Flood Risk Assessment for Planning

March 2025

Prepared for:

Elisabeth & Murray Mackay

Location:

The Barn

Garden Farm

The Town

Great Staughton

St Neots

PE19 5BE

Our reference:

95401-Tye-TheTown



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Document Issue Record

Project Details	
Project:	Flood Risk Assessment for Planning
Prepared for:	Elisabeth & Murray Mackay
Application:	Demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps
Location:	The Barn, Garden Farm, The Town, Great Staughton, St Neots, PE19 5BE
Our reference:	95401-Tye-TheTown
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1. Key Facts

Flood Risk Posed:

- Site is located within Flood Zone Flood Zone 1 (Low Probability).
- No Flood Storage Areas located in close proximity to the site.
- There are no formal raised flood defences owned or operated by the EA protecting the site.
- The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at "Very Low" to "High" chance of flooding from surface water for the present day and between 2040 – 2060.
- The site appears to be located within the 1:30 year, 1:100 year and 1:1000 year surface water extents.
- The site is located partially within an area that has no risk to groundwater flooding and partially within an area where groundwater levels are either at or very near (within 0.025m of) the ground surface in the 100 year return event.
- No information has been presented to suggest that the site itself has been affected by sewer flooding.
- The EA hold no records of historic flooding having affected the site however historic flooding has occurred in the surrounding area in March 1947.

Flood Risk Mitigation:

- The proposed application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.
- Post development, the site will remain "more vulnerable" (residential).
- Flood proofing of the development will be incorporated as appropriate.
- There will be no unacceptable loss of fluvial floodplain storage.
- Due to the scale of development, a full Surface Water Drainage Strategy is not required at this stage of planning.
- The applicant will register with the National Severe Weather Warning Service.

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

2. Introduction

2.1. Unda Consulting Limited have been appointed by Elisabeth & Murray Mackay (hereinafter referred to as "the applicant") to undertake a Flood Risk Assessment for the proposed development at The Barn, Garden Farm, The Town, Great Staughton, St Neots, PE19 5BE (hereinafter referred to as "the site"). The purpose of the study is to support a planning application for the proposed development.

2.2. This report presents our findings based on the readily available information and data relating to the site and surrounding drainage area.

2.3. The site appears to be located within Flood Zone 1 as defined by the Environment Agency (EA) on their Flood Map for Planning. Under the National Planning Policy Framework (NPPF), a FRA is required if a proposed development:

- Includes building or engineering works in Flood Zone 2 or 3;
- Includes building or engineering works on land classified by the Environment Agency as having critical drainage problem;
- Changes the use of land or buildings in a location at risk of flooding from rivers or the sea, or with critical drainage problems;
- Changes the use of land or buildings in a way that increases the flood vulnerability of the development where it may be subject to other sources of flooding;
- Is larger than 1 hectare.

2.4. The assessment should demonstrate to the Local Planning Authority (LPA) and EA how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its potential users.

- Whether the proposed development is likely to be affected by current or future flooding from any source;
- Whether it will increase flood risk elsewhere;
- Whether the measures proposed to deal with these effects and risks are appropriate.

3. Existing Site

3.1. The site comprises of a large timber framed barn adjacent to a 16th Century Grade ll listed Garden Farmhouse.

3.2. The surrounding area is characterised by rural land.

3.3. Existing plans are provided in the report Appendix.

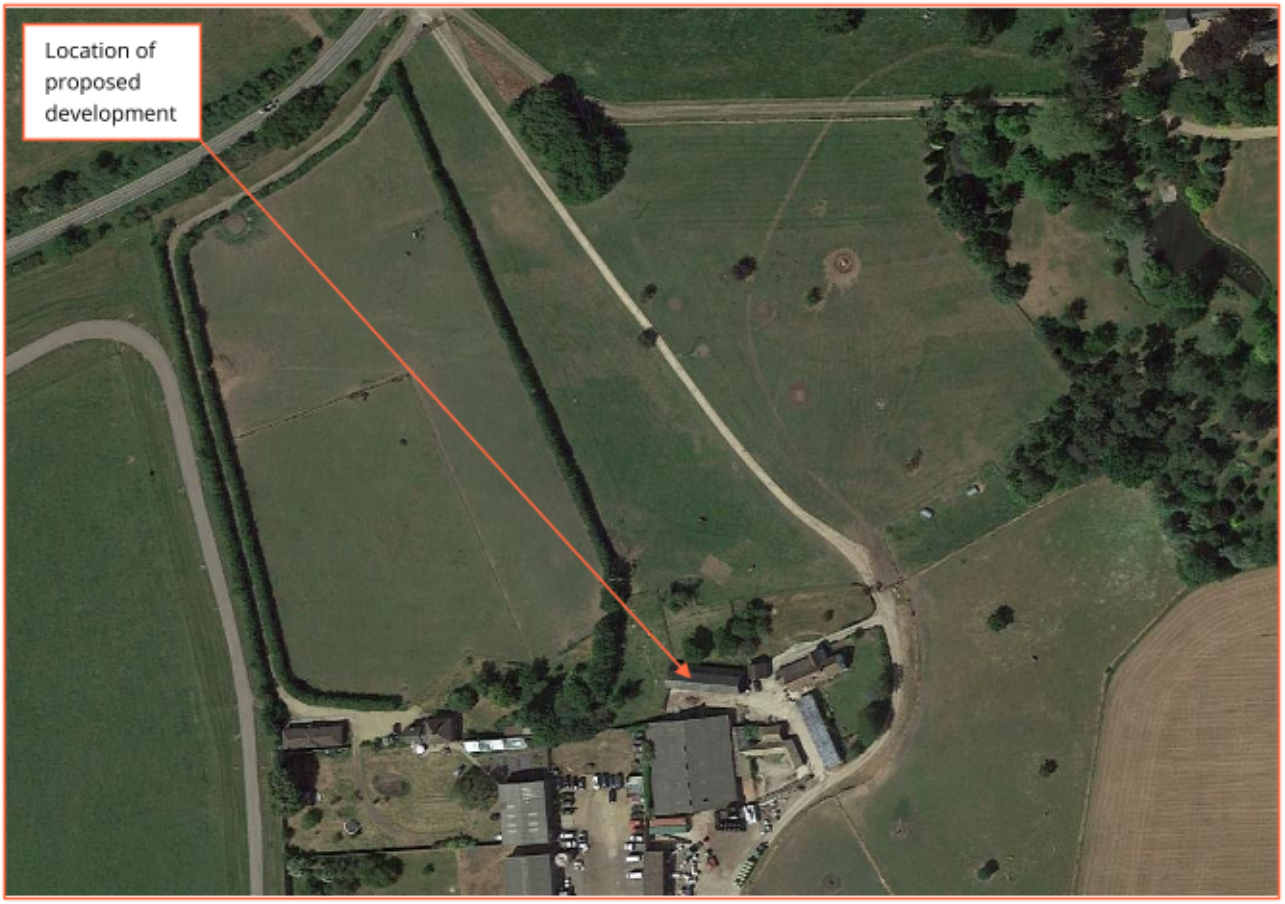


Figure 1: Aerial imagery of site and surrounding area (Source: Google Earth)



Figure 2: Tye Architects

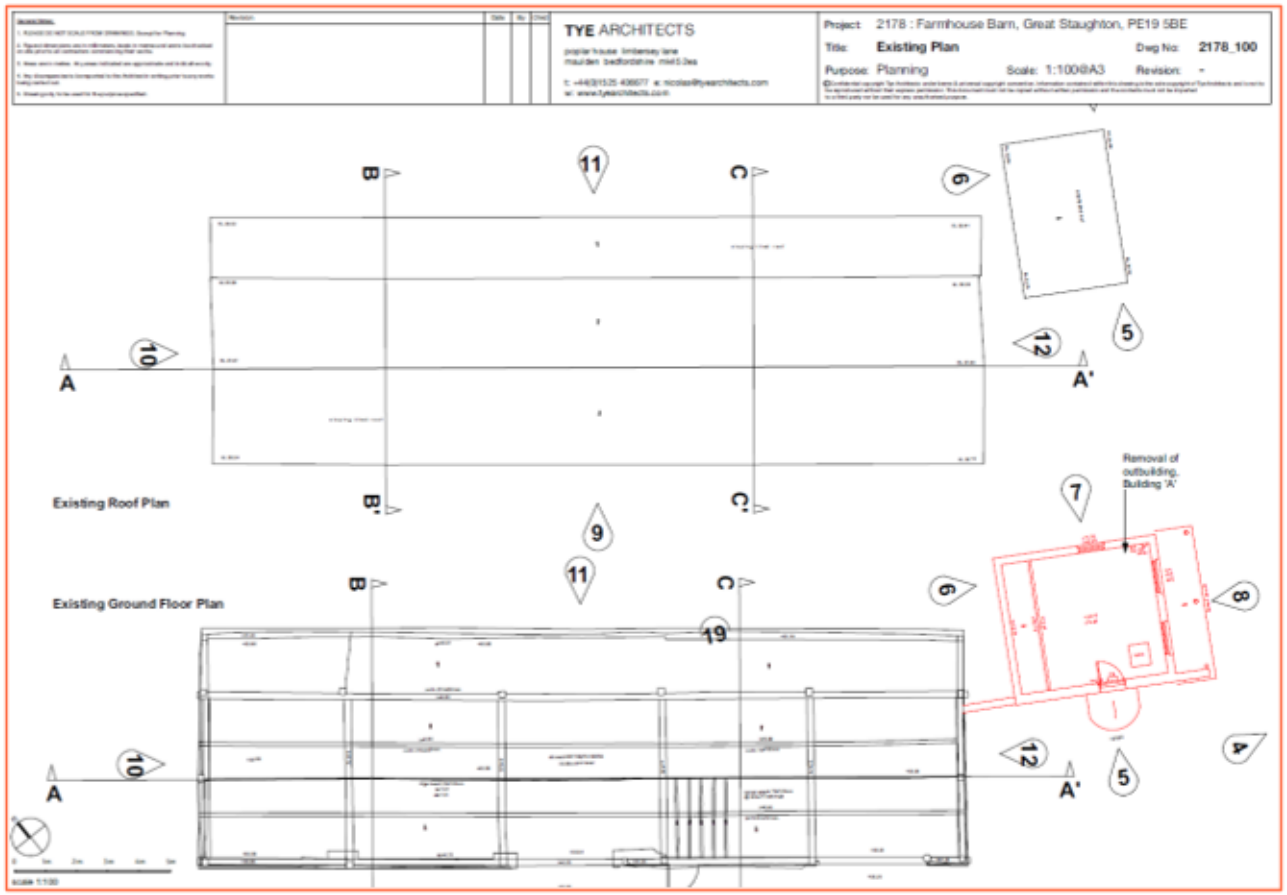


Figure 3: Existing plan (Source: Tye Architects)

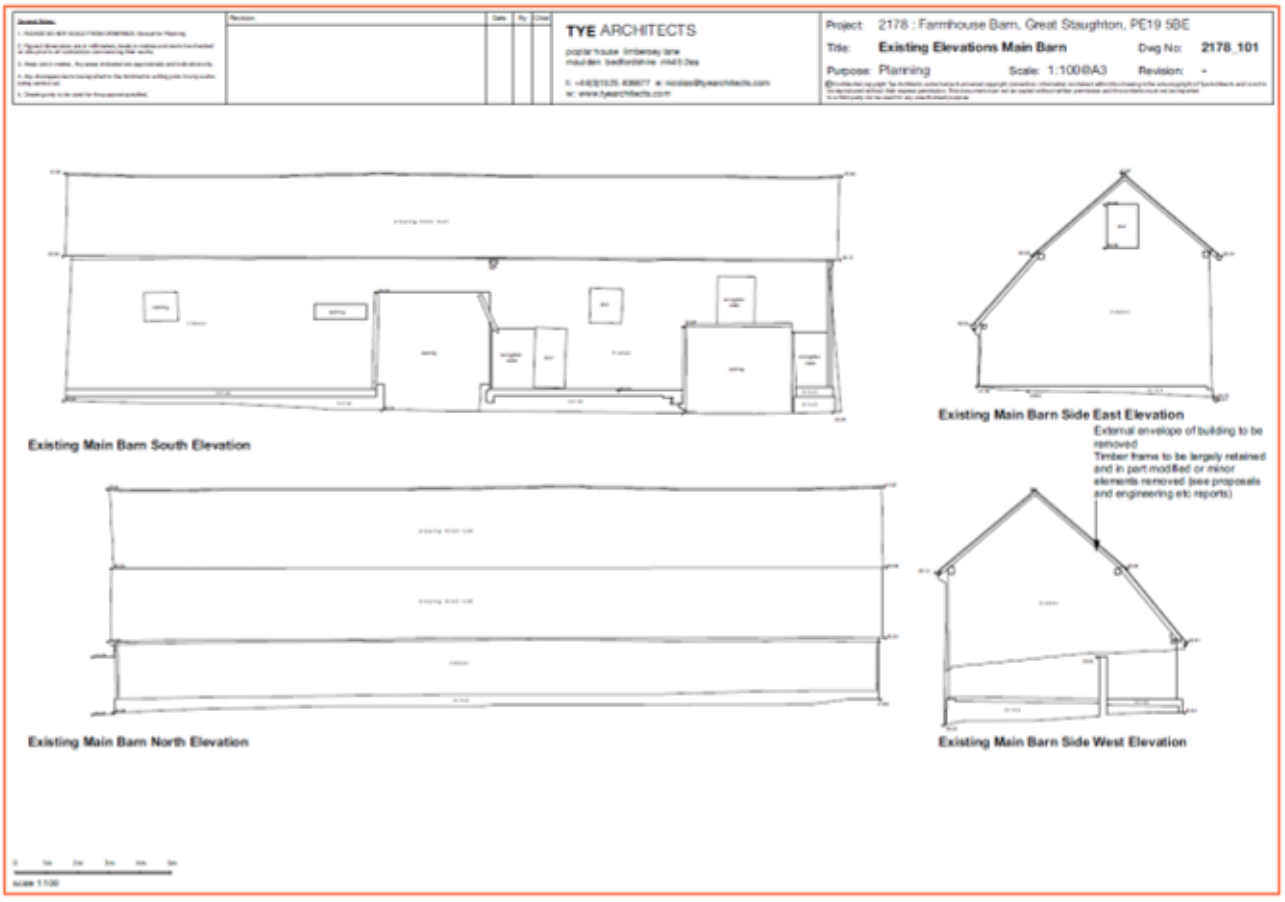


Figure 4: Existing elevations main barn (Source: Tye Architects)

Site Topography:

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

3.5. LiDAR remotely sensed digital elevation data suggests that the ground topography on site ranges from approximately 29.90mAOD to 32.40mAOD.

3.6. Topography in the area of the proposed development ranges from approximately 29.95mAOD to 32.40mAOD.

Existing Ground Conditions:

3.7. The 1:50,000 BGS map shows that the bedrock underlying the site is Oxford Clay Formation – Mudstone.

3.8. The BGS mapping shows superficial deposits of River Terrace Deposits, 1 to 2 – Sand and Gravel underlying part of the site.

3.9. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon relatively deep soils of River Terrace Sand/Gravel parent material with a soil texture of Sand to Sandy Loam and relatively deep soils of Claystone/Mudstone parent material with a soil texture of Clayey Loam to Silty Loam.

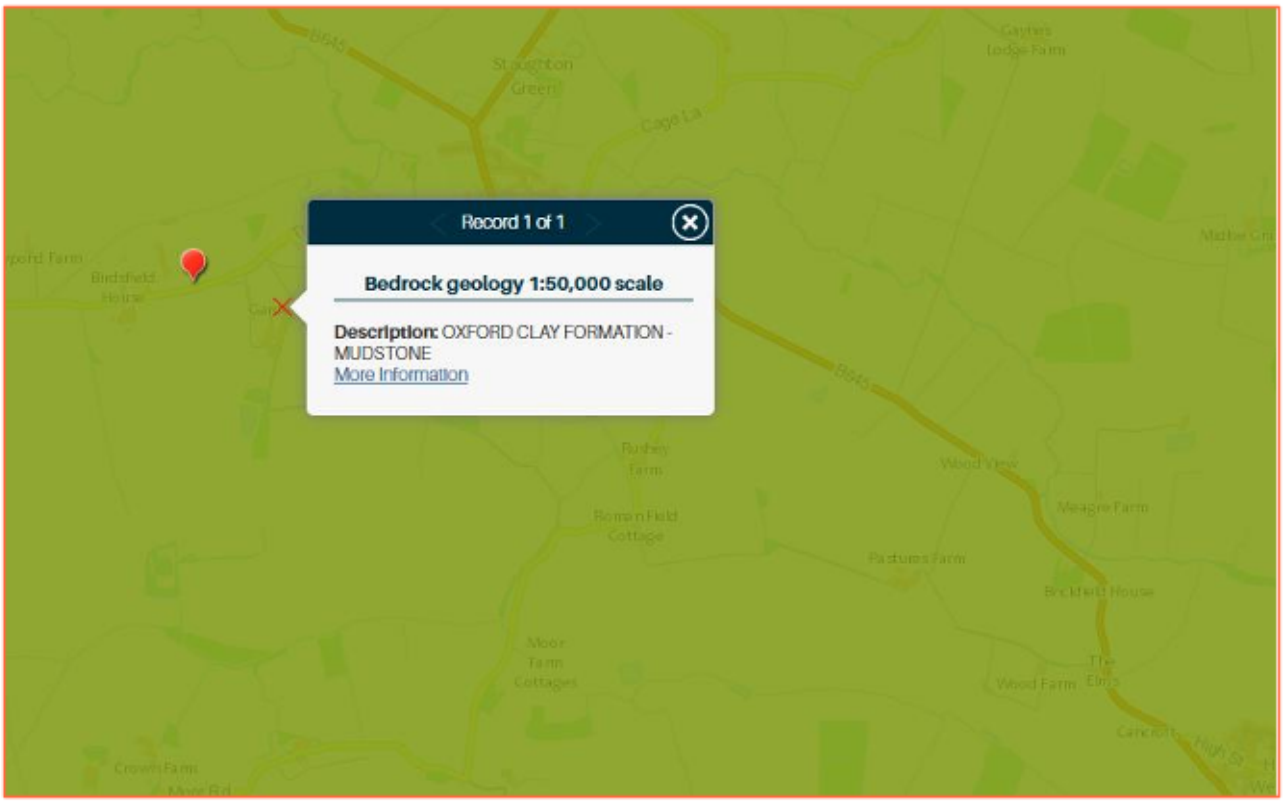


Figure 5: BGS bedrock geology (Source: BGS)

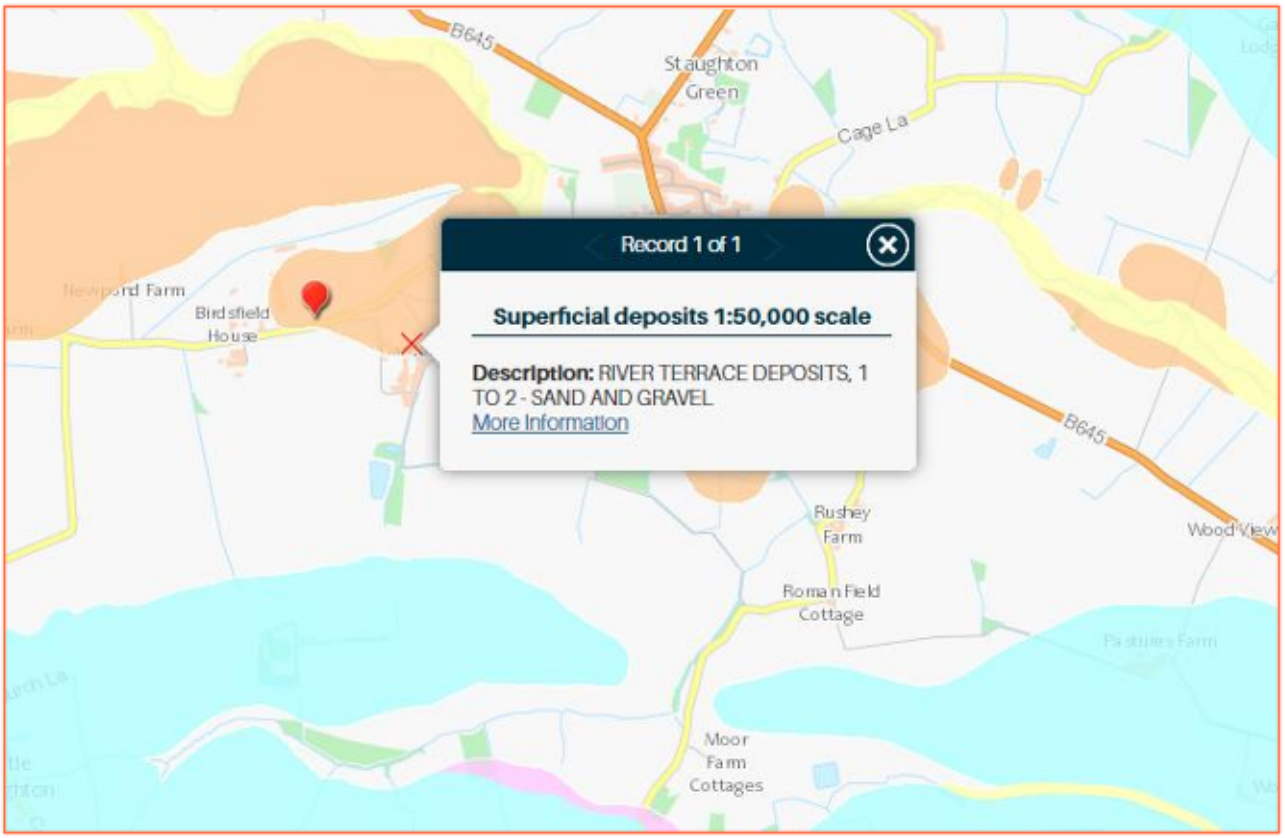


Figure 6: BGS superficial deposits (Source: BGS)

