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ENVIRONMENTAL ASSESSMENT

Flood Risk Assessment

Ancton Barn

Ancton Lane

Ancton

West Sussex

PO22 6NJ

Document Issue Record

Project: Phase 1 Flood Risk Assessment

Prepared for: James Baderman

Reference: 6046

Site Location: Ancton Barn, Ancton Lane, Ancton, West Sussex, PO22 6NJ

Proposed Development: It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glazed roof lights to the existing barn.

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1. Summary

- 1.1 Ambient Environmental Assessment has been appointed by James Baderman to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development at Ancton Barn, Ancton Lane, Ancton, West Sussex, PO22 6NJ.
- 1.2 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn. The proposal is considered a 'Minor Development' under the NPPF as it is for a household development with a footprint of less than 250m², will have Finished Floor Levels no lower than those of the existing building and will not result in a new residential unit on site.
- 1.3 The existing dwelling is classified as More Vulnerable under the National Planning Policy Framework (NPPF). The proposed development is an extension of the existing residential dwelling, which is considered "More Vulnerable" under the NPPF. As such, the flood risk vulnerability will remain the same post-development.
- 1.4 With reference to the Environment Agency (EA) Flood Map for Planning, the proposed development is located within Flood Zones 1, 2 and 3. A review of the site plans against the EA Flood Map for Planning indicates that the extent of Flood Zone 3 is nearly parallel to the northern façade of the existing building, and therefore the existing building appears to be in Flood Zones 1 and 2.
- 1.5 Analysis within this report has indicated that in the 1:100 year +CC (105%) fluvial event, the dwelling could experience flood depths of 0.14m. Furthermore, analysis of EA tidal data indicates that the site could remain unaffected for all tidal events up to and including 1:1000 year present day and 1:200 year +CC (2115) events.
- 1.6 The proposed development could be considered to be at low risk of flooding from surface water and sewer sources, and at moderate risk of flooding from fluvial and groundwater sources.
- 1.7 The Finished Floor Levels of the extension will be set no lower than existing floor levels of the residential dwelling, in line with the EA Standing Advice for Minor Developments.
- 1.8 The proposed development is located within an EA Flood Warning Service Area. As such, it is recommended that site users sign up to this service if not done so already.
- 1.9 To mitigate against potential flood risk, the proposed extension should incorporate flood resilience measures in line with current best practice for construction within an area at risk of flooding in line with CLG 2007 'Improving the Flood Performance of New Buildings. These measures are detailed in Section 7 of the report.
- 1.10 Following the guidelines contained within the NPPF, and given that:
 - The proposed development is for the construction of extensions to the existing dwelling;
 - The site is located in EA Flood Zones 1, 2 and 3;
 - The FFLs of the proposed extension should be set no lower than the existing FFLs in line with the EA Standing Advice for Minor Developments;
 - Flood mitigation measures are recommended in section 7 of this report.

The proposed development could be considered suitable, assuming appropriate mitigation (including adequate warning procedures) can be maintained for the lifetime of the development.

Development Description	Existing	Proposed
Development Type:	Existing Dwelling	Extension to existing dwelling including enlargement of the existing northeast wing, alteration to barn entrances, and addition of opening glaze roof lights to the existing barn.
Number of Bedrooms:	3	5 (4 at ground floor, 1 on 1 st floor)
EA Vulnerability Classification:	More Vulnerable	More Vulnerable
Ground Floor Level:	Topographic Levels on site vary between approximately 2.36mAOD and 4.04mAOD (2m LiDAR data).	Floor levels to be set no lower than existing in line with EA Standing Advice for Minor Developments.
Level of Sleeping Accommodation:	Ground floor	Ground floor and above
Impermeable Surface Area:	N/A ¹	Increase in footprint approximately 23m ²
Surface Water Drainage:	N/A ¹	Discharge via existing or implement betterment by incorporating water butts or rain planters.
Site Size:	Site curtilage approximately 1527m ² .	Site size unchanged
Risk to Development	Summary	Comment
EA Flood Zone:	Flood Zones 1,2 and 3	Majority of site in Flood Zone 1 or 2, with proposed development in Flood Zone 2. Flood Zone 3 extent infringes on the site border but does not fall within the footprint of the proposed development.
Flood Source:	Fluvial	
1:100 Year Flood Level:	N/A ²	At the time of writing, site-specific EA data has not been provided for this site. However, proposed development is considered a Minor Development under the NPPF and as such should adhere to the EA Standing advice for Minor Developments, including setting Finished Floor Levels no lower than existing.
1:100 Year Flood Level & Climate Change:	N/A ²	
1:1000 Year Flood Level:	N/A ²	
Recorded Flood Events in Area:	Yes	Flood event occurred approximately 1.5km east of the proposed development site in December 1997 caused by overtopping of tidal flood defences.
Recorded Flood Events at Site:	No	Site outside EA recorded flood outlines.
SFRA Available:	Yes	Arun District Council SFRA (2016)
Management Measures	Summary	Comment
Ground floor level above extreme flood levels:	N/A ²	Finished Floor Levels to be set no lower than existing in line with EA Standing Advice for Minor Developments.
Safe Access/Egress Route:	Yes	Section 7 of this report. Proposal is Minor Development so access/egress will not change post-development.
Flood Resilient Design:	Yes	Section 7 of this report
Site Drainage Plan:	No	Discharge via existing or implement betterment by incorporating water butts or rain planters.
Flood Warning & Evacuation Plan:	Yes	Section 7 of this report
Offsite Impacts	Summary	Comment
Displacement of floodwater:	Negligible	Proposal is a minor development. See Section 8 of this report.
Increase in surface run-off generation:	Negligible	Discharge via existing system given that footprint only increasing by 23m ² .
Impact on hydraulic performance of channels:	No	Increase in built footprint would be within site and would not affect adjacent watercourse. However, project drainage engineer has advised that runoff will be re-routed from flowing onto the road to directly into the watercourse. Consent may be required from the LLFA.

Table 1 Summary of flood risks, impacts and proposed flood mitigation measures.

N/A¹ not required for this assessment; N/A² data not available.

2. Development Description and Site Area

Proposed Development and Location

- 2.1 The proposed development is located at Ancton Barn, Ancton Lane, Ancton, West Sussex, PO22 6NJ, shown in Figure 1.
- 2.2 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn. This proposed development is shown in Figure 2. The proposed development is considered to be a minor development under the NPPF.
- 2.3 Topographic levels on site vary between approximately 2.36m AOD and 4.04m AOD (2m LiDAR data). Topographic levels at the location of the proposed development vary between 2.61m AOD and 2.95m AOD (2m LiDAR data). The site slopes down to the north/ north east.

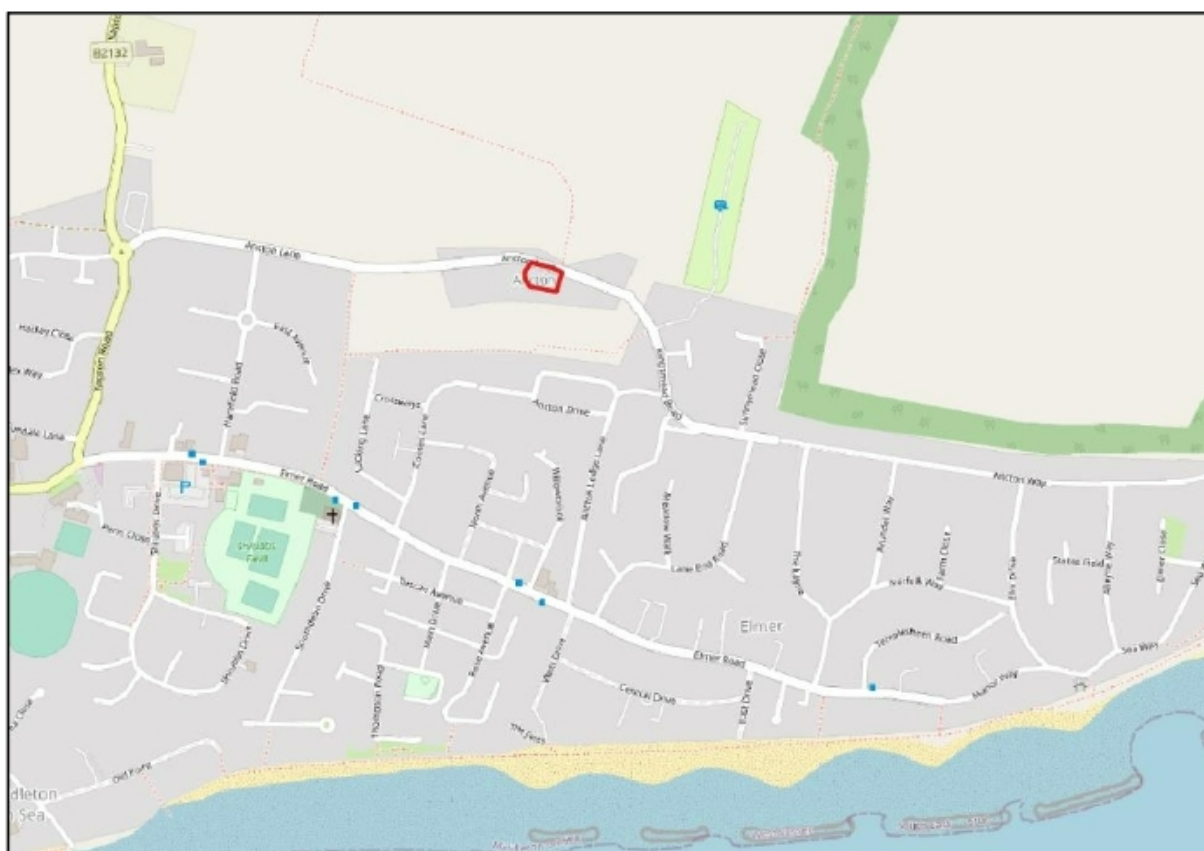


Figure 1 Location Map, identifying the redline curtilage of site (Source: Client). Redline indicates site boundary.



Figure 2: Proposed Development (Source: Client). Redline indicates site boundary.

Vulnerability Classification

- 2.4 The EA Flood Map for Planning (Figure 3) demonstrates that the proposed development lies within Flood Zones 1, 2 and 3. A review of the site plans against the EA Flood Map for Planning indicates that the extent of Flood Zone 3 is nearly parallel to the northern façade of the existing building, and therefore the existing building appears to be in Flood Zones 1 and 2. Flood Zone 1 has a less than 1 in 1000 (0.1%) annual probability of fluvial flooding, Flood Zone 2 has an annual probability of fluvial flooding of between 1 in 100 (1%) and 1 in 1000 (0.1%), and Flood Zone 3 has an annual probability of fluvial flooding of greater than 1 in 100 (1%).
- 2.5 The existing dwelling is classified as More Vulnerable under the National Planning Policy Framework (NPPF) and this classification will not change post development. The proposed development is considered to be a minor development under the NPPF.



Figure 3 EA Flood Map for Planning. (Source: EA) Redline indicates site boundary, blue line indicates proposed building outline.

Geology

- 2.6 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation. This is a Principal aquifer. A Principal aquifer is comprised of layers of rock or drift deposits that have a high intergranular and/or fracture permeability-meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
- 2.7 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the superficial deposits underlying the site are the River Terrace Deposits, comprised of sand, silt and clay. This is a Secondary 'A' aquifer, comprised of permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

3. Sequential Test/Exception Test

- 3.1 Under the NPPF, all new planning applications should undergo a *Sequential Test*. This test should be implemented by local planning authorities with a view to locating particularly vulnerable new developments (e.g. residential, hospitals, mobile homes etc.) outside of the floodplain.
- 3.2 The Flood Risk and Coastal Change Planning Guidance (PPG) *Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table* is reproduced below.

Flood Risk Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	Exception Test Required	✓	✓
Zone 3a	Exception Test Required	✓	✗	Exception Test Required	✓
Zone 3b <i>Functional Floodplain</i>	Exception Test Required	✓	✗	✗	✗

Table 2 The Sequential Test: Flood Risk Vulnerability and Flood Zone 'Compatibility' Table as specified by NPPF.
 Please note: ✓ means development is appropriate; ✗ means the development should not be permitted.

- 3.3 Using the principles of the PPG outlined above, the proposed development is More Vulnerable. The site is located within Flood Zone 1, 2 and 3 (as defined by the EA) and therefore, the proposed development may normally require the application of the Sequential and Exception Tests.
- 3.4 However, the NPPF (paragraph 164) states that:
- Applications for some **minor development** and changes of use¹ should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments set out in footnote².*
- 3.5 As such, given that the proposal is for a minor development, the proposed development may not need to be subject to the Sequential or Exception Tests, but should still be accompanied by an FRA demonstrating that the proposal can be made safe from flooding for its lifetime without increasing flood risk elsewhere.

¹ This includes householder development, small non-residential extensions (with a footprint of less than 250m²) and changes of use; except for changes of use to a caravan, camping or chalet site, or to a mobile home or park home site, where the sequential and exception tests should be applied as appropriate

² A site-specific flood risk assessment should be provided for all development in Flood Zones 2 and 3. In Flood Zone 1, an assessment should accompany all proposals involving: sites of 1 hectare or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use

4. Site Flood Hazards

Sources of Flooding

- 4.1 The proposed development is located within Flood Zones 1,2 and 3 and is considered to be More Vulnerable according to NPPF guidelines. Table 3 summarises the potential sources of flooding to the site:

Source	Description
Fluvial	Existing building is located in Flood Zone 1 and 2. Boundary of Site is partially located in Flood Zone 3.
Tidal	Low Risk due to presence of flood defences
Surface	Low Risk
Groundwater	Moderate Risk
Sewer	Low Risk

Table 3 Summary of flood sources.

Fluvial

- 4.2 The proposed development site is located in the Arun Lower Operational Catchment, within the South East River Basin.
- 4.3 The nearest watercourse is an unnamed drain which flows approximately 7.5m to the north of the proposed development, which flows into the Ryebank Rife (EA Main River). The nearest Main River is the Ryebank Rife (Yapton) which is located approximately 650m north of the proposed development. The Ryebank Rife is a tributary of the River Arun.
- 4.4 From the EA Flood Map for Planning, the proposed development is considered to be located within Flood Zones 1, 2 and 3. A review of the site plans against the EA Flood Map for Planning indicates that the extent of Flood Zone 3 is nearly parallel to the northern façade of the existing building, and therefore the existing building appears to be in Flood Zones 1 and 2.
- 4.5 The EA have provided a Product 4 dataset to inform this FRA. The Product 4 can be found in Appendix II of this report. This Product 4 includes modelled fluvial flood levels at 3 nodes on site. Furthermore, the Product 4 includes modelled flood outlines for a range of fluvial flood events.
- 4.6 The three node points provided by the EA are provided in Figure 4 below. The accompanying modelled flood level tables (Appendix II) indicate that Node 1 would remain unaffected for all modelled fluvial flood events up to and including the 1:100 year +CC (105%) and 1:1000 year event. Nodes 2 and 3 could remain unaffected for all modelled events up to and including the 1:100 year +CC (45%) event. In the 1:100 year +CC (105%) event these nodes could experience flood levels of 3.08mAOD and 3.09mAOD, respectively. Based on topographic levels within the EA model, Nodes 2 and 3 could therefore experience flood depths of 0.18m and 0.31m in the 1:100 year +CC (105%) events.

