possible. Where this is not possible, it may mean land raising and/or the construction of private flood defences are required. These measures should be assessed to make sure that flooding is not increased either on or off the site.

- The nearby drainage ditches have not been modelled and therefore, site-specific modelling may be required as part of the Flood Risk Assessment to represent accurate fluvial flood risk on the site.
- The residual risk should be assessed and include breach modelling for the 2100 0.5% AEP (1 in 200-year) tidal event.
- Development should be steered outside the areas of surface water on site. Where development cannot avoid areas at risk of flooding, then flood resilience and resistance measures e.g. raising of floor levels, including property flood resistance and resilience measures should be implemented, where appropriate. These measures should be assessed to make sure that flooding is not increased either on or off the site.
- SuDS (filtration techniques, conveyance features such as swales or discharging to nearby sewers) should be incorporated throughout the site to manage runoff, provide climate change resilience and deliver wider water quality, biodiversity and amenity benefits.
- A Flood Response Plan will be required. Arrangements for safe access and escape will need to be provided for the 1% AEP (1 in 100-year) surface water and fluvial and 0.5% AEP (1 in 200-year) tidal event with an appropriate allowance for climate change, considering depth, velocity, and hazard. Design and access arrangements will need to incorporate mitigation measures, so development and occupants are safe. Particular consideration should be given to flooding at the proposed access and escape route along the unnamed road, where surface water flooding will restrict access during extreme events.

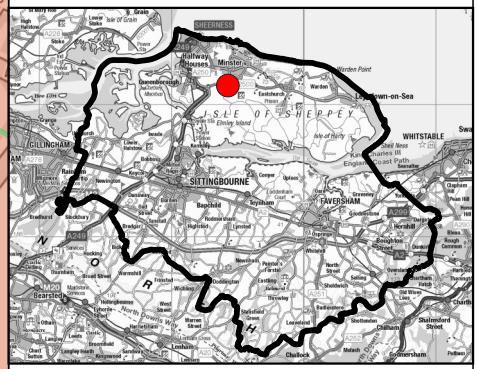
A Sources of information

- National Planning Policy Framework (NPPF) https://www.gov.uk/guidance/national-planning-policy-framework
- Planning Practice Guidance (PPG), Flood Risk and Coastal Change https://www.gov.uk/guidance/flood-risk-and-coastal-change
- Swale Borough Local Plan https://services.swale.gov.uk/media/files/localplan/adoptedlocalplanfinalwebversion.pdf
- Swale Borough Council Sequential and Exception Tests for Planning Applications https://swale.gov.uk/planning-and-regeneration/local-plans/local-plan-review-evidence/flood-risk#h2
- Swale Borough Council Level 1 SFRA
- https://swale.gov.uk/planning-and-regeneration/local-plans/local-plan-review-evidence/flood-risk#h2
- Kent County Council Local Flood Risk Management Strategy https://www.kent.gov.uk/__data/assets/pdf_file/0016/205621/Local-Flood-Risk-Management-Strategy-2024-2034.pdf
- Flood risk assessments: applying for planning permission https://www.gov.uk/guidance/flood-risk-assessments-applying-for-planning-permission
- Kent County Council's Drainage and Planning Policy Statement https://www.kent.gov.uk/about-the-council/strategies-and-policies/service-specific-policies/economic-regeneration-and-planning-policies/planning-policies/flooding-drainage-and-water-management-policies-and-guidance
- Defra's National standards for sustainable drainage systems (SuDS) https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds
- Flood Map for Planning - Flood Zones dataset https://environment.data.gov.uk/dataset/04532375-a198-476e-985e-0579a0a11b47
- Flood Map for Planning - Flood Zones plus Climate Change https://environment.data.gov.uk/dataset/59065c43-257e-4867-8798-fd2366156a6b
- British Geological Survey (BGS) Geology Viewer https://geologyviewer.bgs.ac.uk/
- Flood Warning sign up https://www.gov.uk/sign-up-for-flood-warnings

B Flood Risk Mapping



Location Plan



Legend

- Swale Borough Outline
- Site boundary

Watercourses

- Statutory Main Rivers
- Ordinary watercourses
- North Kent Marshes Water Level Management Board Watercourses
- North Kent Marshes Water Level Management Board

0 200 400 m

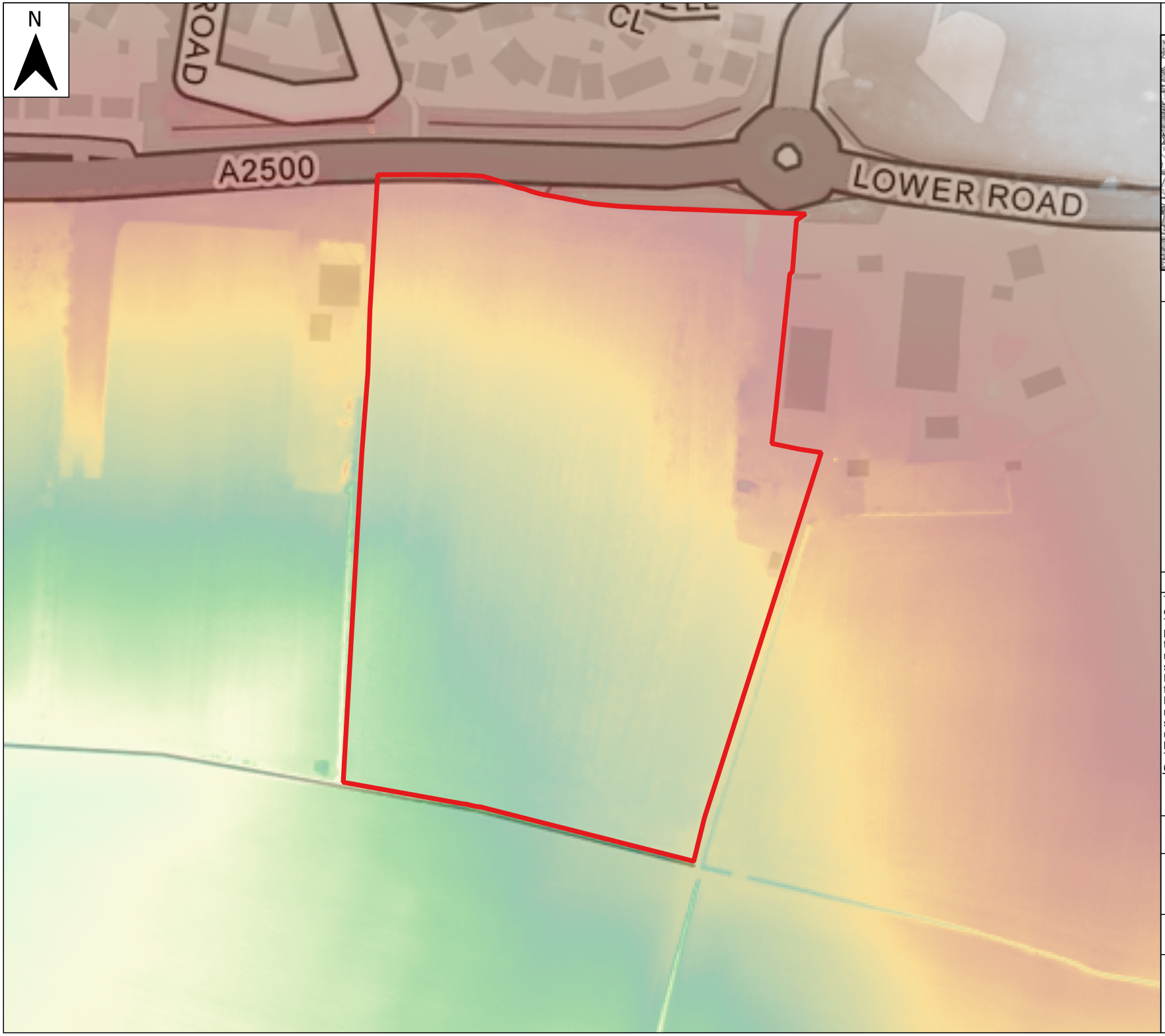
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LEVEL 2 SFRA:
WATERCOURSES - REG3197

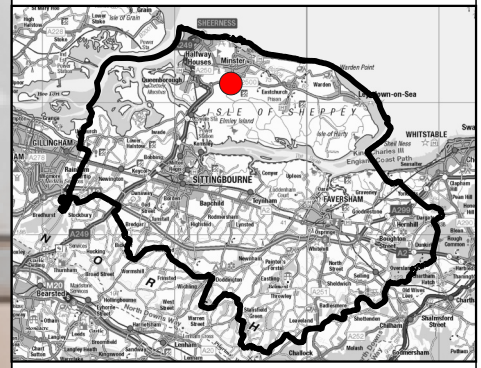
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Making Swale a better place



Location Plan



Legend

Swale Borough Outline

Site boundary

Topography

LIDAR 1m DTM (mAOD)

11.78

1.78

Notes

The LIDAR Composite DTM (Digital Terrain Model) is a raster elevation model covering ~99% of England at 1m spatial resolution. The DTM (Digital Terrain Model) is produced from the last or only laser pulse returned to the sensor. We remove surface objects from the Digital Surface Model (DSM), using bespoke algorithms and manual editing of the data, to produce a terrain model of just the surface.

Produced by the Environment Agency in 2022, the DTM is derived from a combination of the EA's Time Stamped archive and National LIDAR Programme surveys, which have been merged and re-sampled to give the best possible coverage. Where repeat surveys have been undertaken the newest, best resolution data is used. Where data was resampled a bilinear interpolation was used before being merged.

The 2025 LIDAR Composite contains surveys undertaken between 6th June 2000 and 1st August 2025.

0 60 120 m

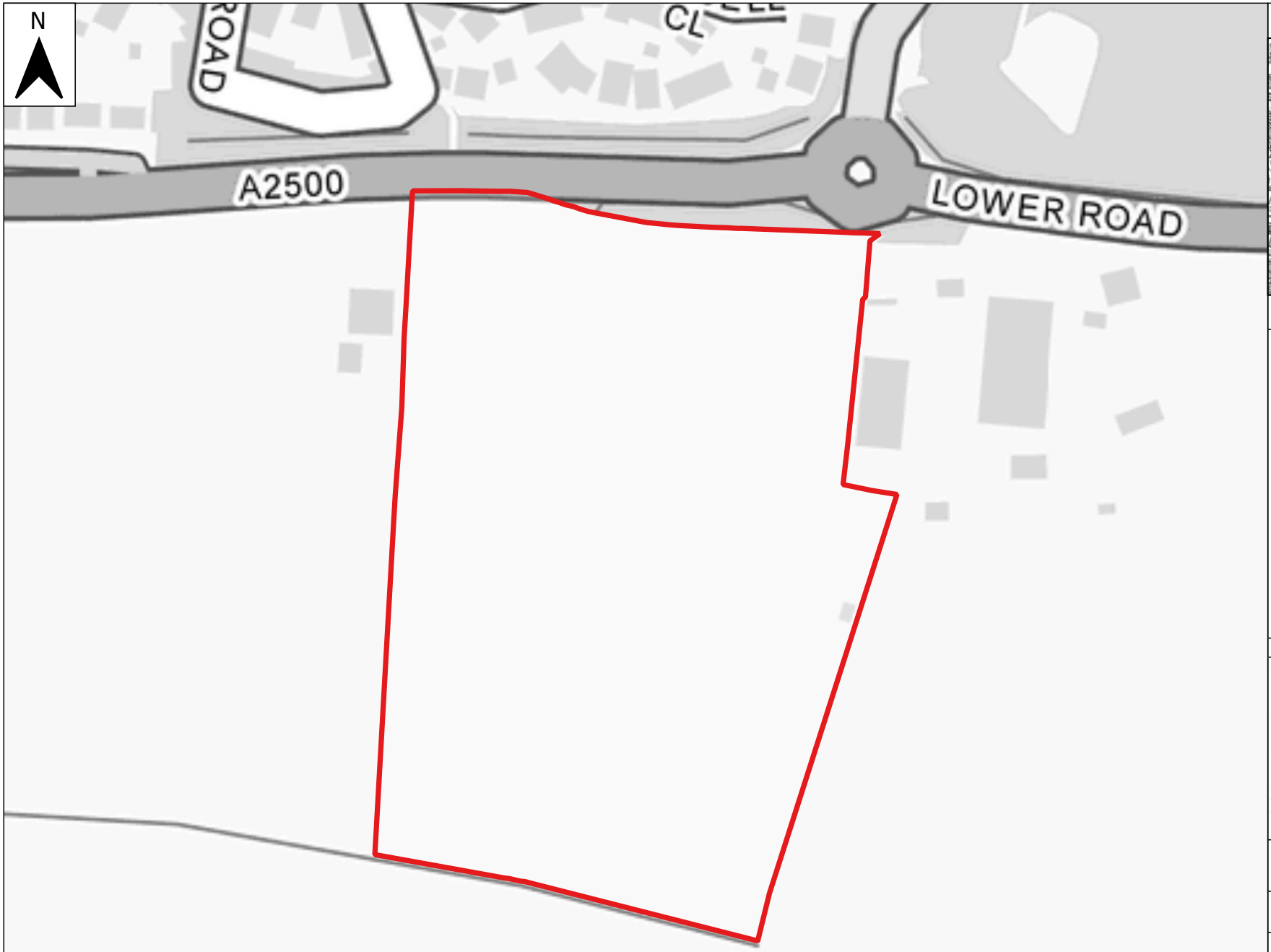
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LEVEL 2 SFRA:
TOPOGRAPHY - REG3197

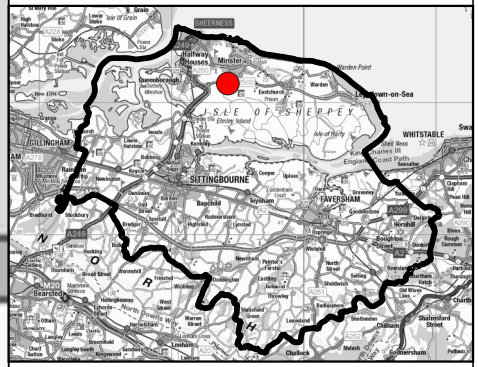
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

Environment Agency recorded flood outlines

- Main Rivers
- Sea

Notes

The Historic Flood Map shows the recorded flood outlines available from the Environment Agency. The dataset records historical flooding from rivers, the sea, groundwater and surface water.
It is possible that the pattern of flooding has changed and area would now flood or not flood under different circumstances.
Please note that not all historical records may be shown on this map, and that it is therefore advised you contact the Environment Agency for updated information.
The map does not include recorded incidents of flooding held by Kent County Council or Southern Water.

