

Flood Risk Assessment

Residential Dwelling

Farmside

Main Road

Shotley

Suffolk

Report Ref: BLI.2022.91

November 2022

Rev 00

Prepared for

Mr. T. Meredith

Flood Risk Assessment

Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk

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Flood Risk Assessment

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1 Introduction

- 1.1 BLI Consulting Engineers Ltd have been commissioned by Mr. T. Meredith to prepare a Flood Risk Assessment in accordance with the:
- National Planning Policy Framework (NPPF).
 - Flood Risk and Coastal Change Planning Practice Guidance (PPG).
- 1.2 This report will form part of the supporting technical documentation to accompany a full planning application comprising of a single residential dwelling and associated hard and soft landscaping.
- 1.3 The application will be submitted by Richard Edwards Associates to Babergh District Council and the purpose of this report shall be to:
- Provide information on the flood risks associated with the application site and to present appropriate mitigation measures for the proposed development where flood risk has been identified.
 - Assist where possible with the application of the Sequential Test and Exception Test.
- 1.4 This is to enable the development to obtain planning permission without objection from the Local Planning Authority (LPA) or their consultees and so that the site, its occupants, and the surrounding development is at the minimum risk of flooding.

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2 Development Details

Site Location

2.1 The application site is located:

- **Site Address:** – Farmside, Main Road (B1456), Shotley, Suffolk
- **Post Code:** - IP9 1EY
- **Central Grid Reference:** – TM 22186 36329

2.2 Refer to Figure 2.1 below for Site Location.

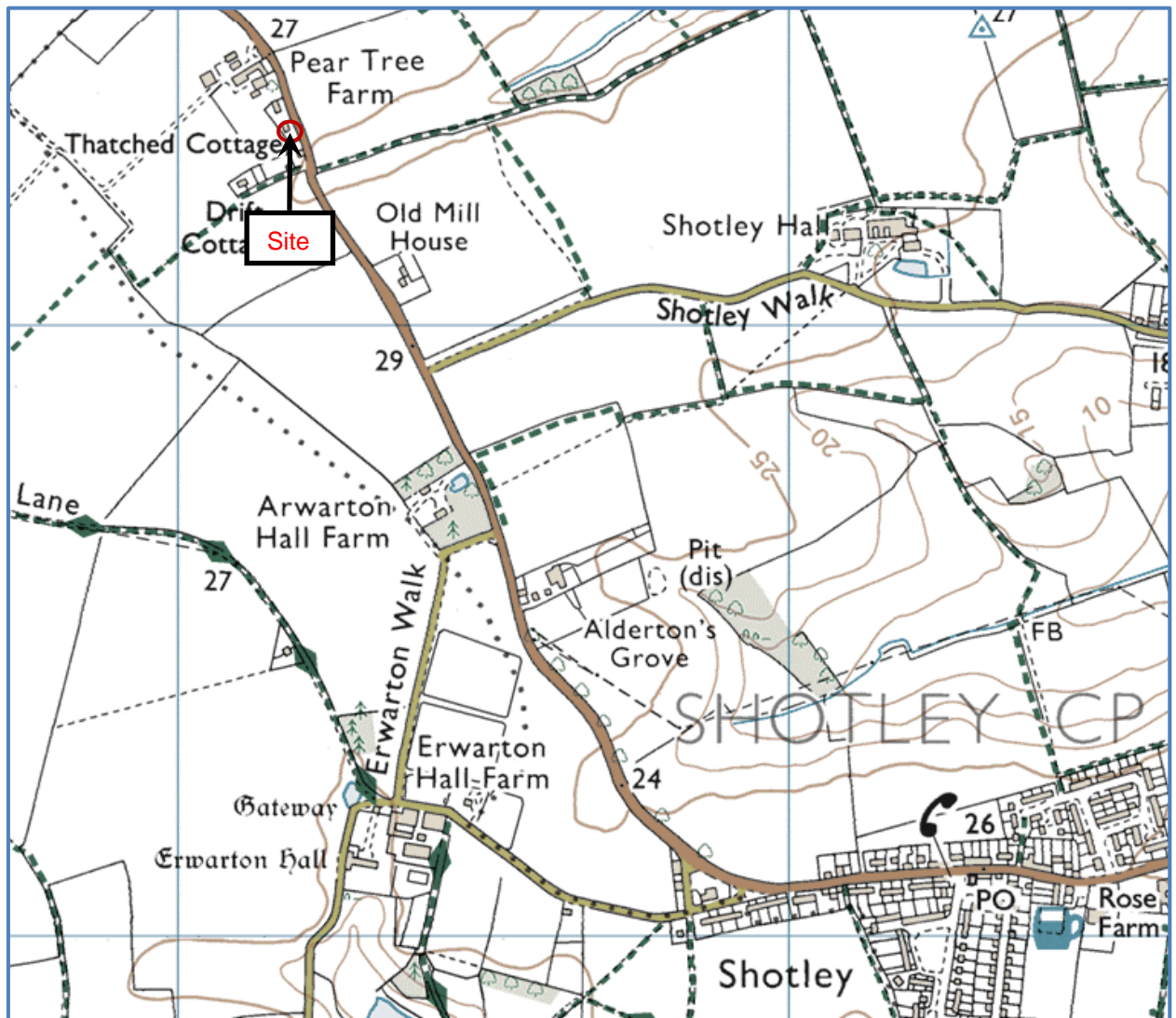


Figure 2.1 – Site Location Plan

Flood Risk Assessment

Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk

Existing Site Layout

2.3 The application boundary encloses an area of approximately 0.090 ha and is surrounded by:

- A residential dwelling (Farmside) to the north.
- A residential dwelling to the south with farmland beyond.
- Main Road (adopted highway) to the east with farmland beyond.
- Farmland to the west.

2.4 A copy of the existing site layout has been included within Appendix A and currently comprises of garden area associated with the existing dwelling (Farmside) to the north. Ground levels fall in a southerly direction across the site and the land is primary made up of grassland with dense vegetation along the south and west boundary.

2.5 Vehicular and pedestrian access to the site is currently achieved off Main Road (adoptable highway) located to the east of the site.

2.6 The existing site layout currently has no impermeable area and is not served by any form of positive drainage system. Therefore, rainfall infiltrates into ground and has a surface water discharge equal to the natural greenfield run-off rate.

Development Proposal

2.7 The proposed development as shown in Appendix B comprises of a single residential dwelling, separate cart lodge building and associated gravel driveway and garden area.

2.8 Vehicle and pedestrian access will continue to be achieved via the existing access leading onto Main Road (adoptable highway) to the east of the site.

2.9 The development layout has an impermeable area of approximately 0.019 ha comprising of roof and hardstanding areas as detailed above.

3 Flood Hazard Review

Source of Flooding

- 3.1 **Fluvial Flooding** - is caused by rivers and occurs when the river channel capacity is exceeded by the flow. Most rivers have a natural flood plain which in built up areas is sometimes encroached upon by development.
- 3.2 The indicative fluvial and tidal flood mapping available on the GOV.UK website and as shown in Figure 3.1 below demonstrates that the entire development site is located within Flood Zone 1 in accordance with Table 1 of the Flood Risk and Coastal Change PPG.
- 3.3 Therefore, the proposed development is considered to be at a 'LOW RISK' of flooding from this source.