- 4.7 The client has advised that the existing and proposed FFL of the dwelling is 2.95mAOD. As such, based on the 1:100 year +CC (105%) flood level at Node 3, the dwelling could experience flood depths of up to 0.14m in this event.



Figure 4 EA Data Nodes (Sources: EA, OS)

- 4.8 As such, the risk of fluvial flooding to the proposed development could be considered **moderate**. However, as the proposed development is considered a Minor Development, the FFLs can be set no lower than the existing FFLs in line with the EA Standing Advice for Minor Developments.

Tidal

- 4.9 In addition to the fluvial data provided, the EA have also provided modelled tidal flood levels at the Nodes in Figure 4. Modelled flood extents are also provided in Appendix II of this report.
- 4.10 The EA data indicates that in the defended scenario, the site would remain unaffected for all tidal events up to and including 1:1000 year present day and 1:200 year +CC (2115) events (Figure 5).
- 4.11 However, the undefended scenarios indicate that the site could remain unaffected in the 1:200 year present day undefended event, but could be affected in the 1:200 year (2070, 2115) and 1:1000 year undefended events. The EA Product 4 suggests flood levels of 3.91mAOD, 4.70mAOD and 3.06mAOD in these events. Based on a FFL of 2.95mAOD the dwelling could therefore experience flood depths of 0.96m, 1.75m and 0.11m in these events, respectively.
- 4.12 While the site is not within an area benefitting from the presence of flood defences according to the EA Flood Map for Planning, interrogation of the EA Spatial Flood Defence dataset indicates that there are flood defences within a design standard of protection of 1:50 years along the sea front along Elmer. As such, the defended scenario could be considered representative of flood mechanisms at the site.
- 4.13 As such, due to the presence of flood defences the risk of flooding from tidal sources could be considered **low**.

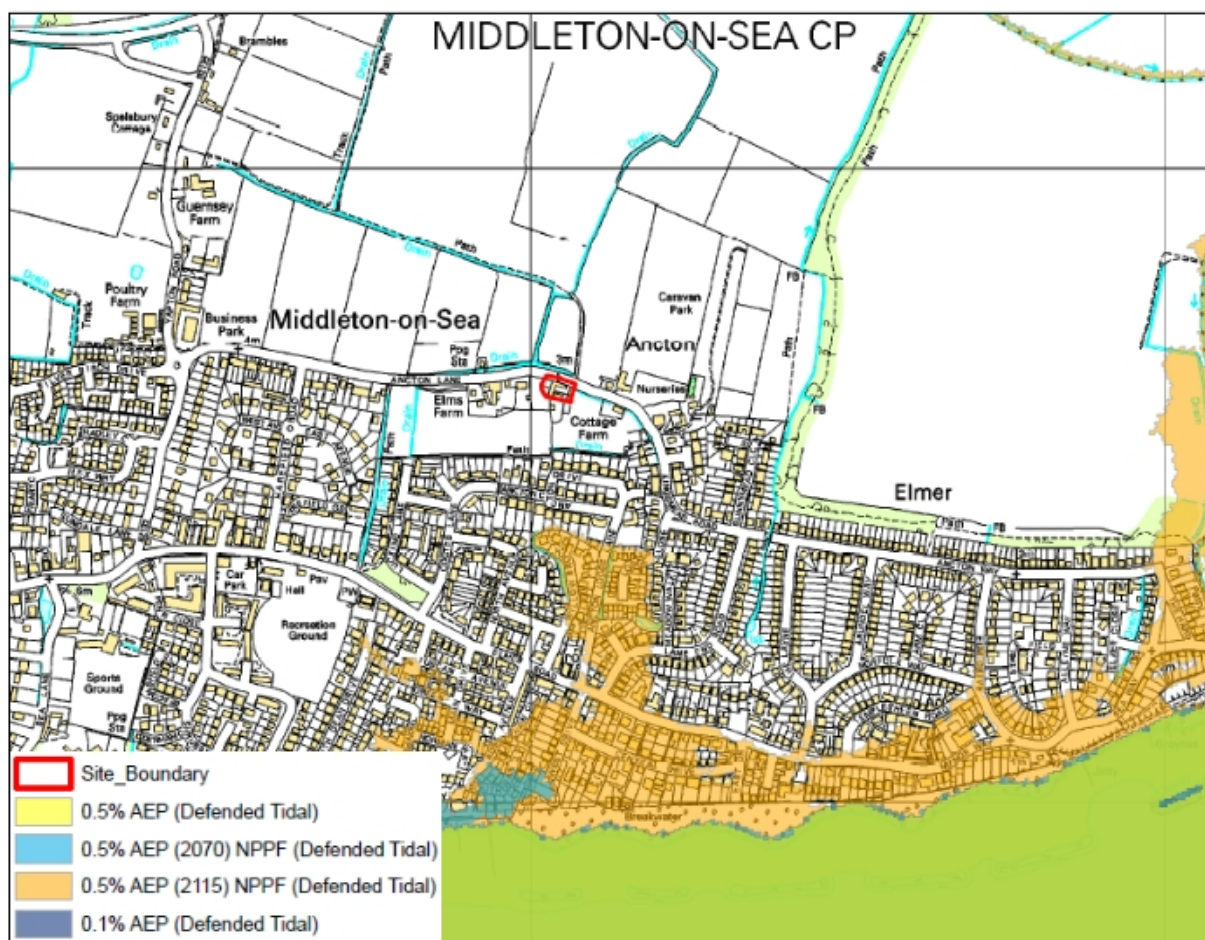


Figure 5 EA Modelled Defended Tidal Flood Extents (Sources: EA, OS)

Surface Water (Pluvial)

- 4.14 The Environment Agency Flood Risk from Surface Water map (Figure 6) shows the proposed development to be within an area of Low Risk of flooding from surface water. Areas identified to be at low risk of flooding have a probability of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%) of flooding from this source.
- 4.15 The EA Surface Water Flood Depth Map for the 1 in 30 year (3.3%) Scenario (Figure 7) indicates that the proposed development would not be affected in the modelled surface water flood events, although a small area of the site area (approximately 14m²) and some of the access route could experience flood depths of up to 600mm.
- 4.16 The EA Surface Water Flood Depth Map for the 1 in 100 year (1%) Scenario (Figure 8) indicates that the proposed development would not be affected in the modelled surface water flood events, although a small area of the site area (approximately 48m²) and some of the access route could experience flood depths of up to 900mm.
- 4.17 The EA Surface Water Flood Depth Map for the 1 in 1000 year (0.1%) Scenario (Figure 9) indicates that much of the proposed development site would be affected in the modelled surface water flood event, with flood depths of 300mm to 600mm and 600mm to 900mm. Flood depths of 900mm to 1200mm could be experienced at the northeast corner of the site.
- 4.18 The surface water flood risk to site could be considered **low**.

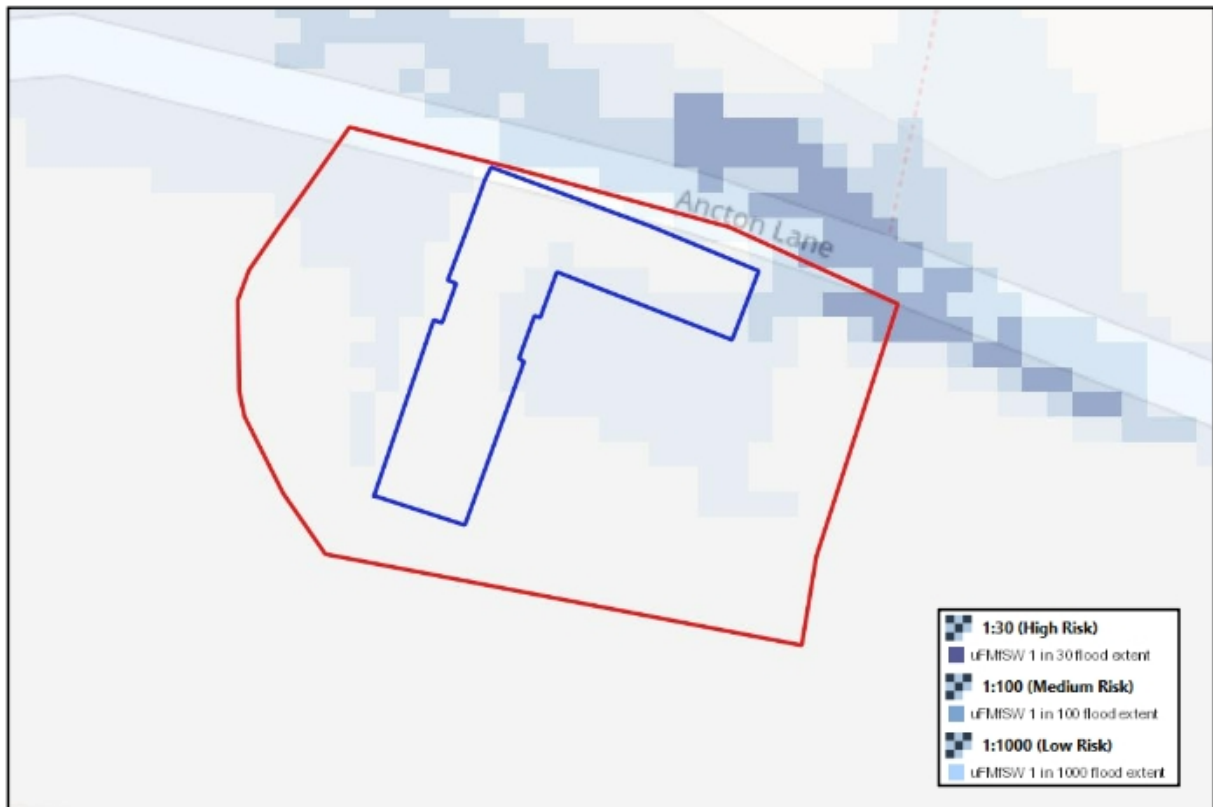


Figure 6 EA Surface Water Flood Risk Map. (Source: EA) Redline indicates site boundary, blue line indicates proposed building outline.

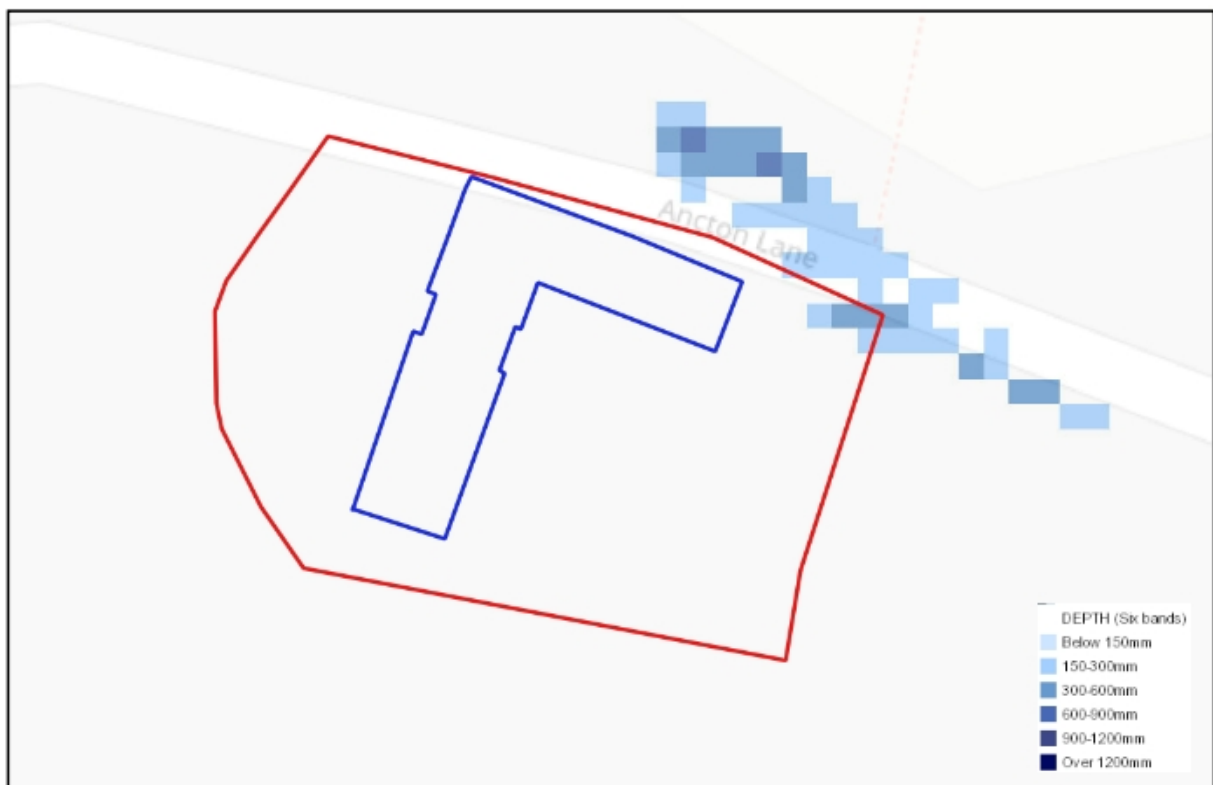
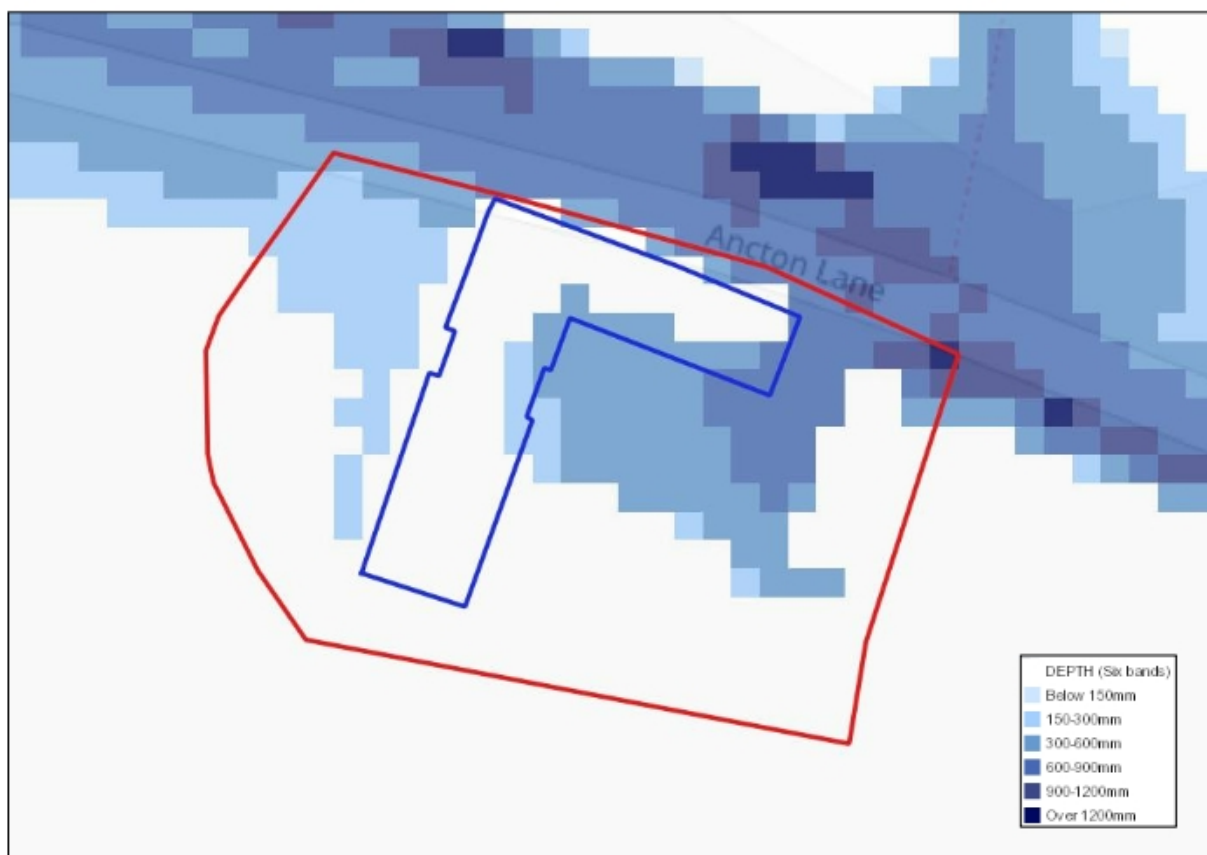
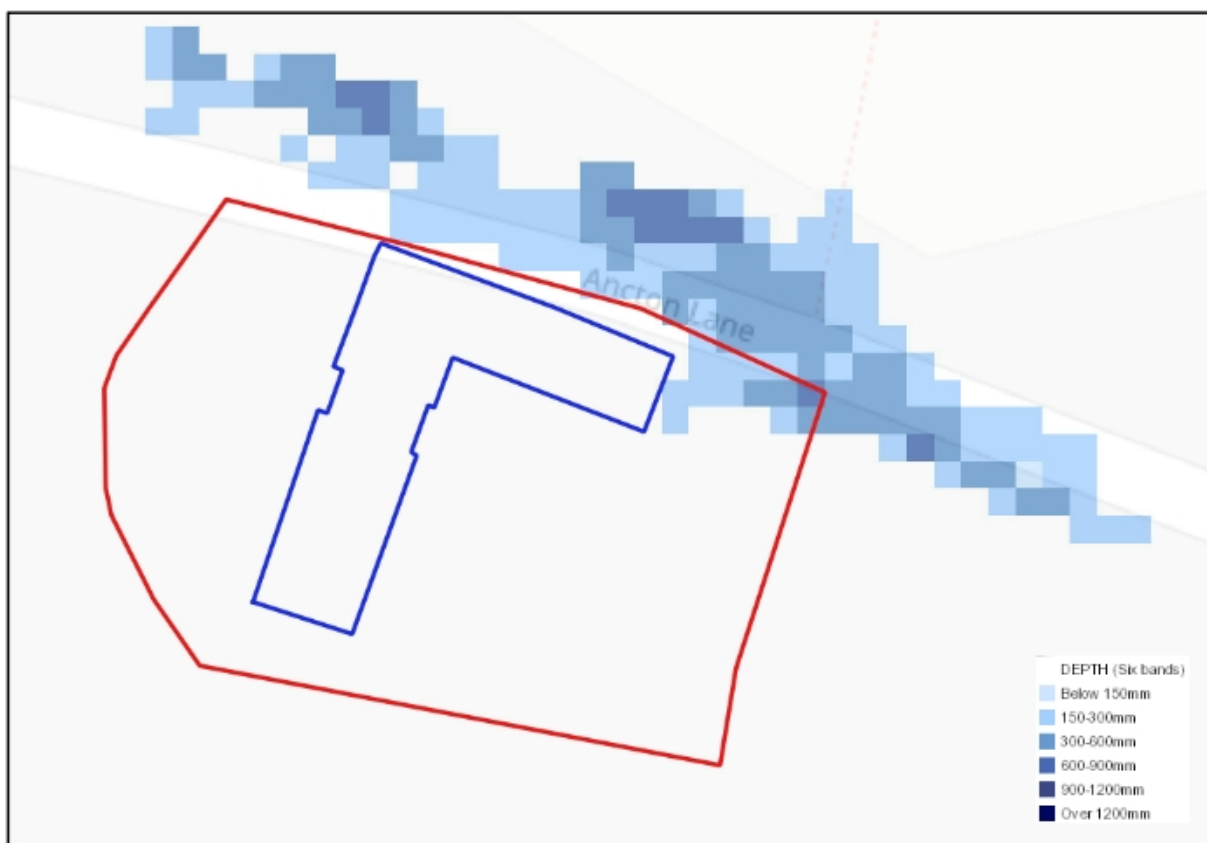