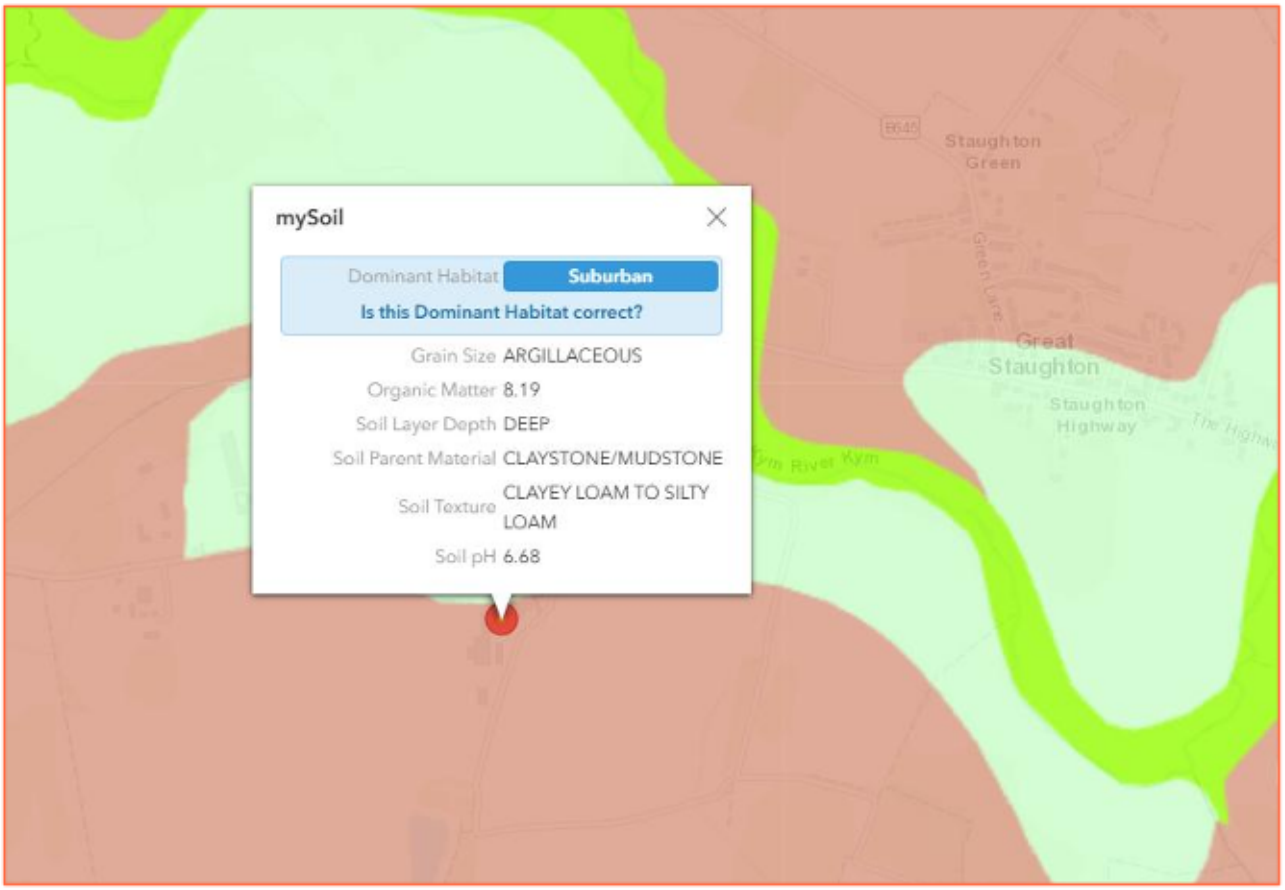


Figure 7: Soil map (Source: UK Soils, BGS)

Nearby Watercourses / Drainage Features:

3.10. The nearest watercourse to the site is an unnamed drain located approximately 80m south. The River Kym is located approximately 450m northeast.

4. Development Proposal

4.1. The proposed application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.

4.2. Proposed plans are provided in the report Appendix.

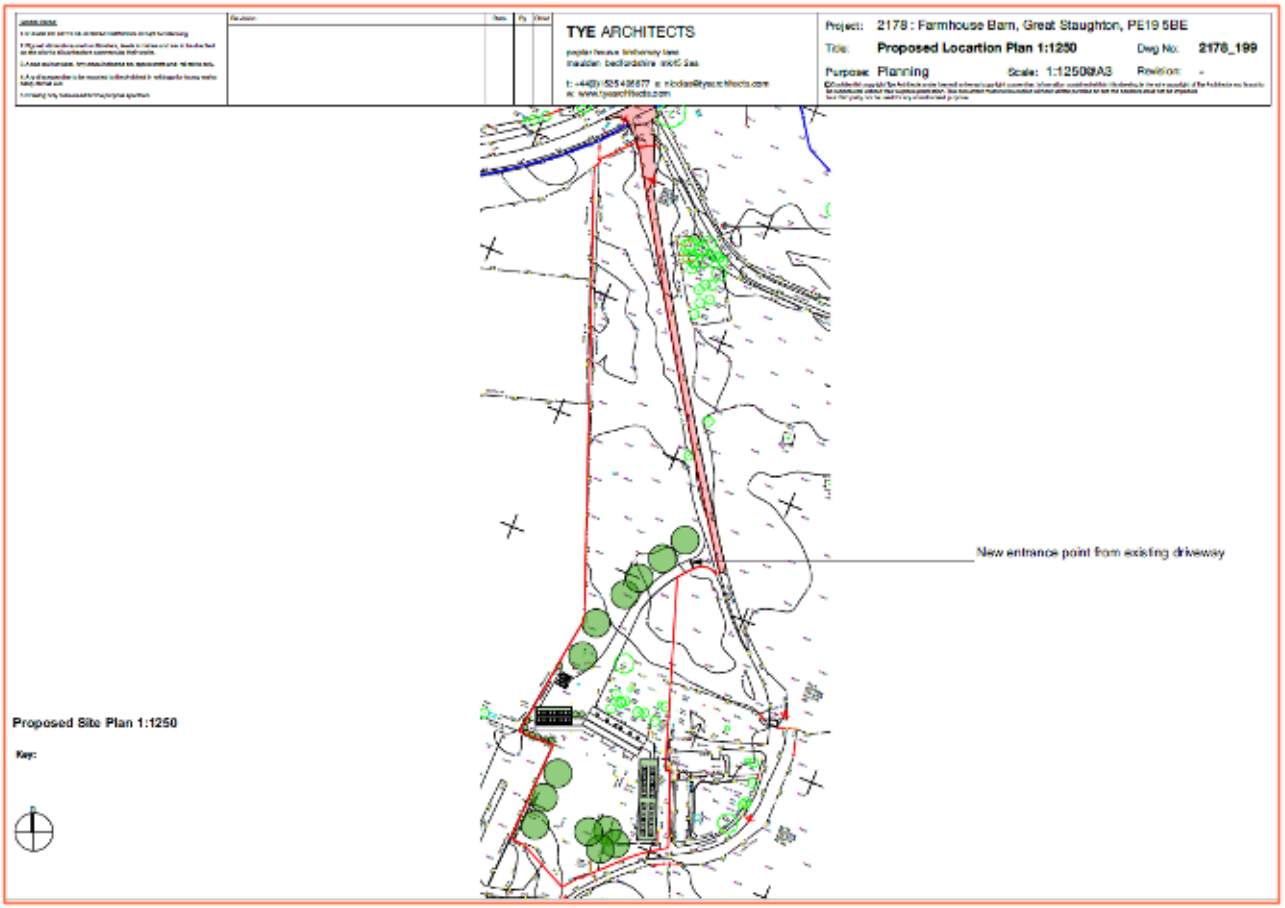


Figure 8: Proposed location plan (Source: Tye Architects)

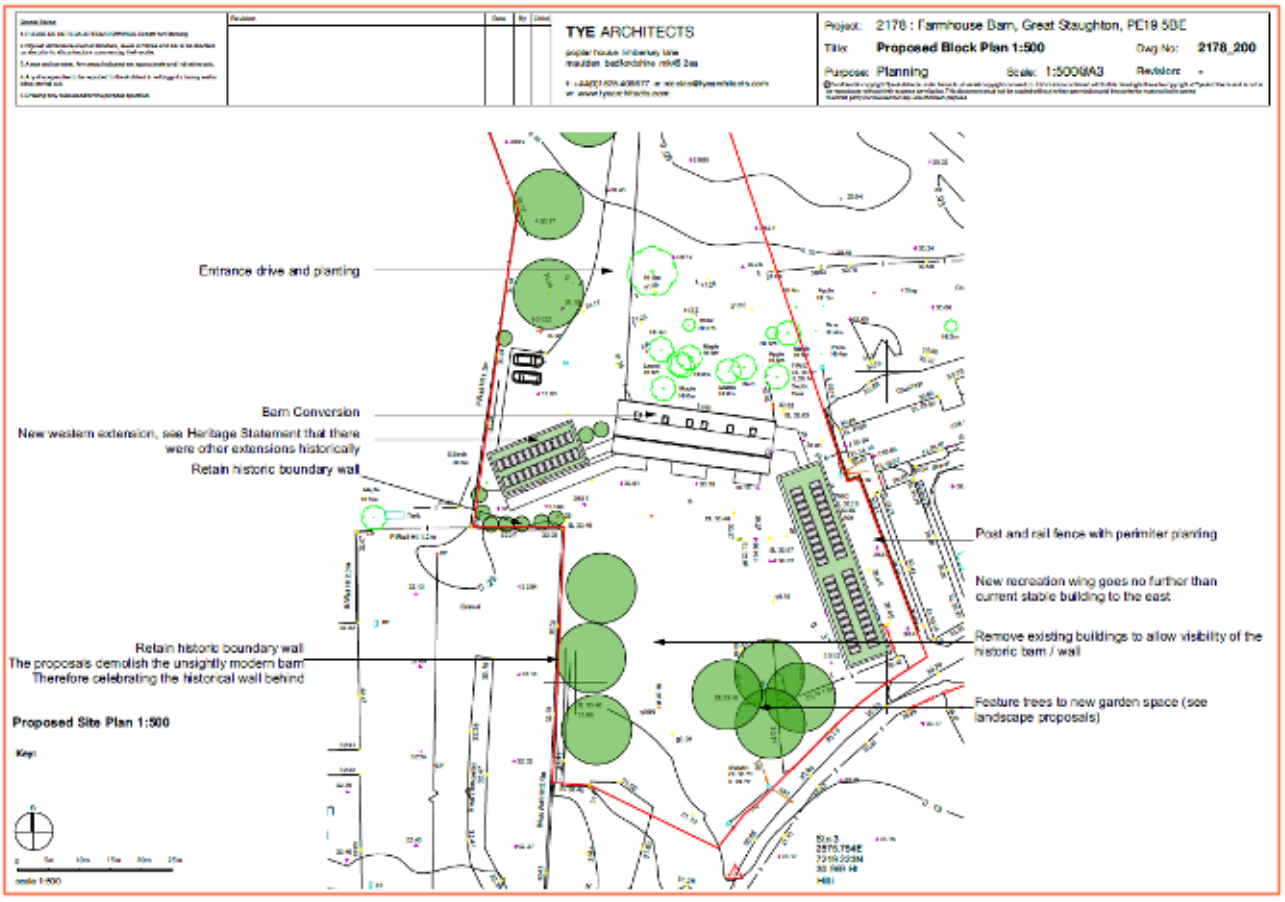


Figure 9: Proposed block plan (Source: Tye Architects)

5. Flood Risk Assessment

EA Flood Zones:

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

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

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

5.2. The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

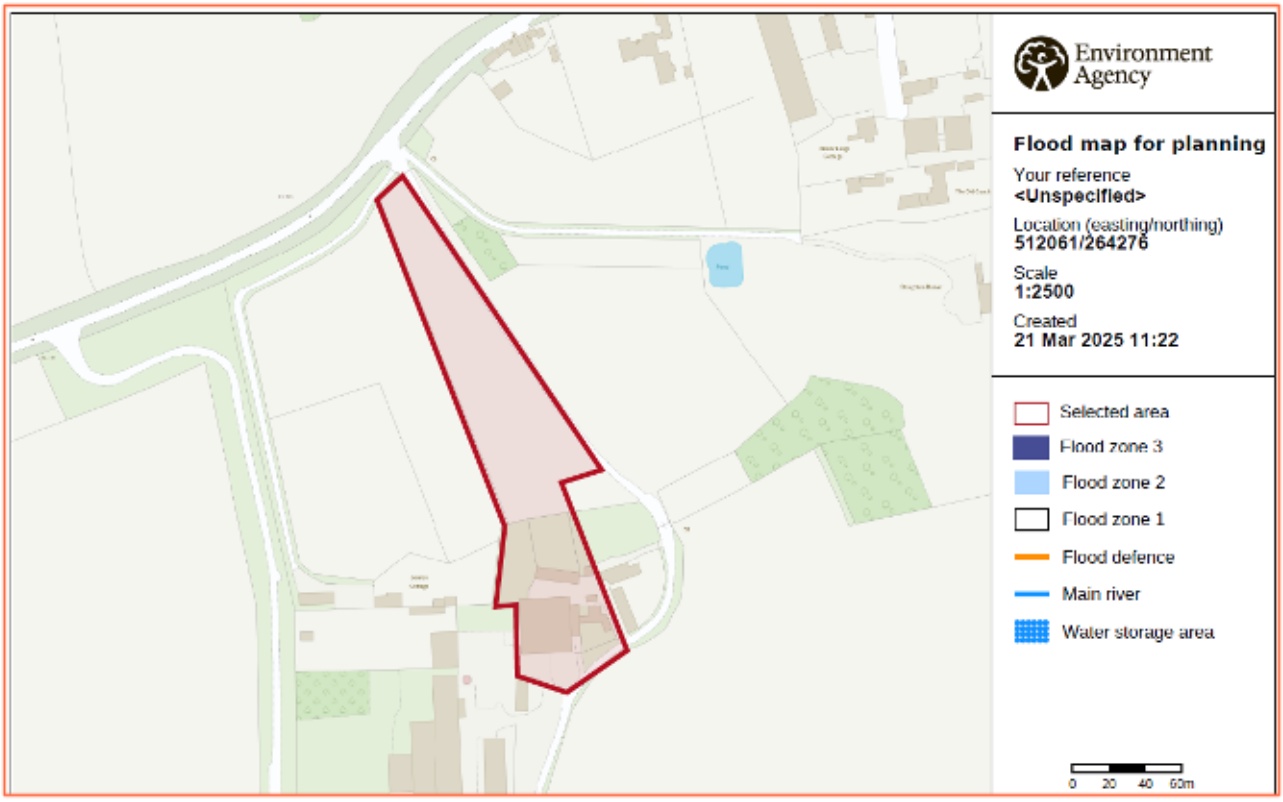


Figure 10: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

5.3. The site is situated entirely in Flood Zone 1 (Low Probability), defined as land having a less than 1:1000 year probability of river or sea flooding.

Alternative Flood Zones:

5.4. Within their Strategic Flood Risk Assessment (SFRA), Huntingdonshire District Council differentiates Flood Zone 3a from Flood Zone 3b, the functional floodplain. Flood Zone 3b comprises land where water is required to flow or be stored in times of flood. The functional floodplain designation encompasses land which would flood with an annual probability of 1 in 30 or greater in any year; and includes areas of land required for water conveyance routes.

5.5. According to the 2024 Huntingdonshire District Council SFRA, the site is located within Flood Zone 1, entirely outside of the functional floodplain.

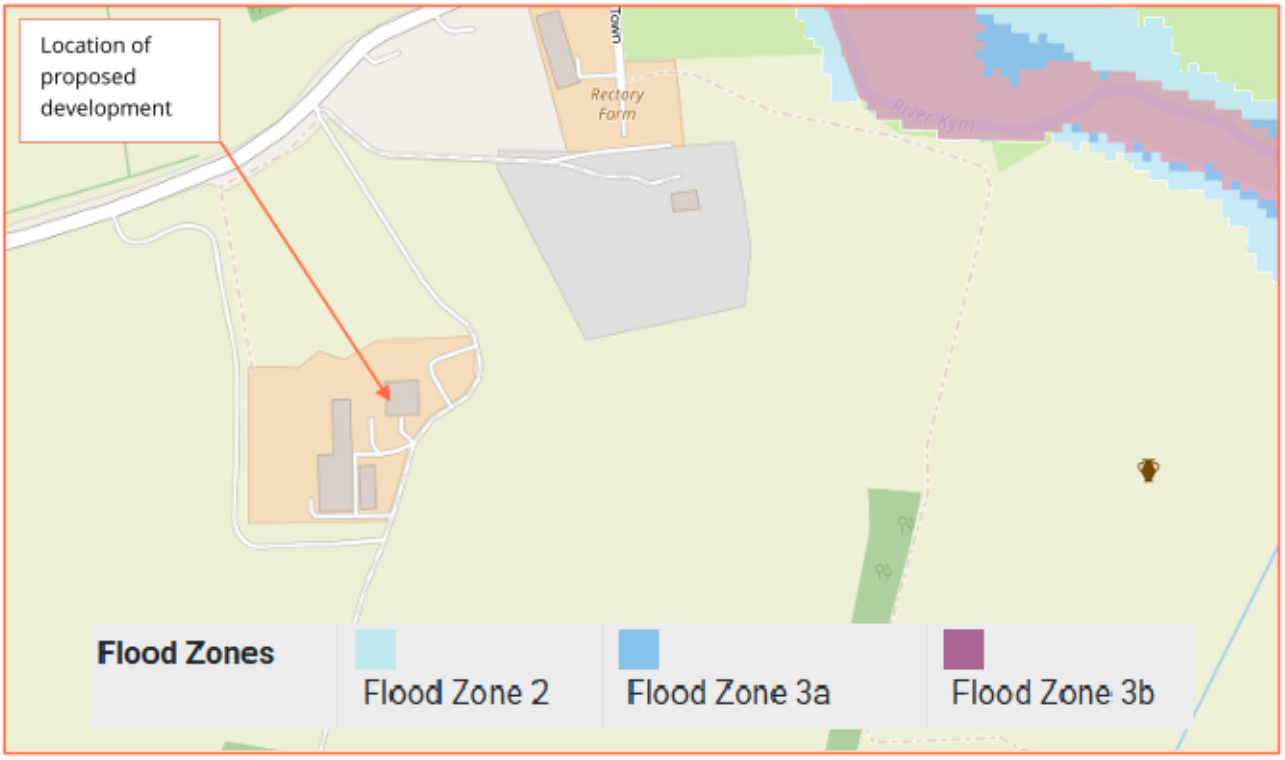


Figure 11: Huntingdonshire District Council Flood Zones (Source: 2024 Huntingdonshire SFRA)

Fluvial:

5.6. The site is situated entirely in Flood Zone 1 (Low Probability), defined as land having a less than 1:1000 year probability of river or sea flooding.

5.7. The nearest watercourse to the site is an unnamed drain located approximately 80m south. The River Kym is located approximately 450m northeast.

Flood Storage Areas:

5.8. Flood Storage Areas are areas that act as a balancing reservoir, storage basin or balancing pond. Their purpose is to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel. It may also delay the timing of a flood peak so that its volume is discharged over a longer time interval. Flood storage areas do not completely remove the chance of flooding and can be overtopped or fail in extreme weather conditions.