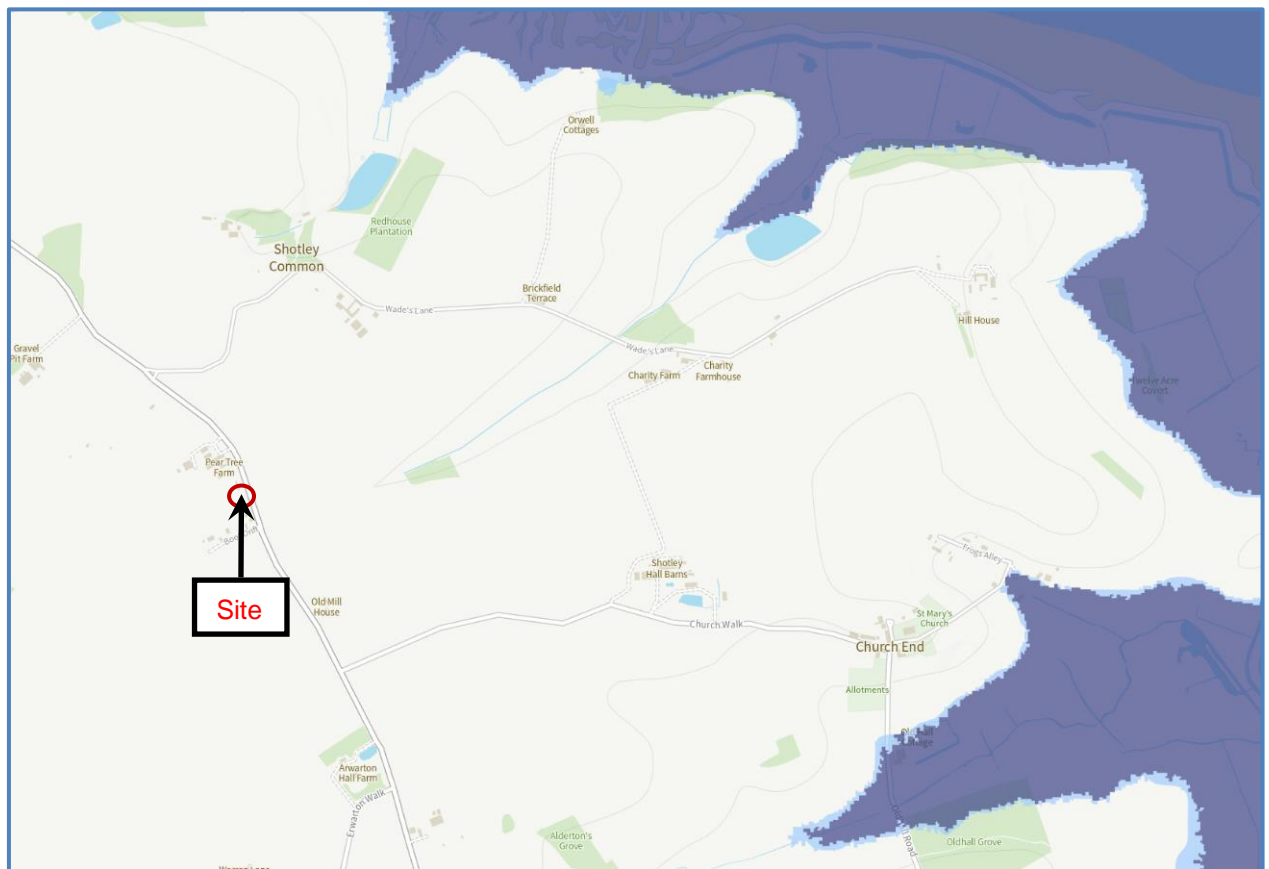


Figure 3.1 – Fluvial and Tidal Indicative Flood Mapping

- 3.4 **Tidal Flooding** - from the sea occurs when high tides and storm surges raise the level of tidal waters above the level of the shore or riverbank. They can be sudden and severe but are dependent on a number of factors.

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- 3.5 As shown within Figure 3.1 above, the proposed development site is located within Flood Zone 1 in accordance with Table 1 of the Flood Risk and Coastal Change PPG.
- 3.6 Therefore, the development is also considered to be at a 'LOW RISK' of flooding from this source.
- 3.7 **Surface Water Flooding** – commonly occurs within highly dense urban areas where there are large areas of impermeable surfacing e.g., roof areas, car parking and roads. It is possible during high intensity rainfall storms events for surface water run-off to be unable to soak into the ground or enter the man-made drainage systems at a quick enough rate. Where this occurs, the excess water can flow across land and potentially cause flooding.
- 3.8 The indicative surface water flood mapping available on the GOV.UK website and as shown in Figure 3.2 below demonstrates that the southern half of the site (garden area) is subject to surface water flooding.

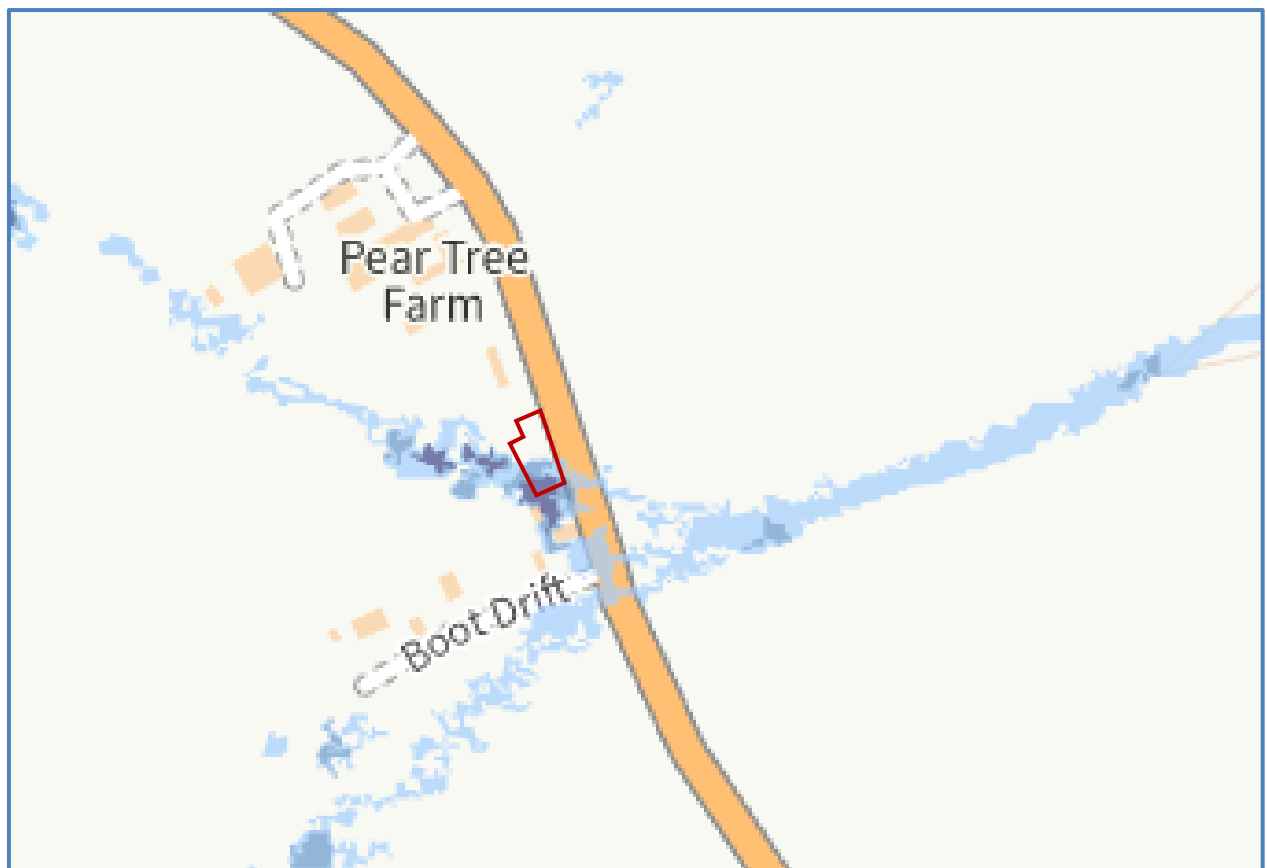


Figure 3.2 – Surface Water Indicative Flood Mapping

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3.9 To obtain a more accurate understanding of the surface water flood risk, flood data has been downloaded from the online Defra Data Download website and uploaded into QGIS software. The proposed development layout has also been uploaded into the QGIS software to enable a comparison of the flood extents against the proposed development during the 30-year, 100-year and 1000-year storm events.