Figure 7 Surface Water Depths for a High Risk (1 in 30 year) Scenario. (Source: EA) Redline indicates site boundary, blue line indicates proposed building outline.



Groundwater

- 4.19 The British Geological Survey (BGS) Geology of Britain Viewer indicates that the bedrock underlying the site is the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Source: BGS). This is considered to be a principal aquifer (Magic Map online resource). A principal aquifer is comprised of layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
- 4.20 The BGS Geology of Britain Viewer indicates that the superficial deposits underlying the site are the River Terrace Deposits, comprised of sand, silt and clay (Source: BGS). This is considered to be a Secondary 'A' aquifer (Source: EA; Magic Map online resource). A Secondary 'A' aquifer is comprised of permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
- 4.21 The BGS Susceptibility to Groundwater Flooding Dataset (Figure 10) indicates that the proposed development site is located in an area with potential for groundwater flooding to occur at the surface.
- 4.22 The risk of groundwater flooding could be considered **moderate**.



Figure 10 Groundwater Susceptibility. (Source: BGS Groundwater Susceptibility Dataset.) Red crosshairs indicate site location.

Sewer

- 4.23 The Arun District Council SFRA (2016) provides a table of sewer flooding by postcode, based on Southern Water DG5 register. This table indicates that there have been 27 recorded flood incidents in the PO22 6 postcode area as of 25/2/2016.
- 4.24 The location of the site with respect to these incidents is unknown.
- 4.25 No records could be found to indicate that the site has flooded from sewer sources previously.
- 4.26 As such, the risk of sewer flooding to the proposed development could be considered **relatively low**. Any new sewer connection from the site should be agreed with the local provider and fitted with non-return valves to mitigate the risk of flooding from sewer sources.

Surface Water Drainage Strategy

- 4.27 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn.
- 4.28 The proposed development is considered to be a minor development under the NPPF. The proposed extensions will have a footprint of approximately 23m². As such, this area could be considered negligible and runoff could be discharged via the existing system.

Records of Historical Flooding

- 4.29 The nearest recorded flood outline is approximately 1.5km to the south east of the proposed development. This flooding event occurred in December 1997 and was caused by an overtopping of flood tidal defences (Figure 11).
- 4.30 The Arun District Council SFRA (2016) indicates that there have been 27 recorded sewer flooding incidents in the PO22 6 postcode area since February 2016.
- 4.31 The client, through liaison with Arun District Council, has advised that Ancton Lane has previously flooded to a depth of approximately 1m however details of these event are unknown at the time of writing.

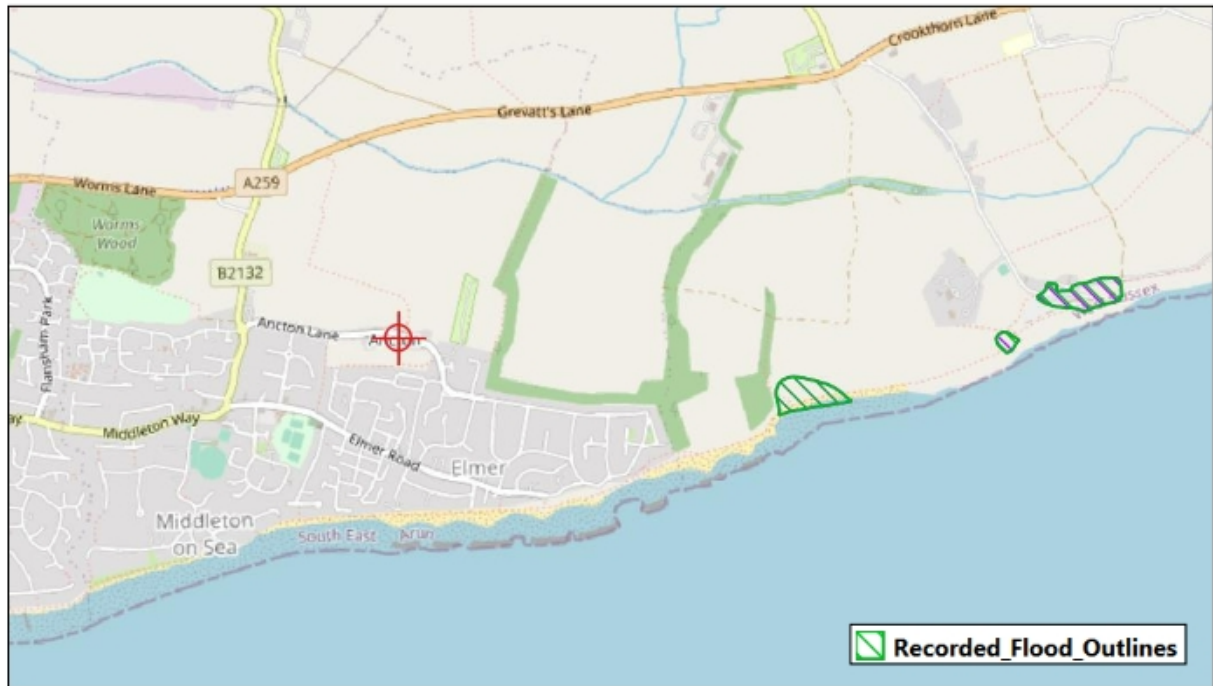


Figure 11 Historic Flooding. (Source: EA). Crosshairs mark site.

5. Probability of Flooding

Flood Zones

- 5.1 According to the EA Flood Map for Planning, the site is located within Flood Zones 1, 2 and 3, and at a moderate risk of fluvial flooding.
- 5.2 The EA Flood Map for Planning has been produced in part using a relatively coarse, national scale flood modelling strategy, and in part by detailed modelling. It is important to note that only the potential floodplain is modelled; **the mitigating effects of any flood defences currently in place are not considered.** For reference, the definition of the NPPF flood risk zones is included below.

Zone	Description
1	Low Probability. This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).
2	Medium Probability. This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% – 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% – 0.1%) in any year.
3a	High Probability. This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.
3b	The Functional Floodplain. This zone comprises land where water has to flow or be stored in times of flood. SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability to be agreed between the LPA and the EA, including water conveyance routes).

Table 4 Definition of the NPPF Flood Zones. (Source: EA)

Climate Change on Site

- 5.3 Climate change is likely to increase the flow in rivers and raise sea levels and storm intensity. The proposed development is likely to be at more risk of flooding in the future.
- 5.4 No modelled EA data is available at the time of writing to quantify the risk of fluvial flooding with respect to climate change. However, the proposal is for a Minor Development and can adhere to the EA Standing Advice for such (setting FFLs no lower than the existing).
- 5.5 The EA have stated that climate change will increase the peak rainfall intensity allowance in small and urban catchments. The EA climate change allowances for peak rainfall intensity are shown in Table 5 below. The proposed development will be at more risk of surface water flooding in the future.

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

Table 5 Peak rainfall intensity allowance in small and urban catchments (Source: EA)

6. Residual Risks

Identification of Residual Risks

6.1 Residual risks are those remaining after applying the sequential approach to the location of development and taking mitigating actions. Examples of residual flood risk include:

- the failure of flood management infrastructure such as a breach of a raised flood defence, blockage of a surface water conveyance system, overtopping of an upstream storage area, or failure of a pumped drainage system;
- failure of a reservoir; and,
- a severe flood event that exceeds a flood management design standard, such as a flood that overtops a raised flood defence, or an intense rainfall event which the drainage system cannot cope with.

Defence Breach

6.2 The proposed development is located within Flood Zones 1, 2 and 3 and is not located within an area that is considered to benefit from flood defences according to the EA Flood Map for Planning. The risk to site, in the event of a breach of defences, would be considered negligible.

Reservoir Failure

6.3 The EA Risk of Flooding from Reservoir Map demonstrates that the site is outside flood extents in the event of reservoir flooding.

Drainage Exceedance

6.4 In the event of drainage system failure under extreme rainfall events or blockage, flooding may occur within the site. In the event of the development's drainage system failure, the runoff flow will be dictated by topography on site. Topographic elevations from 2m LiDAR suggest that runoff would be directed towards the north/north east of the site.

7. Flood Risk Management Measures

Flood Risks

- 7.1 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn. The proposed development is considered to be a minor development under the NPPF.
- 7.2 The proposed development is located within Flood Zones 1, 2 and 3. The proposed development could be considered to be at low risk of flooding from surface water and sewer sources, and at moderate risk of flooding from fluvial and groundwater sources.
- 7.3 As the proposed extension is considered to be a Minor Development under the NPPF, it should adhere to the EA Standing Advice for such (FFLs to be set no lower than existing).
- 7.4 The proposed development is located within the Elmer Flood Warning Area.
- 7.5 As such, the following mitigation measures are recommended:
- FFLs to be set no lower than existing in line with EA Standing Advice for Minor Developments;
 - Extension to be of flood proof construction at ground floor to mitigate ingress of groundwater and surface water flooding;
 - Internal access to be maintained from proposed extension to upper floors of dwelling for lifetime of development;
 - Any new sewer connection from the site should be agreed with the local provider and fitted with non-return valves to mitigate the risk of flooding from sewer sources.
 - Site owner(s) and occupants to sign up to the EA's Flood Warning Service.

Flood Warning Service

- 7.6 The EA operates a 24-hour telephone service on 0345 988 1188 that provides frequently updated flood warnings and associated floodplain information. Further information can be found on www.environment-agency.gov.uk/floodline. Floodline Warnings Direct is a free service operated by the EA that provides flood warnings direct to occupants by telephone, mobile phone, fax or pager.
- 7.7 The proposed development site is located within an EA Flood Warning Service Area. As such, it is recommended that site users sign up to this service if not done so already.
- 7.8 In the event of receiving a flood warning, users should evacuate following the recommended evacuation route. As the proposed development is an extension, the evacuation route could be the same as for the existing dwelling.

8. Off Site Impacts

Flood Water Displacement

- 8.1 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn. The proposal could be considered Minor Development (extension of existing dwelling, <250m²) and under Paragraph 047 of the Flood Risk and Coastal Change PPG:
- 8.2 Minor developments are unlikely to raise significant flood risk issues unless:
- *they would have an adverse effect on a watercourse, floodplain or its flood defences;*
 - *they would impede access to flood defence and management facilities, or;*
 - *where the cumulative impact of such developments would have a significant effect on local flood storage capacity or flood flows.*
- 8.3 As such, minor developments are unlikely to raise significant flood risk issues in isolation.

Generation of Runoff

- 8.4 The proposed development is considered a minor development and will increase built footprint by approximately 23m². It could therefore be considered impractical to implement full SUDS measures. It is recommended that a betterment is provided over the existing by incorporating water butts or rain planters.