5.9. According to EA data, there are no Flood Storage Areas located in close proximity to the site.

Flood Defences:

5.10. Flood defences are typically raised structures that alter natural flow patterns and prevent floodwater from entering property in times of flooding. They are generally categorised as either 'formal' or 'informal' defences. A 'formal' flood defence is a structure that was built specifically for the purpose of flood defence, and is maintained by its respective owner, which could be the EA, Local Authority, or an individual. An 'informal' flood defence is a structure that has not been specifically built to retain floodwater, and is not maintained for this specific purpose, but may afford some protection against flooding.

5.11. Asset inspections are undertaken on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings. It is unclear when both assets were last inspected.

5.12. Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

5.13. According to the EA, there are no formal raised flood defences owned or operated by the EA protecting the site.

Residual Risk (breach or overtopping of flood defences):

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

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

5.16. The site is not shown to be defended by formal flood defences.

Tidal Flooding:

5.17. Due to the site topography and distance to the nearest coast/tidal watercourse, the risk of tidal flooding is considered to be very low.

Pluvial (Surface Water):

5.18. Pluvial (surface water) flooding occurs when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

5.19. The mapping below shows the Risk of Flooding from Surface Water (RoFSW). Please note that the EA to not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness

in areas which may be at risk and may require additional investigation. This information tells you the flood risk of the land around a building, not the building itself.

5.20. The RoFSW products are an assessment of where surface water flooding may occur.

5.21. The mapping shows the following likelihood categories, for the present day risk of flooding from surface water, and the climate change scenarios have been produced to indicate the predicted impacts of climate change on future flood risk.

- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any year.
- Medium – Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year.
- Low – Less than 1 in 100 (1%) but greater than or equal to 1 in 1000 (0.1%) chance of flooding in any given year.

5.22. The climate change allowances are based on the latest UK Climate Projections (UKCP18) from the Met Office, using the Representative Concentration Pathway (RCP) 8.5. A near-term epoch (2040 – 2060 "2050s" epoch) and central allowances are being used initially, to support short and medium-term decisions informed by the highest flood likelihood projections.

5.23. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at "Very Low" to "High" chance of flooding from surface water.

5.24. The EA Risk of Flooding from Surface Water mapping shows the site to be at "Very Low" to "High" chance of flooding between 2040 and 2060.



Figure 12: Extract from 2025 EA Risk of Flooding from Surface Water mapping – present day (Source: EA)

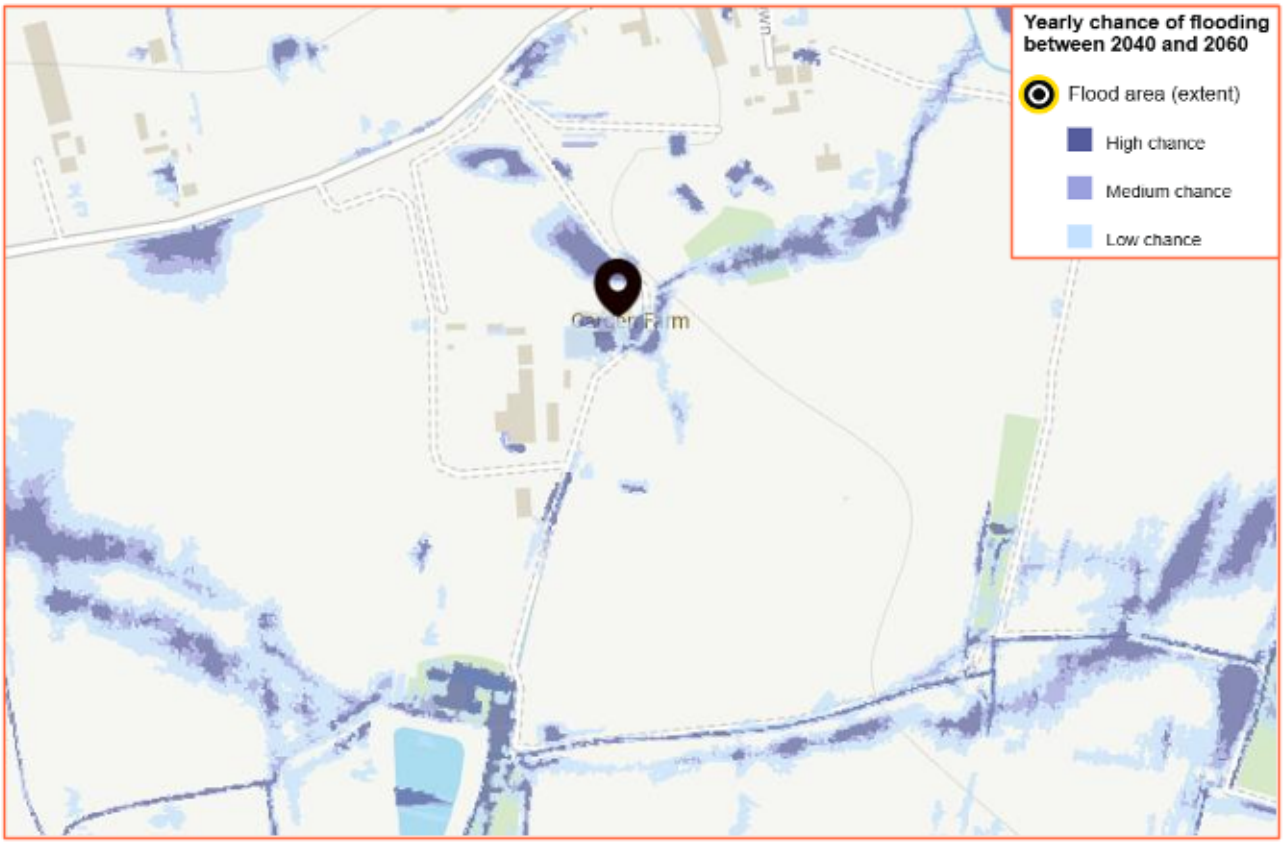


Figure 13: Extract from Environment Agency RoFSW map – between 2040 and 2060 (Source: EA)

5.25. The 2024 Huntingdonshire District Council SFRA has also provided surface flood maps which is based on the EA's Risk of Flooding from Surface Water (RoFSW) data set which was updated in 2013.

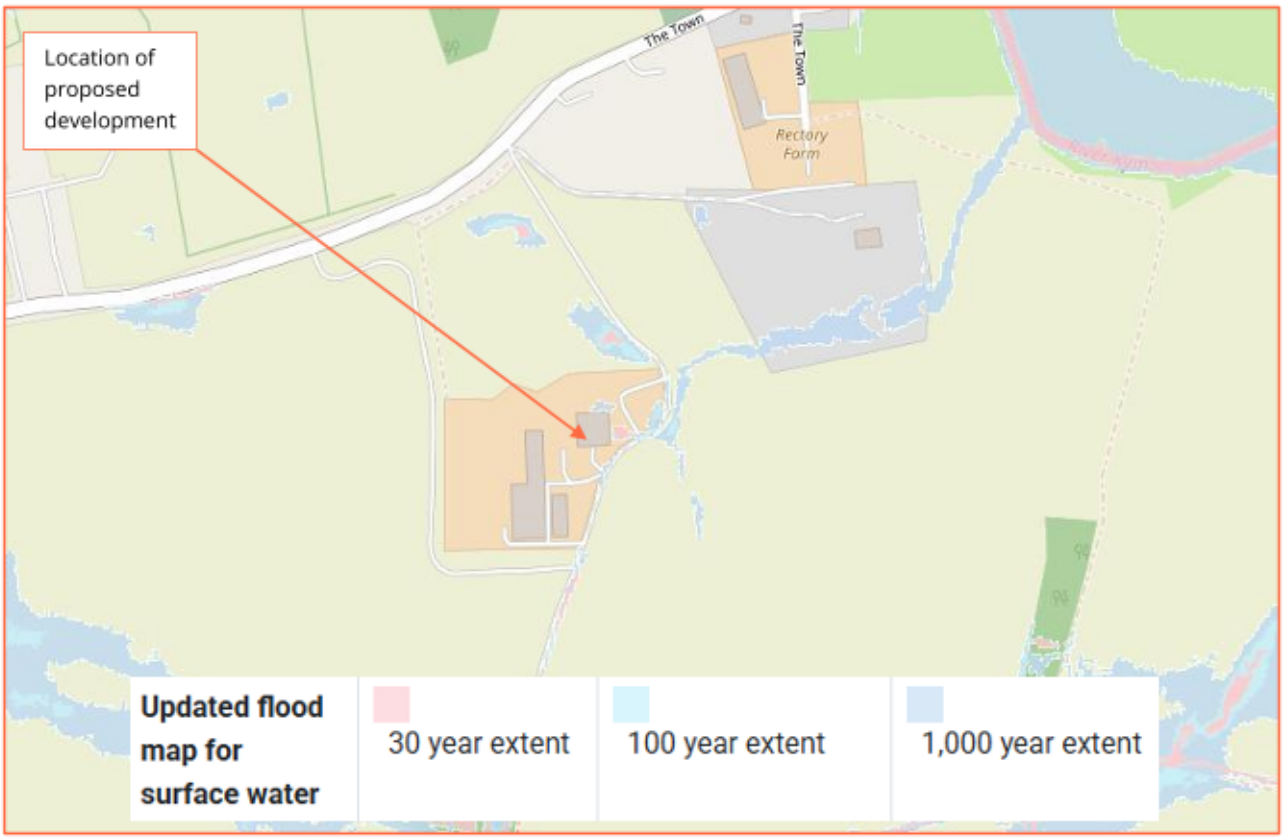


Figure 14: Huntingdonshire District Council Surface Water Extents (Source: 2024 Huntingdonshire SFRA)

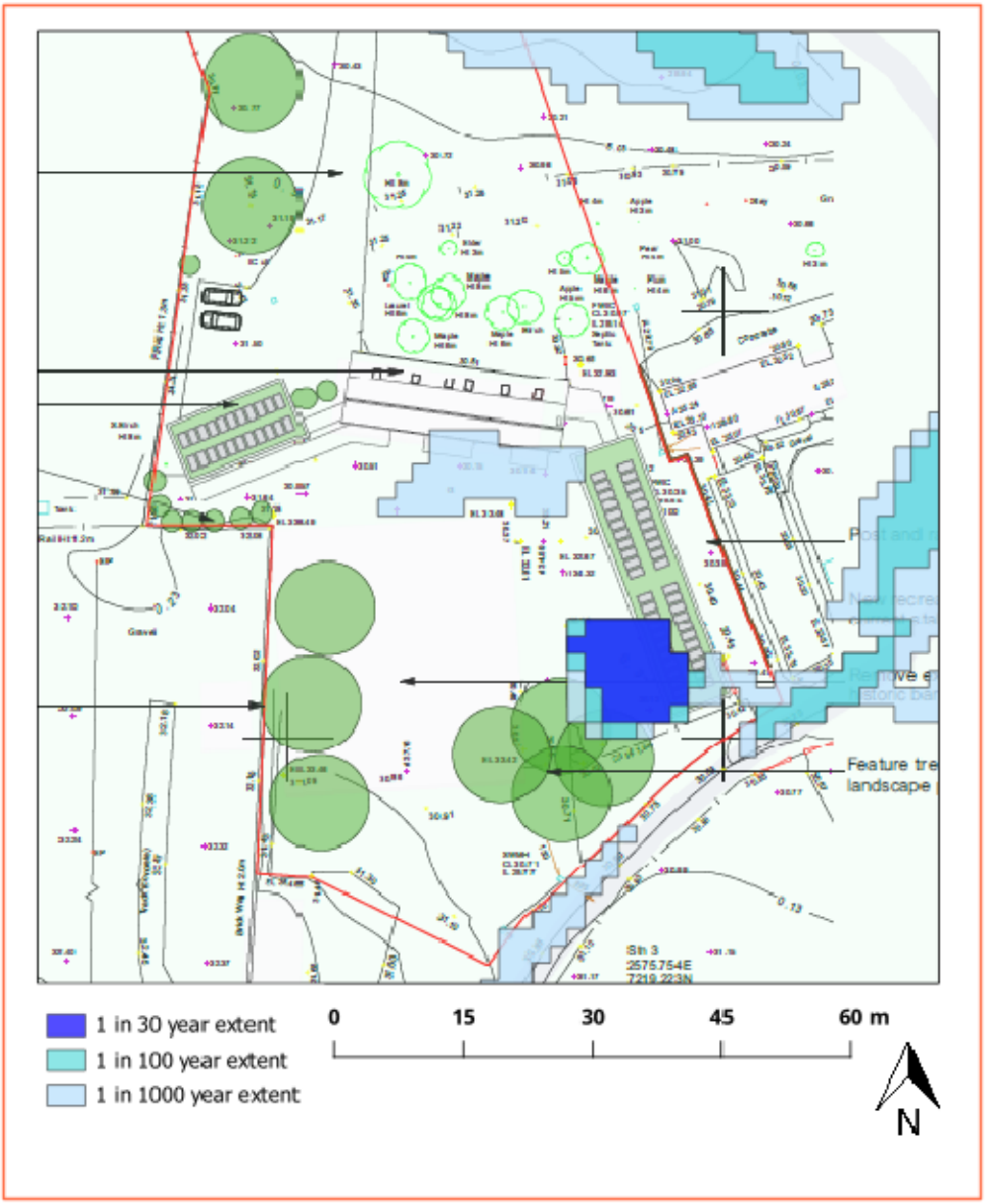


Figure 15: Environment Agency surface water flood extents overlain onto site plan (Source: EA)

5.26. The site appears to be located within the 1:30 year, 1:100 year and 1:1000 year surface water extents.

5.27. The EA risk of flooding from surface water depth maps show:

- For the 1:30 year event (High), on the site there is a maximum flood depth of between 0.30 – 0.60m.
- For the 1:100 year event (Medium), on the site there is a maximum flood depth of between 0.30 – 0.60m.
- For the 1:1000 year event (Low), on the site there is a maximum flood depth of between 0.60 – 0.90m.

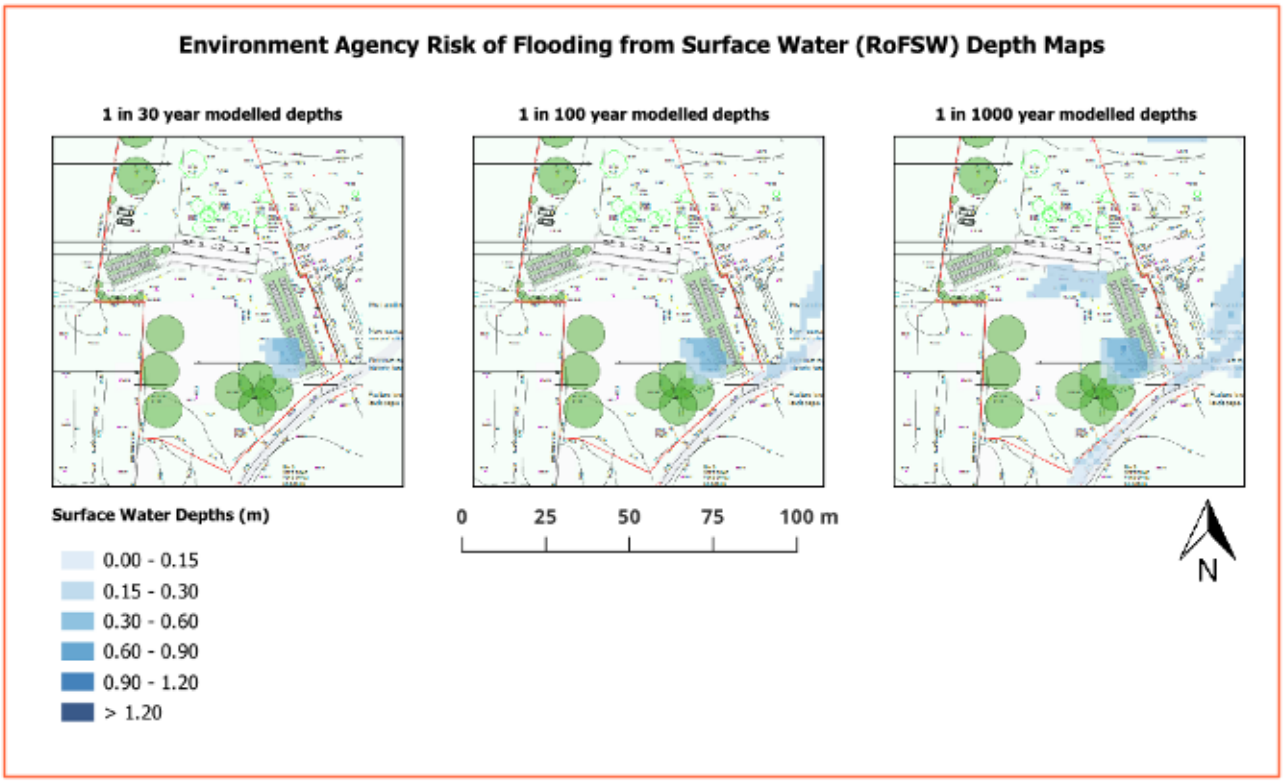


Figure 16: Environment Agency Risk of Flooding from Surface Water Flood Depth Maps for High (1:30yr, Medium (1:100yr) and Low (1:1000yr) modelled events (Source: EA)

Groundwater:

5.28. Groundwater flooding occurs as a result of water rising up from the underlying rocks or from water flowing from abnormal springs. This tends to occur after much longer periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

5.29. Groundwater flooding is most likely to occur in low-lying areas underlain by permeable rocks (aquifers). These may be extensive, regional aquifers, such as chalk or sandstone, or may be localised sands or river gravels in valley bottoms underlain by less permeable rocks. Groundwater flooding takes longer to dissipate because groundwater moves much more slowly than surface water and will take time to flow away underground.

5.30. According to the 2024 Huntingdonshire District Council SFRA, the site is located partially within an area that has no risk to groundwater flooding and partially within an area where groundwater levels are either at or very near (within 0.025m of) the ground surface in the 100 year return event.

5.31. The EA advise that flooding from groundwater is unlikely in this area.

5.32. No information has been provided to suggest that the site has flooded historically due to groundwater.

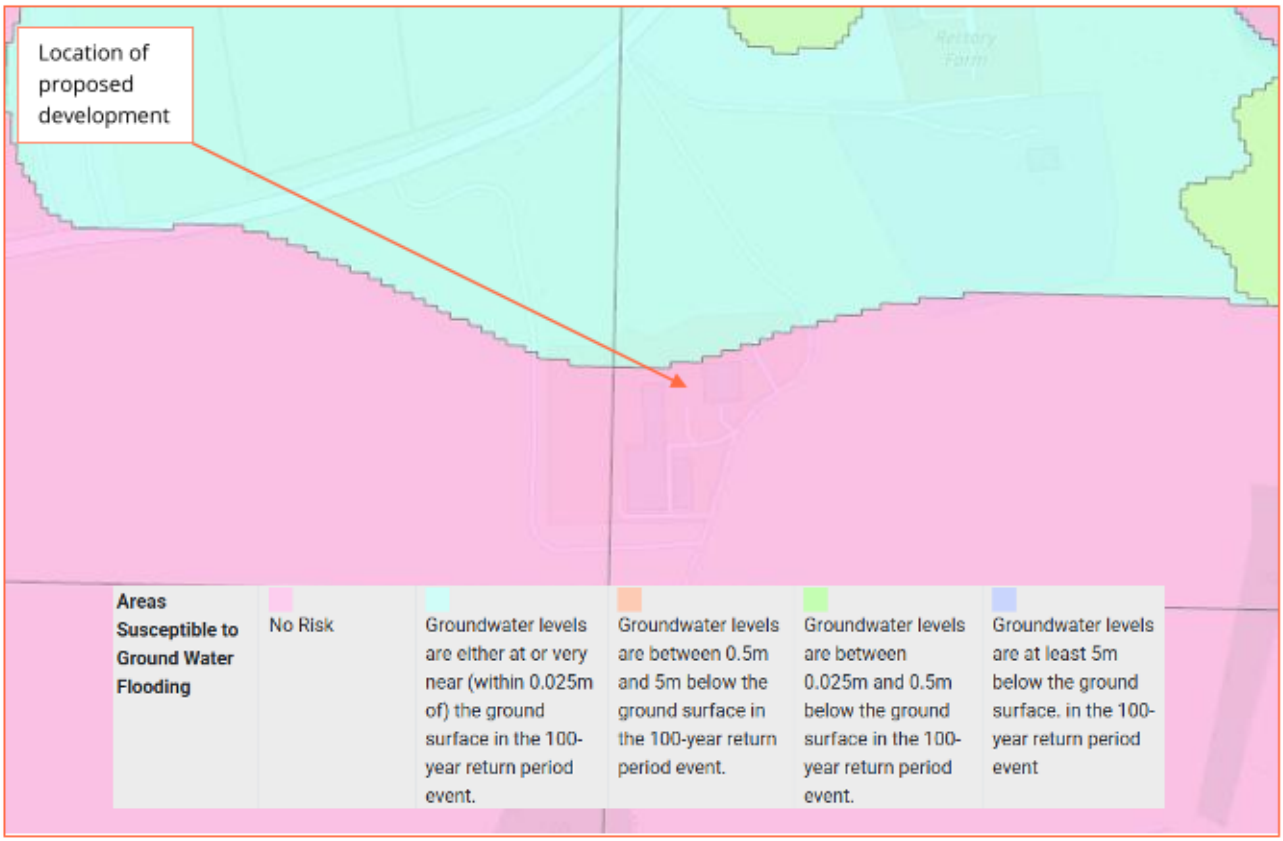


Figure 17: Areas susceptible to ground water flooding (Source: 2024 Huntingdonshire SFRA)

Sewer:

5.33. Sewer flooding occurs when the sewer network cannot cope with the volume of water that is entering it. It is often experienced during times of heavy rainfall when large amounts of surface water overwhelm the sewer network causing flooding. Temporary problems such as blockages, siltation, collapses and equipment or operational failures can also result in sewer flooding.