0 60 120 m

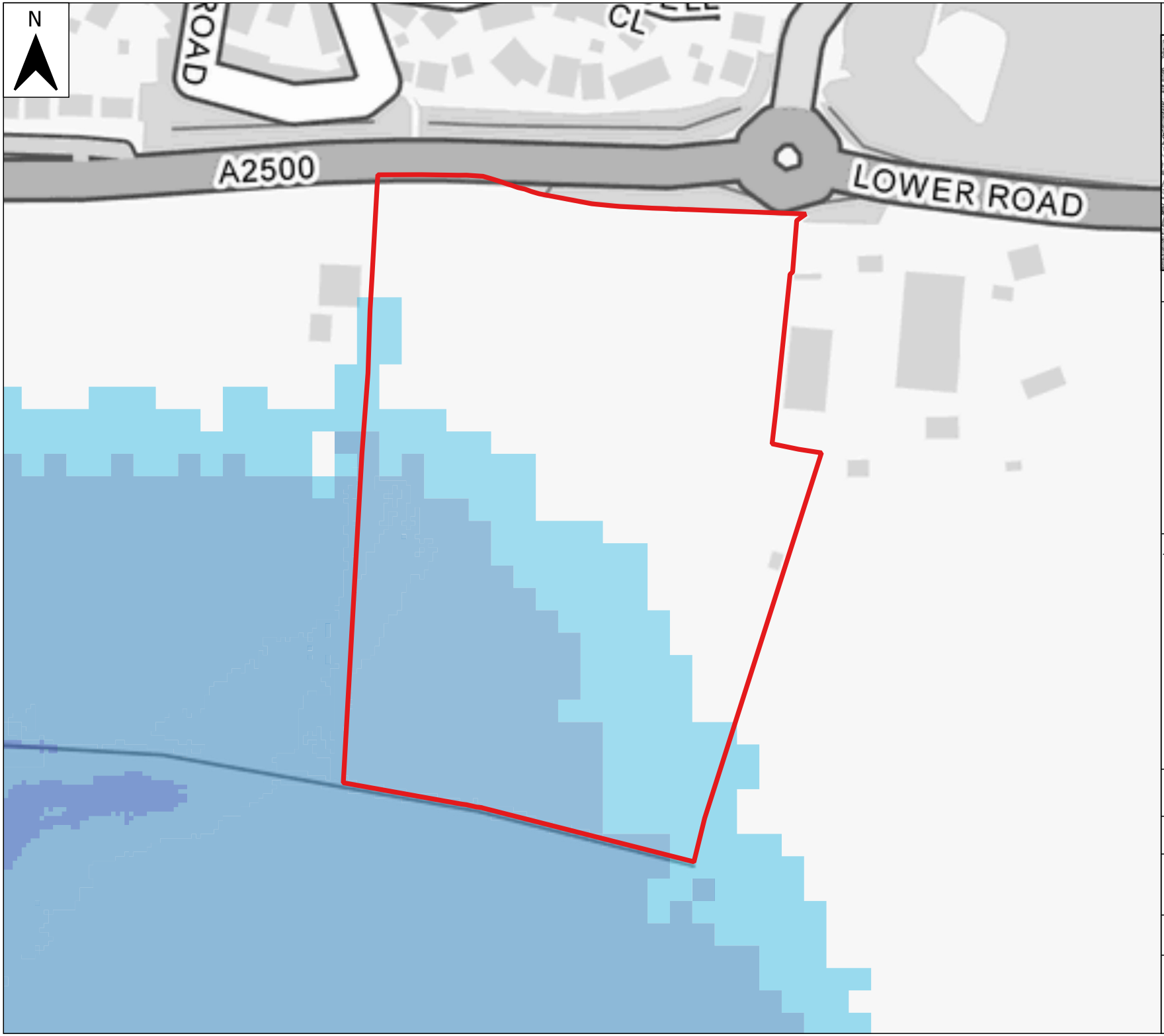
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LEVEL 2 SFRA:
HISTORIC FLOODING - REG3197

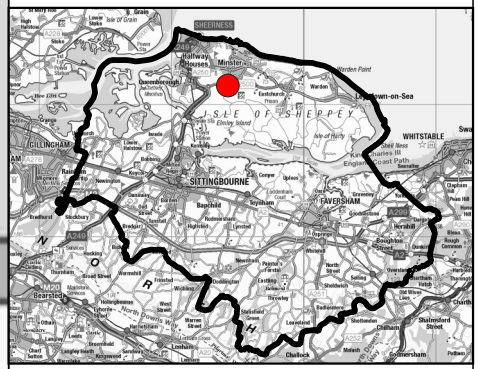
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

Flood Zone

- Flood Zone 2
- Flood Zone 3
- Flood Zone 3b
- Generalised modelling used for Flood Zone 3b

Notes

Flood Zone 1: Land assessed as having a less than 0.1% AEP of river or sea flooding.
Flood Zone 2: Land assessed as having a 0.1% - 1% AEP (1 in 1000-year and 1 in 100-year) of river flooding or a 0.1% - 0.5% AEP (1 in 1000-year and 1 in 200-year) of flooding from the sea.
Flood Zone 3a: Land assessed as having a greater than a 1% AEP (1 in 100-year) of river flooding or a greater than 0.5% AEP (1 in 200-year) of flooding from the sea.
Flood Zone 3b: Land where water has to flow or be stored in times of flood (functional floodplain). The SFRA identifies this Flood Zone as land which floods with an annual probability of 3.3% AEP (1 in 30-year) where detailed modelling exists. Where the 3.3% AEP (1 in 30-year) ouputs are not available, Flood Zone 3a is used as a surrogate as a precautionary approach. If a proposed development is in Flood Zone 3, further analysis should be undertaken in a detailed site specific FRA to define and confirm the extent of Flood Zone 3b.

0 60 120 m

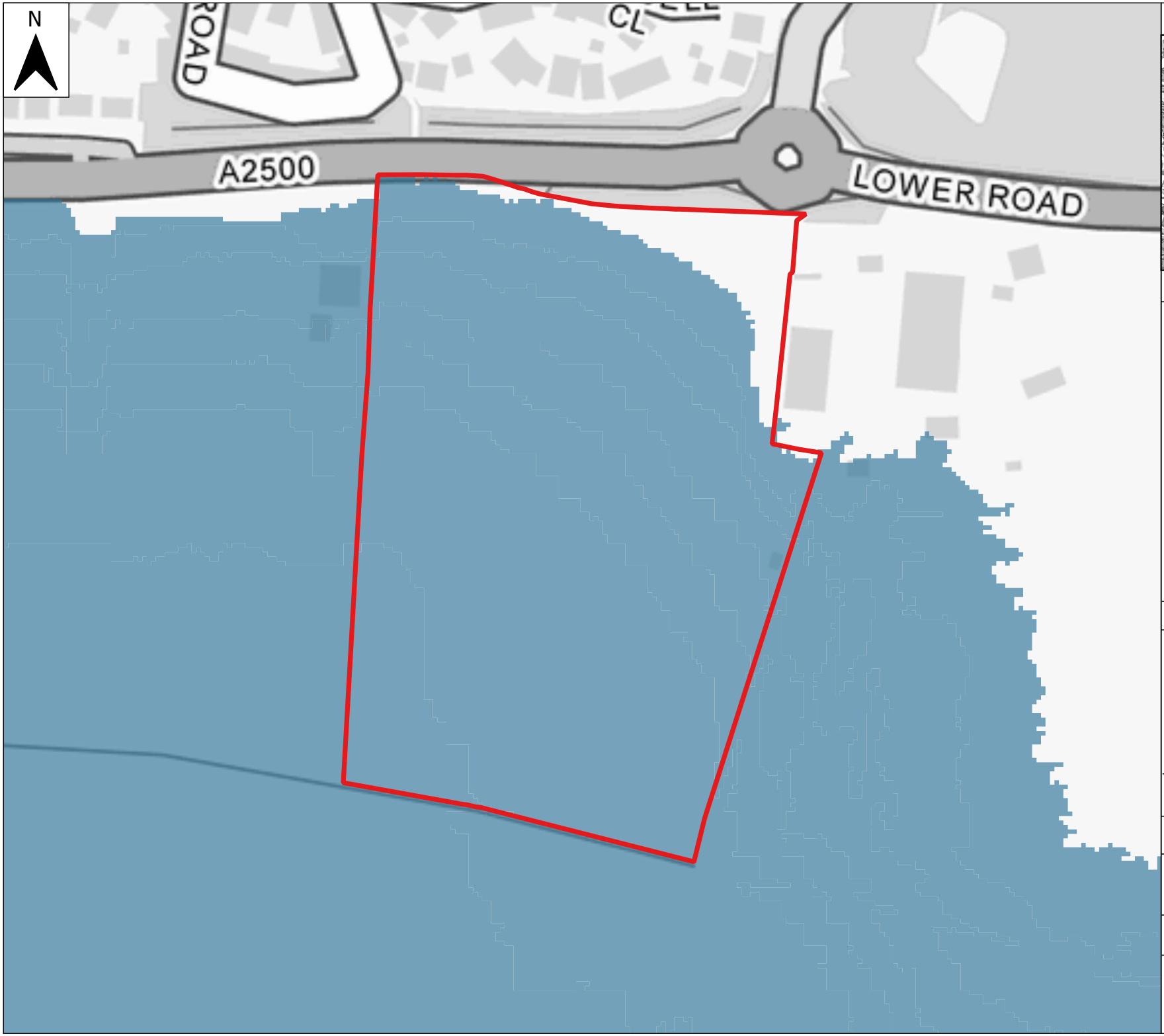
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LEVEL 2 SFRA:
PRESENT DAY FLOOD RISK FROM RIVERS AND SEA (FLOOD ZONES) - REG3197

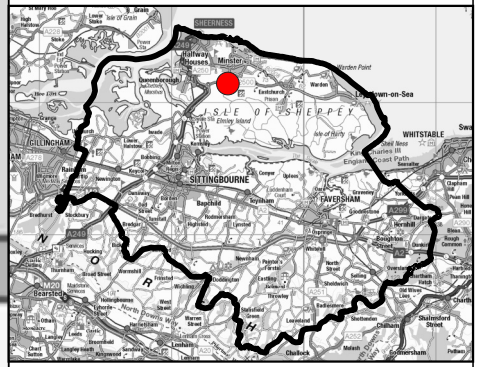
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Location Plan



Legend

- Swale Borough Outline
- Site Boundary
- 1% AEP (1 in 100-year) and 0.1% AEP (1 in 1000-year) undefended extents under the 2125 year climate change scenario