9. Conclusion

- 9.1 Ambiental Environmental Assessment has been appointed by James Baderman to undertake a National Planning Policy Framework (NPPF) compliant Flood Risk Assessment (FRA) for the proposed development at Ancton Barn, Ancton Lane, Ancton, West Sussex, PO22 6NJ.
- 9.2 It is understood that the development is for the construction of extensions to the existing dwelling including enlargement of existing northeast wing, alteration to barn entrances, and addition of opening and fixed glaze roof lights to the existing barn. The proposal is considered a 'Minor Development' under the NPPF as it is for a household development with a footprint of less than 250m², will have Finished Floor Levels no lower than those of the existing building and will not result in a new residential unit on site.
- 9.3 The existing dwelling is classified as More Vulnerable under the National Planning Policy Framework (NPPF). The proposed development is an extension of the existing residential dwelling, which is considered "More Vulnerable" under the NPPF. As such, the flood risk vulnerability will remain the same post-development.
- 9.4 With reference to the Environment Agency (EA) Flood Map for Planning, the proposed development is located within Flood Zones 1, 2 and 3. A review of the site plans against the EA Flood Map for Planning indicates that the extent of Flood Zone 3 is nearly parallel to the northern façade of the existing building, and therefore the existing building appears to be in Flood Zones 1 and 2.
- 9.5 Analysis within this report has indicated that in the 1:100 year +CC (105%) fluvial event, the dwelling could experience flood depths of 0.14m. Furthermore, analysis of EA tidal data indicates that the site could remain unaffected for all tidal events up to and including 1:1000 year present day and 1:200 year +CC (2115) events.
- 9.6 The proposed development could be considered to be at low risk of flooding from surface water and sewer sources, and at moderate risk of flooding from fluvial and groundwater sources.
- 9.7 The Finished Floor Levels of the extension will be set no lower than existing floor levels of the residential dwelling, in line with the EA Standing Advice for Minor Developments.
- 9.8 The proposed development is located within an EA Flood Warning Service Area. As such, it is recommended that site users sign up to this service if not done so already.
- 9.9 To mitigate against potential flood risk, the proposed extension should incorporate flood resilience measures in line with current best practice for construction within an area at risk of flooding in line with CLG 2007 'Improving the Flood Performance of New Buildings. These measures are detailed in Section 7 of the report.
- 9.10 Following the guidelines contained within the NPPF, and given that:
- The proposed development is for the construction of extensions to the existing dwelling;
 - The site is located in EA Flood Zones 1, 2 and 3;
 - The FFLs of the proposed extension should be set no lower than the existing FFLs in line with the EA Standing Advice for Minor Developments;
 - Flood mitigation measures are recommended in section 7 of this report.

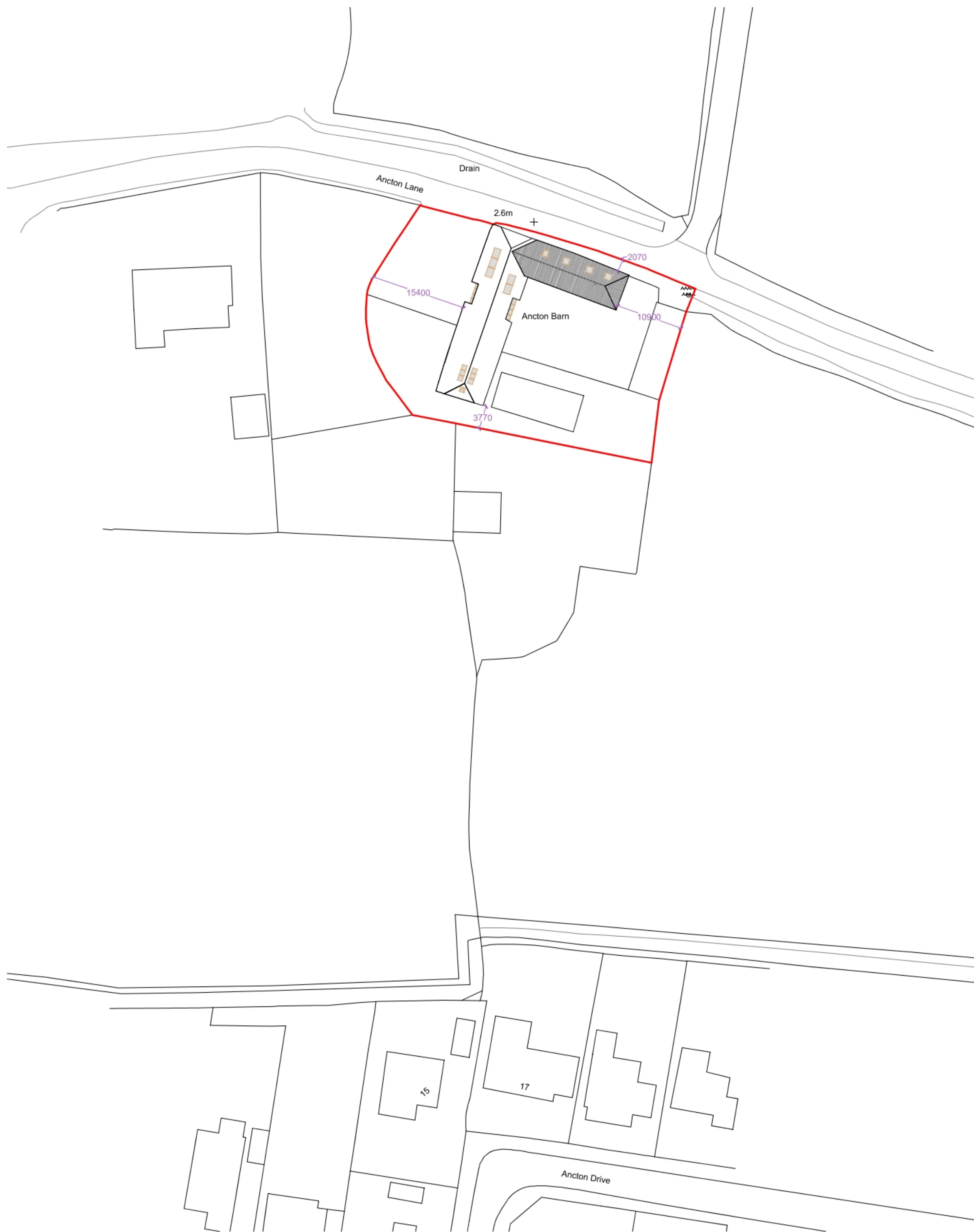
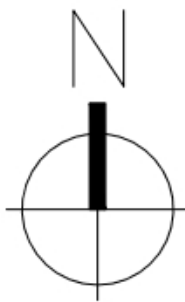
The proposed development could be considered suitable, assuming appropriate mitigation (including adequate warning procedures) can be maintained for the lifetime of the development.

Appendix I - Site Plans

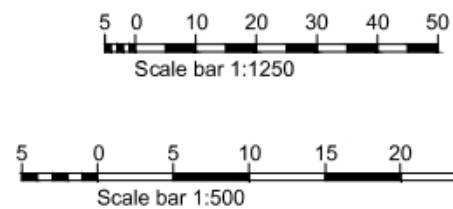


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Location Plan 1:1250



Block Plan 1:500



Notes:
Red line depicts boundary of application site
Hatching depicts proposals

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10-11 The Parade, Willowhayne Crescent,
East Preston, West Sussex BN16 1NS

tel: 01903 774754

email: architectural@fuller-associates.co.uk
www.fuller-associates.co.uk

Job Title
Ancton Barn, Ancton
Client
Mr J Baderman

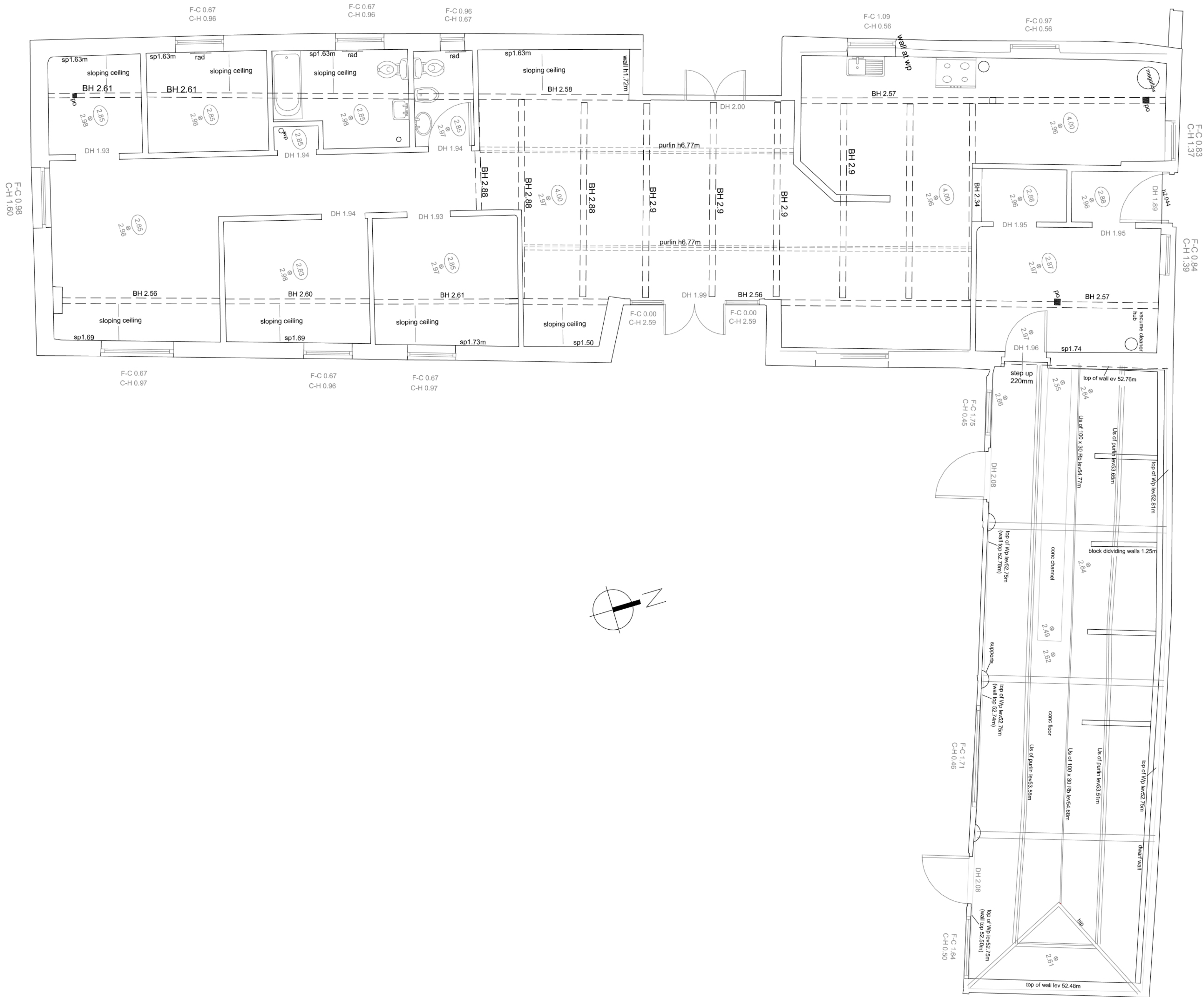
Drawing Name
Location Plan and Block Plan

Drawing Status
Planning

Drawn by ALP Date Dec 20
Checked by DF Date Dec 20

Drawing Scale
1:1250, 1:500 at A1

Drawing No 203109/ 07 Status Revision



Existing Ground Floor Plan 1:50

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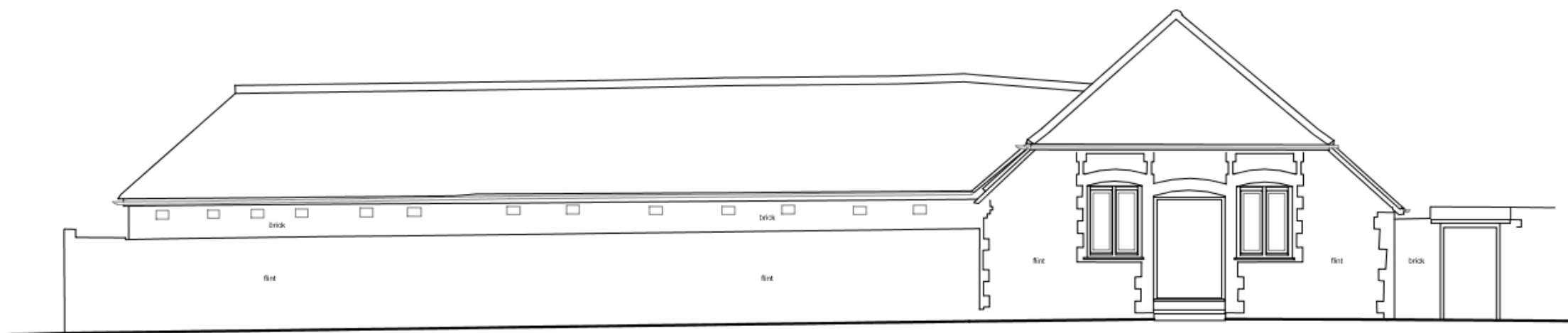
Drawing Name
**Ground Floor Plan -
Existing**

Drawing Status
Planning

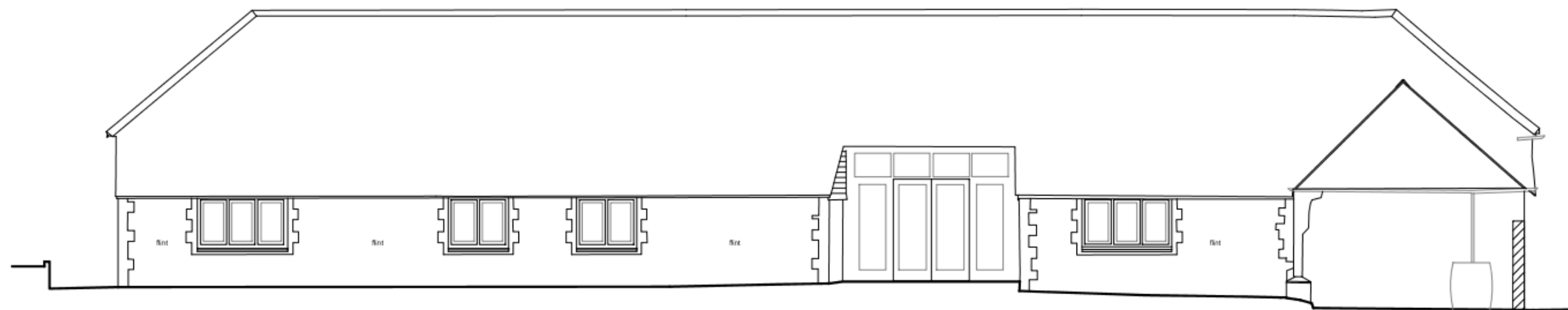
Drawn by **ALP** Date **Dec 20**
Checked by **DF** Date **Dec 20**