5.34. All Water Companies have a statutory obligation to maintain a register of properties/areas which have reported records of flooding from the public sewerage system, and this is shown on the DG5 Flood Register. This includes records of flooding from foul sewers, combined sewers and surface water sewers which are deemed to be public and therefore maintained by the Water Company. The DG5 register records of flood incidents resulting in both internal property flooding and external flooding incidents. Once a property is identified on the DG5 register, water companies can typically put funding in place to address the issues and hence enable the property to be removed from the register. It should be noted that flooding from land drainage, highway drainage, rivers/watercourses and private sewers is not recorded within the register.

5.35. No information has been presented to suggest that the site itself has been affected by sewer flooding.

Other Sources:

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

flooding to occur. The Environment Agency Reservoir Flood Map illustrated below, illustrates the largest area that might be flooded if the storage area were to fail and release the water it is designed to hold during a flood event.

5.37. Records of flooding from reservoirs and canals are erratic as there is no requirement for the Environment Agency to provide information on historic flooding from canals and raised reservoirs on plans. In particular, the NPPF does not require flood risk from canals and raised reservoirs to be shown on the Environment Agency flood zones.

5.38. Overflows from canals can be common as they are often fed by land drainage, and often do not have controlled overflow spillways. Occasionally, major bank breaches also occur, leading to rapid and deep flooding of adjacent land.

5.39. No information has been provided to suggest that the site is susceptible to flooding from other sources.



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

Historical Flood Events:

5.40. The EA hold records of historic flood events from rivers and the sea. The EA map flooding to land, not individual properties. Their historic flood event record outlines are an indication of the geographical extent of an observed flood event. Their historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

5.41. The EA hold no records of historic flooding having affected the site however historic flooding has occurred in the surrounding area in March 1947.

5.42. The EA historical flood records are not comprehensive, and they advise that further enquiries locally are made with specific reference to flooding at the location.

6. Flood Risk Management

Vulnerability to Flooding:

6.1. The NPPF classifies property usage by vulnerability to flooding.

6.2. The existing site usage is classified as "less vulnerable" (Agricultural buildings).

6.3. Post development, the site will become "more vulnerable" (residential), as the application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.

6.4. Accordingly, it is considered that the vulnerability of the site as a whole will increase post development.

EA Standing Advice for Minor Extensions:

6.5. EA Standing Advice guidance is for domestic extensions and non-domestic extensions where the additional footprint created by the development does not exceed 250m^2. It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.

6.6. The proposed application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.

Physical Design Measures:

6.7. The site is located within Flood Zone 1 according to the EA Flood Map for planning (Rivers and the Sea).

6.8. The EA Risk of Flooding from Surface Water Map suggests that risk at the site ranges from "Very Low" to "High" risk.

6.9. To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the development where practical and feasible, in consultation with the Local Authority building control department. These measures can include the following:

- Solid concrete ground floor slab, with waterproof membrane;
- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- Waterproof screed used on ground floors;
- Damp proof membranes;
- External walls rendered resistant to flooding to at least 600mm above ground floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Raised wiring and power outlets at least 600mm above ground floor level;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at least 600mm above ground floor level;
- Boilers, control and water storage / immersion installed at least 600mm above ground floor level;
- Gas meter installed at least 600mm above ground floor level;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Kitchen units of solid, water resistant material at ground floor level;
- Use of MDF carpentry (i.e. skirting, architrave, built-in storage) avoided at ground floor level;
- Stairs of solid hardwood construction with wood faces treated to resist water penetration at ground floor level.

6.10. It is recommended that flood proof doors and windows are installed for all external doors and windows. Demountable flood defence barriers to 600mmm to defend ground level doorways and low windows could be used if flood doors are not practical or other planning constraints prevent it.

Safe Escape:

6.11. The NPPF requires a route of safe escape for all residents and users to be provided from new residential properties in Flood Zone 3. Safe escape is usually defined as being through slow moving flood water no deeper than 25cm during the 1:100 year plus allowance for climate change flood event.

6.12. It should be noted that the site is located entirely within Flood Zone 1 and at a "Very Low" to "High" risk of flooding from surface water.

6.13. However, a potential safe egress route from the site is presented below.

6.14. Internal access will be provided from ground floor to first floor level, so that safe refuge is provided at first floor level for all site users and occupants.

6.15. Residents will follow the Flood Warning and Evacuation Plan detailed in the following section.



Figure 19: Potential route of safe egress for the 1:100 year modelled surface water flood hazard (Source: EA, OS)

Flood Warning:

6.16. As the UK's official weather service, the Met Office is responsible for issuing weather warnings, which warn of impacts caused by severe weather. The Met Office provide warnings up to seven days ahead for rain, thunderstorms, wind, snow, lightning, ice and fog.

6.17. Met Office weather warnings are available in a number of ways, which make it easy to get the very latest information wherever you are. These include the Met Office app and website, social media, email alerts, TV, radio and RSS.

6.18. It is recommended that the site owner sign up to the National Severe Weather Warning Service. More information can be found here: https://www.metoffice.gov.uk/weather/guides/warnings.

6.19. The Met Office issues weather warnings, through the National Severe Weather Warning Service, when severe weather has the potential to bring impacts to the UK. These warnings are given a colour (yellow, amber or red) depending on a combination of both the impact the weather may have and the likelihood of those impacts occurring.



Figure 20: Met Office Weather Warning Impact Matrix (Source: Met Office)

6.20. **Yellow Warning:** Yellow warnings can be issued for a range of weather situations. Many are issued when it is likely that the weather will cause some low level impacts, including some disruption to travel in a few places. Many people may be able to continue with their daily routine, but there will be some that will be directly impacted and so it is important to assess if you could be affected. Other yellow warnings are issued when the weather could bring much more severe impacts to the majority of people but the certainty of those impacts occurring is much lower. It is important to read the content of yellow warnings to determine which weather situation is being covered by the yellow warning.

6.21. **Amber Warning:** There is an increased likelihood of impacts from severe weather, which could potentially disrupt your plans. This means there is the possibility of travel delays, road and rail closures, power cuts and the potential risk to life and property. You should think about changing your plans and taking action to protect yourself and your property. You may want to consider the impact of the weather on your family and your community and whether there is anything you need to do ahead of the severe weather to minimise the impact.

6.22. **Red Warning:** Dangerous weather is expected and, if you haven't already done so, you should take action now to keep yourself and others safe from the impact of the severe weather. It is very likely that there will be a risk to life, with substantial disruption to travel, energy supplies and possibly widespread damage to property and infrastructure. You should avoid travelling, where possible, and follow the advice of the emergency services and local authorities.

Flood Plan:

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

Action	
Before a flood	• Find out if you are at risk of flooding. • Find out if you can receive flood warnings. • Prepare and keep a list of all your important contacts to hand or save them on your mobile phone. • Think about what items you can move now and what you would want to move to safety during a flood such as pets, cars, furniture, and electrical equipment. • Know how to turn off gas, electricity and water supplies. • Prepare a flood kit of essential items and keep it handy. It can include copies of important documents, a torch, a battery-powered or wind-up radio, blankets and warm clothing, waterproofs, rubber gloves and a first aid kit including all essential medication. • Consider buying flood protection products such as flood boards and airbrick covers to help reduce flood water getting into your property.
During a flood	• Tune into your local radio station on a battery or wind-up radio. • Fill jugs and saucepans with water. • Grab your flood kit - if you have prepared one. • Collect blankets, torch, first aid kit, medication and food. • Move important documents, personal items, valuables, and lightweight belongings upstairs or to high shelves. • Raise large items of furniture, or put them in large bags if you have them. • Move people, outdoor belongings, cars and pets to higher ground. • Switch off water, gas and electricity at mains when water is about to enter your home. Do not touch sources of electricity when standing in water. • Fit flood protection products, if you have them, for example flood boards, airbrick covers, sandbags. • Put plugs in sinks and baths. Weigh them down with a pillowcase or plastic bag filled with soil. • If you do not have non-return valves fitted, plug water inlet pipes with towels or cloths. • Move your family and pets upstairs or to a high place with a means of escape. • Listen to the advice of the emergency service and evacuate if told to do so. • Avoid walking or driving through flood water. Six inches of fast-flowing water can knock over an adult and two feet of water can move a car.
After a flood	• If you have flooded, contact your insurance company as soon as possible. • Take photographs and videos of your damaged property as a record for your insurance company. • If you don't have insurance, contact your local authority for information on grants and charities that may help you. • Flood water can contain sewage, chemicals and animal waste. Always wear waterproof outerwear, including gloves, wellington boots and a face mask. • Have your electrics, central heating and water checked by qualified engineers before switching them back on.

Table 2: Flood plan

Off-Site Impacts:

Fluvial Floodplain Storage:

6.24. The NPPF requires that where development is proposed in undefended areas of floodplain, which lie outside of the functional floodplain, the implications of ground raising operations for flood risk elsewhere needs to be considered. Raising existing ground levels may reduce the capacity of the floodplain to accommodate floodwater and increase the risk of flooding by either increasing the depth of flooding to existing properties at risk or by extending the floodplain to cover properties normally outside of the floodplain. Flood storage capacity can be maintained by lowering ground levels either within the curtilage of the development or elsewhere in the floodplain, in order to maintain at least the same volume of flood storage capacity within the floodplain.

6.25. In undefended tidal areas, raising ground levels is unlikely to impact on maximum tidal levels so the provision of compensatory storage should not be necessary.

6.26. For development in a defended flood risk area, the impact on residual flood risk to other properties needs to be considered. New development behind flood defences can increase the residual risk of flooding if the flood defences are breached or overtopped by changing the conveyance of the flow paths or by displacing flood water elsewhere. If the potential impact on residual risk is unacceptable then mitigation should be provided.

6.27. The site is located within Flood Zone 1 entirely outside of the functional floodplain and therefore there will be no unacceptable loss of fluvial floodplain storage.

Surface Water Drainage:

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

1. Store rainwater for later use;
2. Infiltration techniques;
3. Attenuate rainwater by storing in tanks for gradual release;
4. Discharge rainwater direct into watercourse;
5. Discharge rainwater into surface water sewer;
6. Discharge rainwater into a combined sewer.

6.29. Due to the scale of the development, a full Surface Water Drainage Strategy is not required at this stage of planning. However, SuDS features will be incorporated into the development where practically possible or will utilise the existing arrangement on site. As such, any change in surface water runoff from the site will likely be negligible.

7. Sequential and Exception Test

7.1. The Sequential Test aims to ensure that development does not take place in areas at high risk of flooding when appropriate areas of lower risk are reasonably available.

7.2. The Sequential Test is applied to developments in areas identified as being at risk of any source of flooding now or in the future. The Sequential Test ensures that a sequential, risk-based approach is followed to steer new development to areas with the lowest risk of flooding, taking all sources of flood risk and climate change into account.

7.3. The sequential approach is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. This means avoiding, so far as possible, development in current and future medium and high flood risk areas considering all sources of flooding including areas at risk of surface water flooding. Other forms of flooding need to be treated consistently with river and tidal flooding in mapping probability and assessing vulnerability, so that the sequential approach can be applied across all areas of flood risk.

7.4. The site is located within Flood Zone 1 according to the EA Flood Map for planning (Rivers and the Sea) and within an area of "Very Low" to "High" risk of flooding from surface water. Post development, the site will become "more vulnerable", as the application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.

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

Table 3: Flood risk vulnerability and flood zone 'compatibility'

7.5. Using the table above, the proposed application ("more vulnerable") is considered to be suitable within Flood Zone 1.

8. Discussion and Conclusion

8.1. Unda Consulting Limited have been appointed by Elisabeth & Murray Mackay to undertake a Flood Risk Assessment for the proposed development at The Barn, Garden Farm, The Town, Great Staughton, St Neots, PE19 5BE. The purpose of the study is to support a planning application for the proposed development.

8.2. The site comprises of a large timber framed barn adjacent to a 16th Century Grade II listed Garden Farmhouse.

8.3. The proposed application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.

8.4. The existing site usage is classified as "less vulnerable" (Agricultural buildings). Post development, the site will become "more vulnerable" (residential). Accordingly, it is considered that the vulnerability of the site as a whole will increase post development.

8.5. The site is situated entirely in Flood Zone 1 (Low Probability), defined as land having a less than 1:1000 year probability of river or sea flooding.

8.6. The nearest watercourse to the site is an unnamed drain located approximately 80m south. The River Kym is located approximately 450m northeast.

8.7. According to EA data, there are no Flood Storage Areas located in close proximity to the site.

8.8. According to the EA, there are no formal raised flood defences owned or operated by the EA protecting the site.

8.9. The EA Risk of Flooding from Surface Water Map suggests that the site is located within an area at "Very Low" to "High" chance of flooding from surface water for the present day and between 2040 – 2060.

8.10. The 2024 Huntingdonshire District Council SFRA has also provided surface flood maps which is based on the EA's Risk of Flooding from Surface Water (RoFSW) data set which was updated in 2013.

8.11. The site appears to be located within the 1:30 year, 1:100 year and 1:1000 year surface water extents.

8.12. The EA risk of flooding from surface water depth maps show:

- For the 1:30 year event (High), on the site there is a maximum flood depth of between 0.30 – 0.60m.
- For the 1:100 year event (Medium), on the site there is a maximum flood depth of between 0.30 – 0.60m.
- For the 1:1000 year event (Low), on the site there is a maximum flood depth of between 0.60 – 0.90m.

8.13. According to the 2024 Huntingdonshire District Council SFRA, the site is located partially within an area that has no risk to groundwater flooding and partially within an area where groundwater levels are either at or very near (within 0.025m of) the ground surface in the 100 year return event.

8.14. No information has been presented to suggest that the site itself has been affected by sewer flooding.

8.15. The site is located outside the maximum inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely.

8.16. The EA hold no records of historic flooding having affected the site however historic flooding has occurred in the surrounding area in March 1947.

In Summary:

- The proposed application is for the demolition of existing outbuildings and conversion and extension of existing barn to a single self-build dwelling and associated works including the installation of air source heat pumps.
- Post development, the site will remain "more vulnerable" (residential).
- Flood proofing of the development will be incorporated as appropriate.
- There will be no unacceptable loss of fluvial floodplain storage.
- Due to the scale of development, a full Surface Water Drainage Strategy is not required at this stage of planning.
- The applicant will register with the National Severe Weather Warning Service.

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

Unda Consulting Limited
March 2025

Appendix

A – Development Plans:

- Site location, existing and proposed plans – Tye Architects.

B – EA Flood Map for Planning:

- Flood Map for Planning – Environment Agency.

C- EA Surface Water Maps:

- Risk of Flooding from Surface Water depth and extent maps – Environment Agency.

D – NPPF Annex 3:

- NPPF Annex 3: Flood risk vulnerability classification table.

Appendix A

General Notes:

1. PLEASE DO NOT SCALE FROM DRAWINGS. Except for Planning

2. Figured dimensions are in millimeters, levels in metres and are to be checked on site prior to all contractors commencing their works.

3. Areas are in metres. Any areas indicated are approximate and indicative only.

4. Any discrepancies to be reported to the Architect in writing prior to any works being carried out.

5. Drawing only to be used for the purpose specified.

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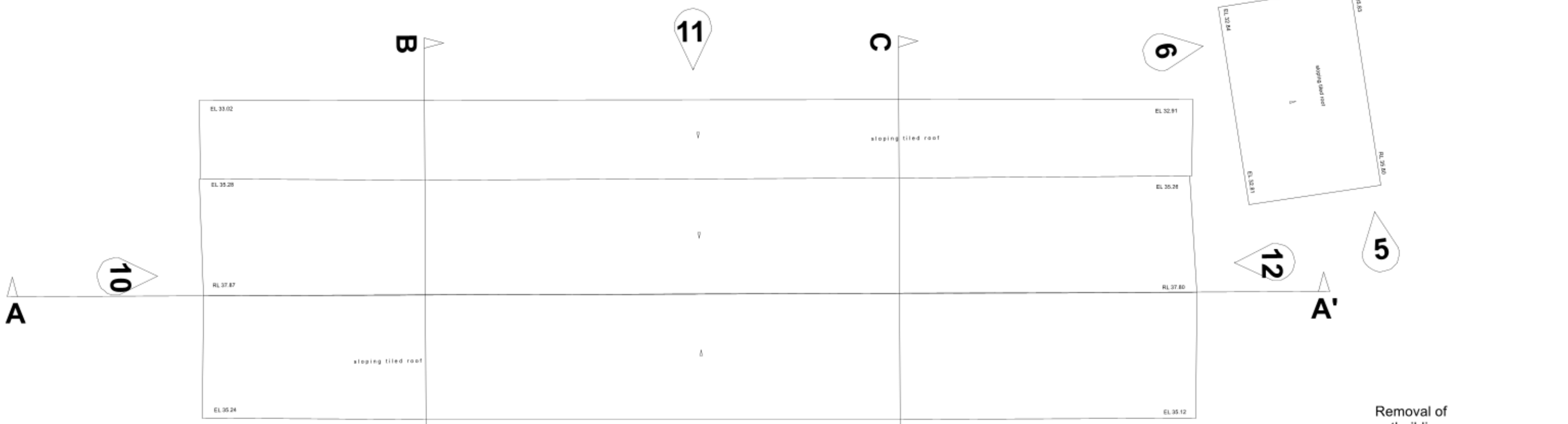
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Existing Plan** Dwg No: **2178_100**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Existing Roof Plan