Notes

The Flood Zone plus Climate Change mapping was produced by combining the Flood Zone 2 and Flood Zone 3 extents with the relevant climate change allowances to illustrate the potential future flood risk to the area. This represents an undefended scenario, meaning that existing flood defences are not considered in the modelling. For further information on this flood extent dataset, please refer to the guidance available on;

https://flood-map-for-planning.service.gov.uk/how-to-use-

0 60 120 m

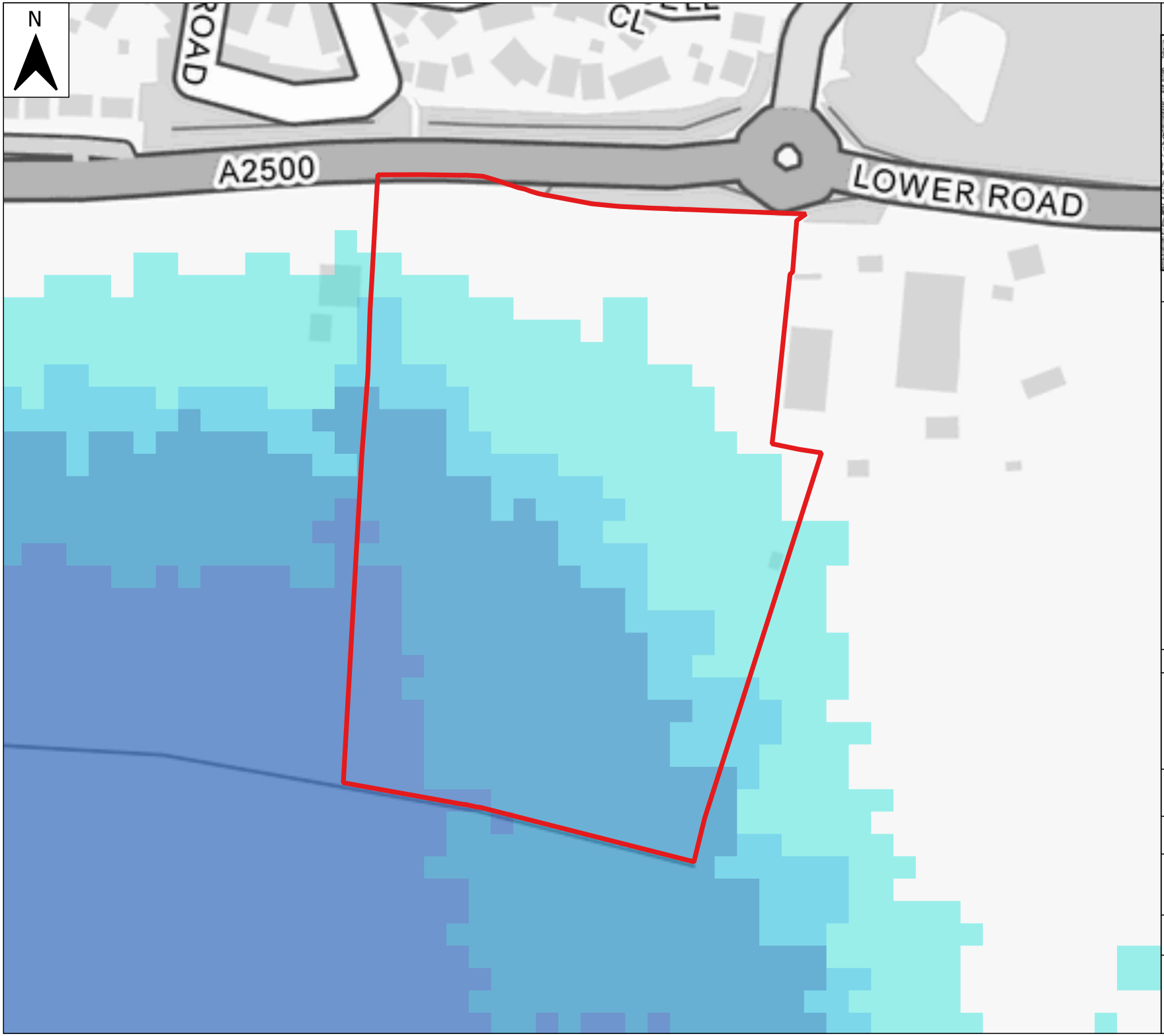
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LEVEL 2 SFRA:
FUTURE FLOOD RISK FROM RIVERS AND SEA - FLOOD MAP FOR PLANNING- REG3197

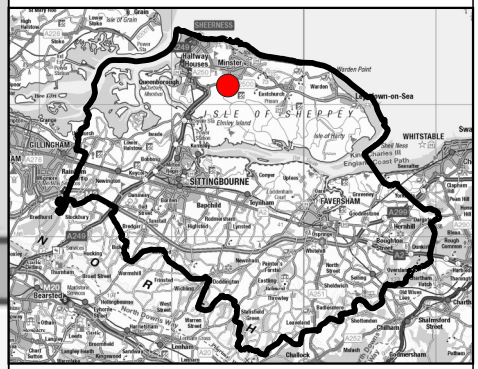
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Location Plan



Legend

- Swale Borough Outline
- Site boundary
- 0.5% AEP (1 in 200-year) 2100 defended (higher central)
- 0.5% AEP (1 in 200-year) 2100 defended (upper end)
- 0.5% AEP (1 in 200-year) 2125 defended (higher central)
- 0.5% AEP (1 in 200-year) 2125 defended (upper end)

Notes

Climate change extents for the 0.5% AEP (1 in 200-year) events with the Higher Central and Upper End estimates (2100 and 2125) are shown. The difference in flood extents are relatively small.

0 60 120 m

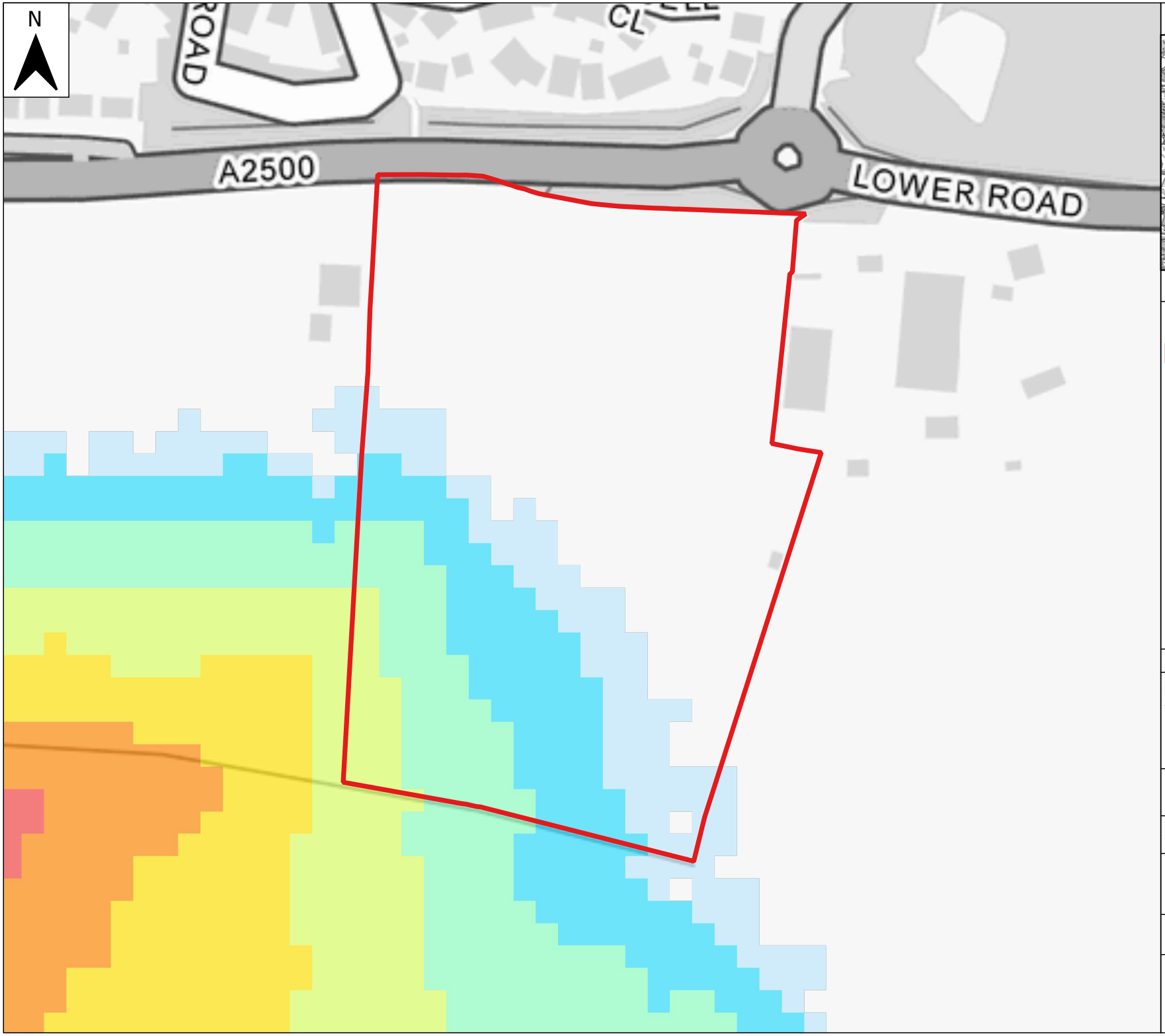
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LEVEL 2 SFRA:
FUTURE FLOOD RISK FROM THE SEA - NORTH KENT COAST MODEL - REG3197

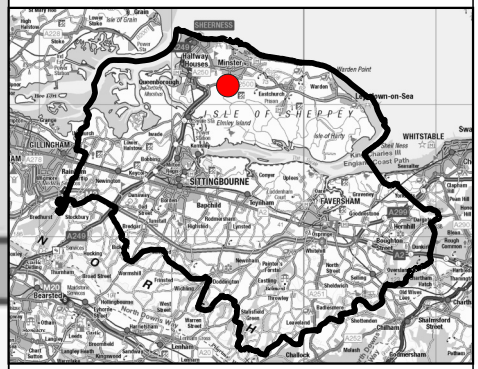
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Location Plan



Legend

Swale Borough Outline

Site boundary

North Kent Coast Model - Defended
0.5% AEP (1 in 200-year) 2100 UE depth (m)

- 0.00 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- > 2.50

Notes

Climate change depths for the 0.5% AEP (1 in 200-year) event with the Upper End estimate (2100) is shown.

0 60 120 m

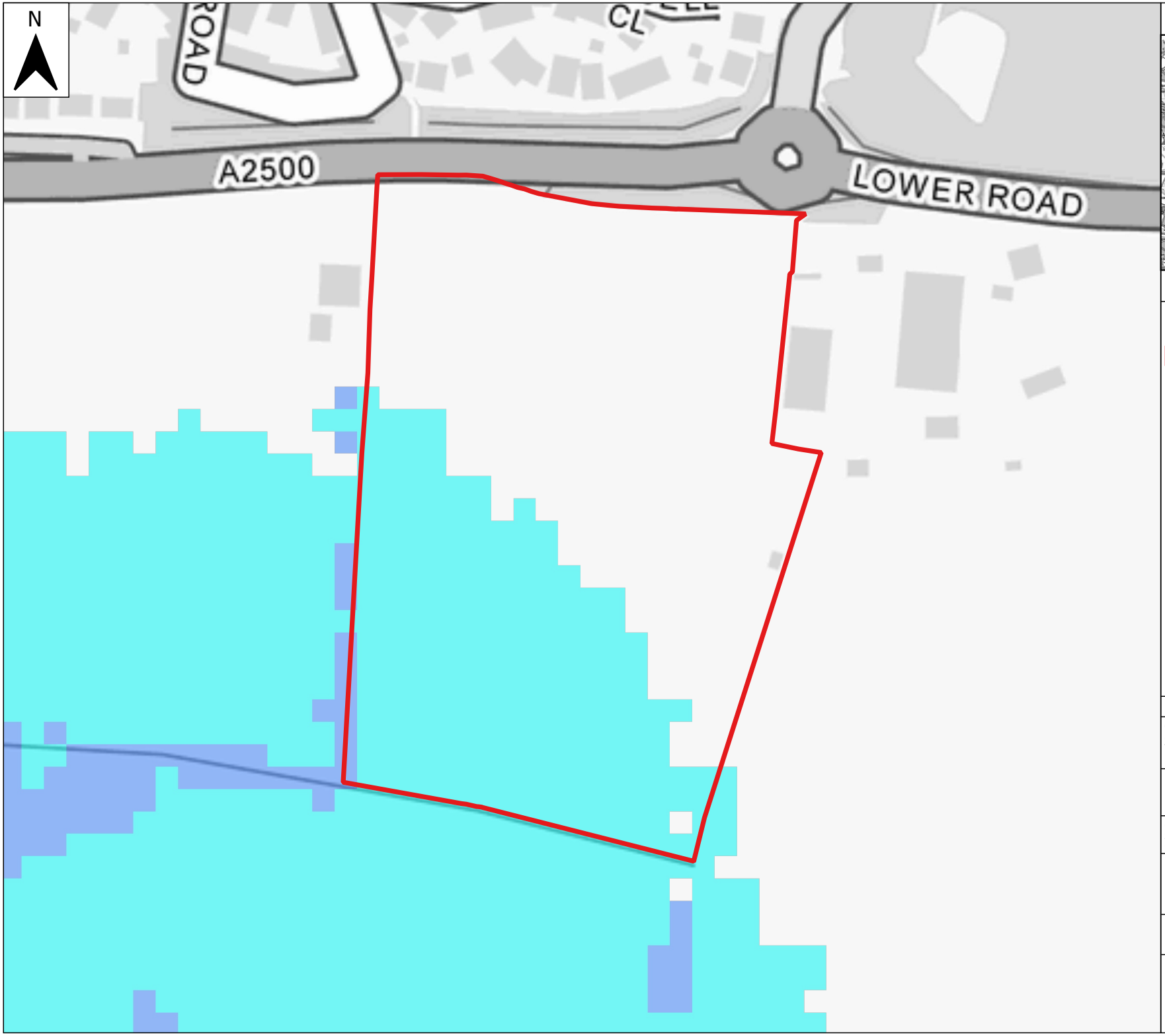
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LEVEL 2 SFRA:
FUTURE FLOOD RISK FROM THE SEA - NORTH KENT COAST MODEL DEPTH - REG3197

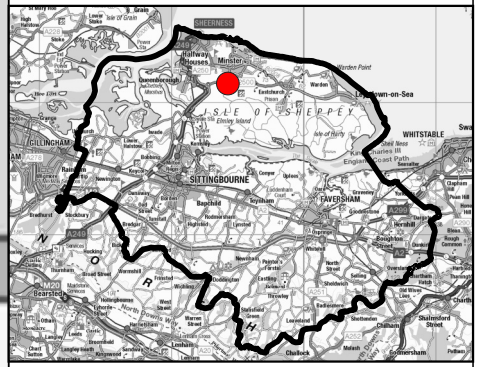
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

North Kent Coast Model - Defended 0.5% AEP (1 in 200-year) 2100 UE Velocity (m/s)

- 0.0 - 0.2
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Notes

Climate change velocity for the 0.5% AEP (1 in 200-year) event with the Upper End estimate (2100) is shown.