30-Year Storm Event

3.10 The surface water flood mapping included within Appendix C represents the 'High Risk' flood scenario which equates to flooding of greater than 3.3% probability (30-year event).

3.11 The mapping demonstrates that:

- The proposed dwelling and cart lodge is located outside of the anticipated flood extents and has a risk rating of 'Very Low'.
- A small area of the garden and adjacent residential land is subject to surface water flooding/ponding. The mapping demonstrates a maximum flood depth between 300mm and 600mm, and a flow velocity less than 0.25 m/s.
- Two small areas of surface water flooding/ponding have been identified to the west of the site. The mapping demonstrates a maximum flood depth between 300mm and 600mm, and a flow velocity less than 0.25 m/s.

100-Year Storm Event

3.12 The surface water flood mapping included within Appendix D represents the 'Medium Risk' flood scenario which equates to flooding between the 1.0% and 3.3% probability (30-year event to 100-year event).

3.13 The mapping demonstrates that:

- The proposed dwelling and cart lodge has remained located outside of the anticipated flood extents and has a risk rating of 'Very Low'.
- The extent of surface water flooding/ponding identified within the rear garden and adjacent residential land has increased. The mapping demonstrates a maximum flood depth between 300mm and 600mm, and a typical flow velocity less than 0.25 m/s.

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- The extent of surface water flooding/ponding identified to the west of the site has increased. The mapping demonstrates a maximum flood depth between 600mm and 900mm and a flow velocity between 0.25 m/s and 0.50 m/s.

1000-Year Storm Event

- 3.14 The surface water flood mapping included within Appendix E represents the 'Low Risk' flood scenario which equates to flooding between the 0.1% and 1.0% probability (100-year event to 1000-year event).
- 3.15 The mapping demonstrates that:
- The proposed dwelling and cart lodge has remained located outside of the anticipated flood extents and has a risk rating of 'Very Low'.
 - The extent of surface water flooding/ponding identified within the rear garden and adjacent residential land has increased and connected with the surface water flooding identified to the west of the site. The mapping demonstrates a maximum flood depth between 300mm and 600mm, and a typical flow velocity between 0.25 m/s and 0.50 m/s.
- 3.16 In summary, the surface water flood mapping demonstrates that the proposed dwelling and cart lodge has been sequentially located outside the surface water flood extent up to the 1000-year storm event and the mitigations measure within Section 4 will further reduce this risk.
- 3.17 Therefore, the development is considered to be at a 'LOW RISK' of flooding from this source
- 3.18 **Groundwater Flooding** - occurs in areas where the level of groundwater is high. Rainfall that soaks into the ground can raise it to a level where structures within the ground are at a risk of flooding. Structures such as basements or detention ponds can be at risk, although this is dependent upon the ground conditions of the site.
- 3.19 A review of the Groundwater Susceptibility Mapping included within the Babergh & Mid Suffolk Level 1 Strategic Flood Risk Assessment (JBA Consulting – August 2020) has been undertaken and an extract of the mapping has been included within Figure 3.3 below.
- 3.20 The mapping demonstrates that the site is located within an area where 'Flooding from Groundwater is not Likely'.

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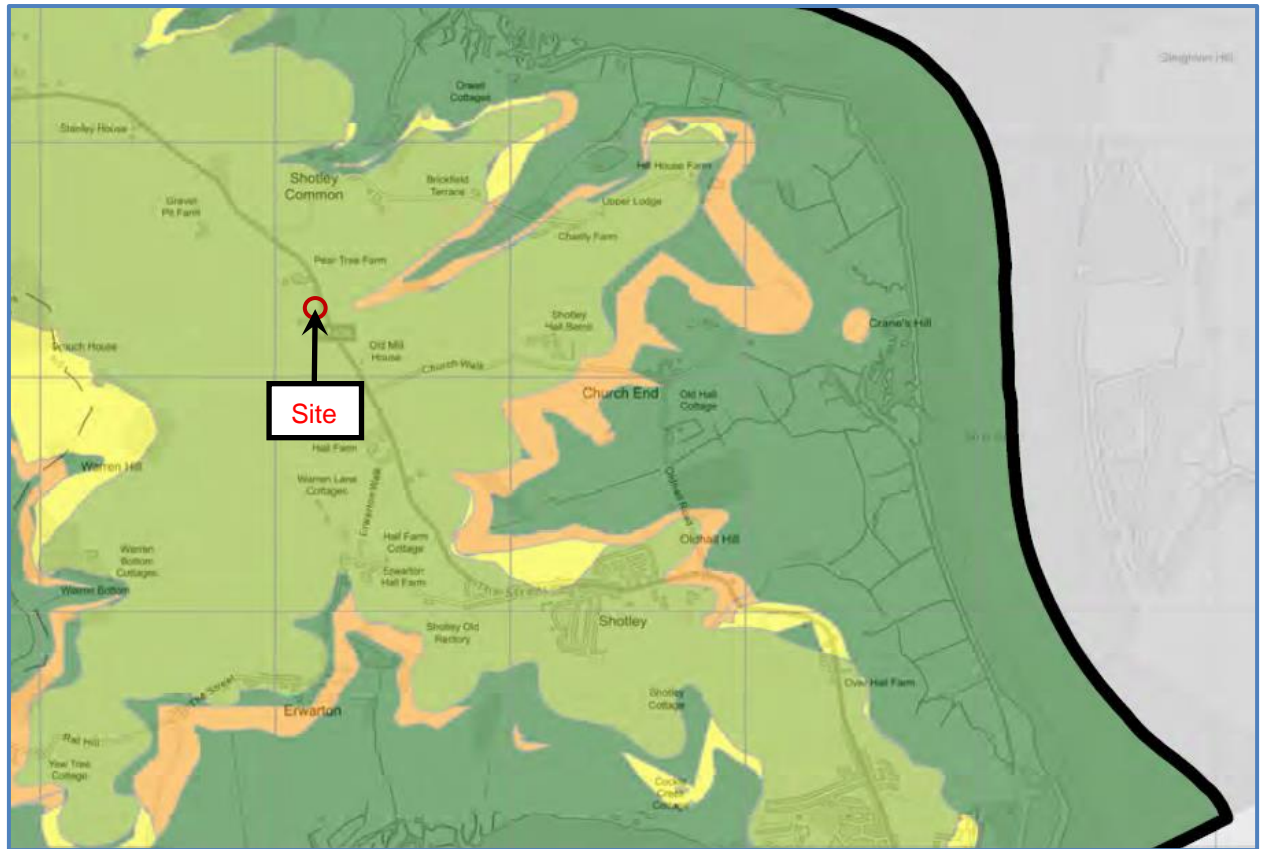


Figure 3.3 – Groundwater Flooding Susceptibility Map

3.21 However, to further minimise the risk of groundwater flooding, the proposed development:

- Will incorporate a raised Finished Floor Level as part of the surface water mitigation strategy detailed within Section 4 of this report.
- Does not include any below ground basement construction.