Existing Ground Floor Plan

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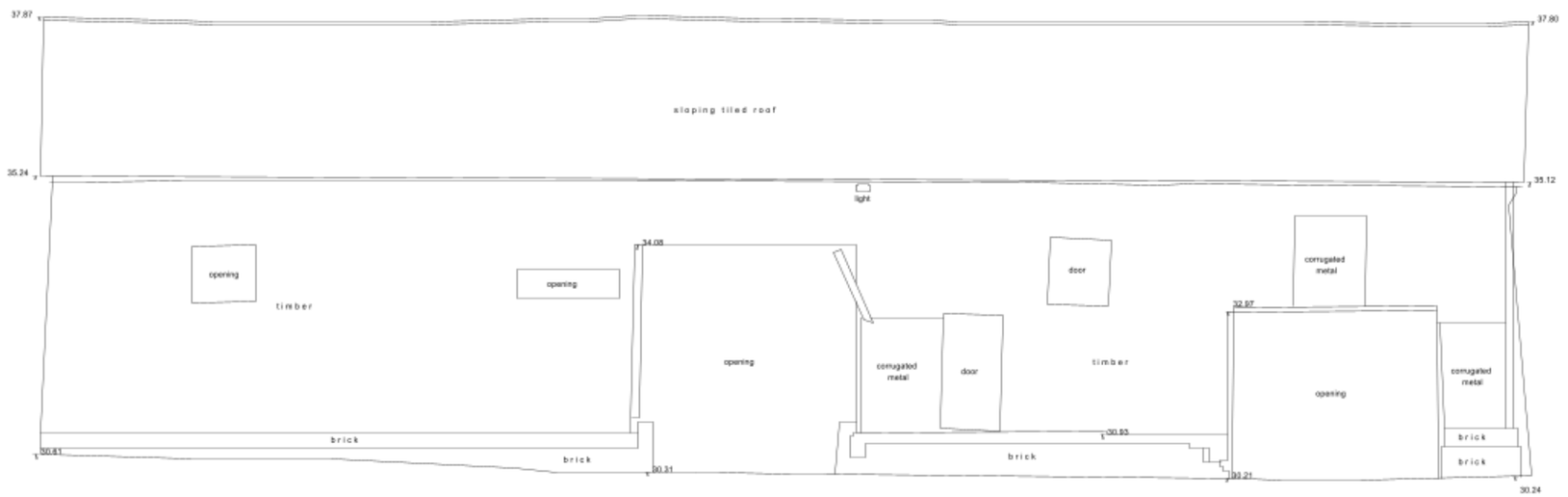
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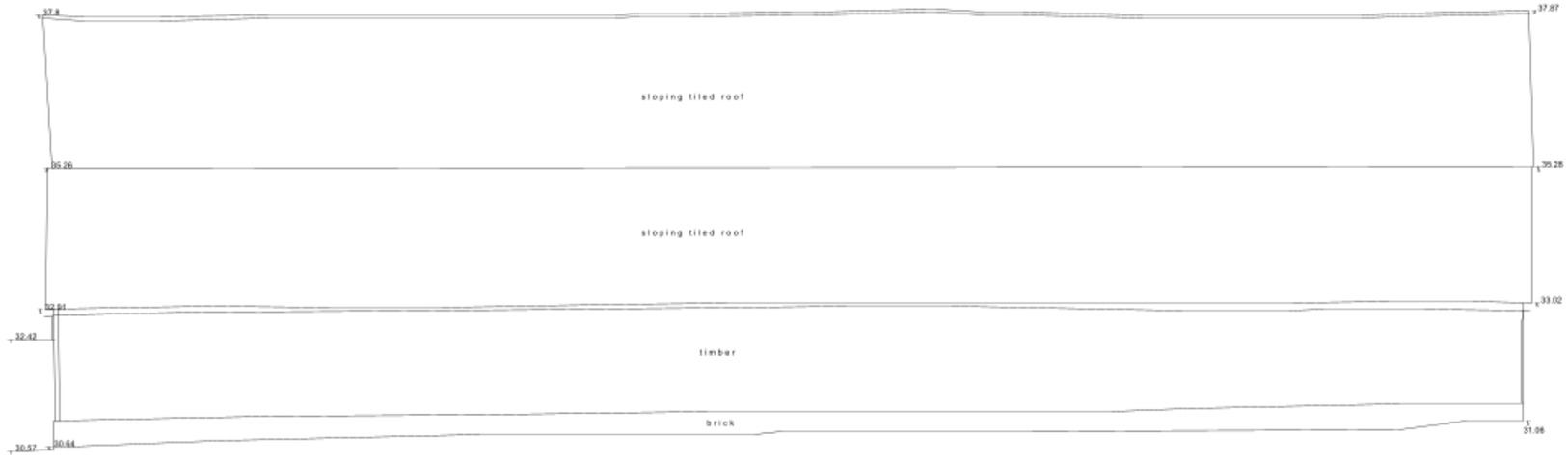
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Purpose: Planning Scale: 1:100@A3 Revision: -

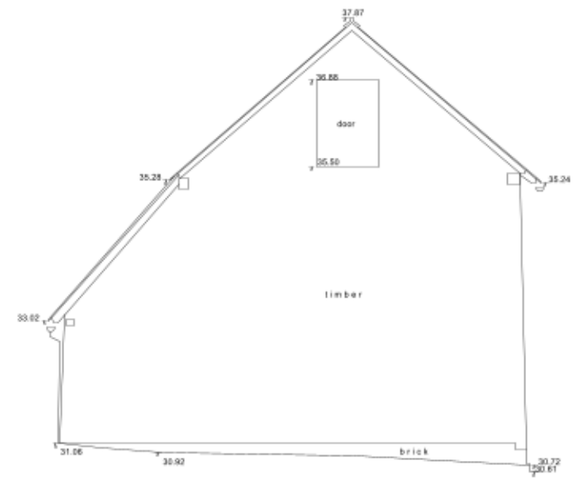
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Existing Main Barn South Elevation

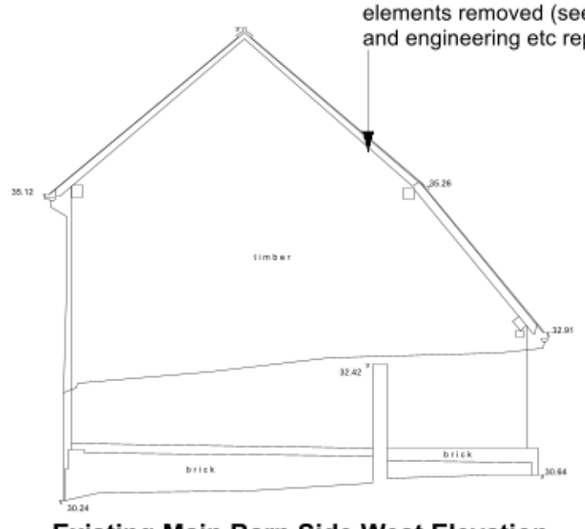


Existing Main Barn North Elevation



Existing Main Barn Side East Elevation

External envelope of building to be removed
Timber frame to be largely retained and in part modified or minor elements removed (see proposals and engineering etc reports)



Existing Main Barn Side West Elevation

0 1m 2m 3m 4m 5m

scale 1:100

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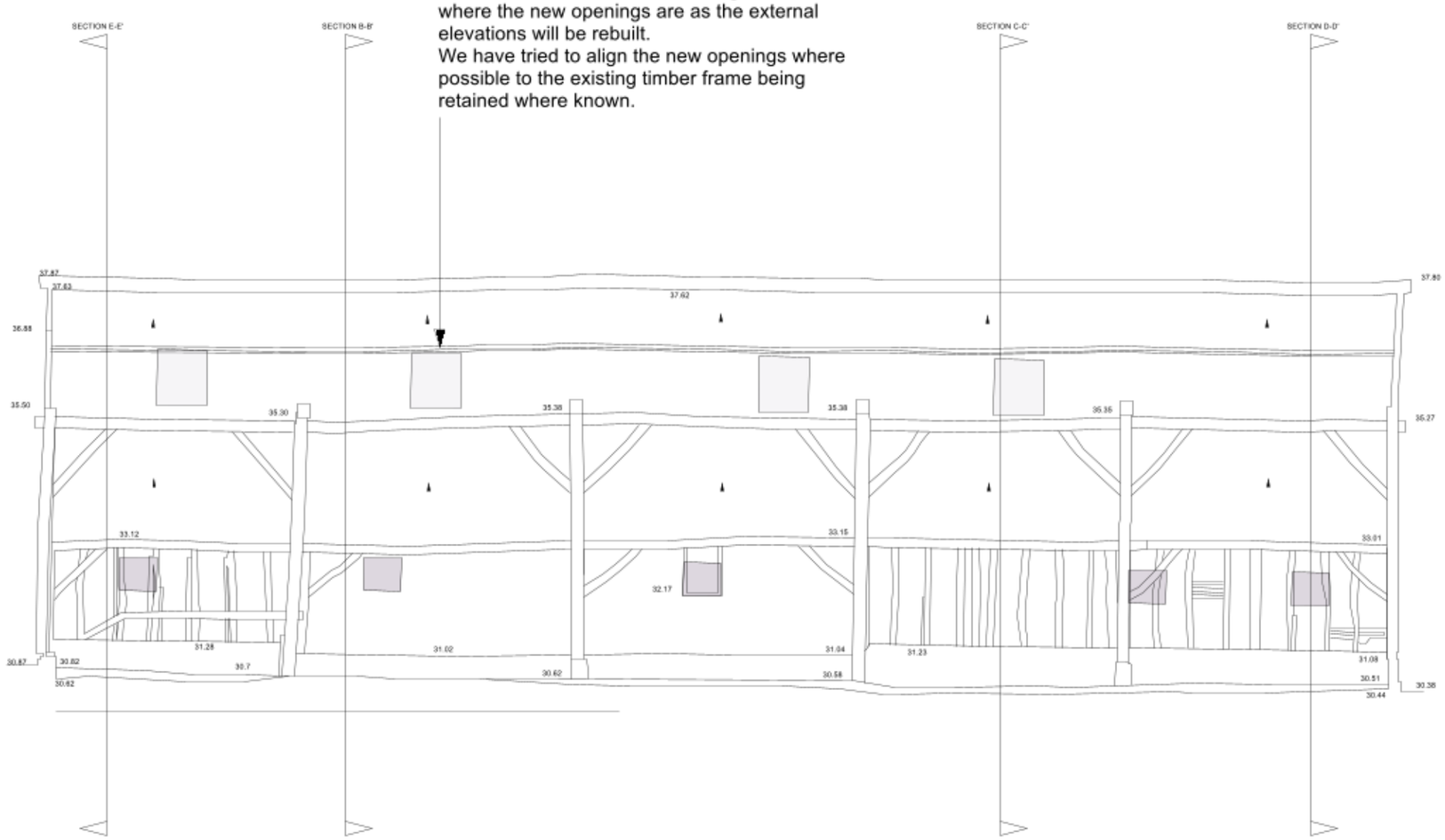
Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Existing Internal Elevation North** Dwg No: **2178_102**

Purpose: Planning Scale: 1:100@A3 Revision: -

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We have marked on to the existing internals where the new openings are as the external elevations will be rebuilt.
We have tried to align the new openings where possible to the existing timber frame being retained where known.



Existing Internal Elevation looking north

0 1m 2m 3m 4m 5m

scale 1:100

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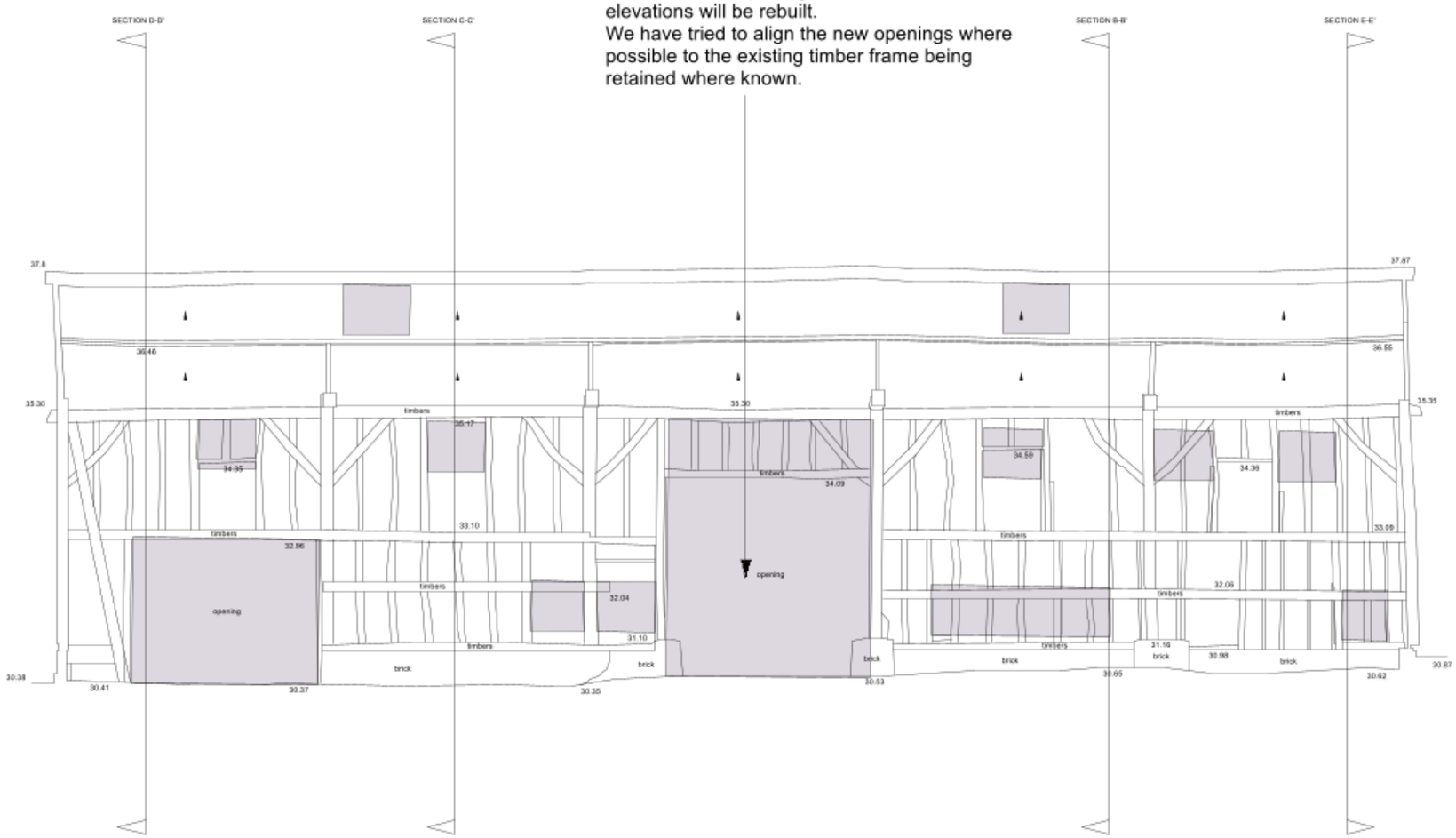
Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Existing Internal Elevation South** Dwg No: **2178_103**

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Existing Internal Elevation looking south

0 1m 2m 3m 4m 5m

scale 1:100

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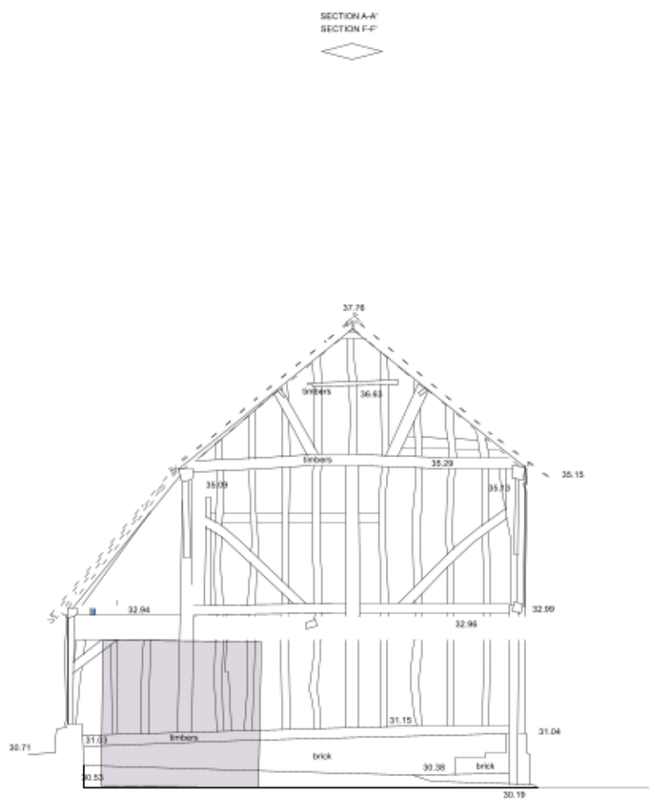
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Title: **Existing Internal Elevation West / East** Dwg No: **2178_104**

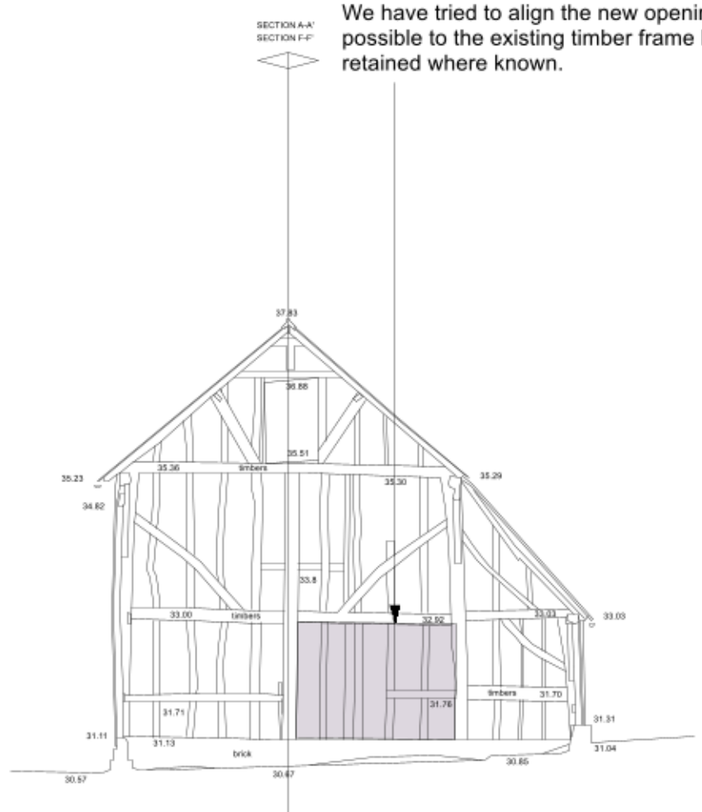
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We have marked on to the existing internals where the new openings are as the external elevations will be rebuilt.
We have tried to align the new openings where possible to the existing timber frame being retained where known.



Existing Internal Elevation looking east



Existing Internal Elevation looking west

0 1m 2m 3m 4m 5m

scale 1:100

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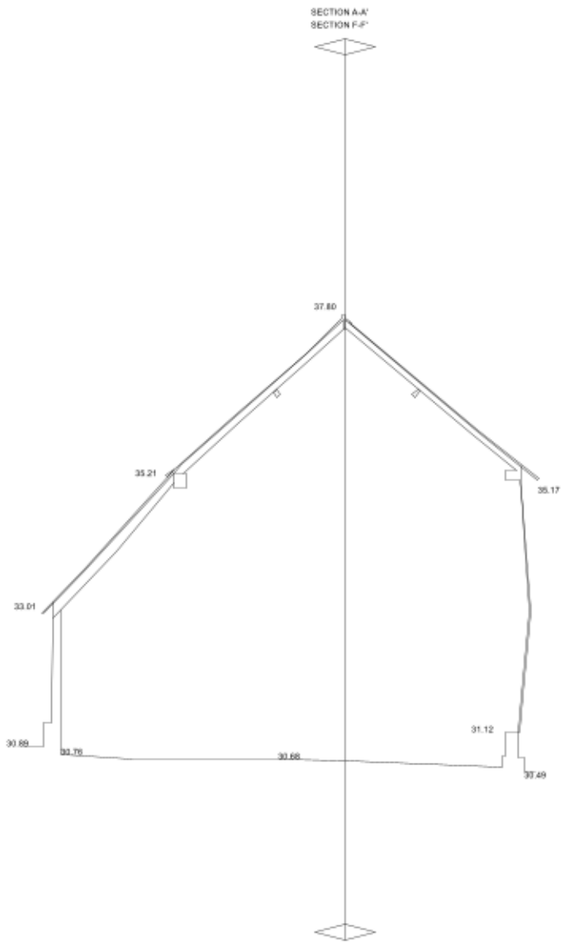
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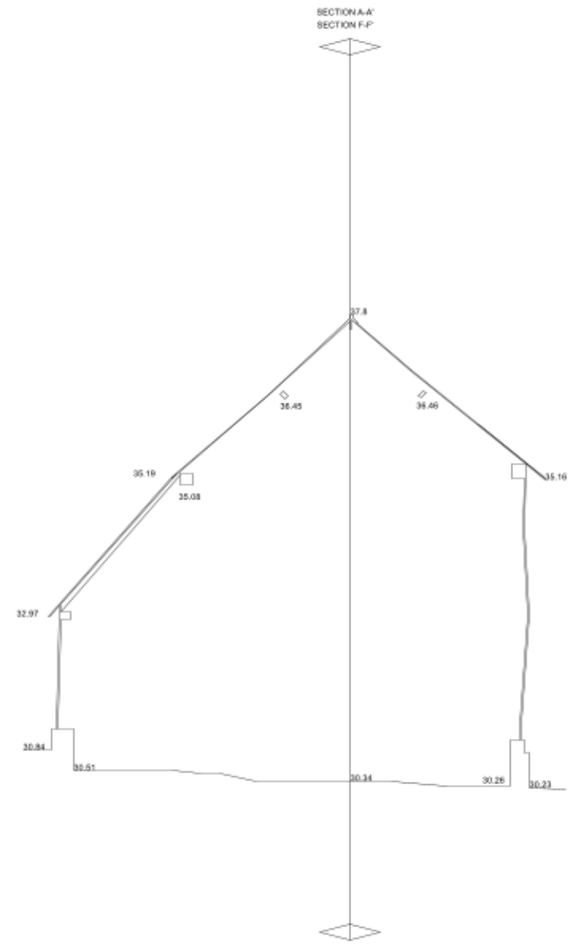
Title: **Existing Short Sections North-South** Dwg No: **2178_105**