0 60 120 m

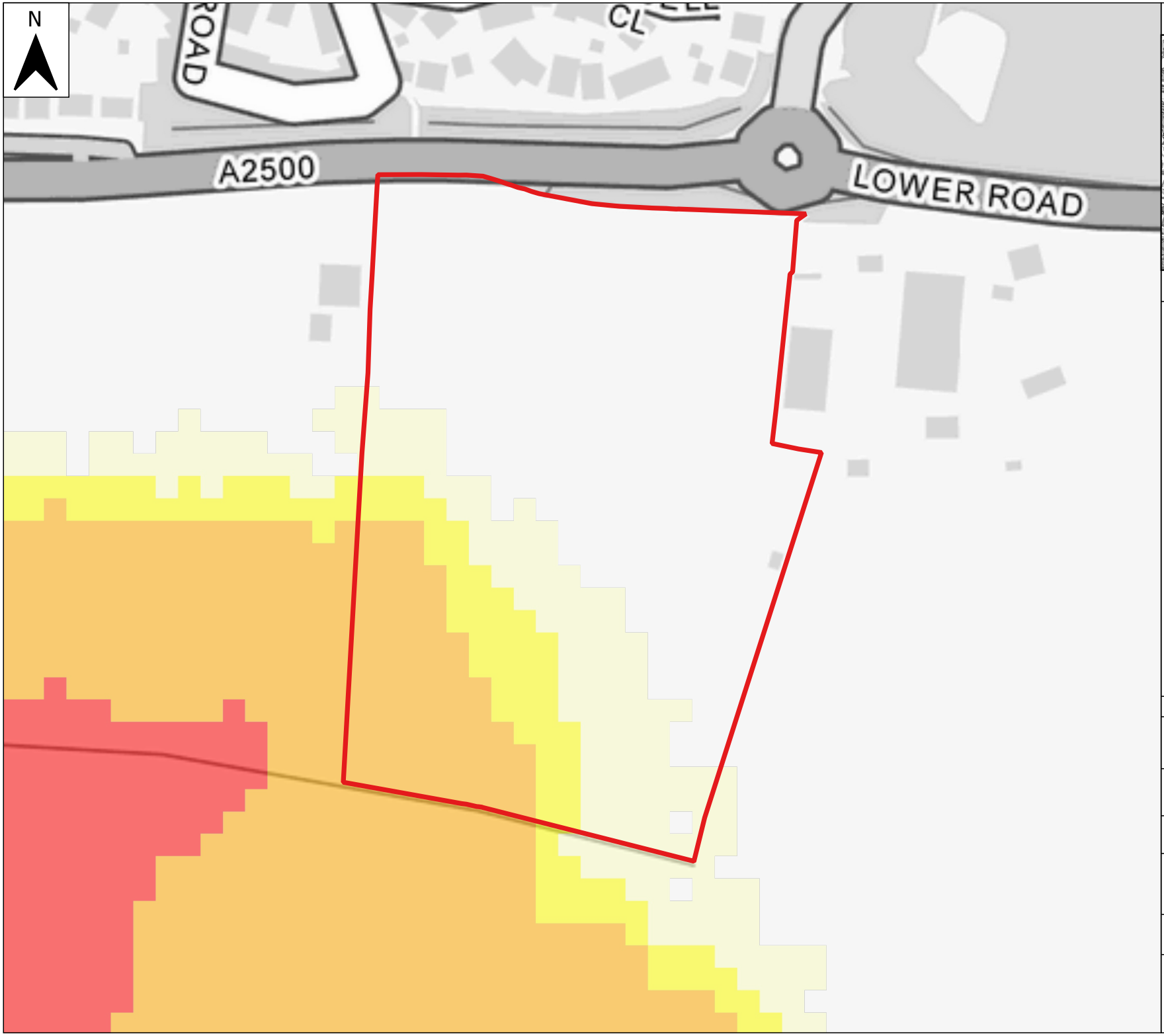
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LEVEL 2 SFRA:
FUTURE FLOOD RISK FROM THE SEA - NORTH KENT COAST MODEL VELOCITY - REG3197

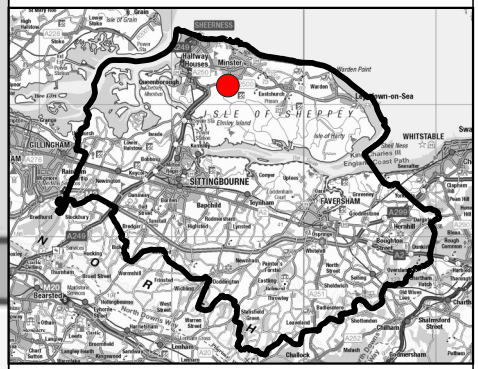
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

North Kent Coast Model - Defended 0.5% AEP (1 in 200-year) 2100 UE hazard classification

- No hazard
- Very low hazard - Caution
- Danger for some
- Danger for most
- Danger for all

Notes

Climate change hazard for the 0.5% AEP (1 in 200-year) event with the Upper End estimate (2100) is shown.

0 60 120 m

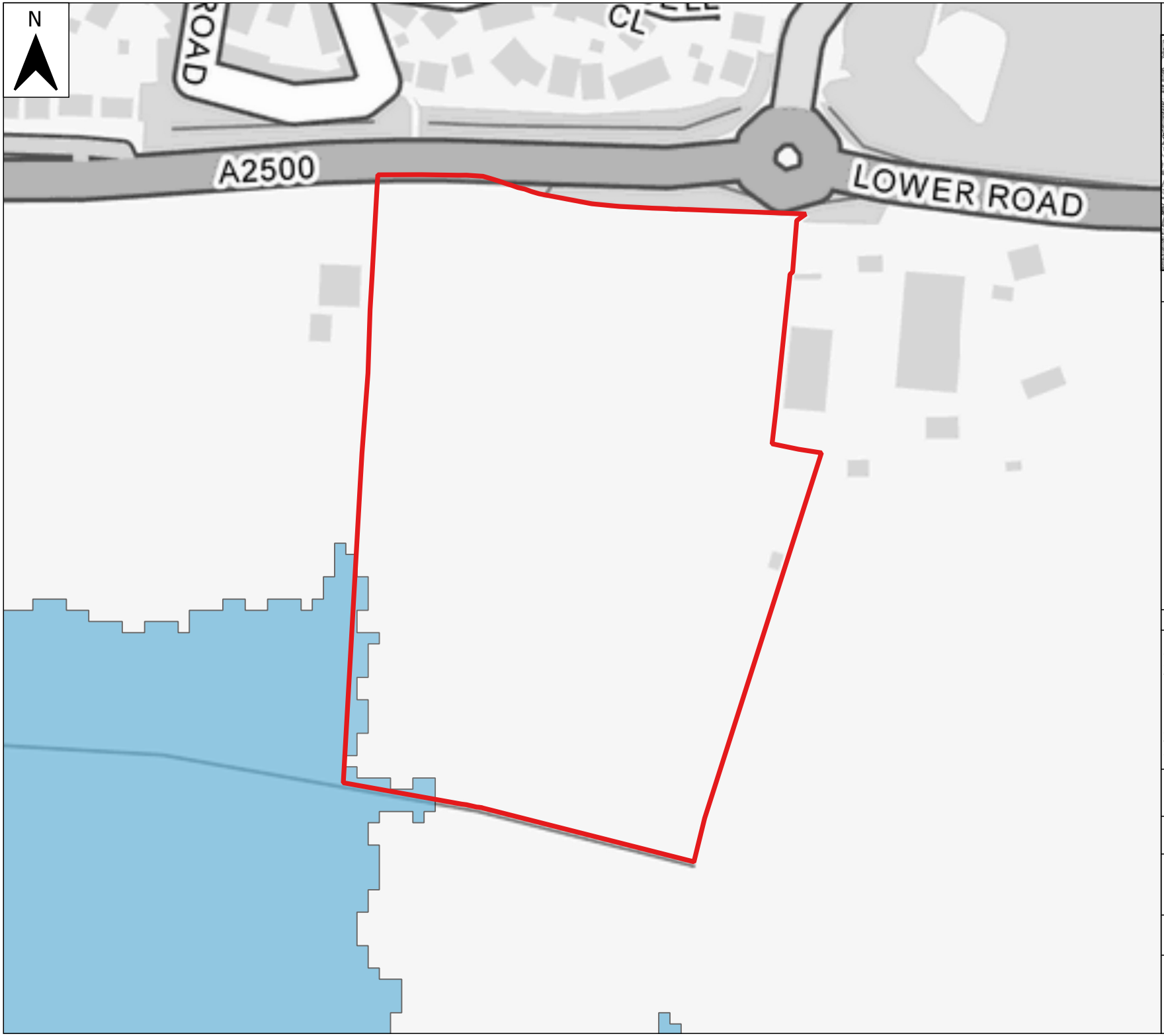
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LEVEL 2 SFRA:
FUTURE FLOOD RISK FROM THE SEA - NORTH KENT COAST MODEL HAZARD - REG3197

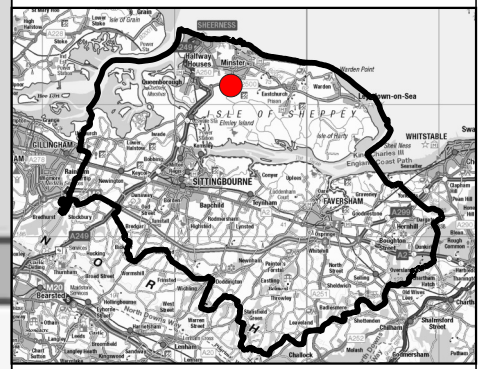
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Location Plan



Legend

- Swale Borough Outline
- Site boundary
- North Kent Coast Model - 0.5% AEP (1 in 200-year) 2075 UE Breach Extent

Notes

Breach modelling is a hydraulic approach used to simulate the failure or overtopping of a flood defence, such as a flood wall or embankment, during a given flood event. It assesses how such a failure would influence flood extents and the potential impacts on surrounding areas.
In the North Kent Coast Model, breach modelling was carried out at several locations. The results presented here relate to all of the breaches, which represent simulated failures of surrounding defences during the climate change 0.5% AEP (1 in 200-year) event with the Upper End estimate (2075), illustrating the predicted extent of flooding under these conditions.

0 60 120 m

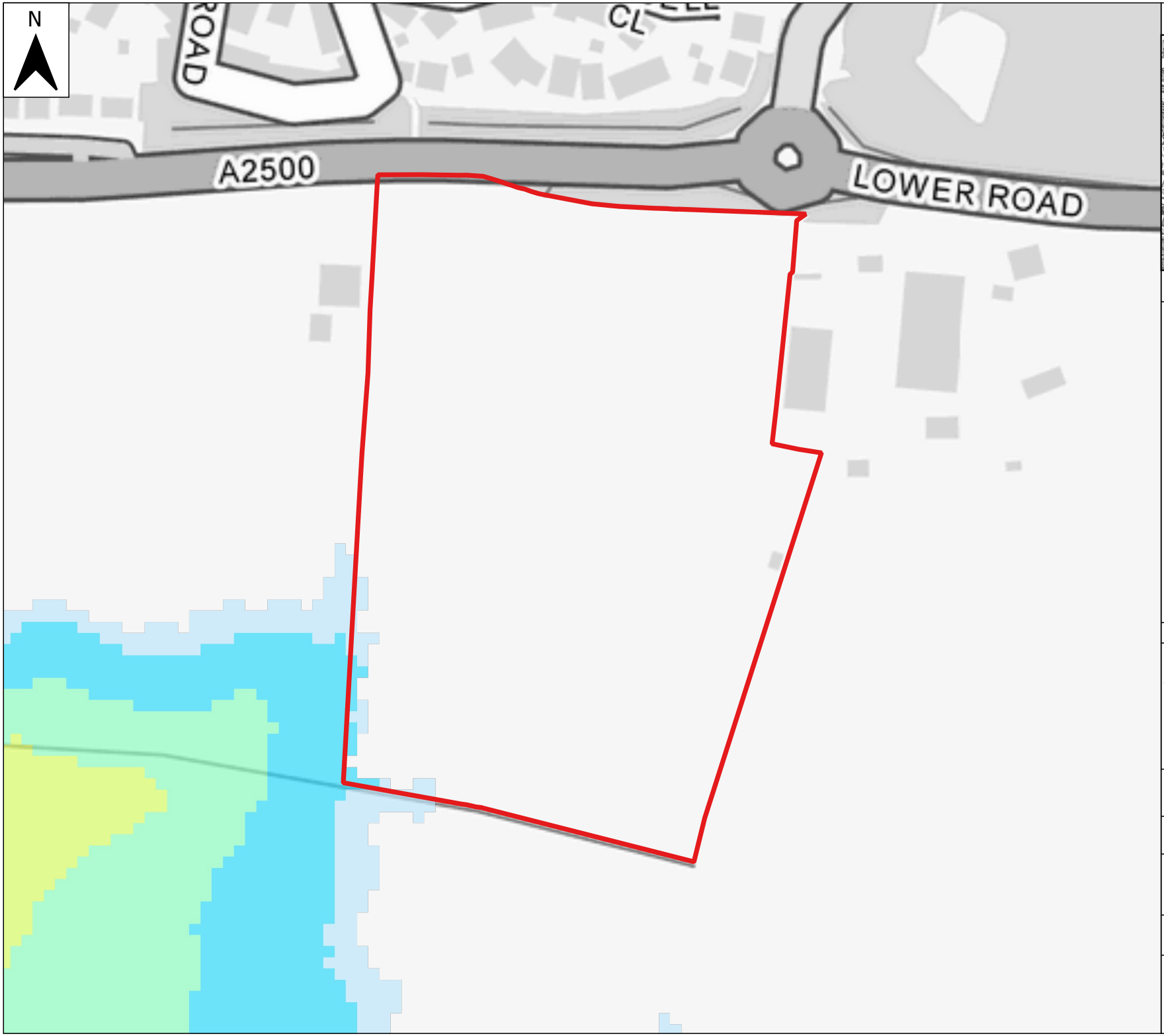
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FUTURE BREACH RISK FROM THE SEA - NORTH KENT COAST MODEL EXTENT - REG3197