3.22 Therefore, the proposed development is considered to be at a ‘LOW RISK’ of flooding from this source.

3.23 **Non-natural or Artificial Flooding** - can include reservoirs, canals and lakes where water is retained above the natural ground level and flooding may occur as a result of the facility becoming overwhelmed or as a result of dam or bank failure. The potential effects of flood risk management infrastructure should also be considered.

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3.24 The indicative reservoir flood mapping available on the GOV.UK website and included within Figure 3.4 below demonstrates that the proposed development site is located outside the extent of any reservoir breach flooding scenario.



Figure 3.4 – Reservoir Indicative Flood Mapping

3.25 In addition to the above flood mapping, a review of the OS mapping did not identify any artificial sources of flooding which could affect the proposed development.

3.26 Therefore, the proposed development is considered to be at a 'LOW RISK' of flooding from this source.

Strategic Flood Risk Assessment

3.27 As part of the site assessment, a review of the following documents has been undertaken:

- Babergh & Mid Suffolk Level 1 Strategic Flood Risk Assessment (JBA Consulting – August 2020)
- Babergh & Mid Suffolk Level 2 Strategic Flood Risk Assessment (JBA Consulting – October 2020)

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3.28 The above reports did not provide any site-specific comments in relation to flood risk and surface water drainage beyond the above site-specific assessment.

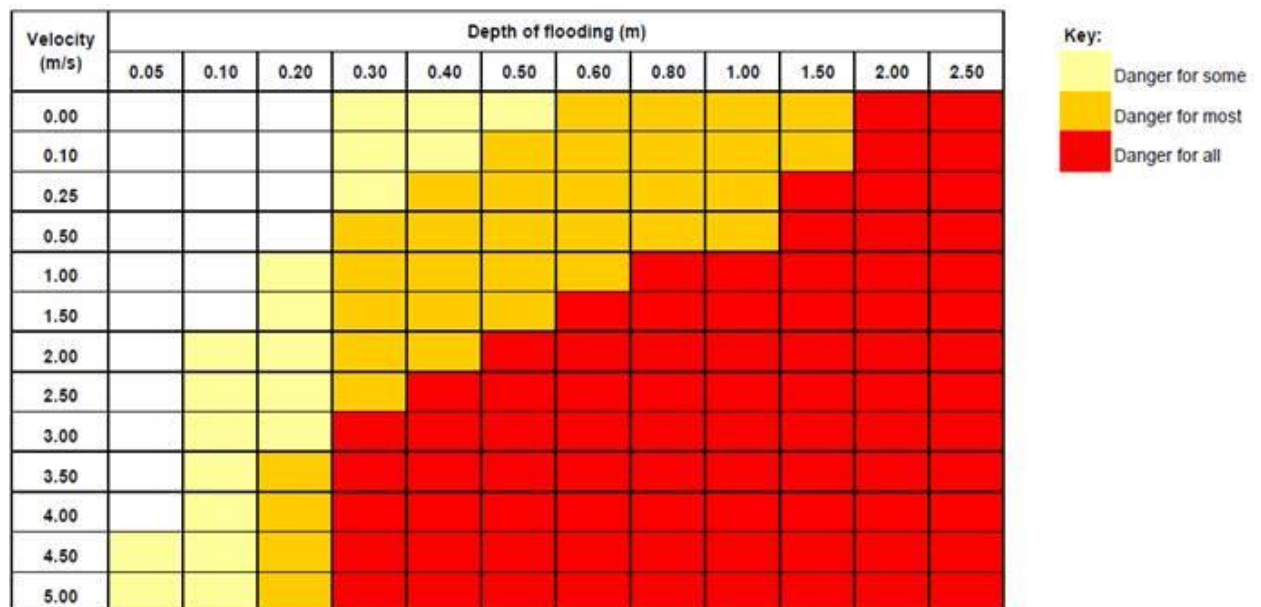
Description of Flooding

3.29 The site is considered to be a low risk of flooding from all sources except surface water flooding which is considered to present a ‘Low’ to ‘Medium’ risk due to the increased amount of impermeable area created by the development of the site and the partial location of the rear garden within the surface water flood extent.

3.30 Therefore, the focus of this report will be to mitigate the flood risk posed from this source of flooding by implementing the mitigation measures stated within Section 4. However, flood risk from other sources will not be overlooked and the measures put forward to mitigate the risk of surface water flooding will also further reduce the already low risk from other sources of flooding.

Access and Egress

3.31 In accordance with the NPPF and the Flood Risk and Coastal Change PPG, access and egress to the site during a range of storm events should be considered with preference being over dry land. However, where this is not possible, evacuation should fall within the white cells as classified within Table 13.1 of FD2320_TR2 and shown below.



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3.32 The access and egress route for the proposed dwelling has been included within Figure 3.5 below. The route includes direct access onto Main Road (adopted highway) via the private gravel driveway and then continues north where ground levels continue to rise.