Drawing Scale
1:50 at A1

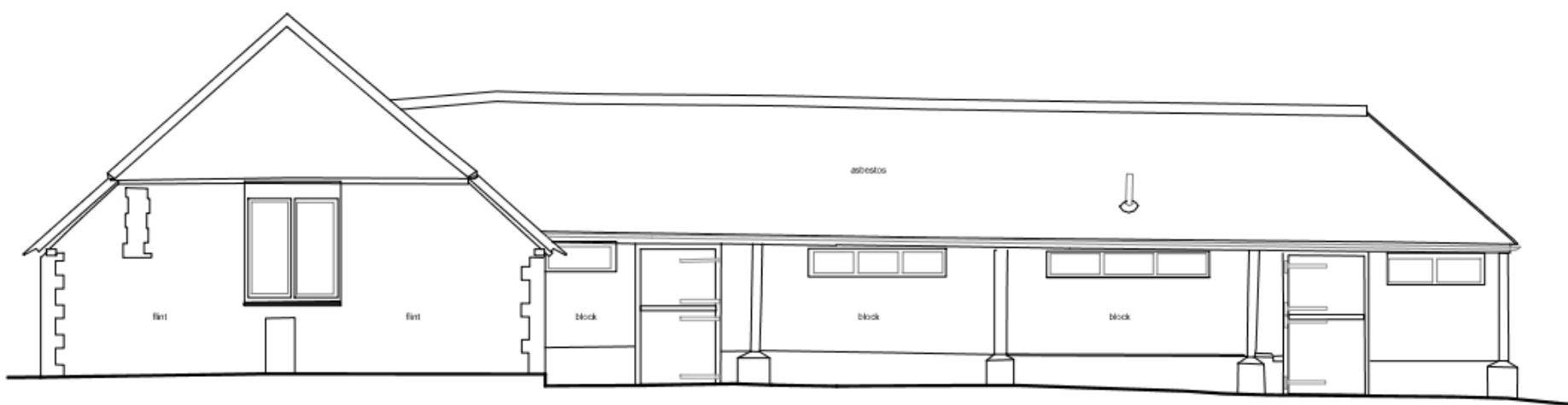
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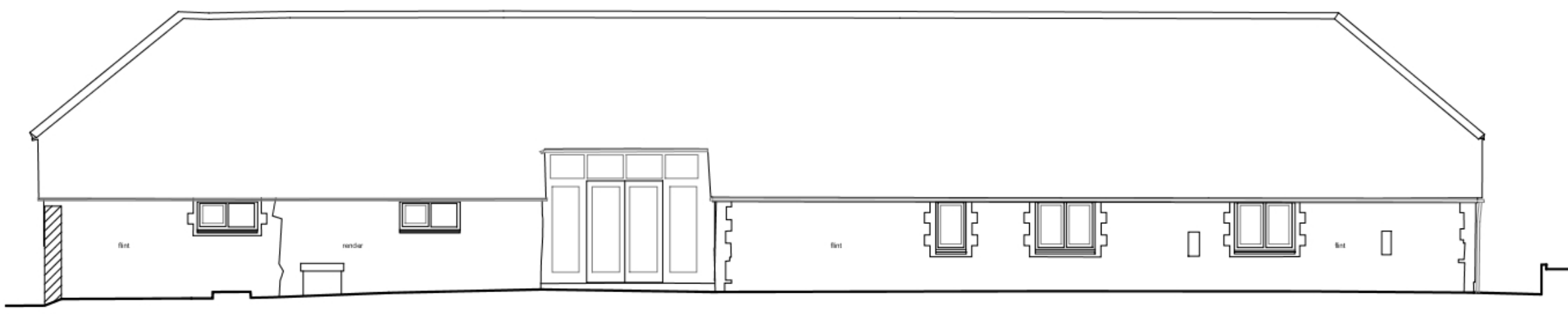
North Elevation



East Elevation

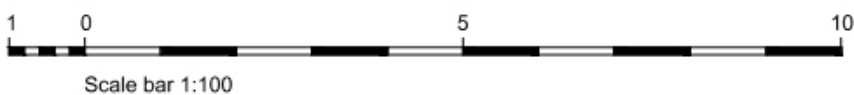


South Elevation



West Elevation

Existing Elevations 1:100



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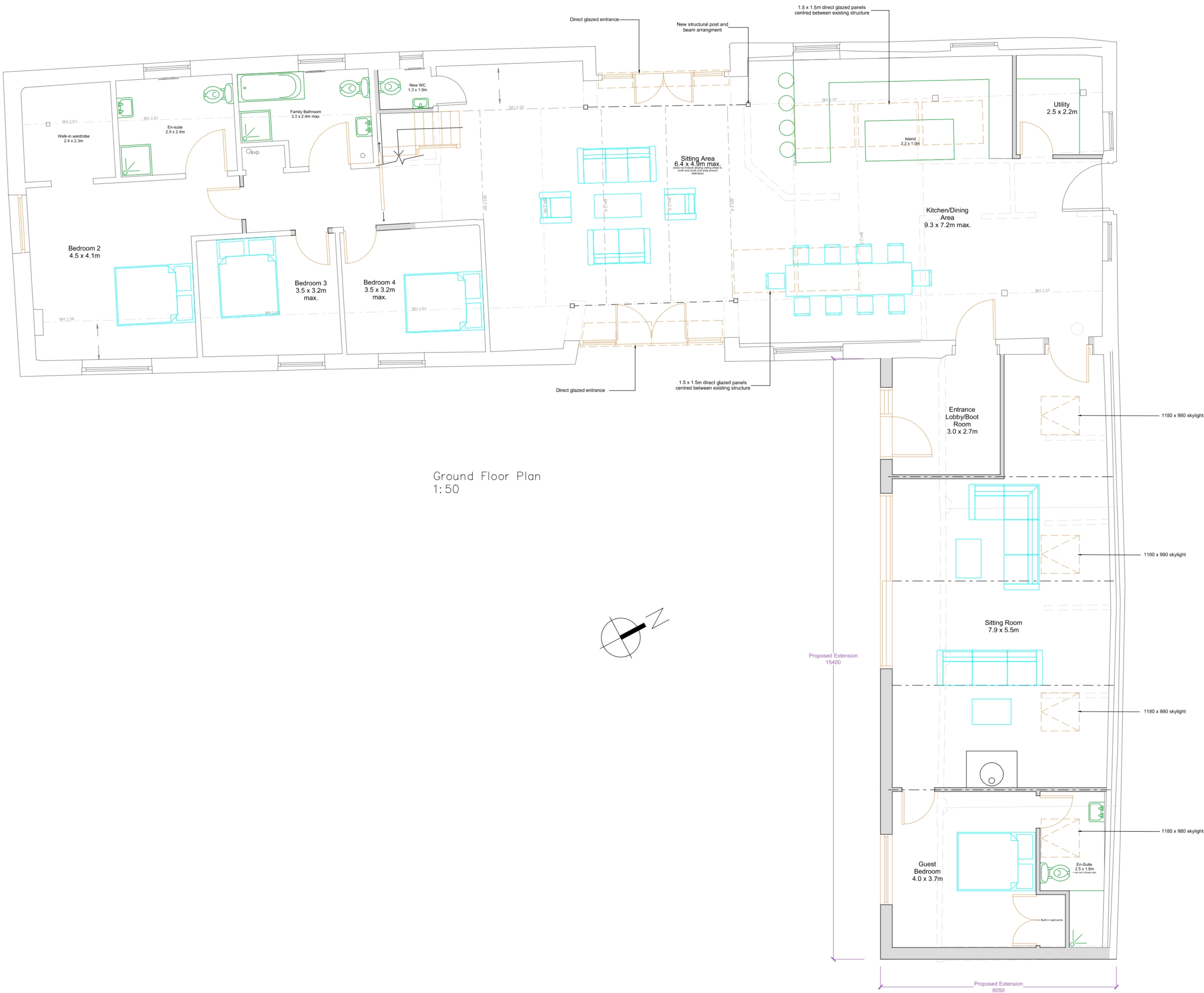
Drawing Name
Elevations - Existing

Drawing Status
Planning

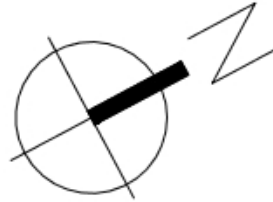
Drawn by **ALP** Date **Dec 20**
Checked by **DF** Date **Dec 20**

Drawing Scale
1:100 at A1

Drawing No **203109/ 03** Status Revision



Ground Floor Plan
1:50



Proposed Extension
15400

Proposed Extension
6050



Notes:

General

Grey hatching depicts new walls

Faint grey dashed lines depict demolished walls

Grey chain lines depict centre line of existing beam positions

Black chain lines depict centre line of proposed beam positions

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Job Title

Ancton Barn, Ancton

Client

Mr J Baderman

Drawing Name

Ground Floor Plan -
Proposed

Drawing Status

Planning

Drawn by

ALP

Date Dec 20

Checked by

DF

Date Dec 20

Drawing Scale

1:50 at A1

Drawing No

Status Revision

203109/ 04



First Floor Plan
1:50

Notes:

General

Grey hatching depicts new walls

Faint grey dashed lines depict demolished walls

Grey chain lines depict centre line of existing beam positions

Black chain lines depict centre line of proposed beam positions

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Job Title

Ancton Barn, Ancton

Client

Mr J Baderman

Drawing Name

First Floor Plan -
Proposed

Drawing Status

Planning

Drawn by

ALP

Date

Dec 20

Checked by

DF

Date

Dec 20

Drawing Scale

1:50 at A1

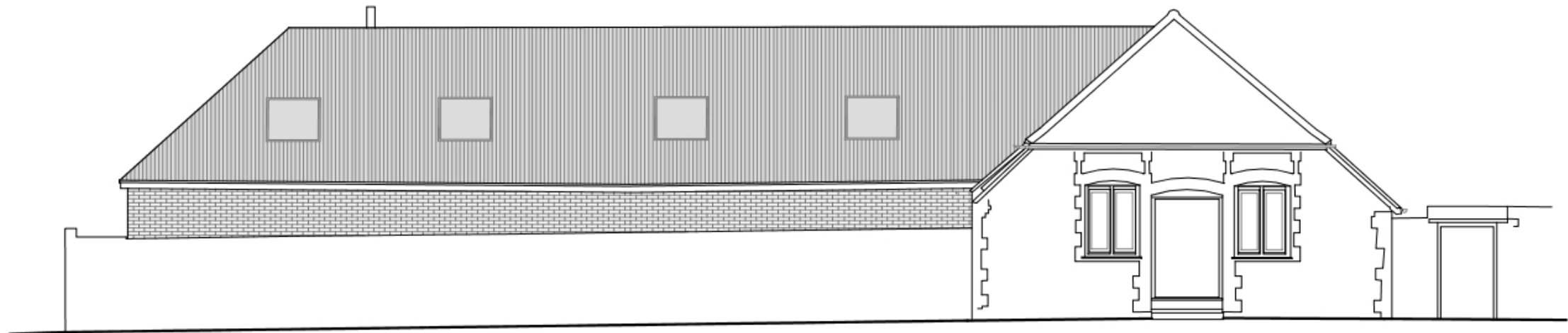
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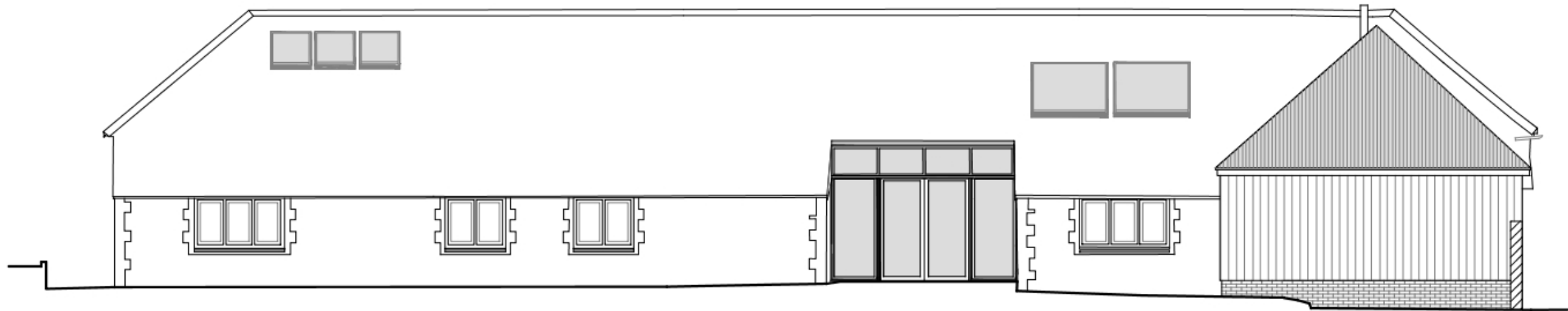
Revision

203109/ 05

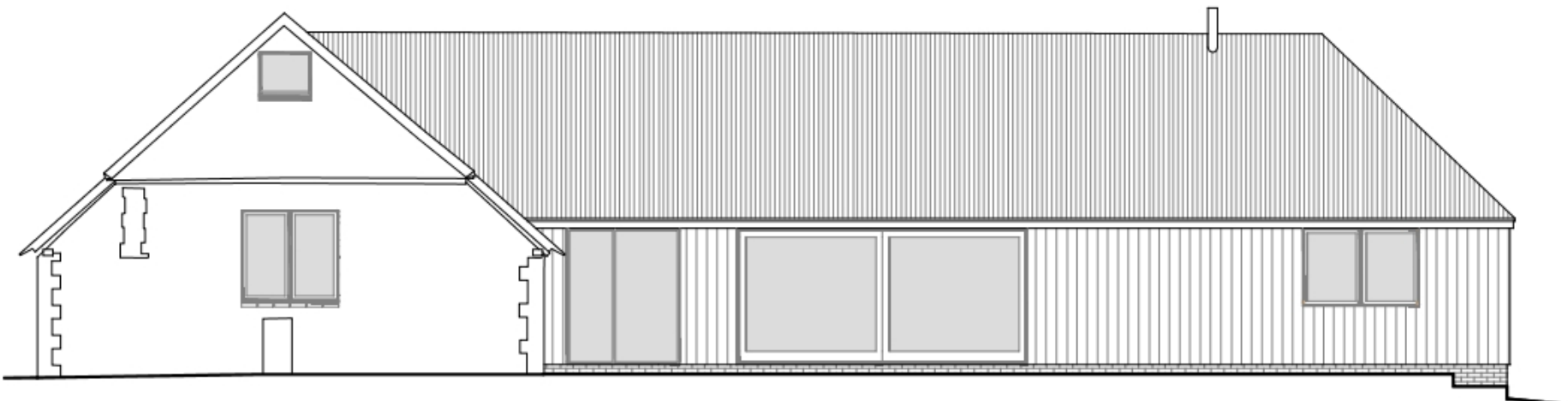




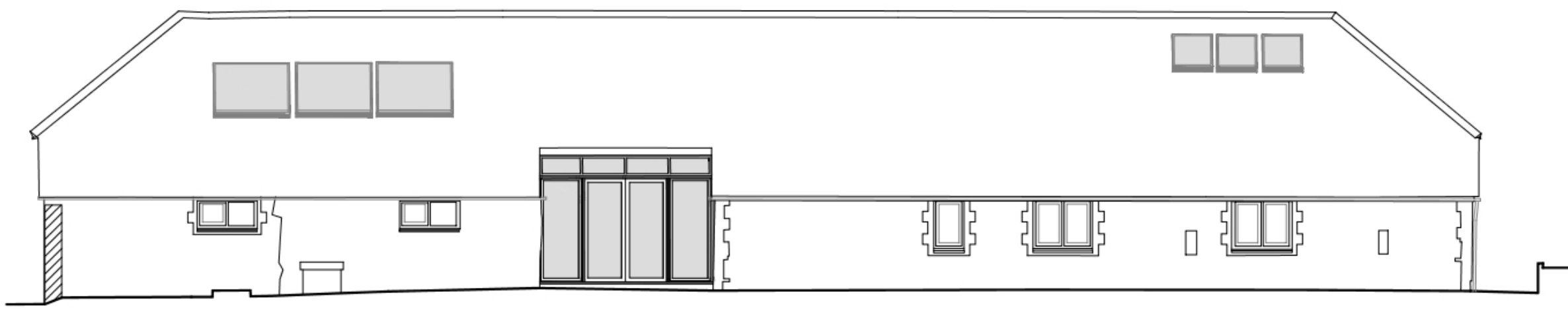
North Elevation



East Elevation

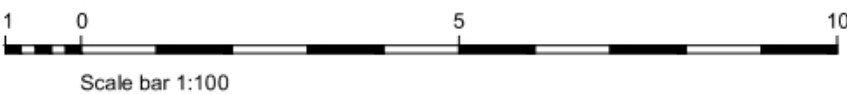


South Elevation



West Elevation

Elevations 1:100



Notes:

General

Hatched/shaded elements depict proposals

Materials Proposed

Walls

Facing brick at low level and vertical cedar cladding to South and East elevations of 'cow shed' wing - North elevation to be increased in height using matching brickwork

Roof

Corten steel corrugated roofing panels

Mixture of direct glazing and manufactured skylights (Velux or similar)

Windows/Doors

Aluminium casements in 'cow shed' wing - anthracite

Double glazed fixed and opening skylights.