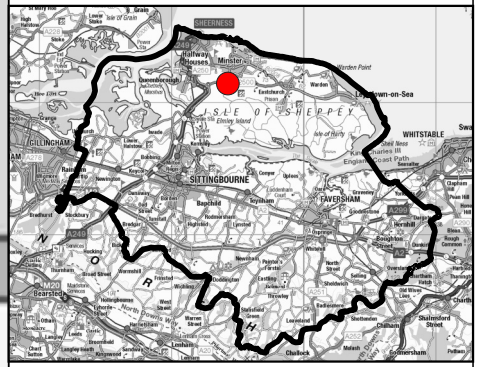
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Location Plan



Legend

Swale Borough Outline

Site boundary

North Kent Coast Model - 0.5% AEP (1 in 200-year) 2075 UE Breach Depth (m)

- 0.00 - 0.10
- 0.10 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- > 2.50

Notes

Breach modelling is a hydraulic approach used to simulate the failure or overtopping of a flood defence, such as a flood wall or embankment, during a given flood event. It assesses how such a failure would influence flood extents and the potential impacts on surrounding areas.

In the North Kent Coast Model, breach modelling was carried out at several locations. The results presented here relate to the maximum depth of all the breaches, which represent simulated failures of surrounding defences during the climate change 0.5% AEP (1 in 200-year) event with the Upper End estimate (2075), illustrating the predicted depth of flooding under these conditions.

0 60 120 m

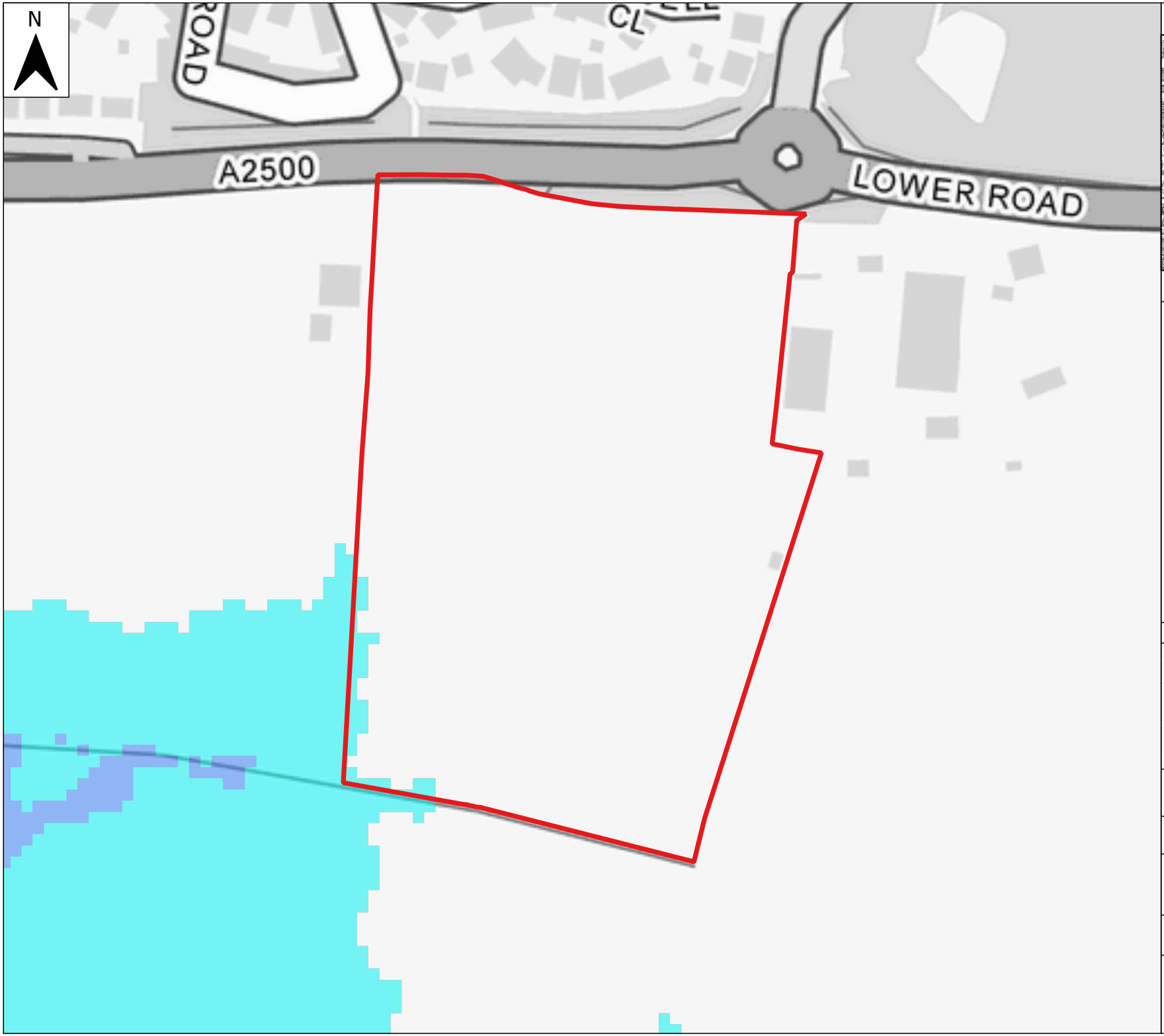
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FUTURE BREACH RISK FROM THE SEA - NORTH KENT COAST MODEL DEPTH - REG3197

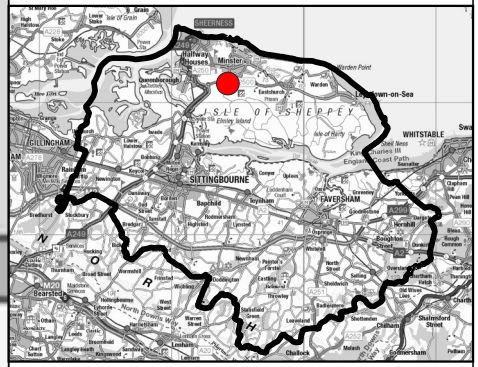
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Location Plan



Legend

Swale Borough Outline

Site boundary

North Kent Coast Model - 0.5% AEP (1 in 200-year) 2075 UE Breach Velocity (m/s)

- 0.0 - 0.2
- 0.2 - 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Notes

Breach modelling is a hydraulic approach used to simulate the failure or overtopping of a flood defence, such as a flood wall or embankment, during a given flood event. It assesses how such a failure would influence flood extents and the potential impacts on surrounding areas.

In the North Kent Coast Model, breach modelling was carried out at several locations. The results presented here relate to the maximum velocity of all the breaches, which represent simulated failures of surrounding defences during the climate change 0.5% AEP (1 in 200-year) event with the Upper End estimate (2075), illustrating the predicted velocity of flooding under these conditions.

0 60 120 m

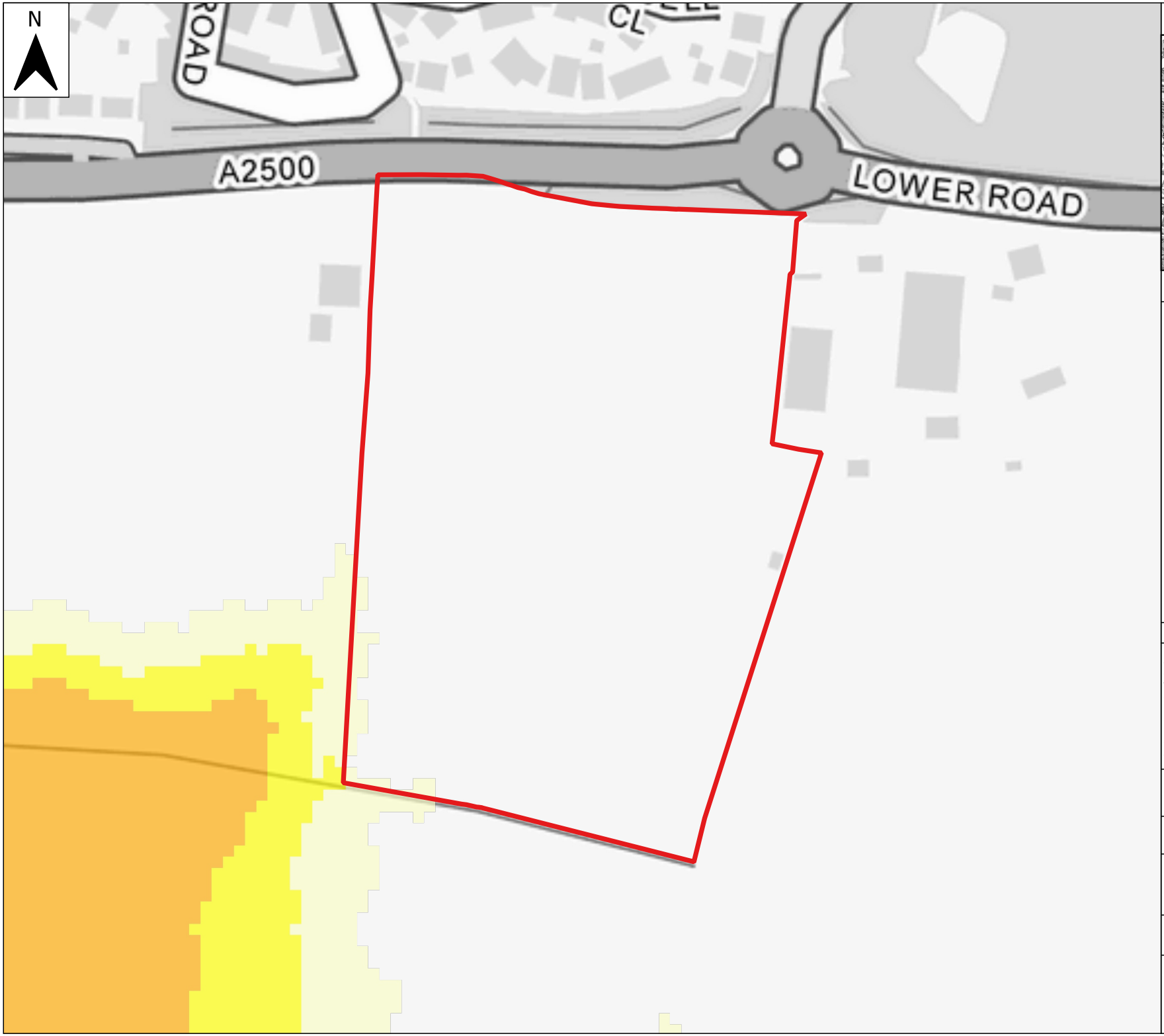
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FUTURE BREACH RISK FROM THE SEA - NORTH KENT COAST MODEL VELOCITY - REG3197

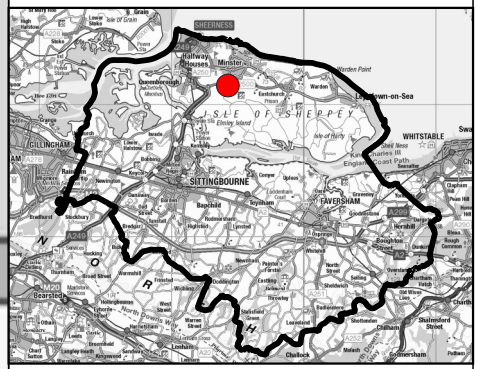
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Location Plan



Legend

Swale Borough Outline

Site boundary

North Kent Coast Model - 0.5% AEP (1 in 200-year) 2075 UE Breach Hazard Classification

- No hazard
- Danger for all
- Very low hazard - Caution
- Danger for some
- Danger for most

Notes

Breach modelling is a hydraulic approach used to simulate the failure or overtopping of a flood defence, such as a flood wall or embankment, during a given flood event. It assesses how such a failure would influence flood extents and the potential impacts on surrounding areas.

In the North Kent Coast Model, breach modelling was carried out at several locations. The results presented here relate to the maximum hazard of all the breaches, which represent simulated failures of surrounding defences during the climate change 0.5% AEP (1 in 200-year) event with the Upper End estimate (2075), illustrating the predicted hazard of flooding under these conditions.