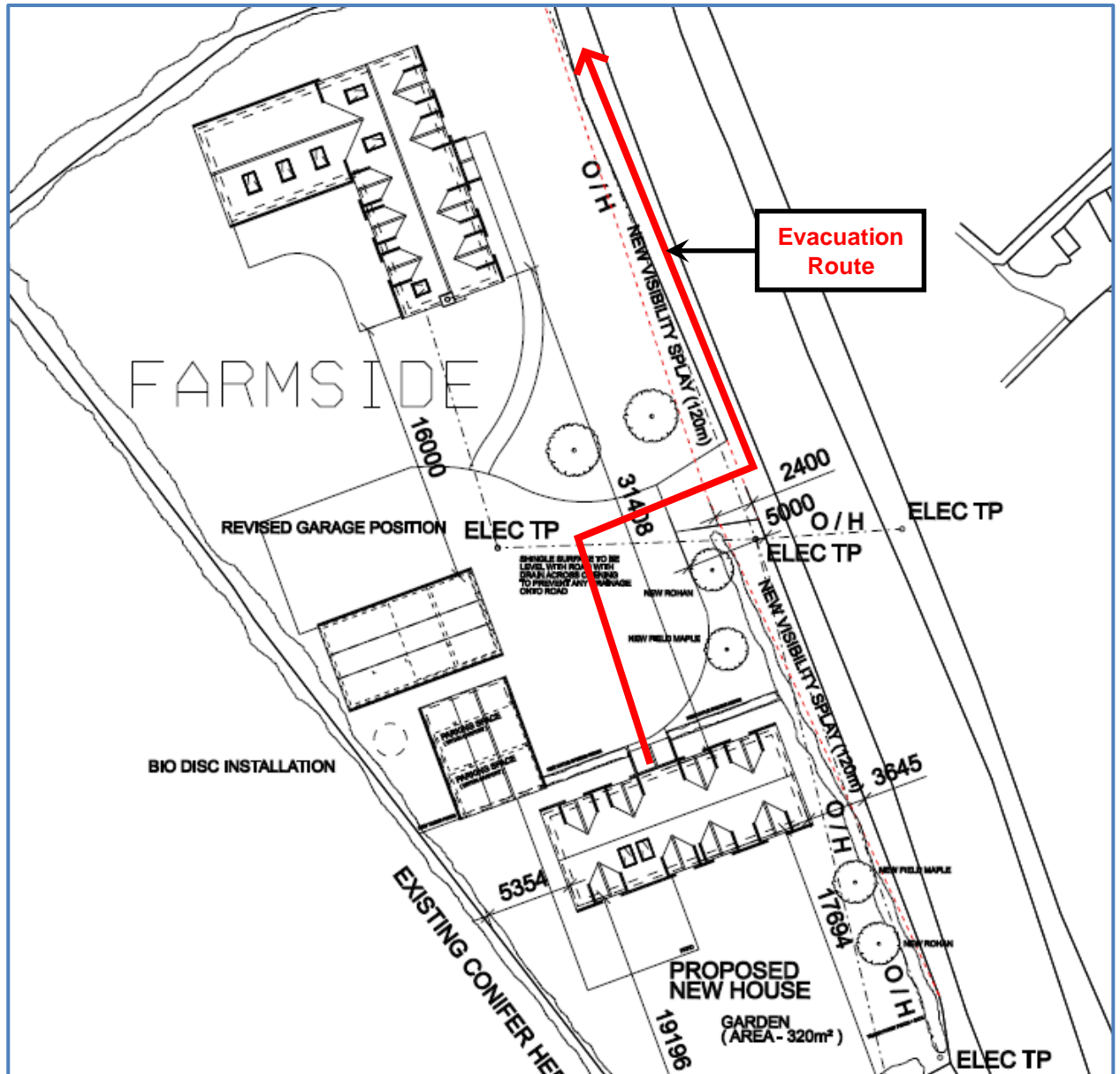


Figure 3.5 – Evacuation Route

3.33 The access and egress route is located outside of the fluvial, tidal and surface water flood extents when compared to the flood mapping included within Figure 3.1 and Figure 3.2. Therefore, the above access and egress conditions are considered to be safe up to the 1000-year storm event.

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Vulnerability Classification

- 3.34 Annex 3 of the Flood Risk and Coastal Change PPG provides a list of different development types which fall into the vulnerability classifications also defined within the Flood Risk and Coastal Change PPG.
- 3.35 The proposed development is intended for residential use and therefore the flood risk classification indicates that this falls within the "**More Vulnerable**" classification.

Sequential and Exception Tests

- 3.36 The proposed development is classified as “More Vulnerable” and the sequential design of the site layout has located the proposed residential dwelling and cart lodge within Flood Zone 1 and outside the extent of surface water flooding.
- 3.37 Therefore, in accordance with Table 2 (see below) of the Flood Risk and Coastal Change PPG,
 - The proposed residential dwelling and cart lodge are located within an acceptable Flood Zone.
 - The Exception Tests is not required to be undertaken by the Local Planning Authority as part of the planning process.

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	x	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	x	x	x

Key: ✓ Development is appropriate.
 x Development should not be permitted.

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4 Flood Risk Mitigation Measures

4.1 To enable the site to be considered in line with the NPPF and the Flood Risk and Coastal Change PPG, appropriate flood mitigation measures need to be set in place. The measures laid out below, are put forward as those that will be incorporated within the detailed design and operation of the proposed development.

Site Level Strategy

- 4.2 The 1000-year surface water flood extent is very close to the south side of the residential dwelling where the flood depth would be 0mm.
- 4.3 Therefore, the Finished Floor Level of the proposed dwelling will be set 300mm above the existing ground levels to the north of the residential dwelling where ground levels are higher than the south. This will provide a freeboard greater than 300mm above the 1000-year surface water flood level.
- 4.4 Where topography permits, all external hard and soft landscaping areas should be designed to fall away from the proposed and existing dwellings. This will reduce flood risk in the event of a sewer surcharging or overland flow flood event and prevent flood water entering the buildings and instead will be flood routed towards the garden area.

Flood Resilient Construction Techniques

- 4.5 The use of flood resilient construction techniques in accordance with 'Improving the Flood Performance of New Buildings: Flood Resilient Construction' and 'Prepare your Property for Flooding' will be considered during the detailed design of the proposed development.

Surface Water Drainage Strategy

- 4.6 The development will incorporate a Sustainable Drainage System (SuDS) that suits the site conditions and location. However, all sites have constraining factors, and this means that certain SuDS solutions may be restricted.
- 4.7 In accordance with the surface water drainage hierarchy, infiltration drainage is the preferred method of surface water disposal, and this has been considered during the early stages of the development's drainage strategy.

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- 4.1 The British Geological Survey (BGS) digital mapping of Great Britain at 1:50,000 scale identifies the site geology as follows:
- Superficial Deposits – Kesgrave Catchment Subgroup (Sand & Gravel)
 - Bedrock Geology – Red Crag Formation (Sand)
- 4.2 Based on the above geology description and the amount of land available within the rear garden, it is proposed that the residential dwelling discharges to infiltration drainage techniques such as soakaways. This is also known to be the current method of surface water disposal for the adjacent development to the north.
- 4.3 During the detailed design stage percolation testing in accordance with BRE 365 will be undertaken to enable the design of the infiltration drainage system to be undertaken and ensure the following design criteria have been taken into account.
- The infiltration drainage system should contain the critical 100-year storm event with a 40% increase in rainfall intensity to allow for the effect of climate change.
 - The infiltration drainage system should have a half drain time of less than 1440 minute (1 day) unless additional storage is provided to contain subsequent storm events.
- 4.4 The private surface water drainage system will be under the ownership of the future occupants of the residential dwelling, and they will be solely responsible for the drainage systems future maintenance and repair.
- 4.5 The maintenance regime for the private surface water drainage system is set out below and has been undertaken in accordance with CIRIA 753 The SuDS Manual.
- Undertake regular inspection and removal of litter and other debris (leaves) from the drainage catchment, including roads, car parks and soft landscaping areas.
 - Inspection and clearance of all gutters and filter meshes installed to protect the RWPs outlet points should be undertaken on an annual basis.
 - Inspection and clearance of all pre-treatment structures including catchpit gullies, inspection chambers (IC) and manholes to be undertaken on an annual basis.
- 4.6 The maintenance regime for the infiltration drainage system will be in accordance with the guidance provided within CIRIA 753 The SuDS Manual.

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Detailed Design

- 4.7 It is proposed that the mitigation measures set out above are controlled by conditions to the planning consent which will be approved by the LPA and their consultees.

5 Discussion and Conclusion

5.1 This Flood Risk Assessment has been undertaken in accordance with the:

- National Planning Policy Framework (NPPF).
- Flood Risk and Coastal Change Planning Practice Guidance (PPG).

5.2 The report demonstrates that:

- The proposed development is located within Flood Zone 1 and is considered to be at a low risk of flooding from all other sources. This risk will be further reduced with the suggested mitigation measures as stated within Section 4 implemented into the development design.
- The sequential design of the site layout has located all built development within Flood Zone 1 and outside of the surface water flood extents. Therefore, the Sequential and Exception Tests are not required to be undertaken as part of the planning process.
- The proposed development will incorporate a sustainable surface water drainage strategy which will ensure the risk of flooding and pollution is not increased.
- The ownership and maintenance strategy for the proposed surface water drainage systems has been identified/provided.

5.3 Therefore, the proposed development is considered appropriate from a flood risk and surface water drainage perspective subject to the implementation of the recommended mitigation measures put forward as part of this report.