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Job Title

Ancton Barn, Ancton

Client

Mr J Baderman

Drawing Name

Elevations - Proposed

Drawing Status

Planning

Drawn by ALP Date Dec 20

Checked by DF Date Dec 20

Drawing Scale

1:100 at A1

Drawing No Status Revision

203109/ 06

Appendix II - EA Data

Lydia Sayers
Ambiental

Our ref: SSD202652

Date: 16/02/2021

Dear Lydia Sayers,

**Enquiry Regarding Product 4 for Flood Risk Assessment for Ancton Barn,
Ancton Lane, Ancton, PO22 6NJ.**

Thank you for your enquiry which was received on 20th January 2021.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004. The information is attached.

The information on Flood Zones in the area relating to this address is as follows:

The site is in an area located within Flood Zone 1, 2 & 3 as shown on our Flood Map for Planning (Rivers and Sea).

Note - This information relates to the area that the above named property is in and is not specific to the property itself as it is influenced by factors such as the height of door steps, air bricks or the height of surrounding walls. We do not have access to this information and is not currently used in our flood modelling.

Flood Zone definitions can be found at www.gov.uk/guidance/flood-risk-and-coastal-change#Table-1-Flood-Zones

Flood Defences

There are tidal flood defences in the form of a rock breakwaters and a sand/shingle beach. These assets are maintained by the Environment Agency.

Model Information

Fluvial: Aldingbourne Flood Risk Mapping Study, completed in 2015 by JBA Consulting, plus climate change allowances (2016). Tidal: River Arun to East Head, completed in 2016 by JBA Consulting.

Flood History

We hold no record of previous flooding events affecting this site.

Please note our records are not comprehensive and may not include all events. I recommend contacting the Lead Local Flood Authority, **West Sussex County Council** or the Local Authority, **Arun District Council** for a more comprehensive flood history check.

[FRA advisory text](#)

Name	Product 4
Description	Detailed Flood Risk Assessment Map for Ancton Barn, Ancton Lane, Ancton, PO22 6NJ.
Licence	Open Government Licence
Information Warnings	The flood risk data provided is based on existing EA hydraulic models for existing 0.5% annual probability events with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 17 December 2019. You should refer to ' Flood risk assessments: climate change allowances ' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.
Information Warning - OS background mapping	<i>The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.</i>
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2021 Ordnance Survey 100024198.

Data Available Online

Many of our flood datasets are available online:

- Flood Map For Planning ([Flood Zone 2](#), [Flood Zone 3](#), [Flood Storage Areas](#), [Flood Defences](#), [Areas Benefiting from Defences](#))
- [Risk of Flooding from Rivers and Sea](#)
- [Historic Flood Map](#)
- [Current Flood Warnings](#)

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

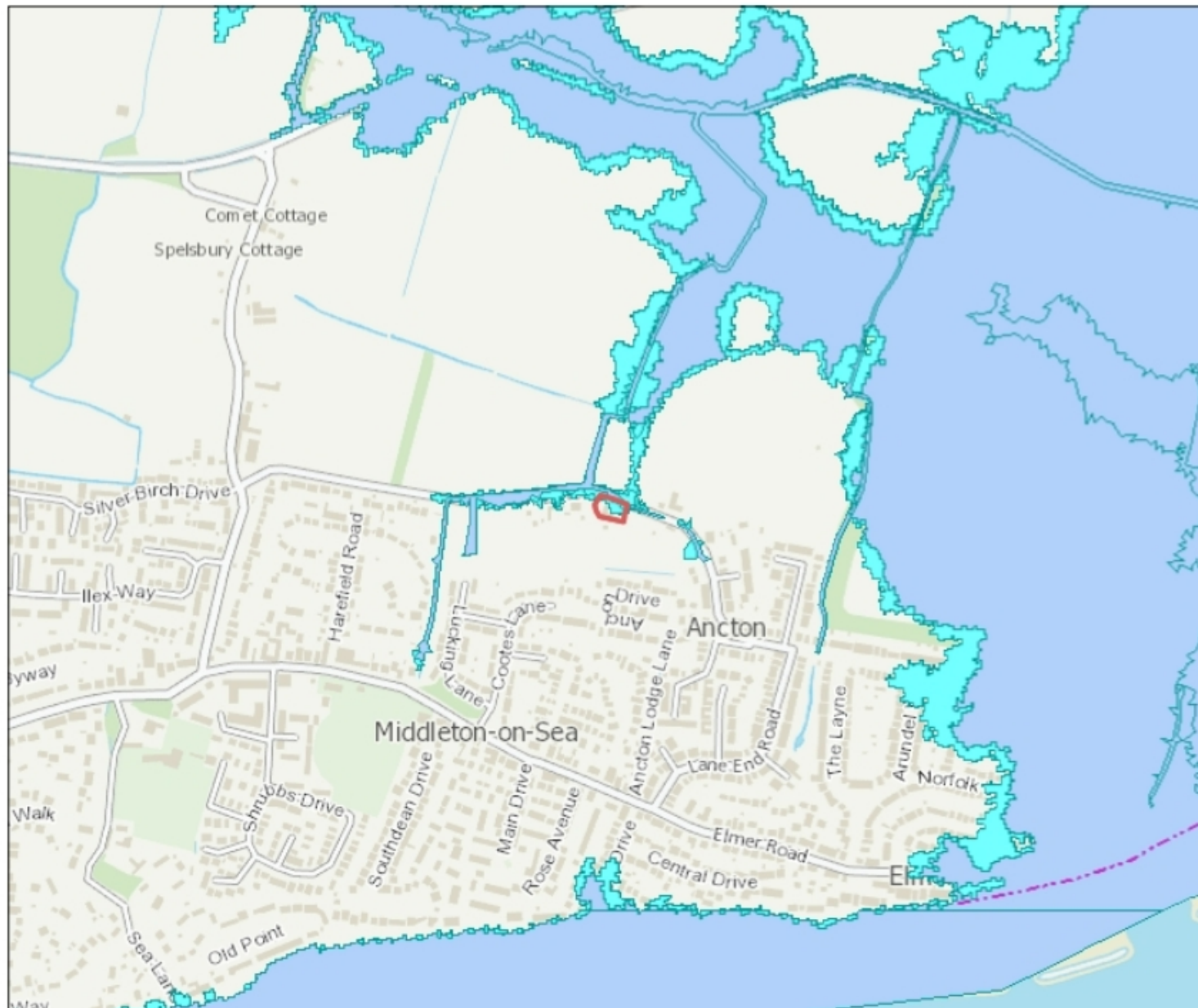
Yours sincerely,

Tom Lamboo

FCRM Officer, Partnership & Strategic Overview West Sussex, Solent and South Downs

Environment Agency, Guildbourne House, Chatsworth Road, Worthing, West Sussex, BN11 1LD

Flood Map for Planning (Rivers and Sea). Centred PO22 6NJ. Created 16/02/2021.



1: 10,000

0 Metres 250



Flood Map for Planning (Rivers & Sea)

- Defences
- Flood Storage Areas
- ▣ Areas benefiting from flood defences
- Flood Zone 3
- Flood Zone 2

Flood Map Areas (assuming no defences)

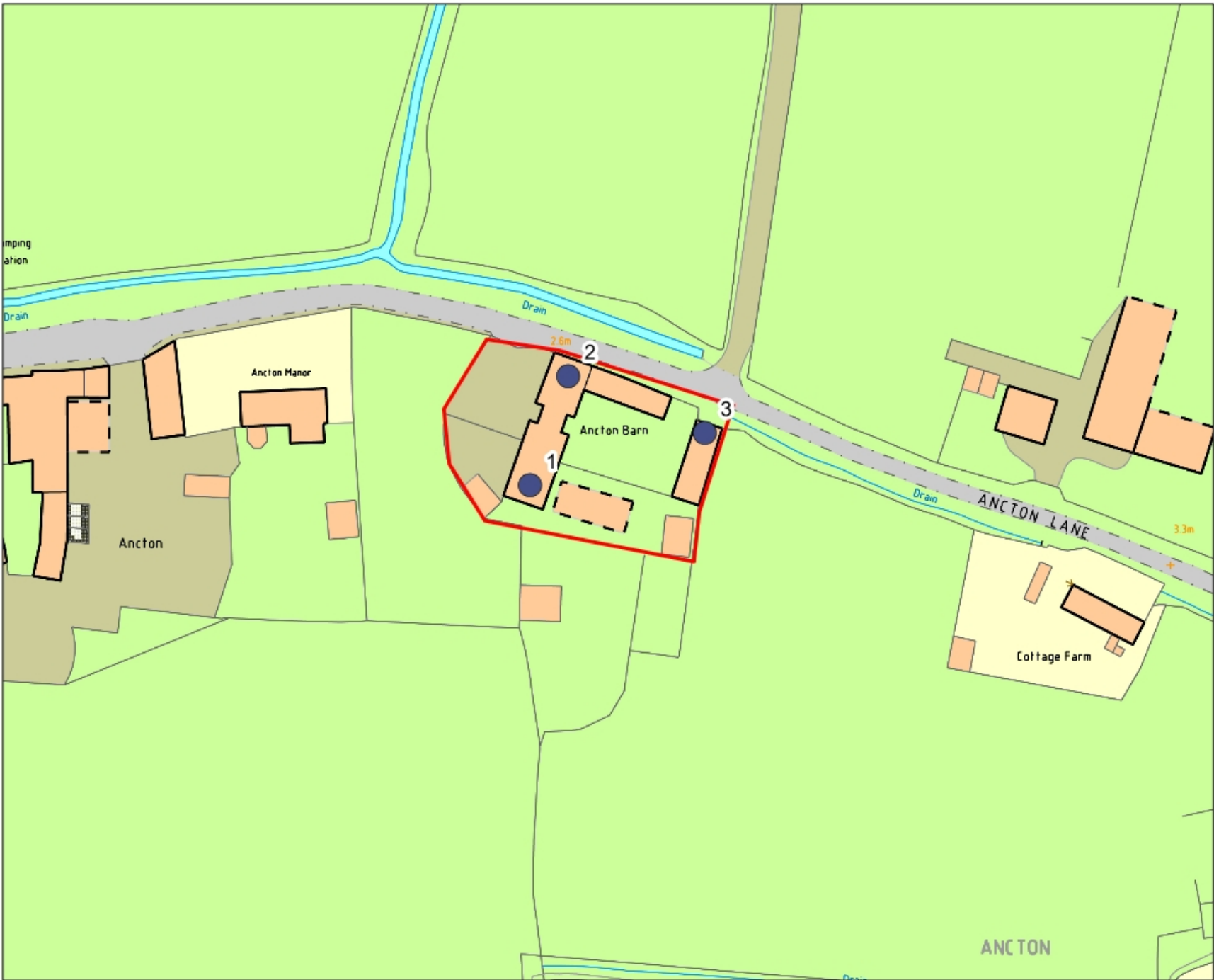
Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk



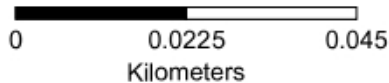
 Environment Agency


N

Legend

-  Site_Nodes
-  Site_Boundary

Scale: 1:1,000



Product 4 Flood Risk Data Requested by: Ambiental

Site: Ancton Barn, Ancton Lane, Ancton, PO22 6NJ.

Table 1: Water Levels: Fluvial Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD					
			Undefended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	498031	100646	-	-	-	-	-	-
2	498039	100667	-	-	-	-	3.08	-
3	498064	100656	-	-	-	-	3.09	-

Table 2: Water Levels: Fluvial Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD					
			Defended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	498031	100646	-	-	-	-	-	-
2	498039	100667	-	-	-	-	3.08	2.98
3	498064	100656	-	-	-	-	3.09	3.00

Table 3: Water Levels: Tidal Undefended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
			Undefended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	498031	100646	-	3.91	4.70	-
2	498039	100667	-	3.91	4.70	3.06
3	498064	100656	-	3.91	4.70	3.06

Table 4: Water Levels: Tidal Defended

Node Ref	NGR		Modelled Flood Levels in Metres AOD			
			Defended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	498031	100646	-	-	-	-
2	498039	100667	-	-	-	-
3	498064	100656	-	-	-	-

Table 5: Water Depths: Fluvial Undefended

Node Ref	NGR		Modelled Flood Depths in Metres					
			Undefended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	498031	100646	-	-	-	-	-	-
2	498039	100667	-	-	-	-	0.18	-
3	498064	100656	-	-	-	-	0.31	-

Table 6: Water Depths: Fluvial Defended

Node Ref	NGR		Modelled Flood Depths in Metres					
			Defended Annual Exceedance Probability					
	Eastings	Northings	5%	1%	1% +CC (35%)	1% +CC (45%)	1% +CC (105%)	0.1%
1	498031	100646	-	-	-	-	-	-
2	498039	100667	-	-	-	-	0.18	0.25
3	498064	100656	-	-	-	-	0.31	0.22

Table 7: Water Depths: Tidal Undefended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Undefended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	498031	100646	-	0.83	1.62	-
2	498039	100667	-	1.06	1.85	0.21
3	498064	100656	-	1.15	1.94	0.29

Table 8: Water Depths: Tidal Defended

Node Ref	NGR		Modelled Flood Depths in Metres			
			Defended Annual Exceedance Probability			
	Eastings	Northings	0.5%	0.5% (2070)*	0.5% (2115)*	0.1%
1	498031	100646	-	-	-	-
2	498039	100667	-	-	-	-
3	498064	100656	-	-	-	-

All levels taken from:

Fluvial: Aldingbourne Flood Risk Mapping Study, completed in 2015 by JBA Consulting, plus climate change allowances (2016). Tidal: River Arun to East Head, completed in 2016 by JBA Consulting.

Produced on: 16/02/2021

Modelled Flood Outlines- Climate Change Allowances (Defended Fluvial).
Centred PO22 6NJ. Created 16/02/2021.