0 60 120 m

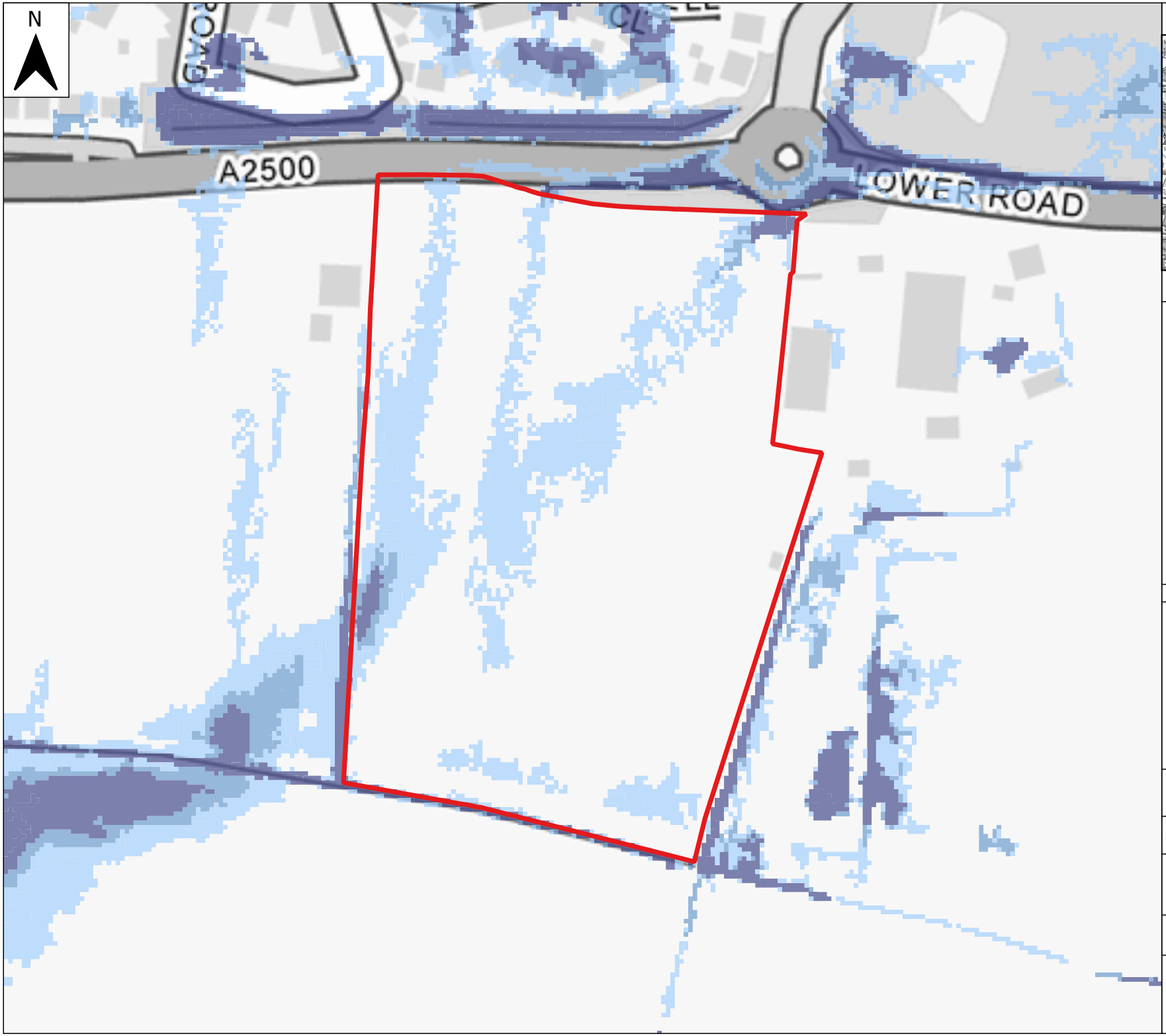
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FUTURE BREACH RISK FROM THE SEA - NORTH KENT COAST MODEL HAZARD - REG3197

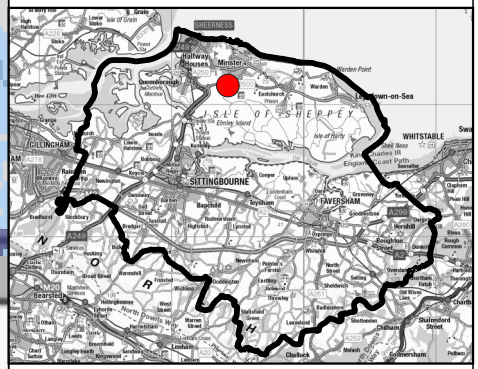
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

FMfP - Surface Water Spatial Planning Extents

- 3.3% AEP (1 in 30-year)
- 1% AEP (1 in 100-year)
- 0.1% AEP (1 in 1000-year)

Notes

The Flood Map for Planning Service includes several layers of information. This includes Surface Water Spatial Planning Extents. These datasets show the extent of land at risk of flooding from surface water to a defined annual exceedance probability (AEP) or chance of flooding each year.
These datasets are designed to only give an indication of flood risk to an area of land and are not suitable for showing whether an individual property is at risk of flooding.

0 60 120 m

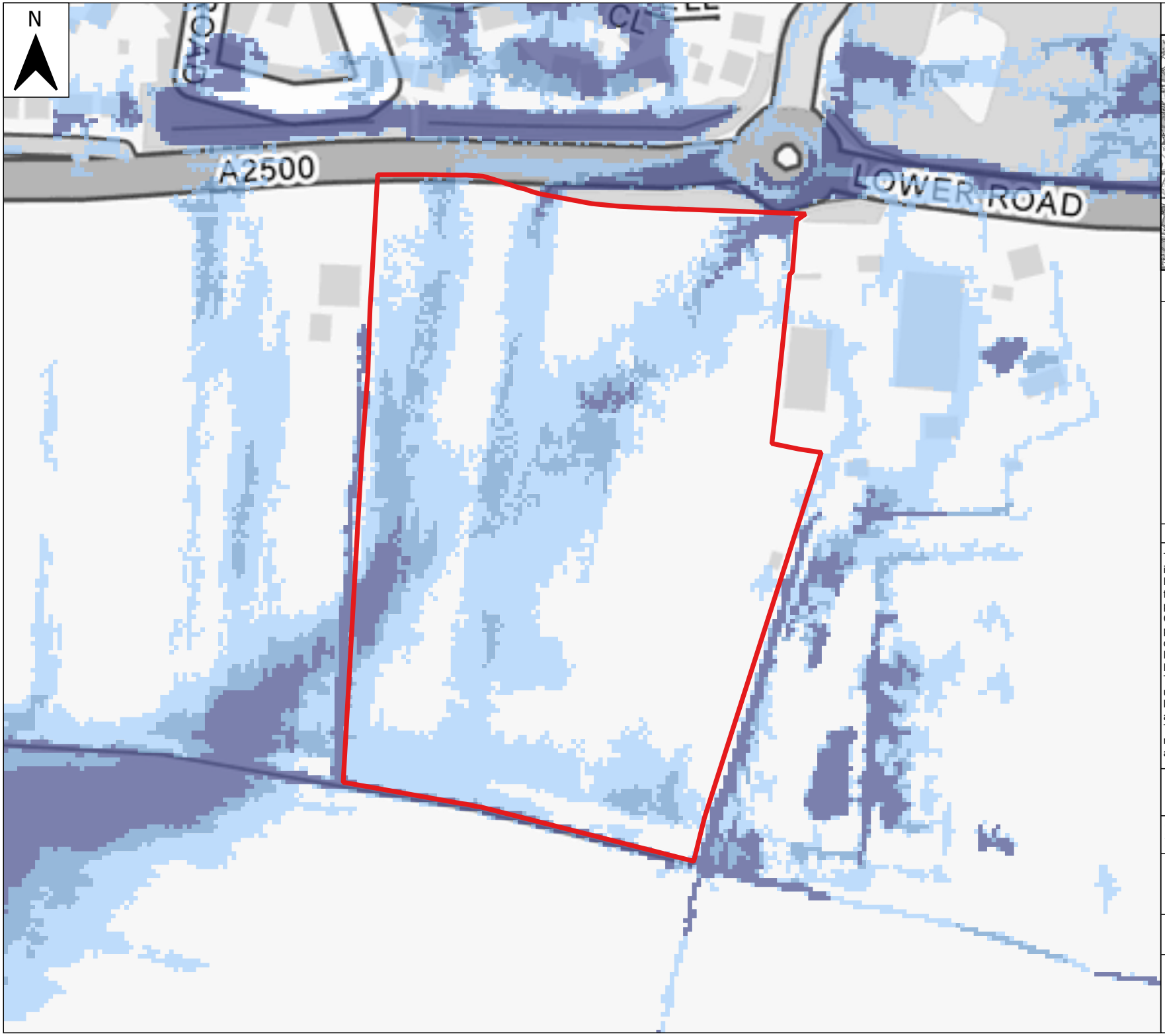
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LEVEL 2 SFRA:
SURFACE WATER FLOODING - REG3197

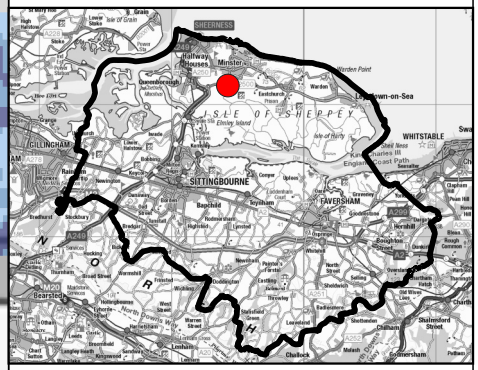
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Making Swale a better place



Location Plan



Legend

- Swale Borough Outline
- Site boundary

FMfP - Surface Water Spatial Planning Extents plus climate change

- 3.3% AEP (1 in 30-year) plus CC
- 1% AEP (1 in 100-year) plus CC
- 0.1% AEP (1 in 1000-year) plus CC

Notes

The Flood Map for Planning Service includes several layers of information. This includes Surface Water Spatial Planning Extents. These datasets show the extent of land at risk of flooding from surface water to a defined annual exceedance probability (AEP) or chance of flooding each year.
Climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. 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.
The 'Upper End' for the 2070s epoch (2061-2125) has been used for the climate change scenarios. We have chosen long-term epochs appropriate to support long-term planning and development decisions.
These datasets are designed to only give an indication of flood risk to an area of land and are not suitable for showing whether an individual property is at risk of flooding.

0 60 120 m

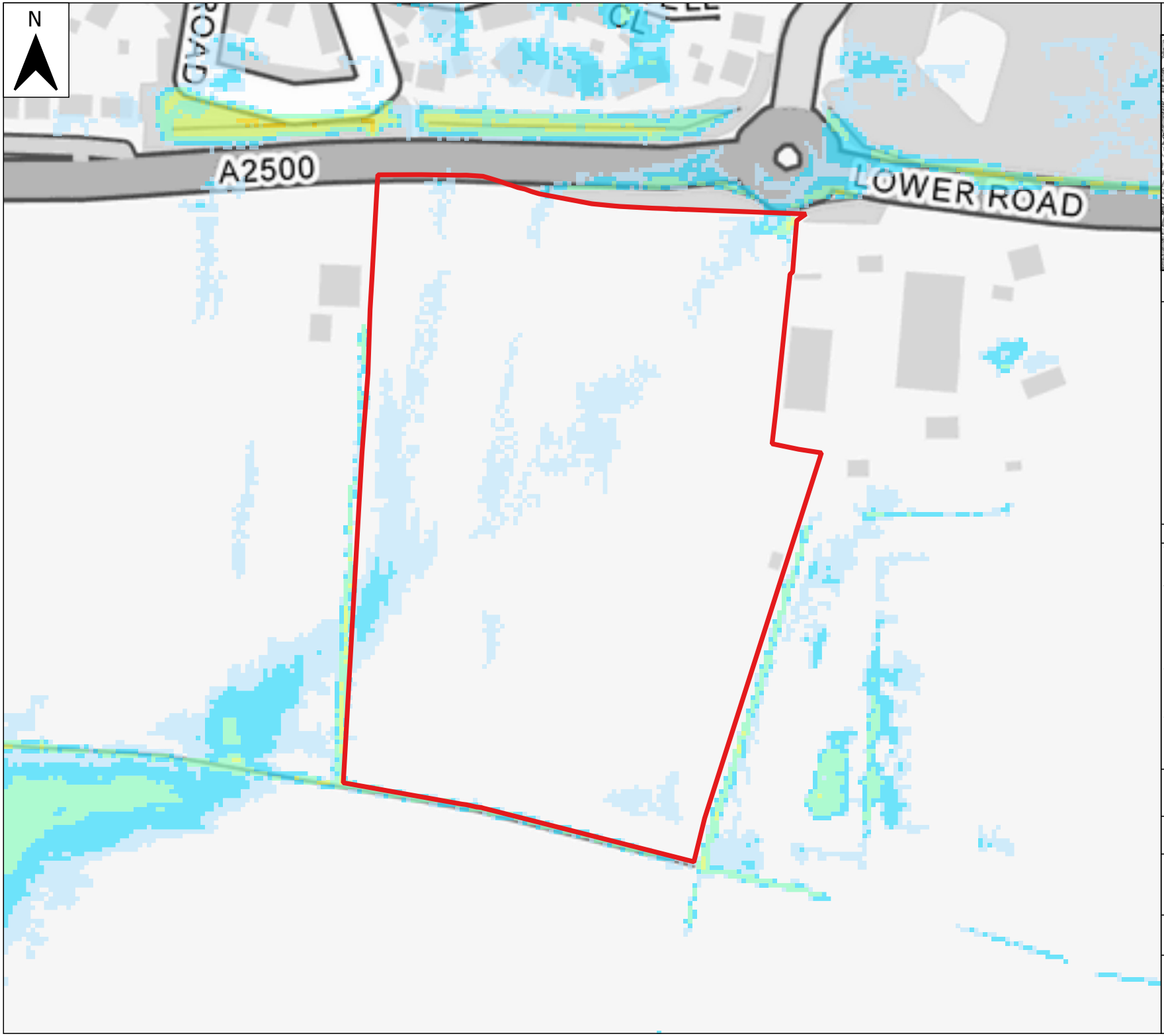
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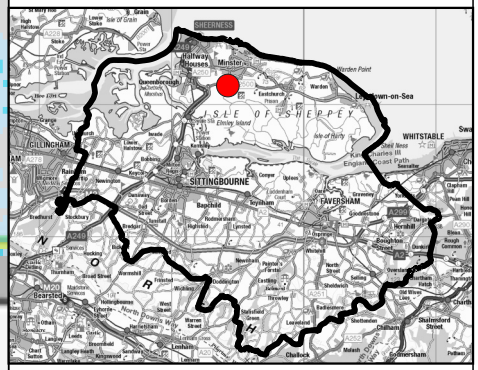
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Location Plan