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Existing Section B-B



Existing Section C-C

0 1m 2m 3m 4m 5m

scale 1:100

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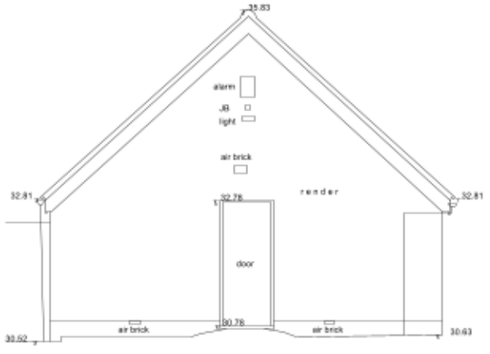
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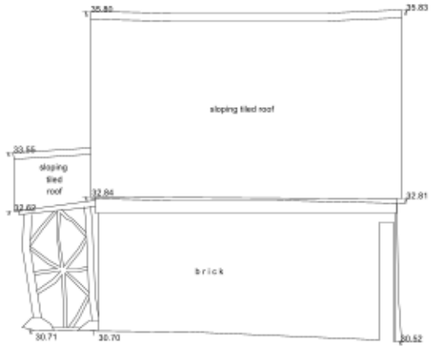
Title: **Existing Elevations Building A** Dwg No: **2178_106**

Purpose: Planning Scale: 1:100@A3 Revision: -

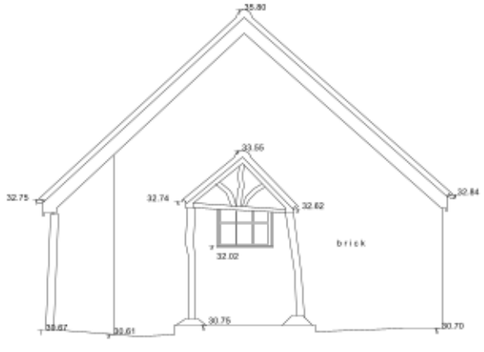
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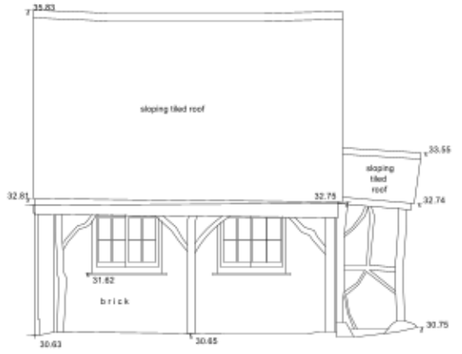
Existing Elevation South



Existing Elevation West



Existing Elevation North



Existing Elevation East

0 1m 2m 3m 4m 5m

scale 1:100

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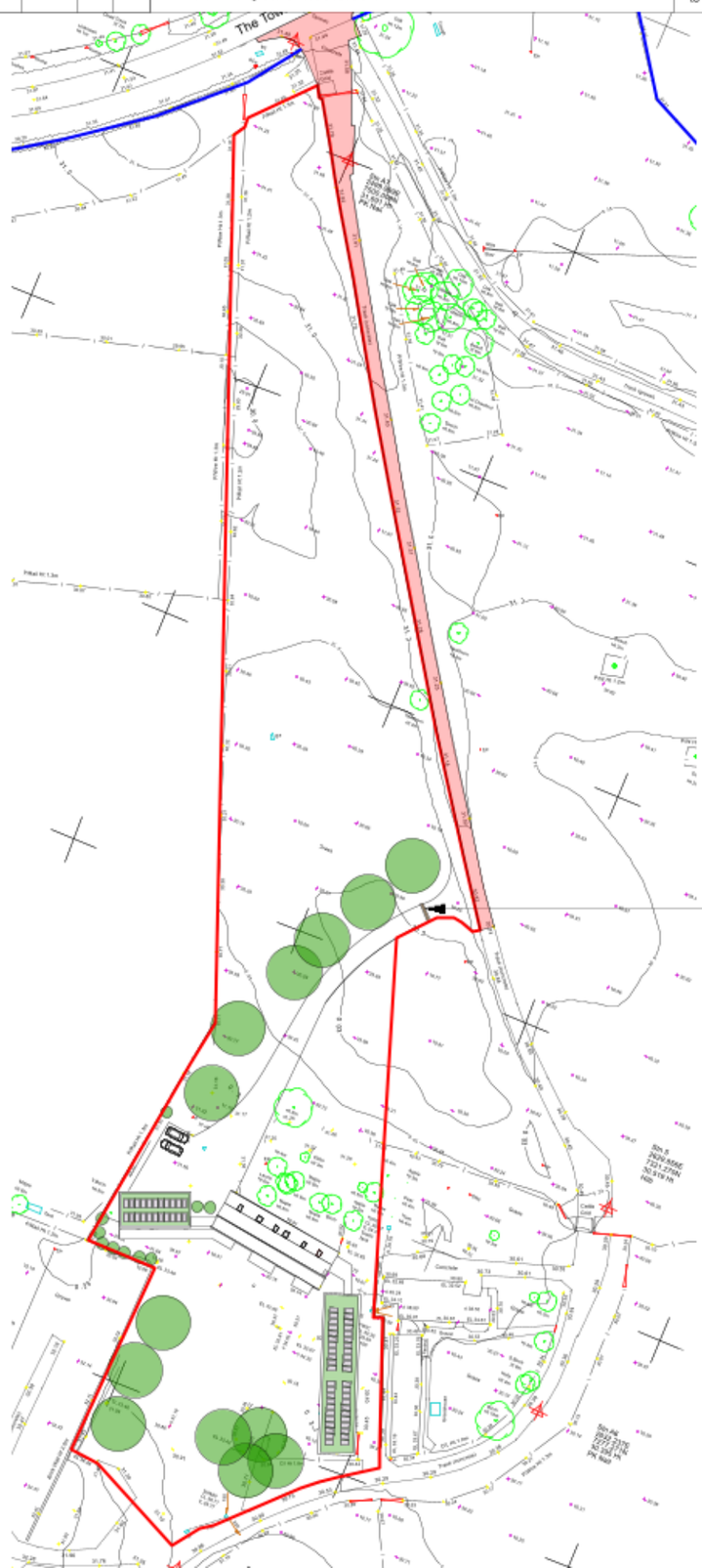
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Locartion Plan 1:1250** Dwg No: **2178_199**

Purpose: Planning Scale: 1:1250@A3 Revision: -

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New entrance point from existing driveway

Proposed Site Plan 1:1250

Key:

n

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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Block Plan 1:500** Dwg No: **2178_200**

Purpose: Planning Scale: 1:500@A3 Revision: -

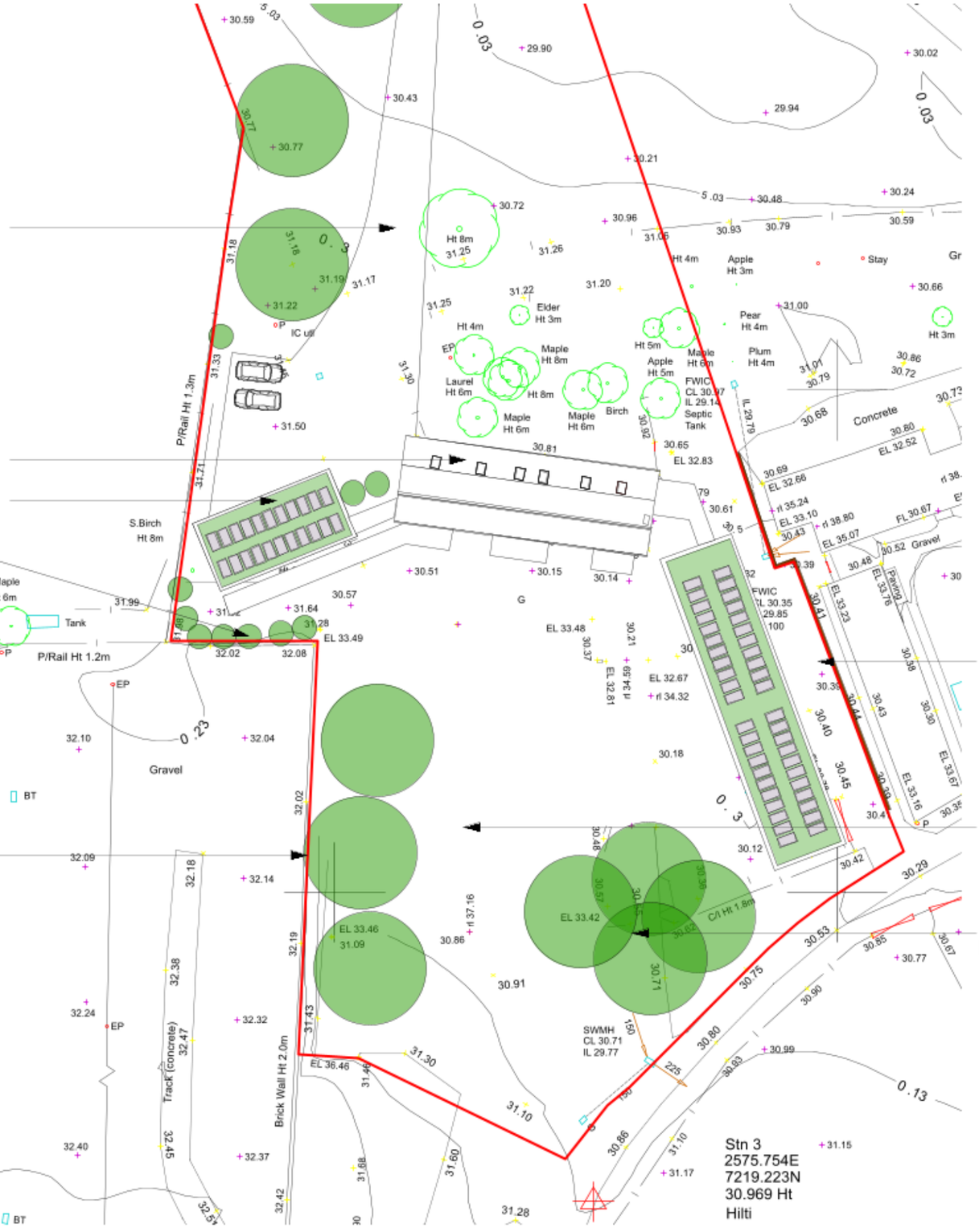
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Entrance drive and planting

Barn Conversion

New western extension, see Heritage Statement that there were other extensions historically

Retain historic boundary wall



Post and rail fence with perimiter planting

New recreation wing goes no further than current stable building to the east

Remove existing buildings to allow visibility of the historic barn / wall

Feature trees to new garden space (see landscape proposals)

Retain historic boundary wall
The proposals demolish the unsightly modern barn
Therefore celebrating the historical wall behind

Proposed Site Plan 1:500

Key:

n

0 5m 10m 15m 20m 25m

scale 1:500

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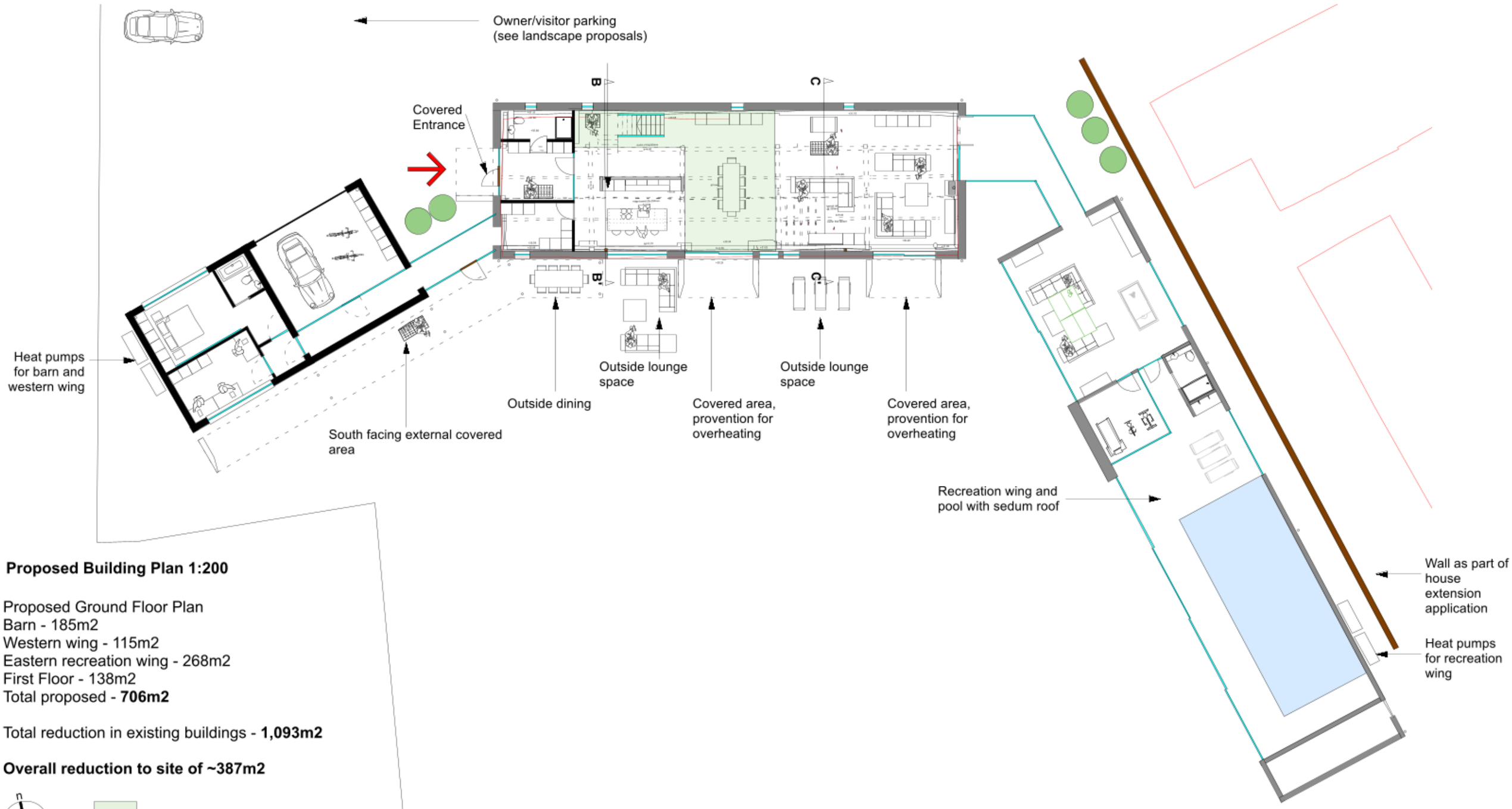
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Ground Floor Plan 1:200** Dwg No: **2178_210**

Purpose: Planning Scale: 1:200@A3 Revision: -

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Proposed Building Plan 1:200

Proposed Ground Floor Plan
Barn - 185m2
Western wing - 115m2
Eastern recreation wing - 268m2
First Floor - 138m2
Total proposed - **706m2**

Total reduction in existing buildings - **1,093m2**

Overall reduction to site of ~387m2

n

Double height space

0 2m 4m 6m 8m 10m

scale 1:200

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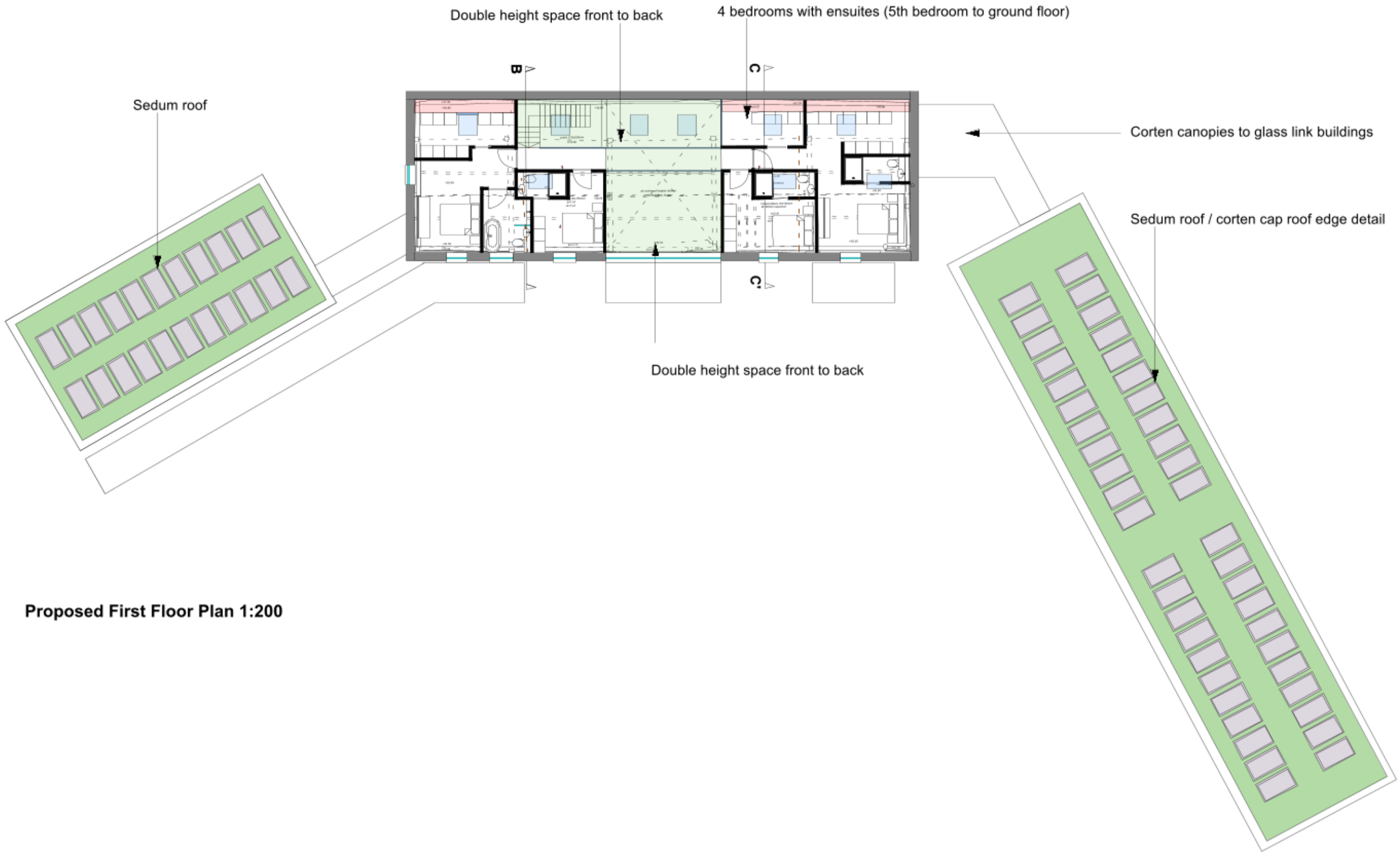
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed First Floor Plan 1:200** Dwg No: **2178_211**