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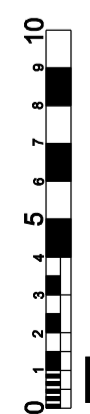
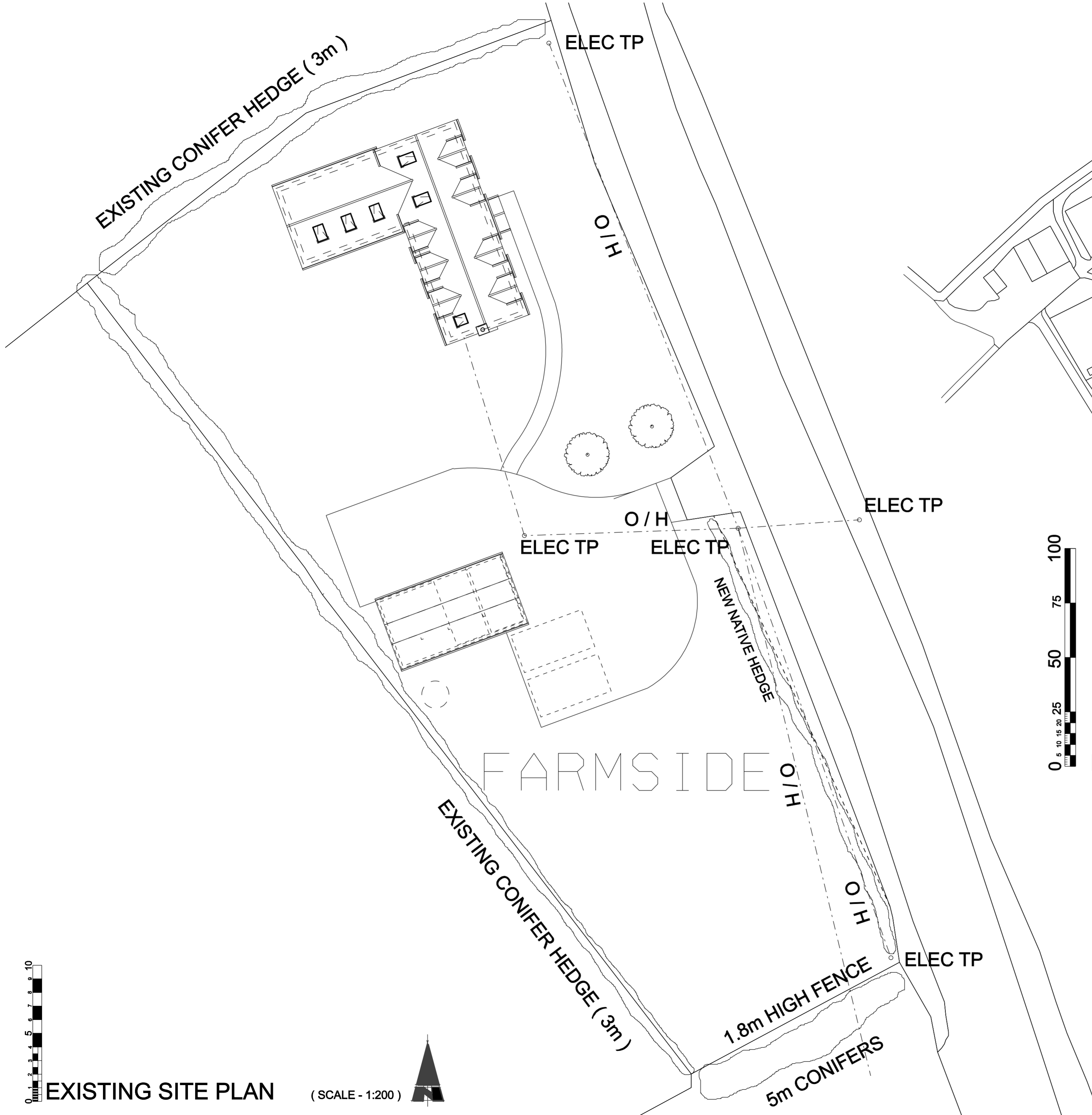
Appendices

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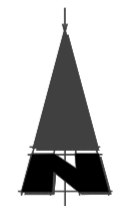
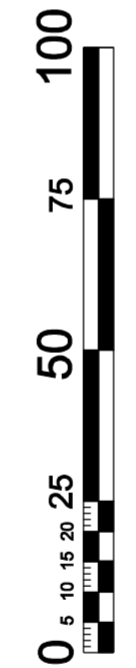
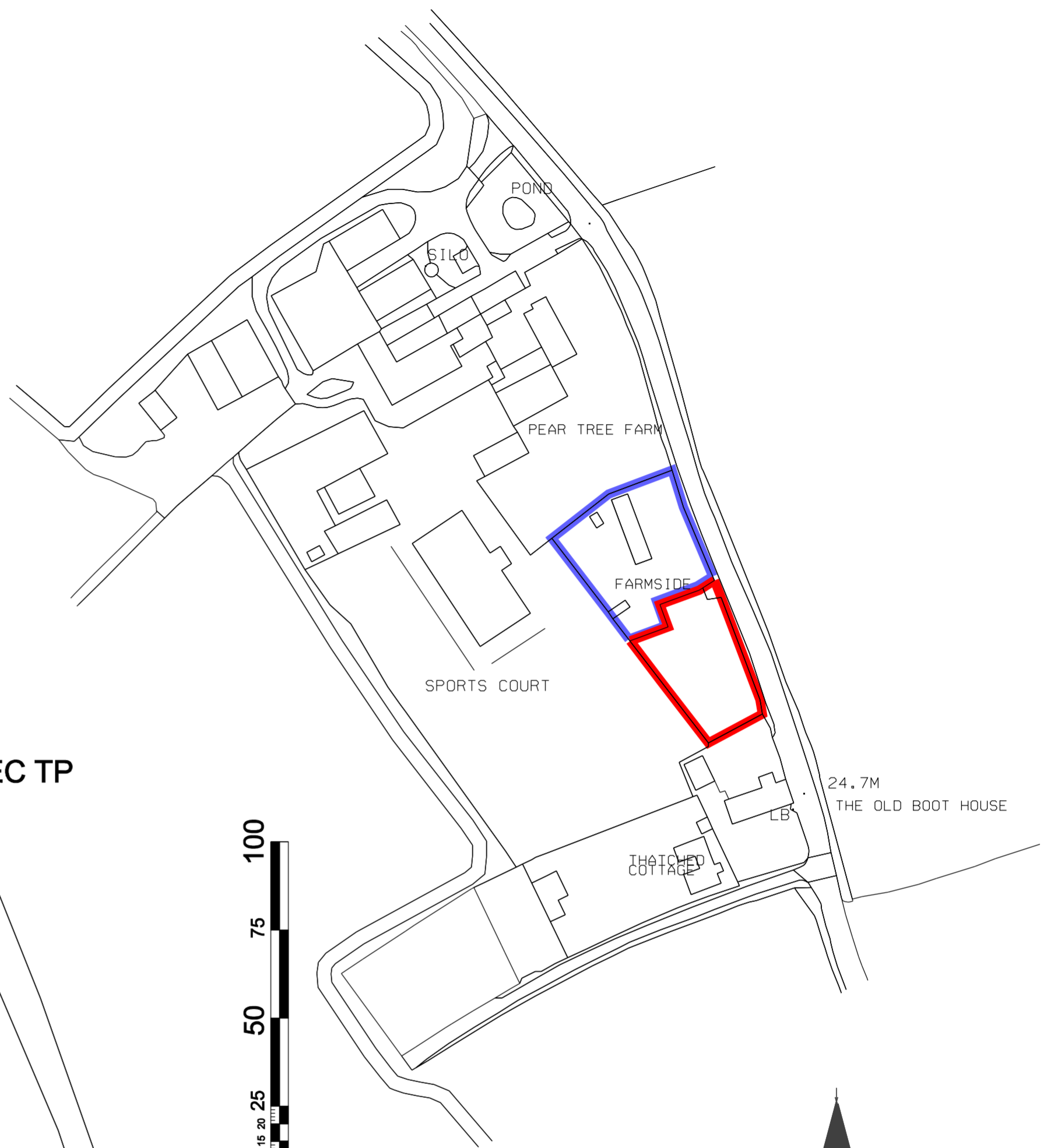
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk

Appendix A


Existing Site Layout



EXISTING SITE PLAN (SCALE - 1:200)



LOCATION PLAN (SCALE - 1:1250)

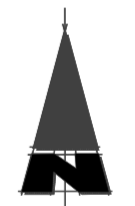
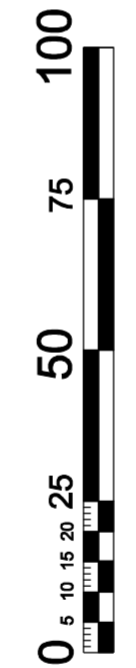
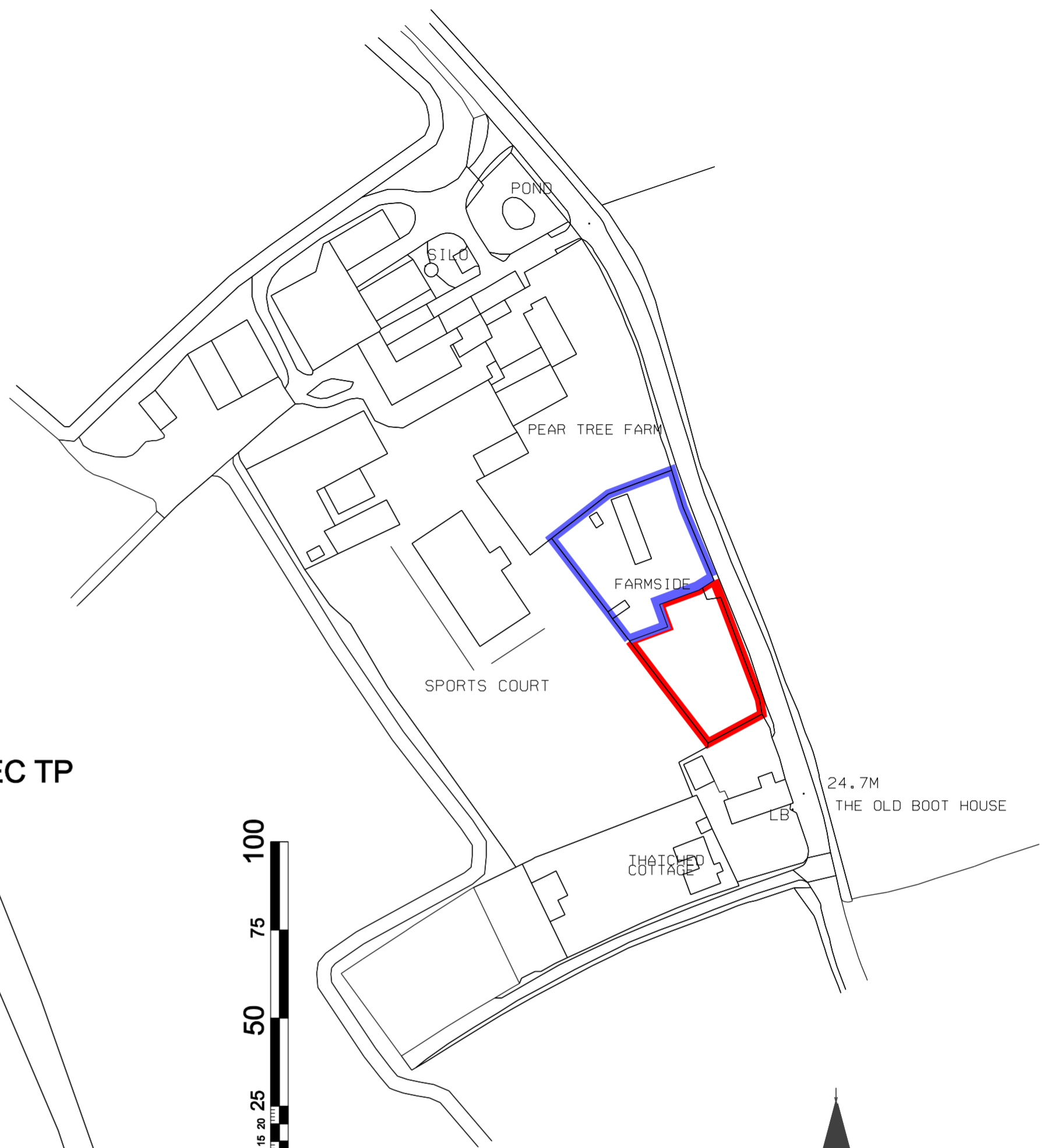
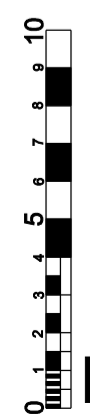
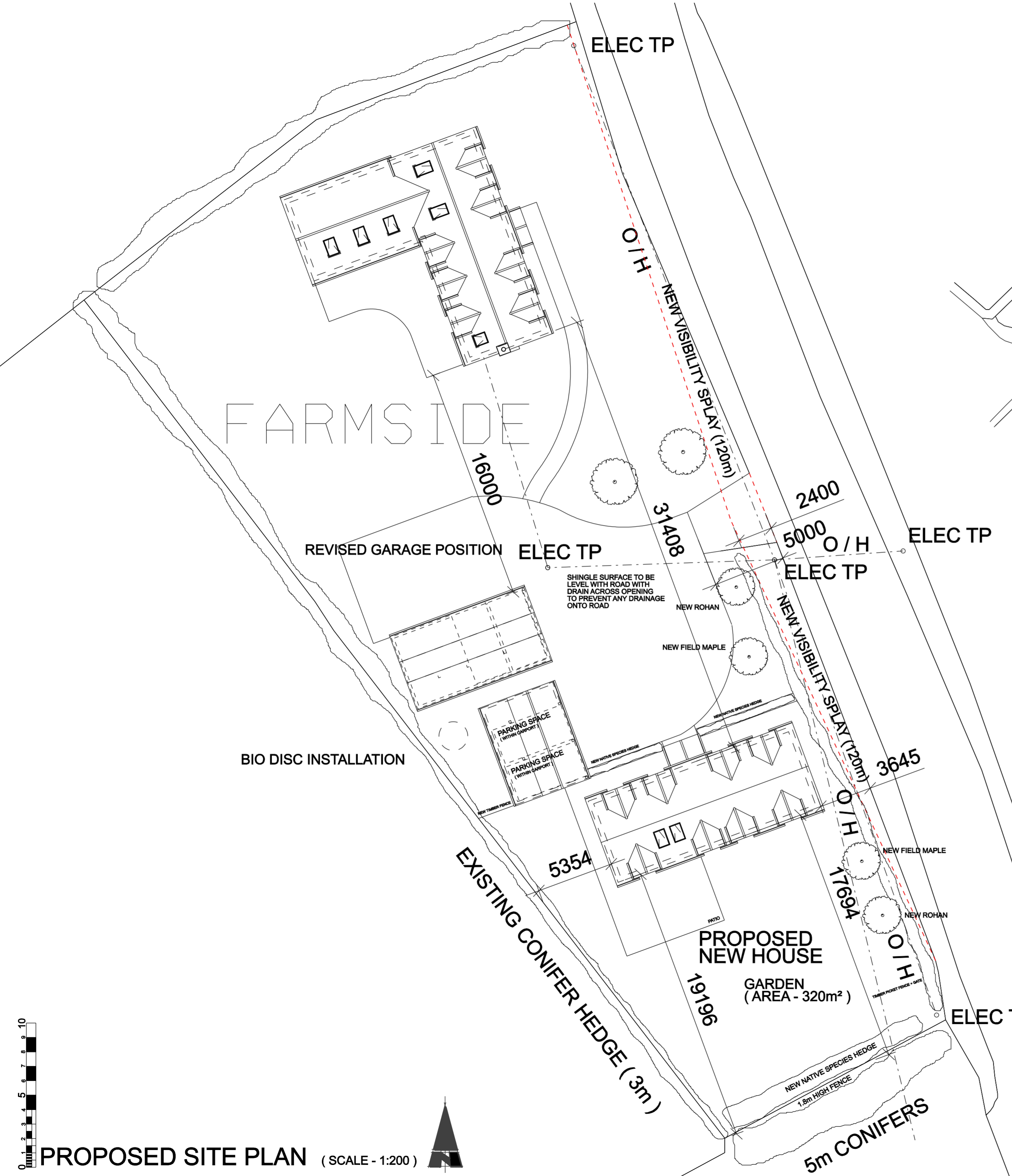
revision	date	amendment
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Scale: AS SHOWN @ A3	Drawing No: E.1888 - 22 - 08	Date: OCTOBER 2022
 Richard Edwards Associates Building Surveyors Tel : 01277 356877 Mobile : 07714 324285 Email : redwardsassoc@aol.com Web : www.redwardsassoc.co.uk The Studio Ivy Hill Writtle Road Margarettng Essex CM4 0EH		
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Appendix B