Legend

- Swale Borough Outline
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FMfP Surface Water Spatial Planning Depths
1% AEP (1 in 100-year) plus climate change

- <150mm
- 150-300mm
- 300-600mm
- 600-900mm
- 900-1200mm
- 1200-2300mm
- >2300mm

Notes

The Flood Map for Planning Service includes several layers of information. This includes Surface Water Spatial Planning Extents. These datasets show the extent of land at risk of flooding from surface water to a defined annual exceedance probability (AEP) or chance of flooding each year.
Climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk. 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.
The 'Upper End' for the 2070s epoch (2061-2125) has been used for the climate change scenarios. We have chosen long-term epochs appropriate to support long-term planning and development decisions.
These datasets are designed to only give an indication of flood risk to an area of land and are not suitable for showing whether an individual property is at risk of flooding. This is because we cannot know all the details about each property.

0 60 120 m

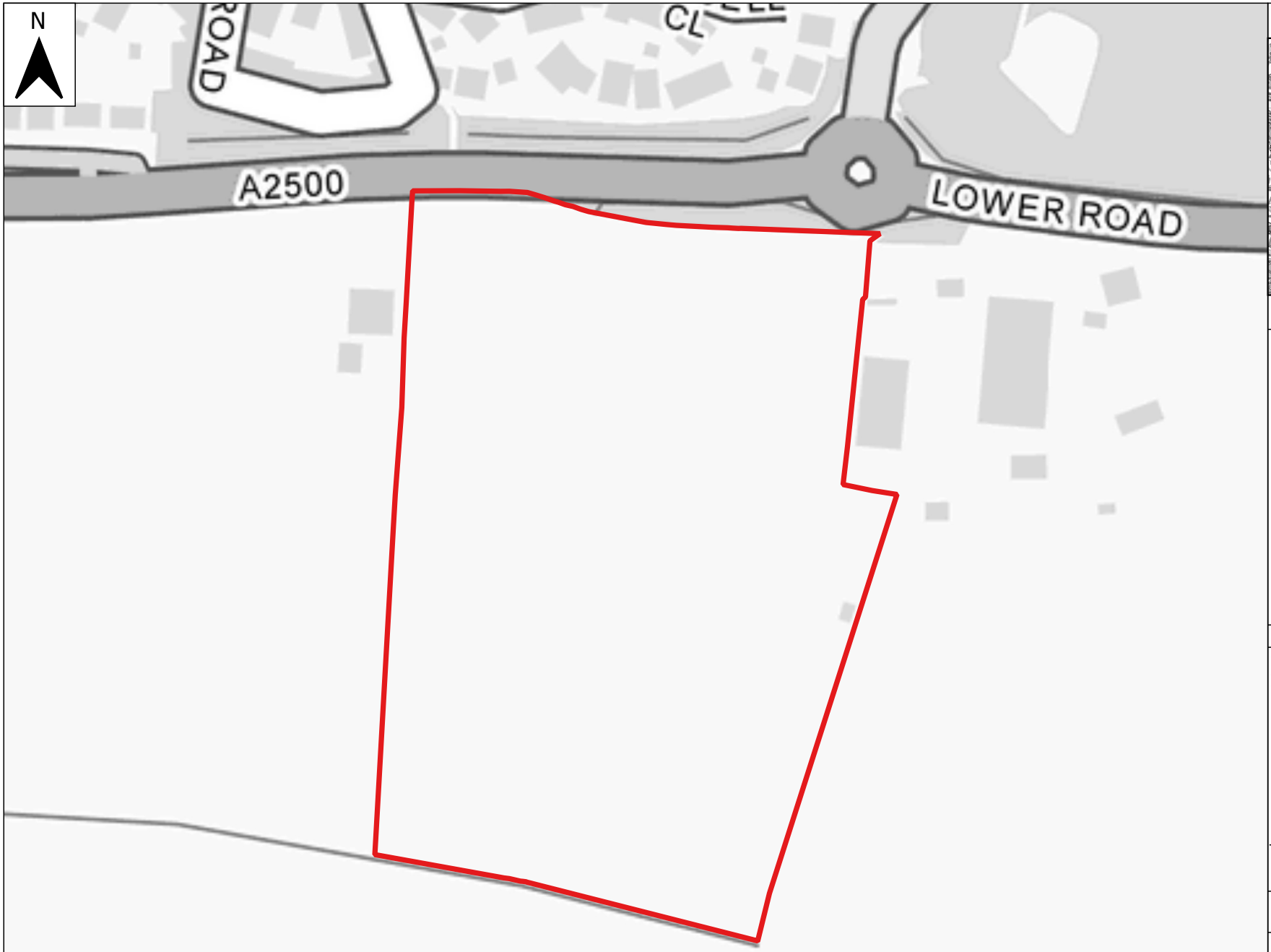
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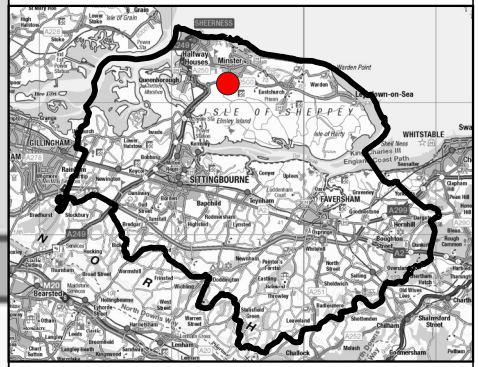
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Location Plan



Legend

Swale Borough Outline

Site boundary

JBA Groundwater Flood Map Depths

Groundwater levels are either at or very near (within 0.025m of) the ground surface.

Groundwater levels are between 0.025m and 0.5m below the ground surface.

Groundwater levels are between 0.5m and 5m below the ground surface.

Groundwater levels are at least 5m below the ground surface.

Low risk.

Notes

The modelled groundwater levels are not predictions of typical groundwater levels, rather they are flood levels. The 5m resolution JBA Groundwater Flood Map categorises the head difference (m) between the predicted groundwater levels and the surface level into five feature classes based on the 100-year flood model outputs.

It should be noted that the JBA Groundwater Flood Map is suitable for general broad-scale assessment of the groundwater flood hazard in an area, but is not explicitly designed for the assessment of flood hazard at the scale of a single property.

0 60 120 m

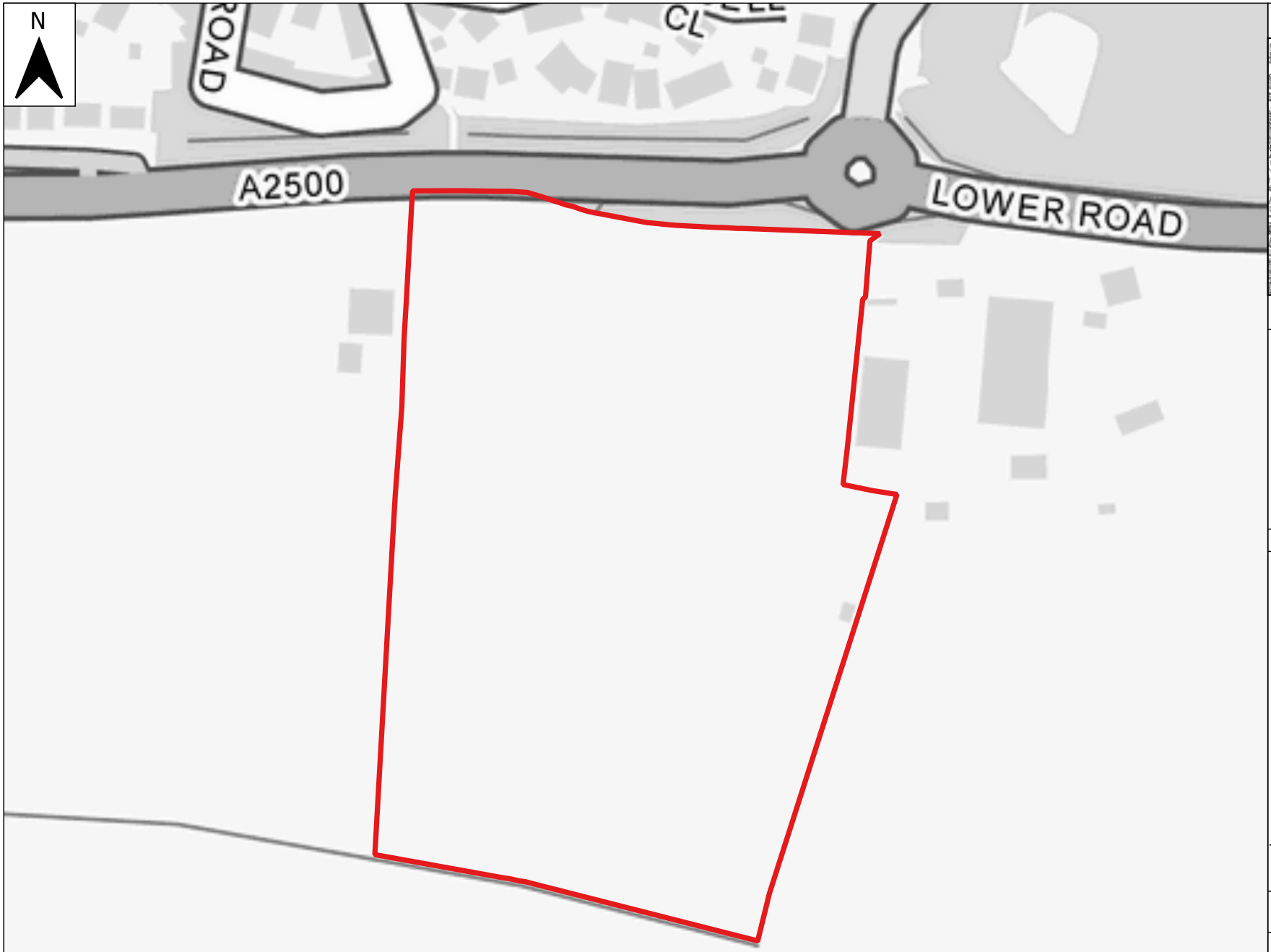
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JBA GROUNDWATER FLOOD MAP - REG3197

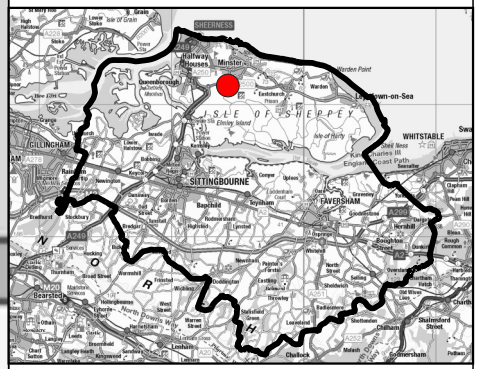
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

Environment Agency Reservoir Flood Extents

- Dry Day
- Wet Day

Notes

The risk of inundation due to reservoir breach or failure of reservoirs within the area has been mapped using the outlines available from the Risk of Flooding from Reservoir dataset, made available by the Environment Agency. The Environment Agency dataset includes areas of sea flooding.