Purpose: Planning Scale: 1:200@A3 Revision: -

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Proposed First Floor Plan 1:200

n

0 2m 4m 6m 8m 10m

scale 1:200

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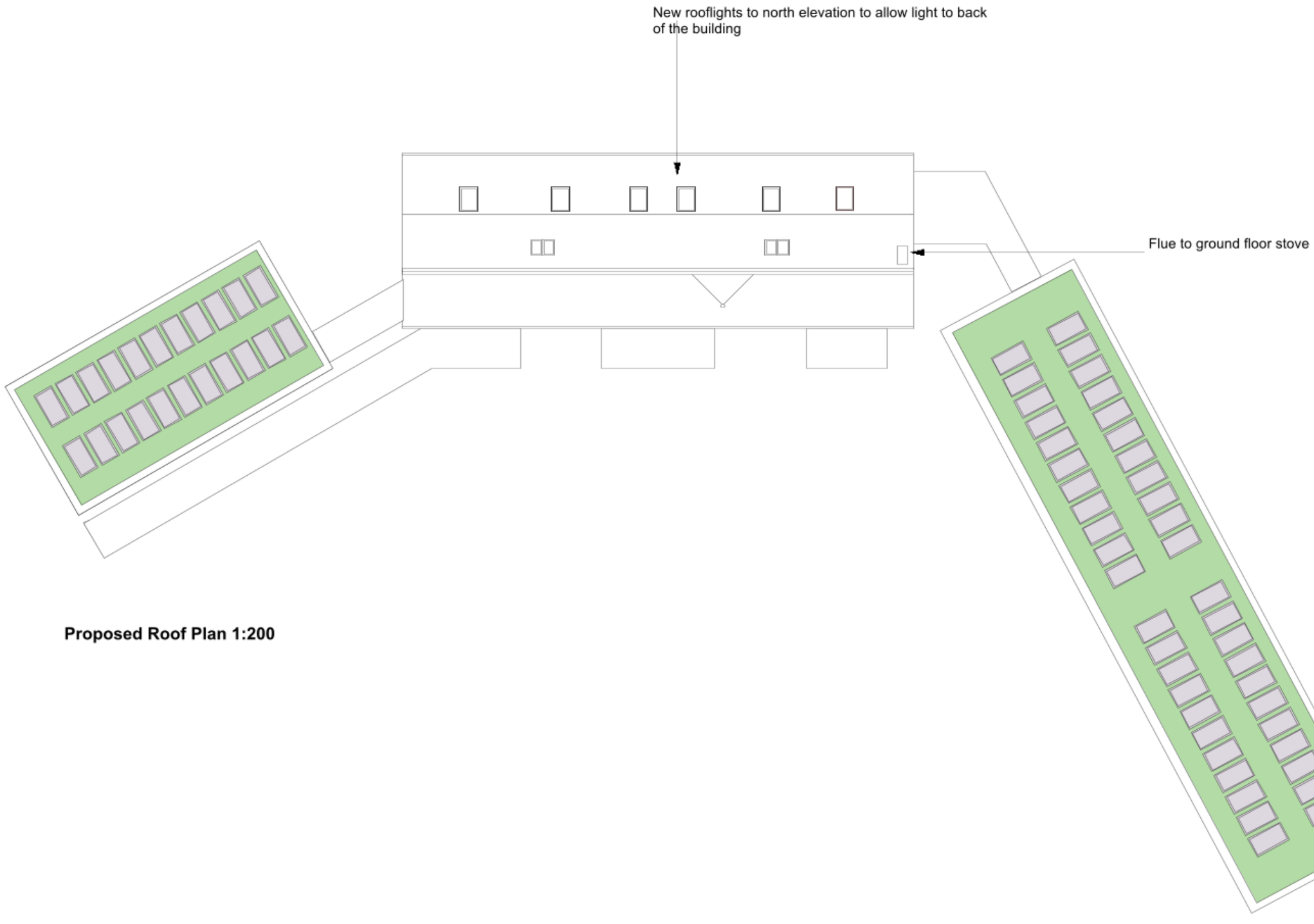
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

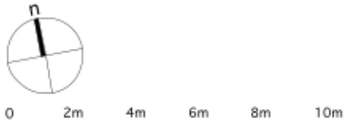
Title: **Proposed Roof Plan** Dwg No: **2178_212**

Purpose: Planning Scale: 1:200@A3 Revision: -

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Proposed Roof Plan 1:200



scale 1:200

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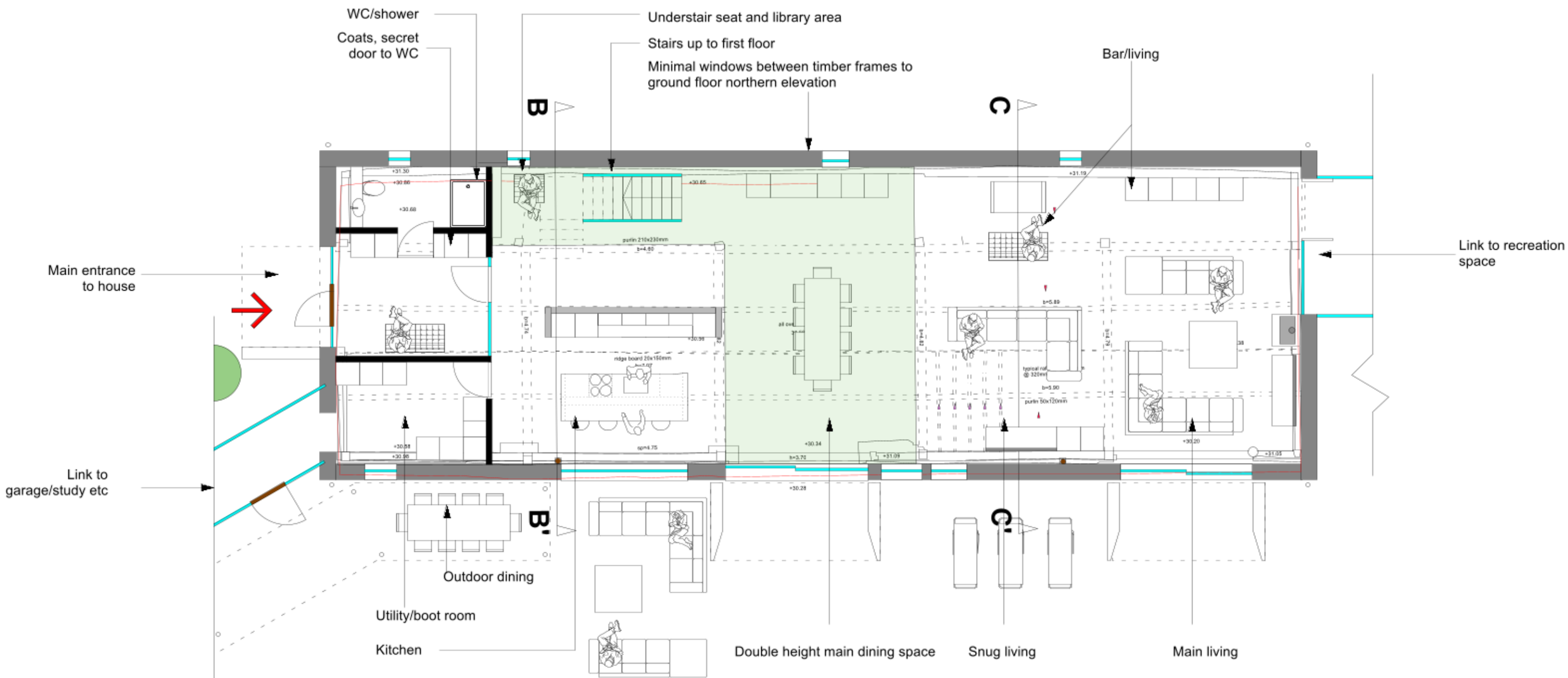
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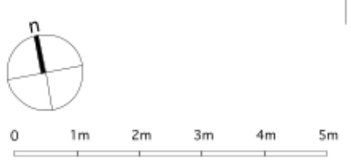
Title: **Main Barn Ground Floor Plan 1:100** Dwg No: **2178_215**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Proposed Barn Ground Floor Plan 1:100



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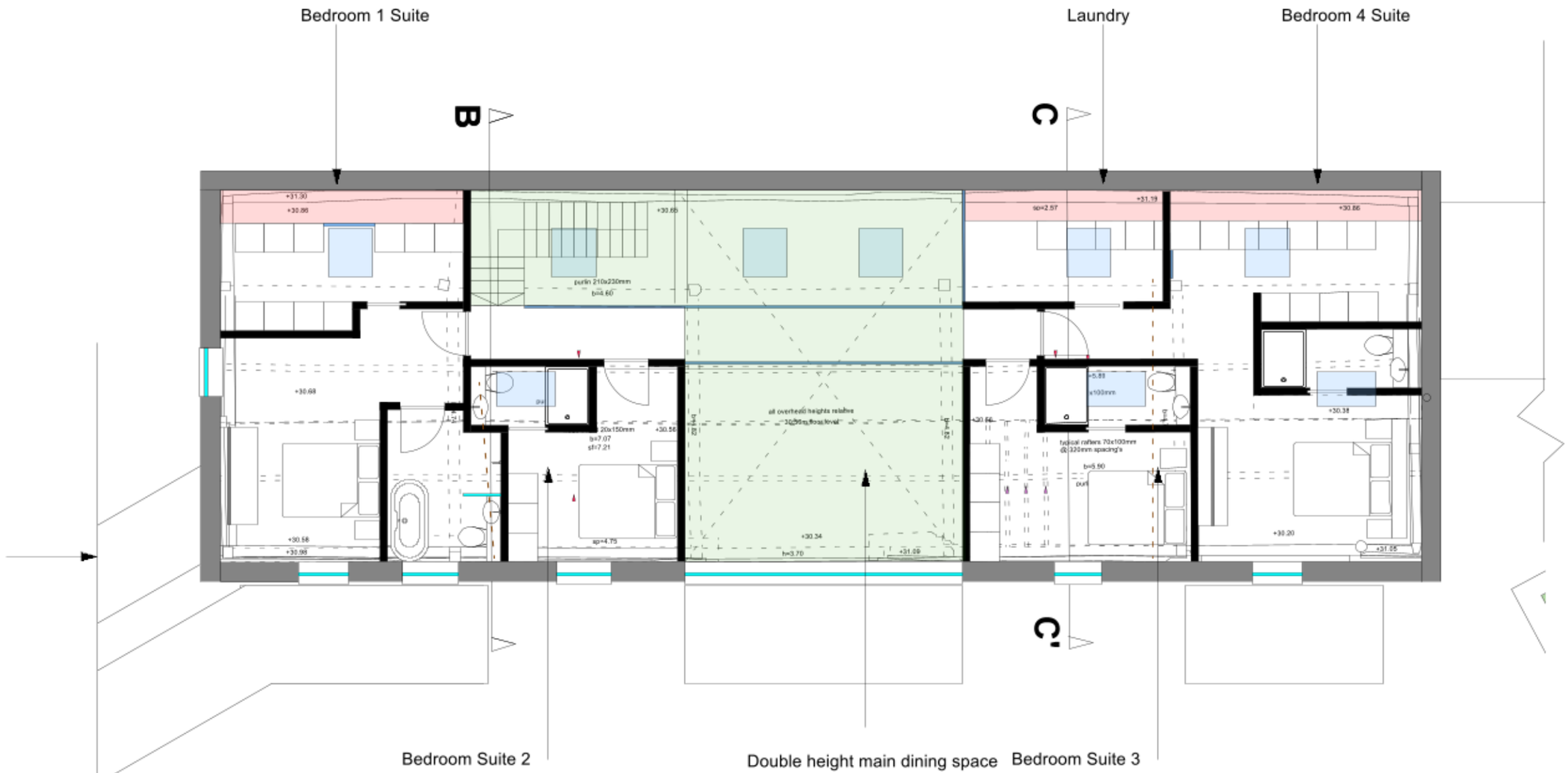
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Main Barn First Floor Plan 1:100** Dwg No: **2178_216**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Proposed Barn First Floor Plan 1:100

Double height space

Low space

n

0 1m 2m 3m 4m 5m

scale 1:100

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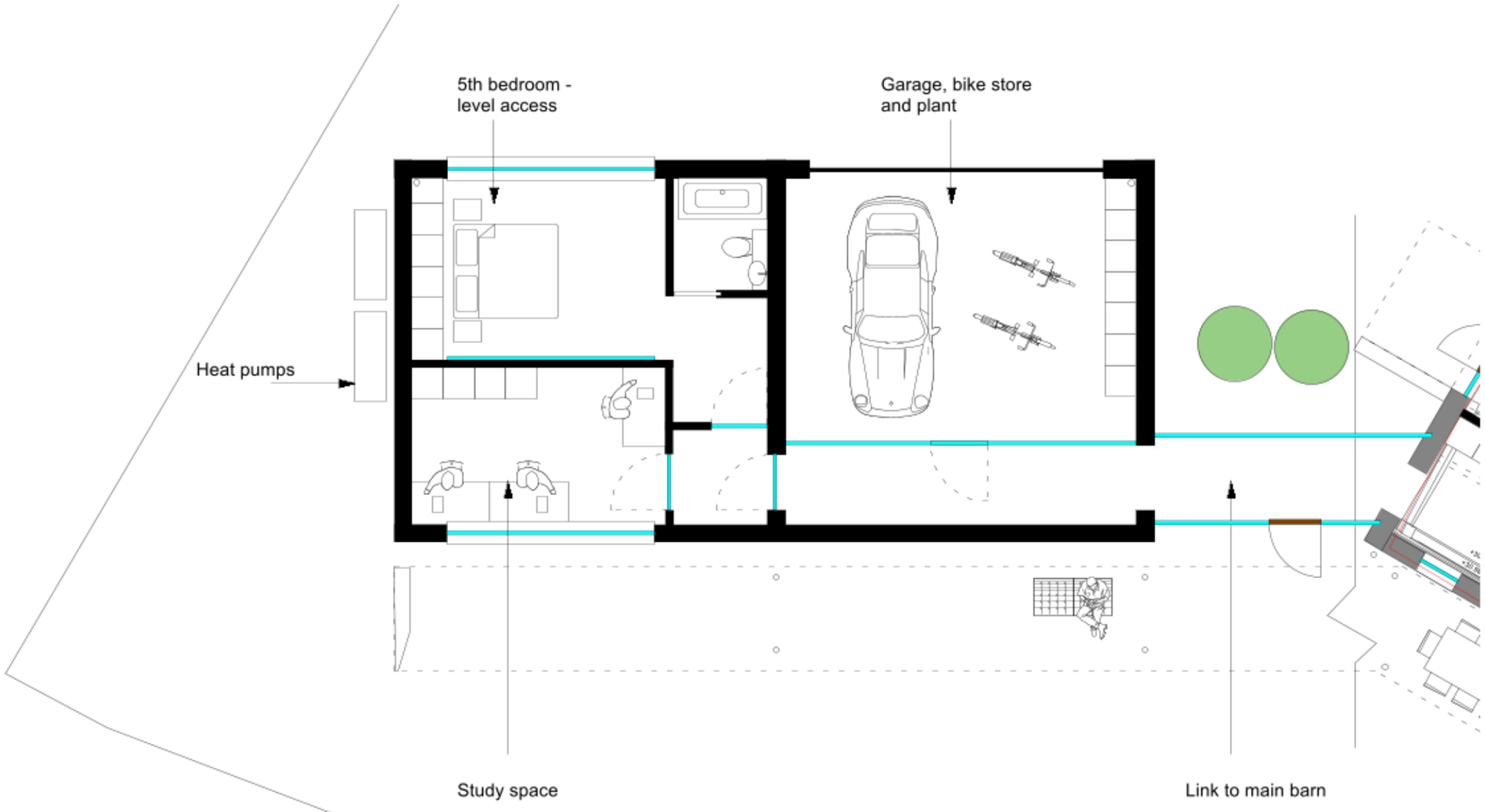
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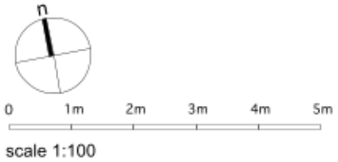
Title: **West Extension Ground Floor Plan 1:100** Dwg No: **2178_217**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Proposed Western Extension and Link 1:100



scale 1:100

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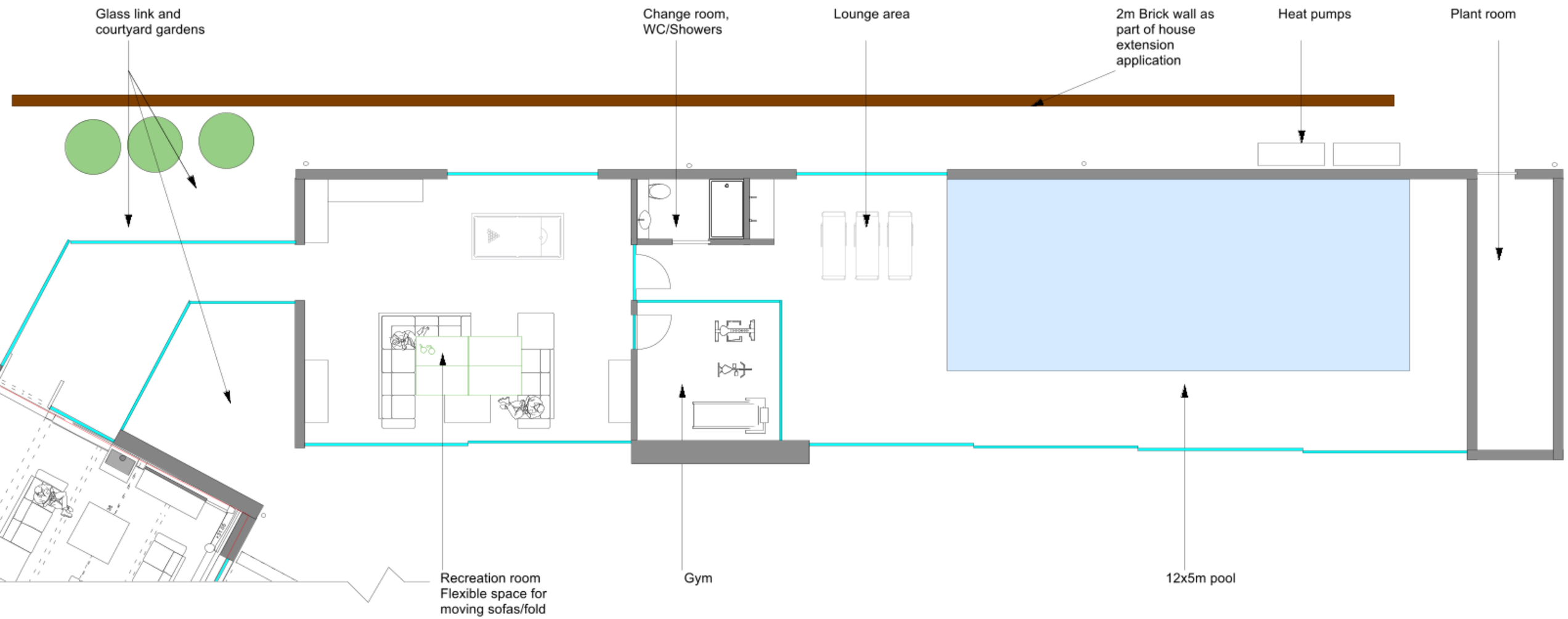
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Recreation Ext Ground Floor Plan 1:100** Dwg No: **2178_218**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Eastern Recreation Extension 1:100

0 1m 2m 3m 4m 5m

scale 1:100

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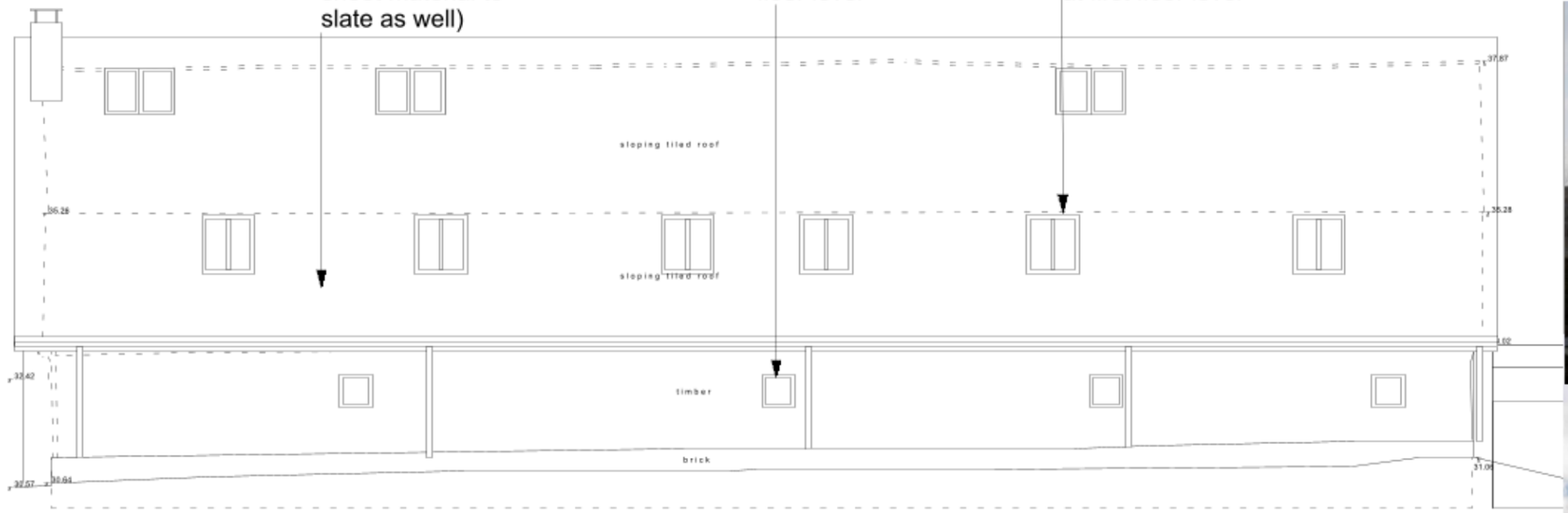
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Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Elevations North / South** Dwg No: **2178_220**