Proposed Development Layout



revision	date	amendment
REV C	29/11/2022	PLAN REVISED
REV B	03/11/2022	PLAN REVISED
REV A	09/10/2022	PLAN REVISED

Client:
FARMSIDE
SHOTLEY IPSWICH SUFFOLK IP9 1EY

Drawing Title:
PROPOSED SITE PLAN AND LOCATION PLAN

Scale: AS SHOWN @ A2	Drawing No: E.1888 - 22 - 01C	Date: AUGUST 2022
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Building Surveyors

RICS

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Appendix C

M30 Surface Water Flood Mapping

30-Year Surface Water Flood Mapping

Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



30-Year Surface Water Flood Extent

30-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



30-Year Surface Water Flood Depth

30-Year Surface Water Flood Mapping
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30-Year Surface Water Flood Velocity

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Appendix D

M100 Surface Water Flood Mapping

100-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



100-Year Surface Water Flood Extent

100-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



100-Year Surface Water Flood Depth

100-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



100-Year Surface Water Flood Velocity

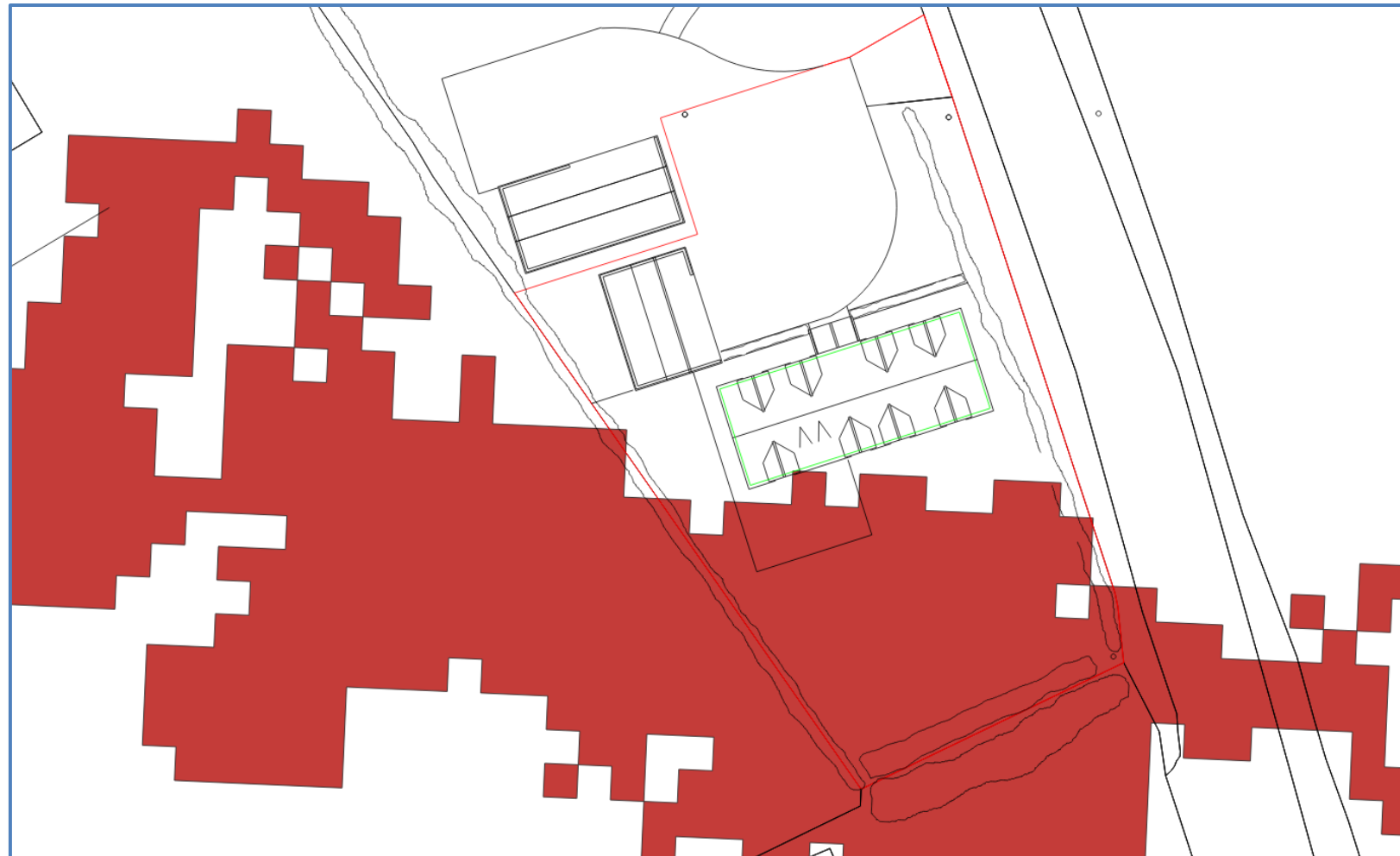
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Appendix E

M1000 Surface Water Flood Mapping

1000-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



1000-Year Surface Water Flood Extent

1000-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



1000-Year Surface Water Flood Depth

1000-Year Surface Water Flood Mapping
Residential Dwelling – Farmside, Main Road (B1456), Shotley, Suffolk, IP9 1EY



1000-Year Surface Water Flood Velocity