0 60 120 m

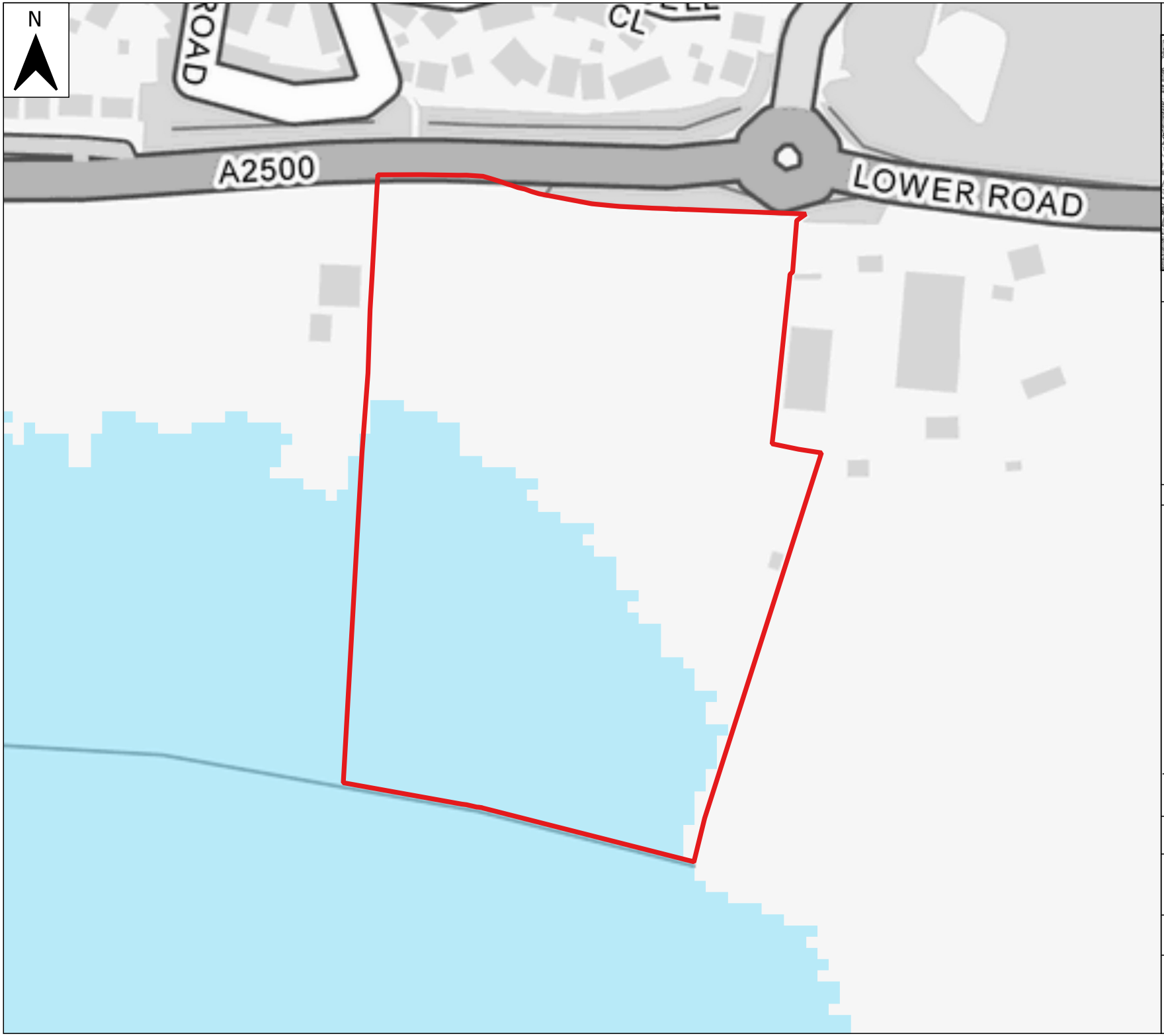
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RISK OF FLOODING FROM RESERVOIRS - REG3197

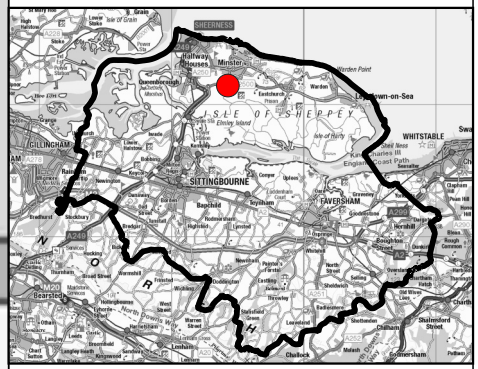
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

Environment Agency Flood Warning and Alerts

- Flood Alert Area
- Flood Warning Area

Notes

Flood Alerts are used by the Environment Agency to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and make early preparations. Flood Alerts are issued earlier than a flood warning to give notice of the possibility of flooding but before the Environment Agency are fully confident that flooding in Flood Warning Areas is expected.

Flood Warnings warn people of expected flooding and encourage them to take action to protect themselves and their property.

0 60 120 m

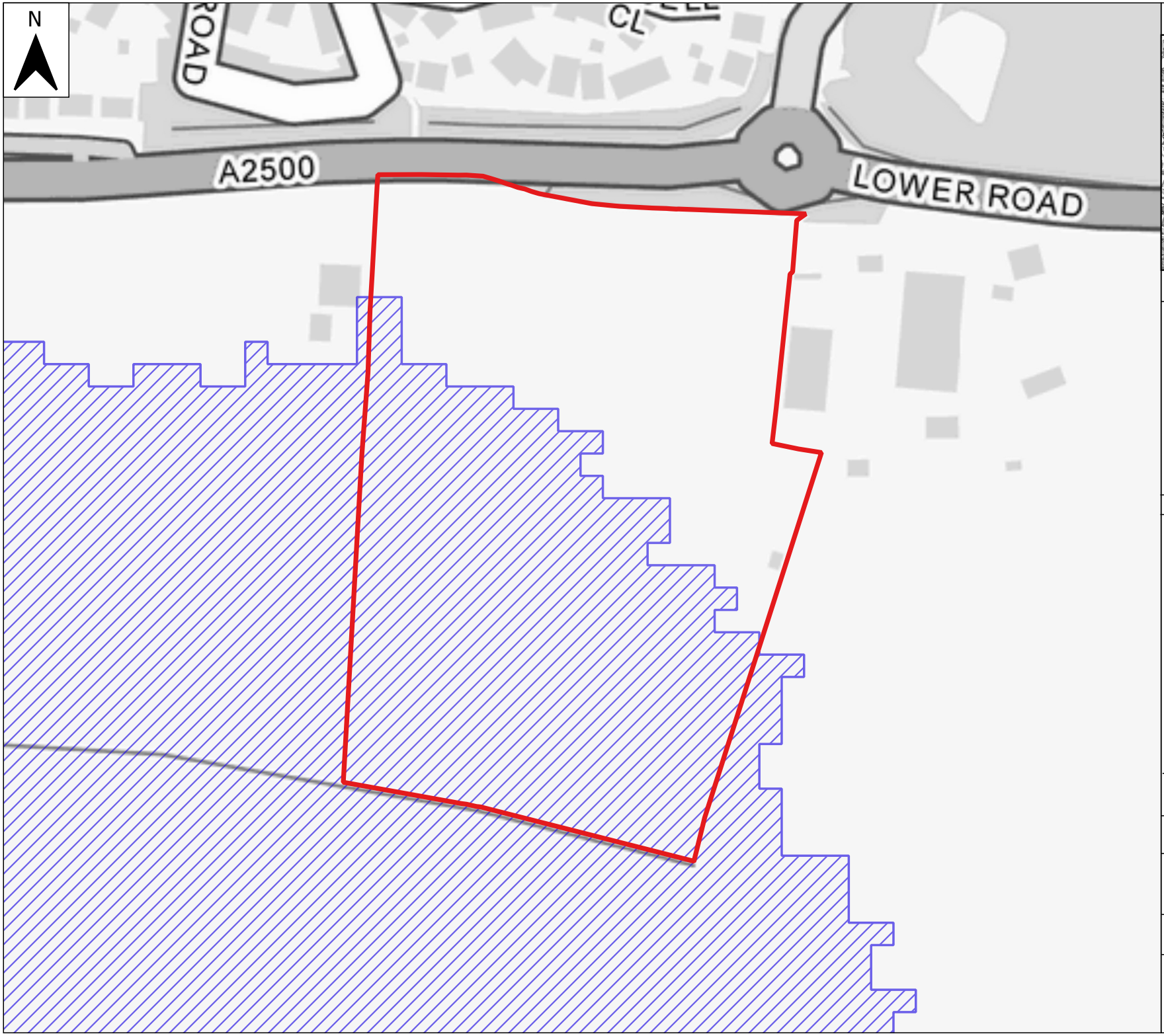
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ENVIRONMENT AGENCY FLOOD WARNINGS AND ALERTS - REG3197

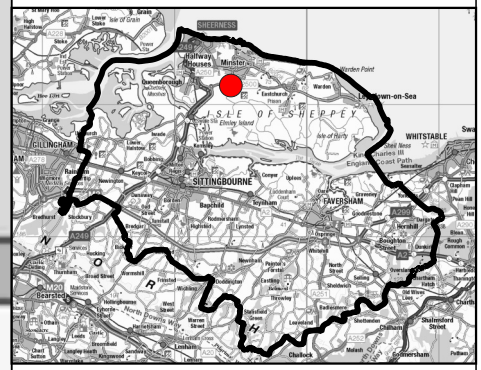
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Location Plan



Legend

- Swale Borough Outline
- Site boundary

Coastal Change Management Area

- Erosion Zone 1
- Erosion Zone 2
- North Kent Coast model Defended 3.3% AEP (1 in 30-year) 2125 Upper End

Notes

The North Kent Coast 2125 Upper End defended 3.3% AEP flood extent has been used to identify land which is predicted to be at risk of inundation by 2125.
The National Coastal Erosion Risk Map (NCERM) Shoreline Management Plan (SMP) 2055 plus 95% (Upper End) climate change allowance and 2105 plus 95% (Upper End) climate change allowance datasets have been used to identify the areas where the whole period covered by the SMP is No Active Intervention or Managed Realignment and there is predicted to be a coastal erosion risk over the next 100 years. It is noted that the SMP considers the year 2105 and does not consider 100 years into the future. However, this is the best readily available information.
Using the two epochs, the CCMA is divided into two separate zones:
• Erosion Zone 1 (defined as the Environment Agency's Coastal Erosion Climate Change (Upper End) to 2055 zone; and
• Erosion Zone 2 (defined as the Environment Agency's Coastal Erosion Climate Change (Upper End) to 2105 zone).

0 60 120 m

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COASTAL CHANGE MANAGEMENT AREAS - REG3197

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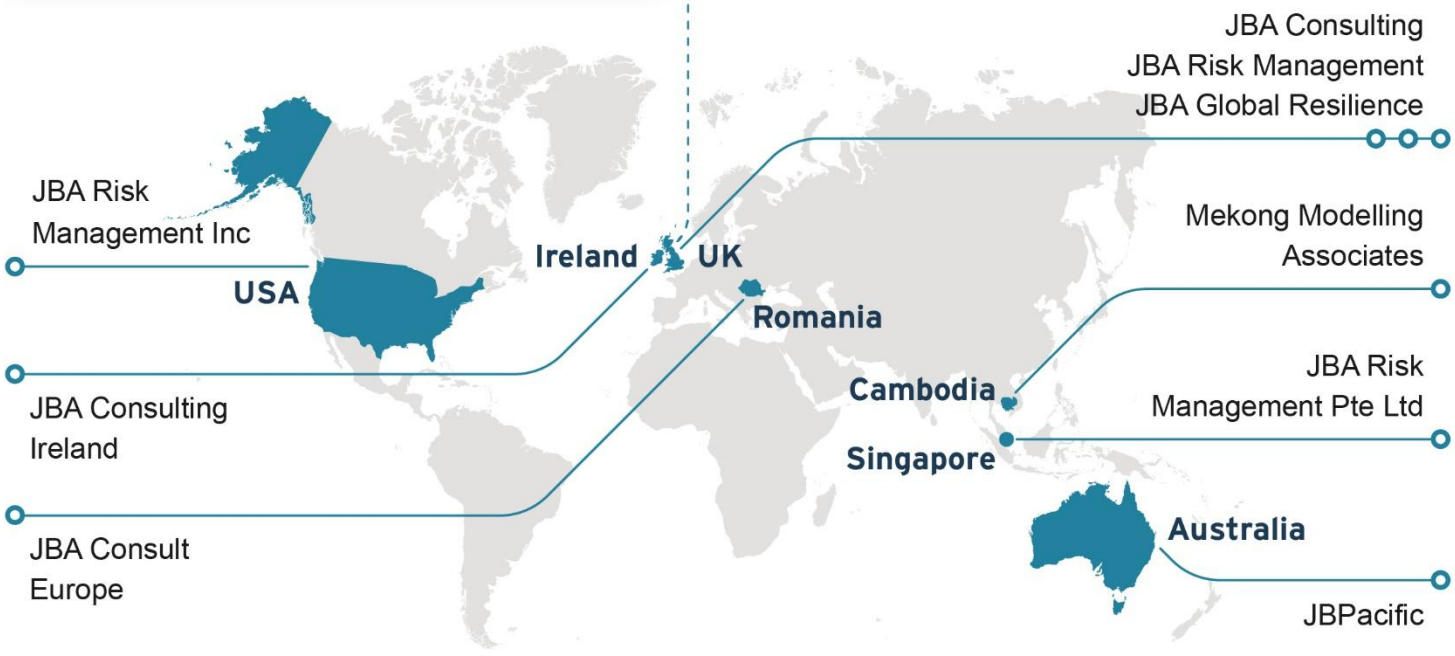
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