Environment
Agency



Legend

-  Site_Boundary
-  1% AEP +35% (Defended Fluvial)
-  1% AEP +45% (Defended Fluvial)
-  1% AEP +105% (Defended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

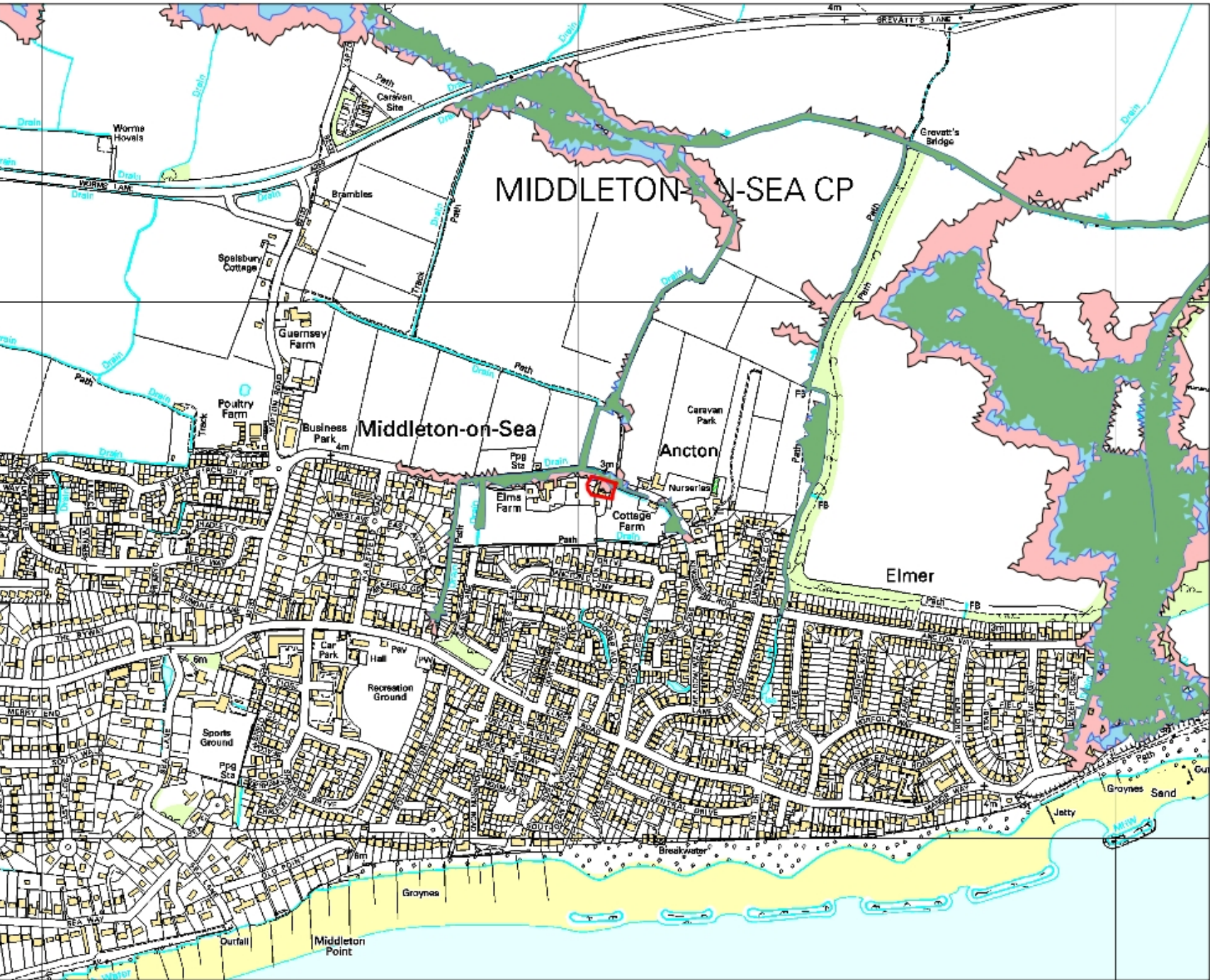
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Kilometers

Modelled Flood Outlines- Climate Change Allowances (Undefended Fluvial).
Centred PO22 6NJ. Created 16/02/2021.



Environment
Agency

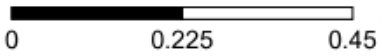


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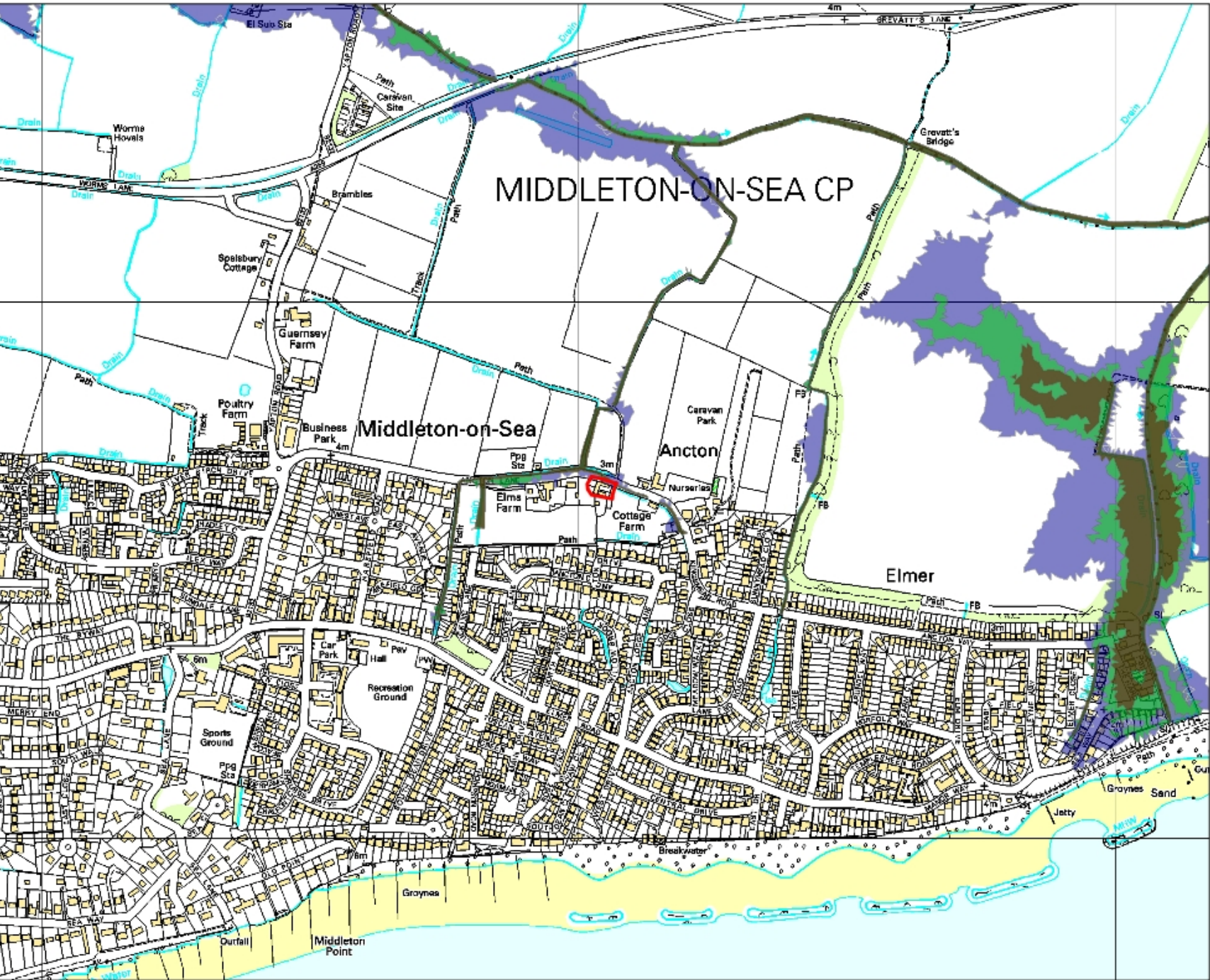
-  Site_Boundary
-  1% AEP +35% (Undefended Fluvial)
-  1% AEP +45% (Undefended Fluvial)
-  1% AEP +105% (Undefended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



0 0.225 0.45
Kilometers



Environment Agency



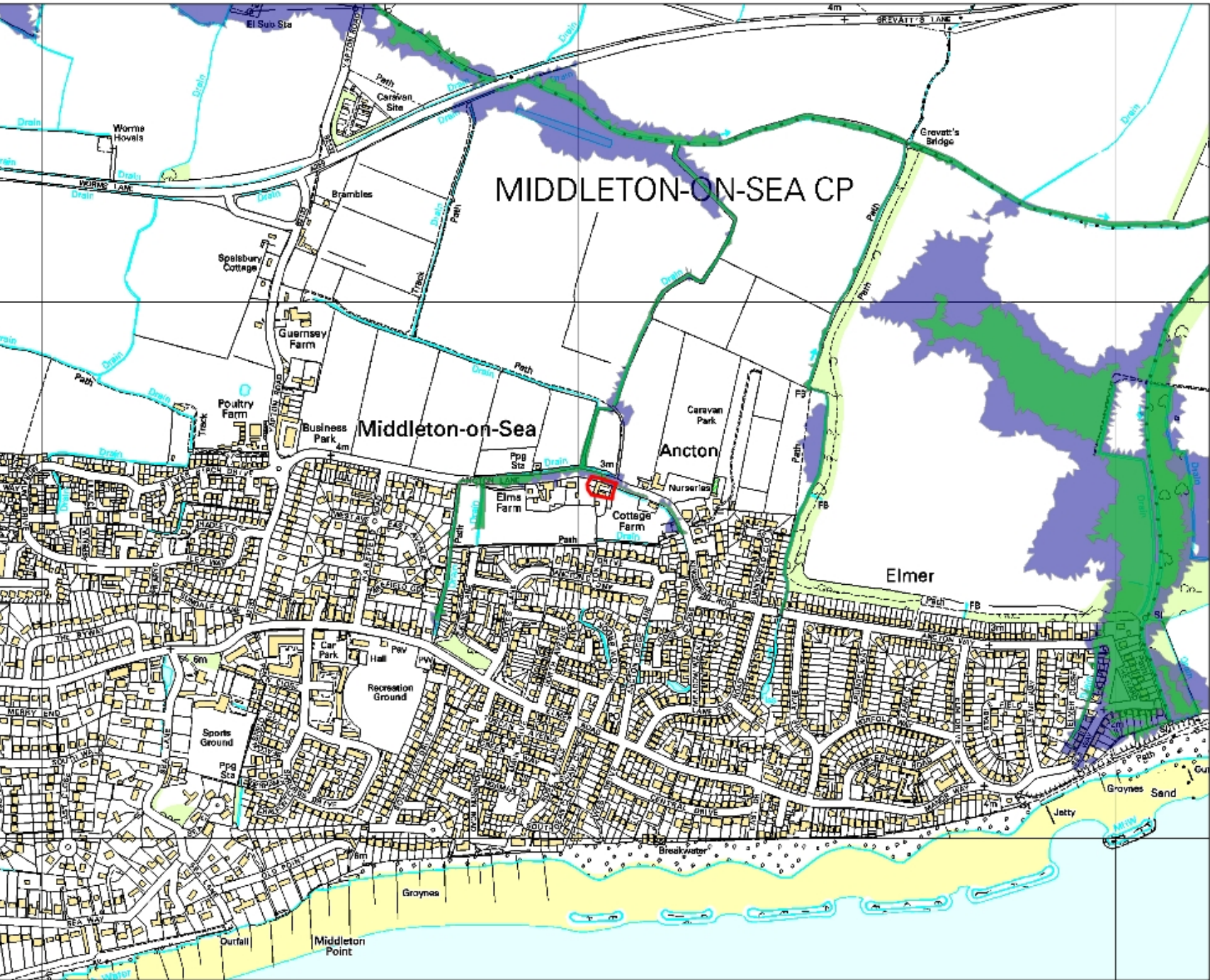
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-  Site_Boundary
-  5% AEP (Defended Fluvial)
-  1% AEP (Defended Fluvial)
-  0.1% AEP (Defended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000


0 0.225 0.45
Kilometers



Environment
Agency

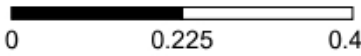


Legend

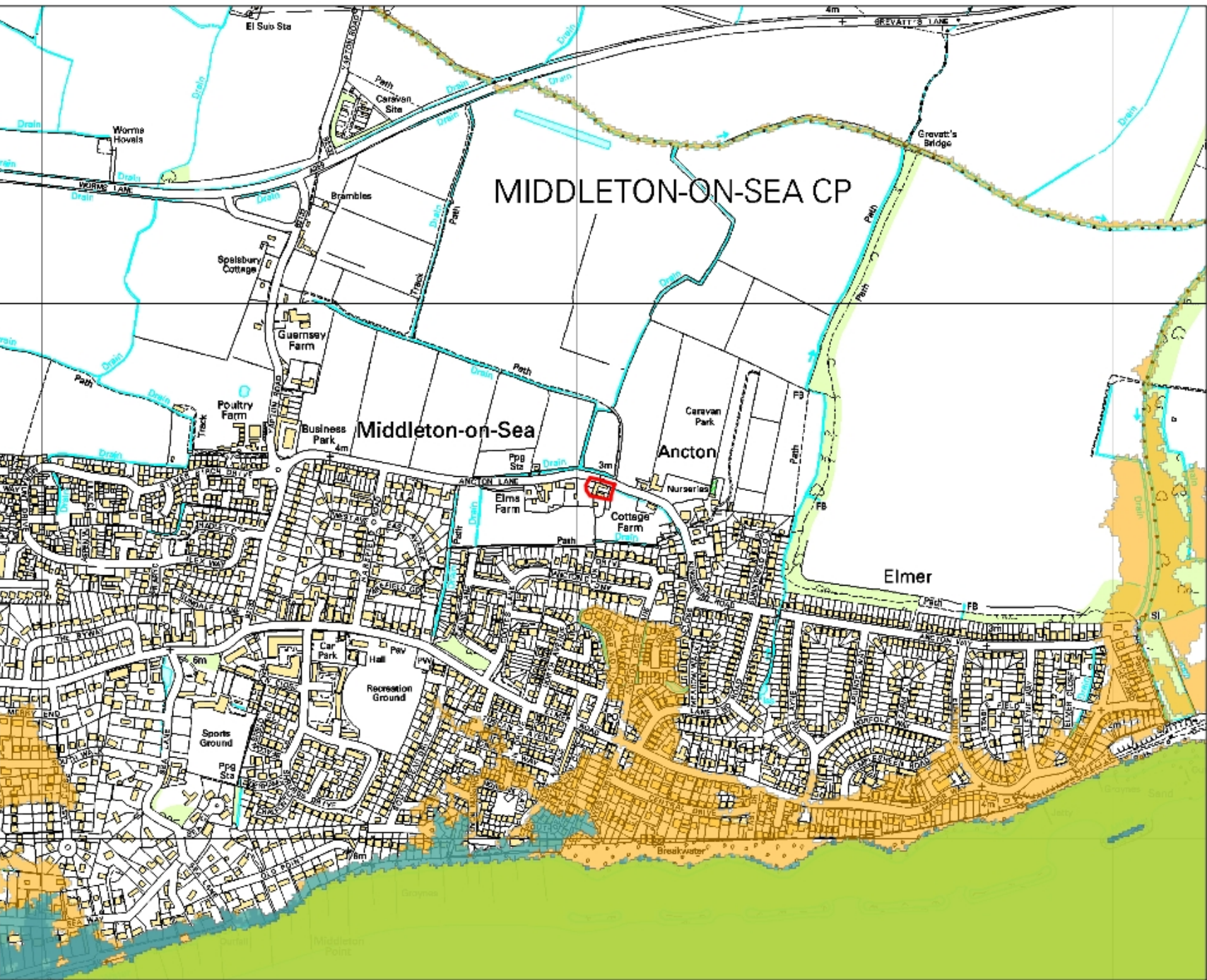
-  Site_Boundary
-  1% AEP (Undefended Fluvial)
-  0.1% AEP (Undefended Fluvial)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