Purpose: Planning Scale: 1:100@A3 Revision: -

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Proposed Rear North Elevation



Proposed Rear South Elevation

0 2m 4m 6m 8m 10m

scale 1:200

Timber cladding

Horizontal windows with timbers remaining



Modern extensions and corten metal canopies for sun protection

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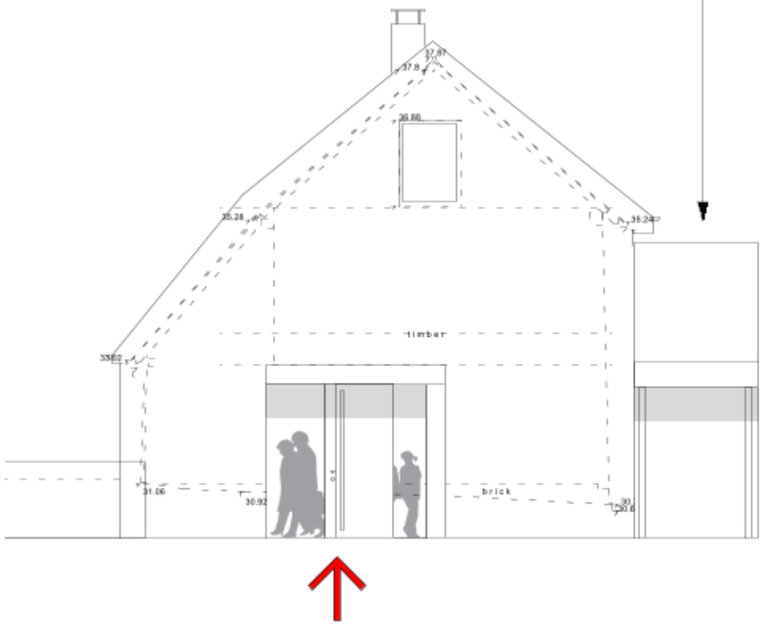
Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Elev. Main Barn West / East** Dwg No: **2178_221**

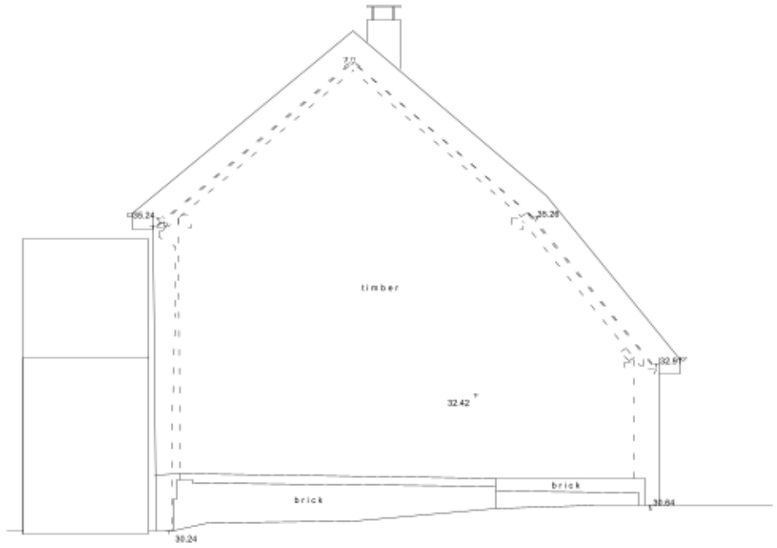
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Southern solar protection
Corten canopy



Proposed Main Barn East Elevation



Proposed Main Barn West Elevation



Barn timber cladding, black windows and black metal roofing

0 2m 4m 6m 8m 10m

scale 1:200

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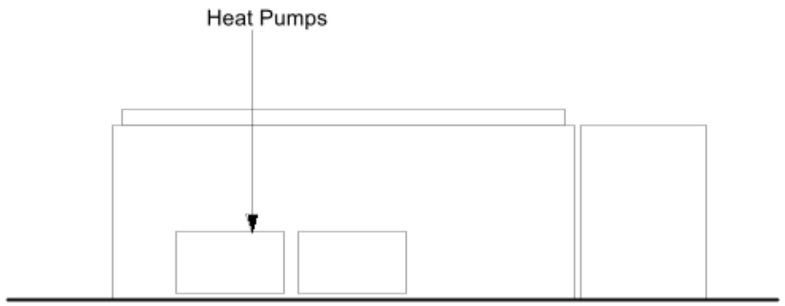
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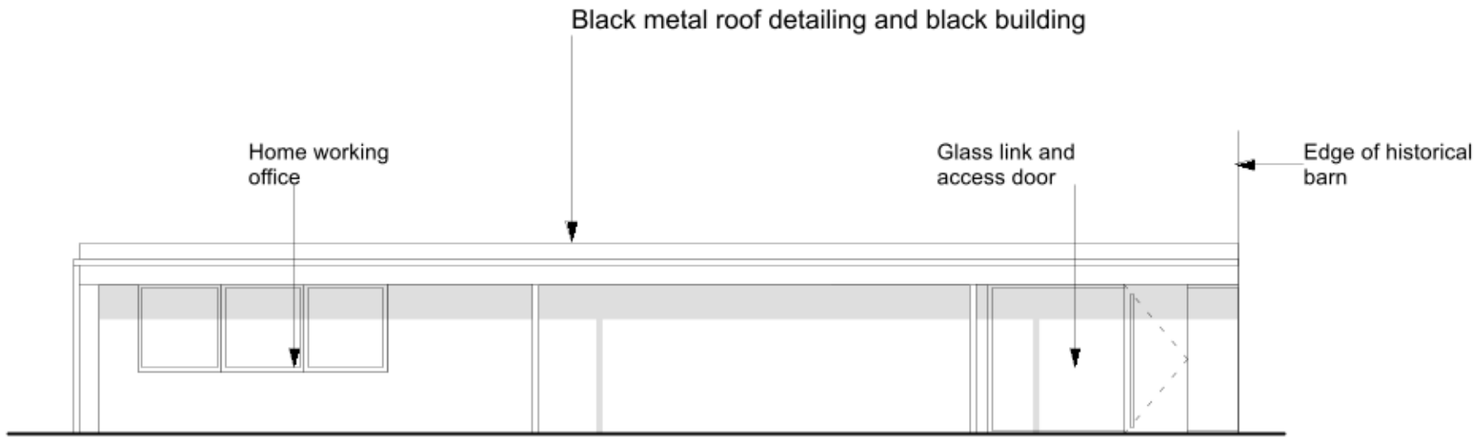
Title: **Proposed Elevations West Extension** Dwg No: **2178_222**

Purpose: Planning Scale: 1:100@A3 Revision: -

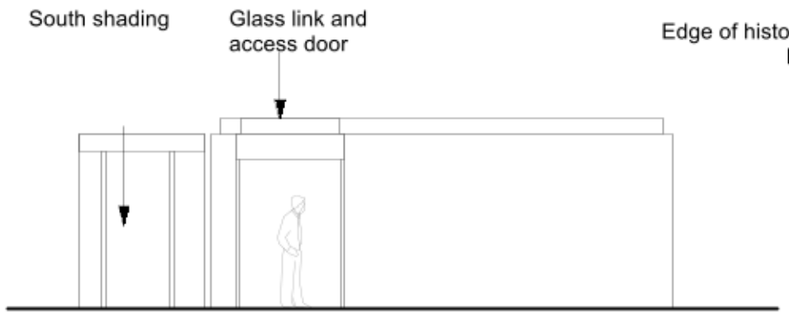
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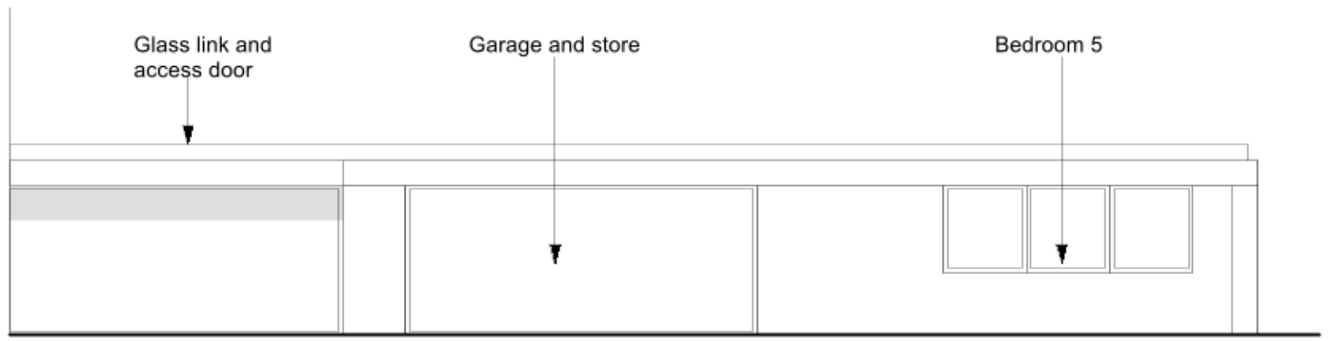
Proposed Side West Elevation



Proposed Rear South Elevation



Proposed Side East Elevation/Section (through glass link)



Proposed Front North Elevation



New extension in black metal, black windows and sedum roofing with solar panels

0 1m 2m 3m 4m 5m

scale 1:100

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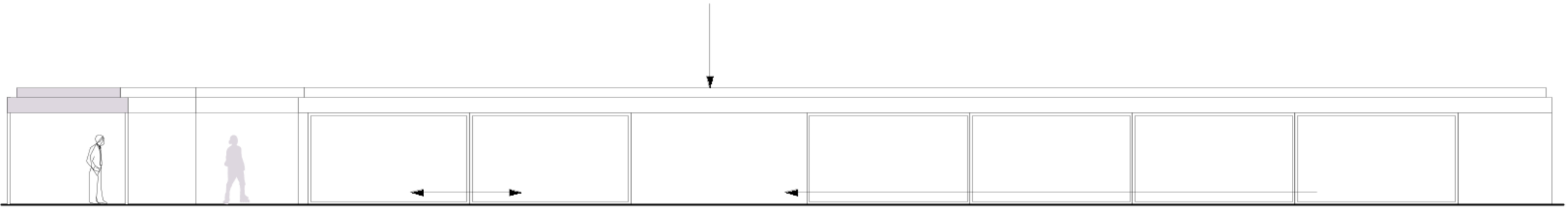
Project: 2178 : Farmhouse Barn, Great Staughton, PE19 5BE

Title: **Proposed Elevations East Extension** Dwg No: **2178_223**

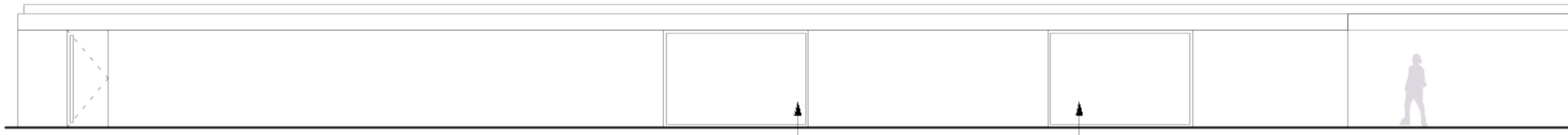
Purpose: Planning Scale: 1:100@A3 Revision: -

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Black metal roof detailing and black building



Proposed Front West Elevation



Proposed Rear East Elevation

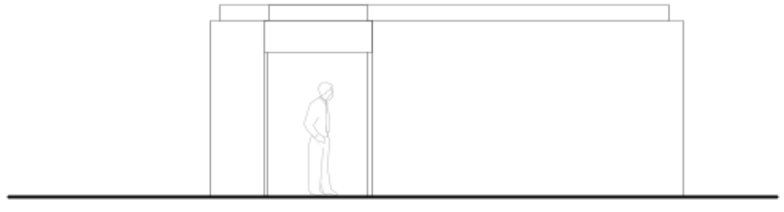
Opaque windows







Proposed Side South Elevation



Proposed Side North Elevation / section

0 1m 2m 3m 4m 5m

scale 1:100

Appendix B

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**512061/264276**	**21 Mar 2025 11:22**

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger that 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

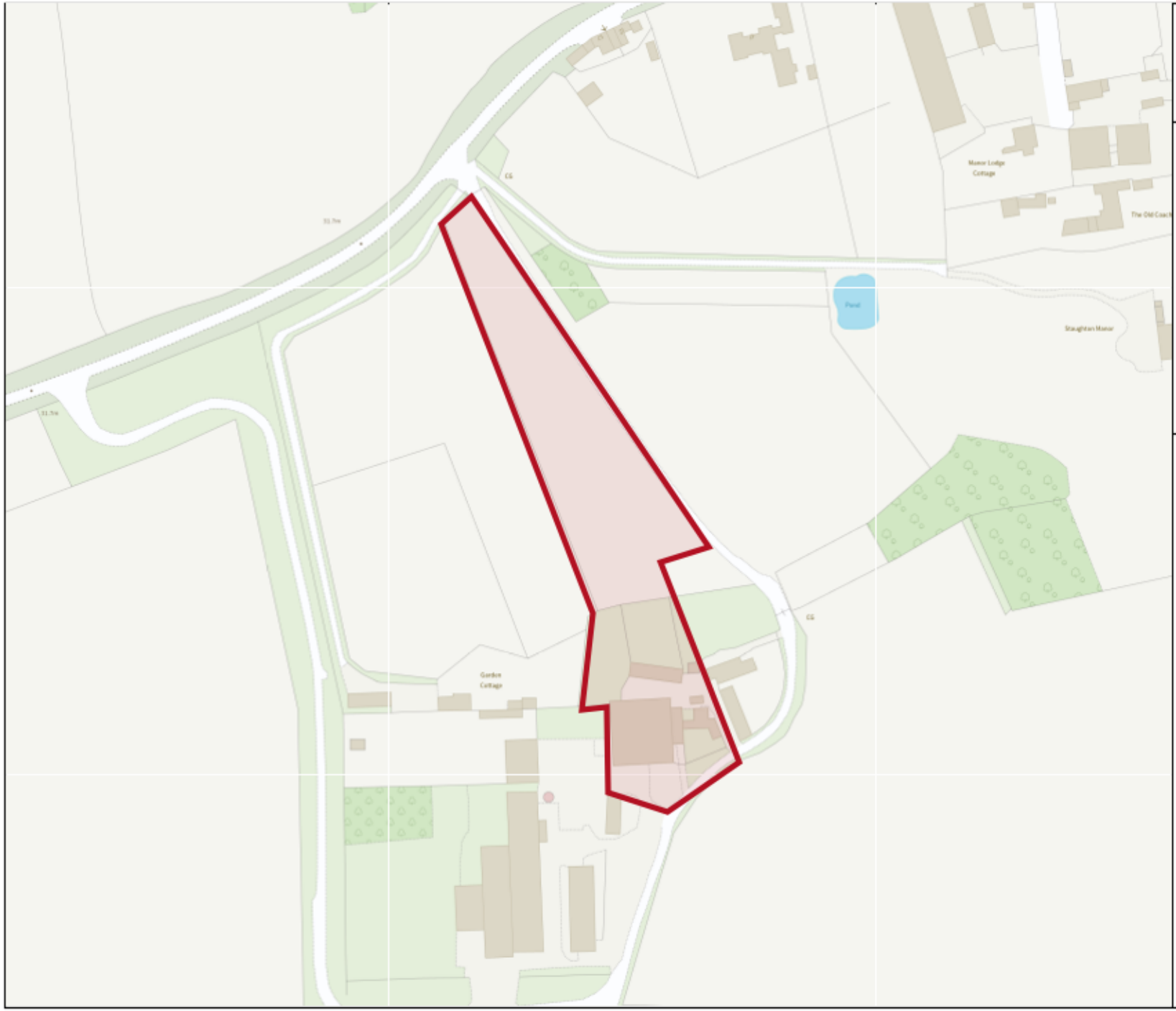
Notes

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

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

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Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
512061/264276

Scale
1:2500

Created
21 Mar 2025 11:22

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

0 20 40 60m

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Appendix C

Environment Agency Risk of Flooding from Surface Water (RoFSW) Depth Maps

1 in 30 year modelled depths



1 in 100 year modelled depths



1 in 1000 year modelled depths

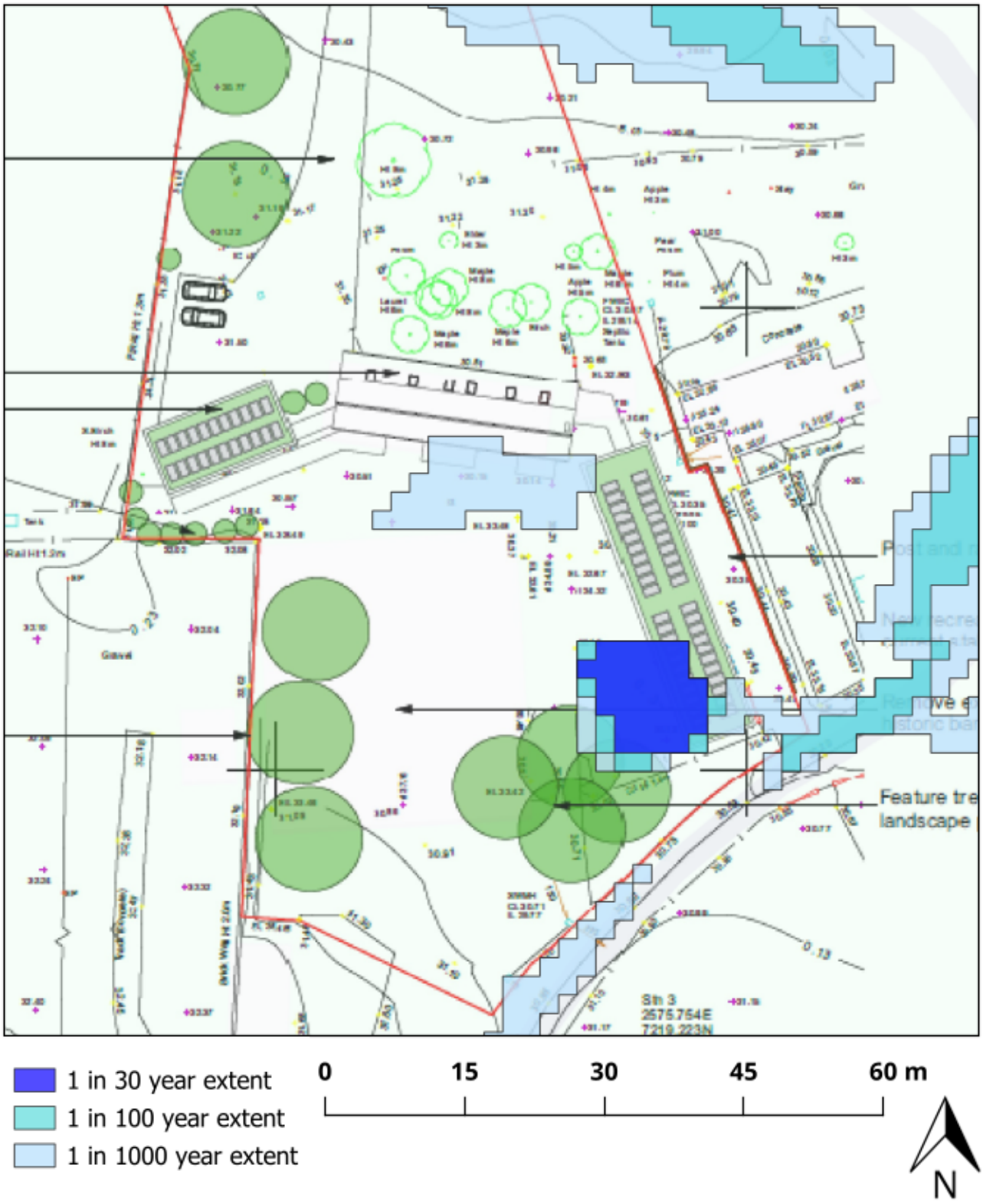


Surface Water Depths (m)

- 0.00 - 0.15
- 0.15 - 0.30
- 0.30 - 0.60
- 0.60 - 0.90
- 0.90 - 1.20
- > 1.20

0 25 50 75 100 m

N


1 in 30 year extent
1 in 100 year extent
1 in 1000 year extent
0
15
30
45
60 m
N
Feature tre
landscape
Bh 3
2575764E
7219223N

Appendix D

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

National Planning Policy Framework Annex 3: Flood risk vulnerability classification