0 0.225 0.45
Kilometers





Environment Agency

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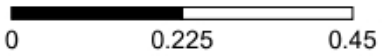


Legend

- Site_Boundary
- 0.5% AEP (Defended Tidal)
- 0.5% AEP (2070) NPPF (Defended Tidal)
- 0.5% AEP (2115) NPPF (Defended Tidal)
- 0.1% AEP (Defended Tidal)

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



0 0.225 0.45
Kilometers

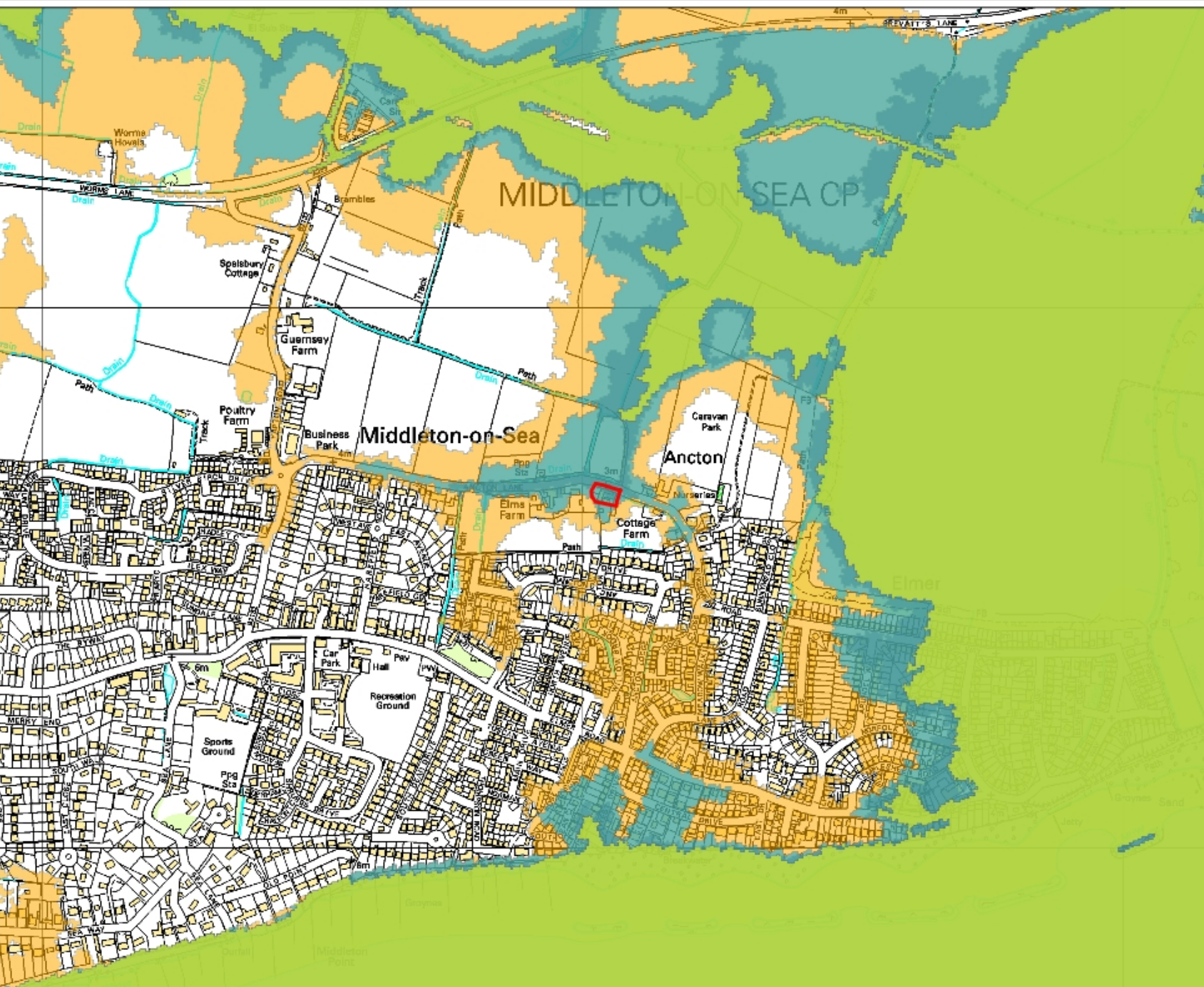
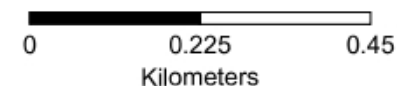


Legend

- Site_Boundary
- 0.5% AEP (Un defended Tidal)
- 0.5% AEP (2070) NPPF (Un defended Tidal)
- 0.5% AEP (2115) NPPF (Un defended Tidal)
- 0.1% AEP (Un defended Tidal)

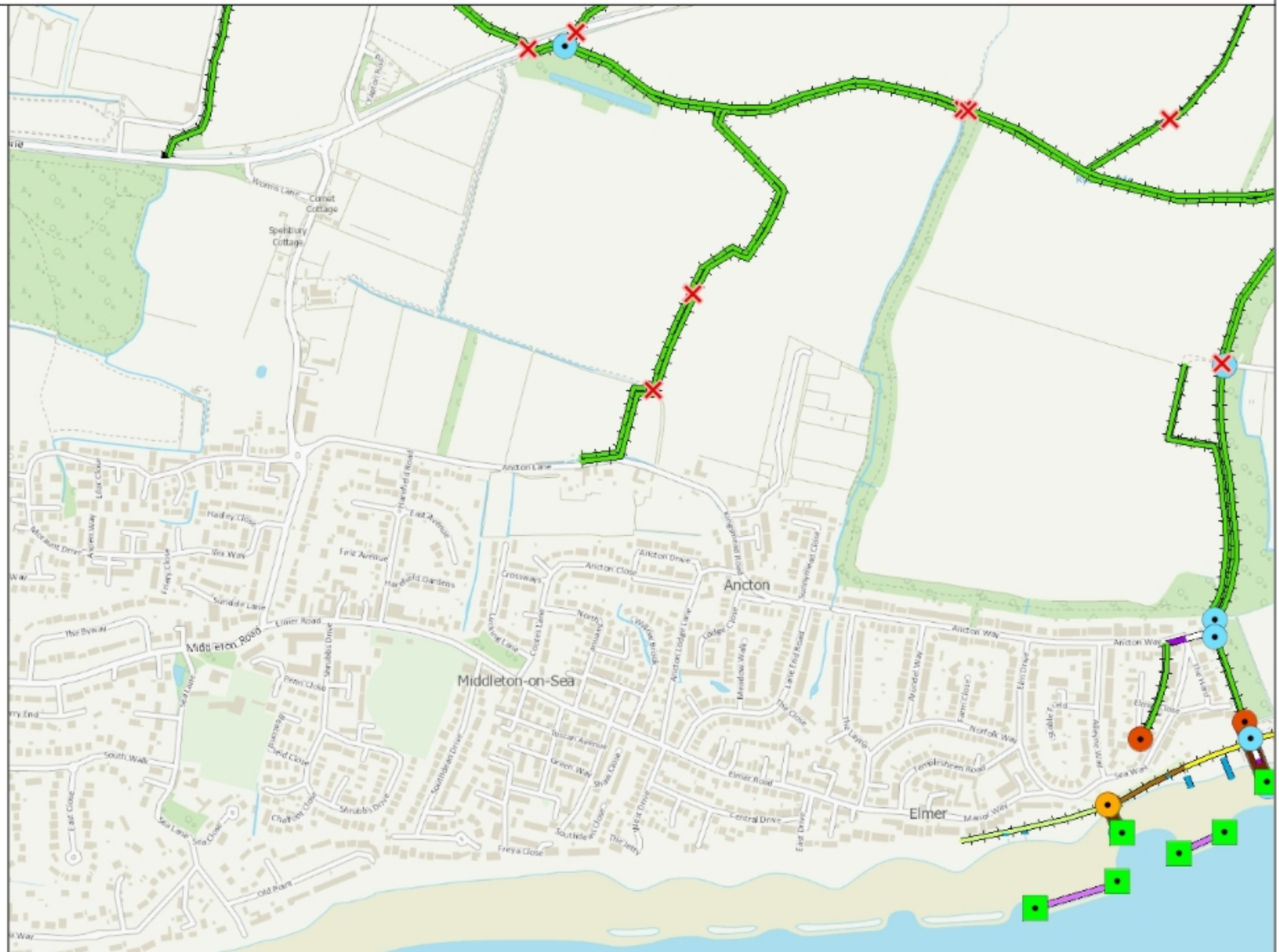
Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occurring in any given year.

Scale: 1:10,000



Legend

Please see page 2 for asset symbology



1: 10,000

0 250

Metres



Structures

-  Control Gate
-  Draw Off Tower
-  Fish Pass
-  Hydrobrake
-  In Channel Stoplogs
-  Inspection Chamber
-  Jetty
-  Outfall
-  Screen
-  Spillway
-  Stilling Basin
-  Weir

Beach Structures

-  Breakwater
- 
-  Ramp
-  Slipway
-  Steps
-  Groyne

Instruments

-  Active Monitoring
-  Passive Monitoring

Channel Crossings

-  Bridge
-  Utility Services

Aids to Navigation

-  Beacon
-  Buoy
-  Dolphin
-  Signage
-  Signal

Building Assets

-  Pump House

Major Civils

-  Abutment
-  Central Pier

Defences

-  Embankment
-  Wall
-  Flood Gate
-  Demountable defence
-  Bridge abutment
-  High Ground
-  Beach
-  Barrier Beach
-  Promenade
-  Quay
-  Cliff
-  Dunes

Channels

-  Open channel
-  Simple culvert
-  Complex culvert

Land

-  Mudflats
-  Saltmarsh
-  Washland

Sites

-  Amenity
-  Control Structure
-  Erosion Protection
-  General
-  Harbour
-  Monitoring
-  Navigation Lock
-  Pumping Station
-  Reservoir
-  Tidal Barrier

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

<https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion>

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

<https://www.gov.uk/flood-risk-assessment-standing-advice>
<http://planningguidance.planningportal.gov.uk/>

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

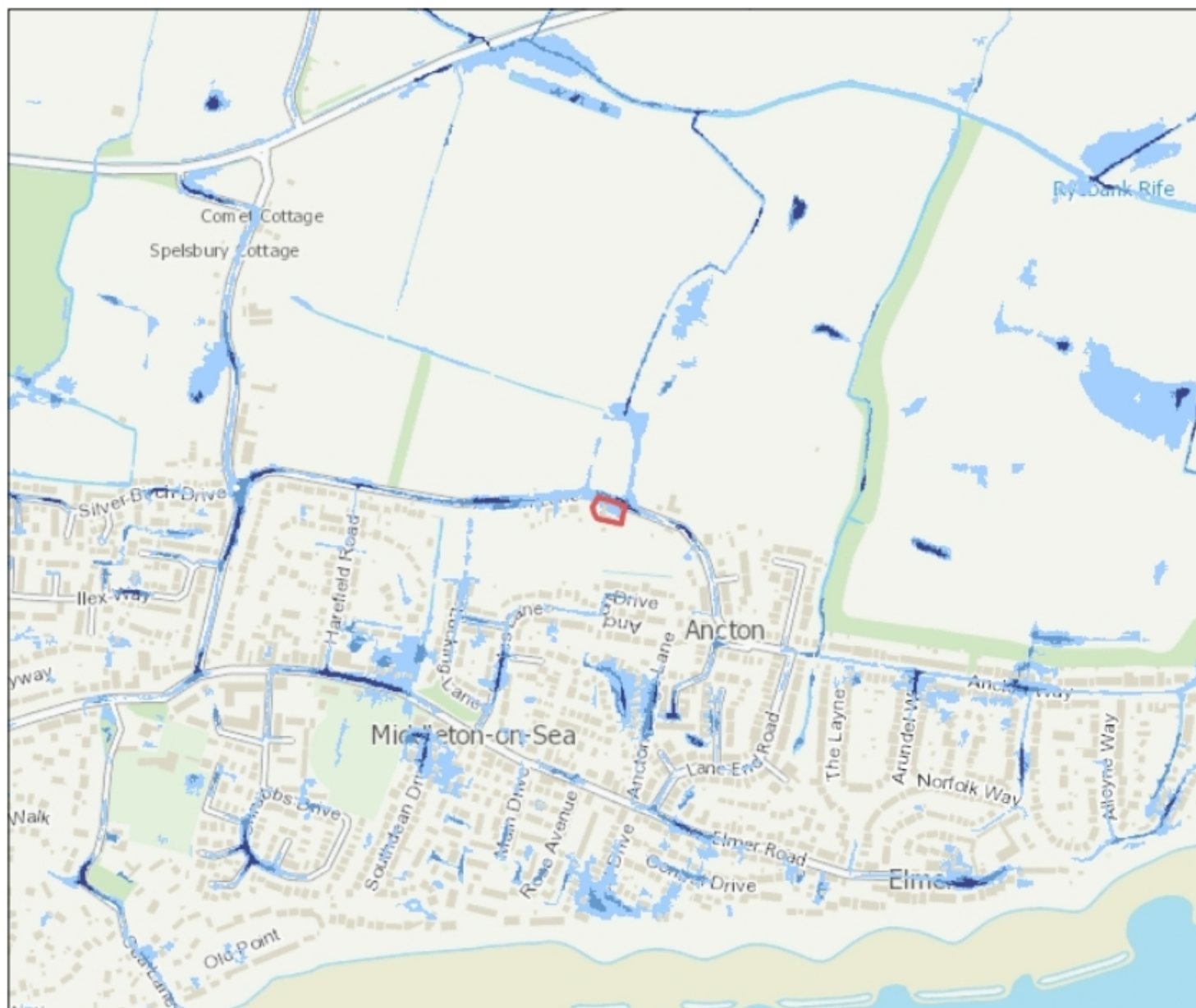
1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

***The flood risk data provided is based on existing EA hydraulic models for existing 0.5% annual probability events with an allowance for climate change. Please note the climate change allowances provided are not up to date. These were updated on 17 December 2019.**

You should refer to '[Flood risk assessments: climate change allowances](#)' for the most up to date allowances. You will need to undertake further assessment of future flood risk using different allowances to ensure your assessment of future flood risk is based on best available evidence.

There is no additional information or health warnings for these levels/depths or the model from which they have been produced.

Risk of flooding from Surface Water. Centred PO22 6NJ. Created 16/02/2021.



1: 10,000

0 Metres 250



Likelihood of flooding from Surface Water

- High ($\geq 3.3\%$)
- Medium (3.3% - 1%)
- Low (1% - 0.1%)
- Very Low
- Flood Extent 1 in 30
- Flood Extent 1 in 100
- Flood Extent 1 in 1000

Likelihood of flooding from Surface Water

- High:** Greater than or equal to 3.3% (1 in 30) chance in any given year
- Medium:** Less than 3.3% (1 in 30) but greater than or equal to 1% (1 in 100) chance in any given year
- Low:** Less than 1% (1 in 100) but greater than or equal to 0.1% (1 in 1,000) chance in any given year
- Very Low:** Less than 0.1% (1 in 1,000) chance in any given year

This information is shown on the Risk of Flooding from Surface Water map on GOV.UK.

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