Flood Risk Assessment for Planning

Prepared for:
Keeley Dixon

Location:
Delaware Barn
Hever Road
Edenbridge
Kent
TN8 7LD

April 2021

Our reference:
89891-Willow-Delaware-v2.0

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Document Issue Record

Project:	Flood Risk Assessment for Planning
Client:	Keeley Dixon
Location:	Delaware Farm, Hever Road, Edenbridge, Kent, TN8 7LD
Application:	Conversion of existing barn into a 3-bed detached dwelling
Our reference:	89891-Willow-Delaware-v2.0
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Lead Consultant:	Mrs Emma Jeffery
Document Check:	Ms Jackie Stone
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1. Key Facts

Flood Risk Posed:

- EA Flood Zone 2 (Medium Risk).
- Fluvial flood risk originating from the River Eden, and tributaries of the River Eden.
- Barn above the modelled 1:100 plus allowance for climate change flood levels for the main River Eden.
- Site entirely outside all modelled flood extents provided by the EA.
- Risk of pluvial flooding would appear to be low.
- Risk of groundwater and sewer surcharge flooding would appear to be low.

Flood Risk Management:

- Finished floor levels set at 39.440mAOD. This is 0.41m above the 1:100 year flood level with Upper End climate change (70%) of 39.03mAOD.
- Safe escape is provided entirely outside of Flood Zone 3.
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.
- Risk of pluvial flooding would appear to be low.
- Risk of groundwater and sewer surcharge flooding would appear to be low.

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

2. Introduction

Unda Consulting Limited have been appointed Keeley Dixon (hereinafter referred to as "the applicant") to undertake a Site Specific Flood Risk Assessment (FRA) for Planning on Delaware Farm, Hever Road, Edenbridge, Kent, TN8 7LD (hereinafter referred to as "the site"). The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The site appears to be located within Flood Zone 2 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.

Given that the proposed application site is located in Flood Zone 2 (Medium Risk of flooding from rivers or the sea), and includes building works, the applicant is required to submit a FRA under the NPPF. 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.

The objectives of a FRA to support a planning application are to establish:

- 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 Situation

3.1. Site Usage:

The site is currently an agricultural barn with integral stables.

The site has the benefit of a previous prior notification in place with reference 18/02174/PAC for a similarly presented 3-bedroom residential dwelling (Source: Studio Hudson architects, Design & Access Statement).

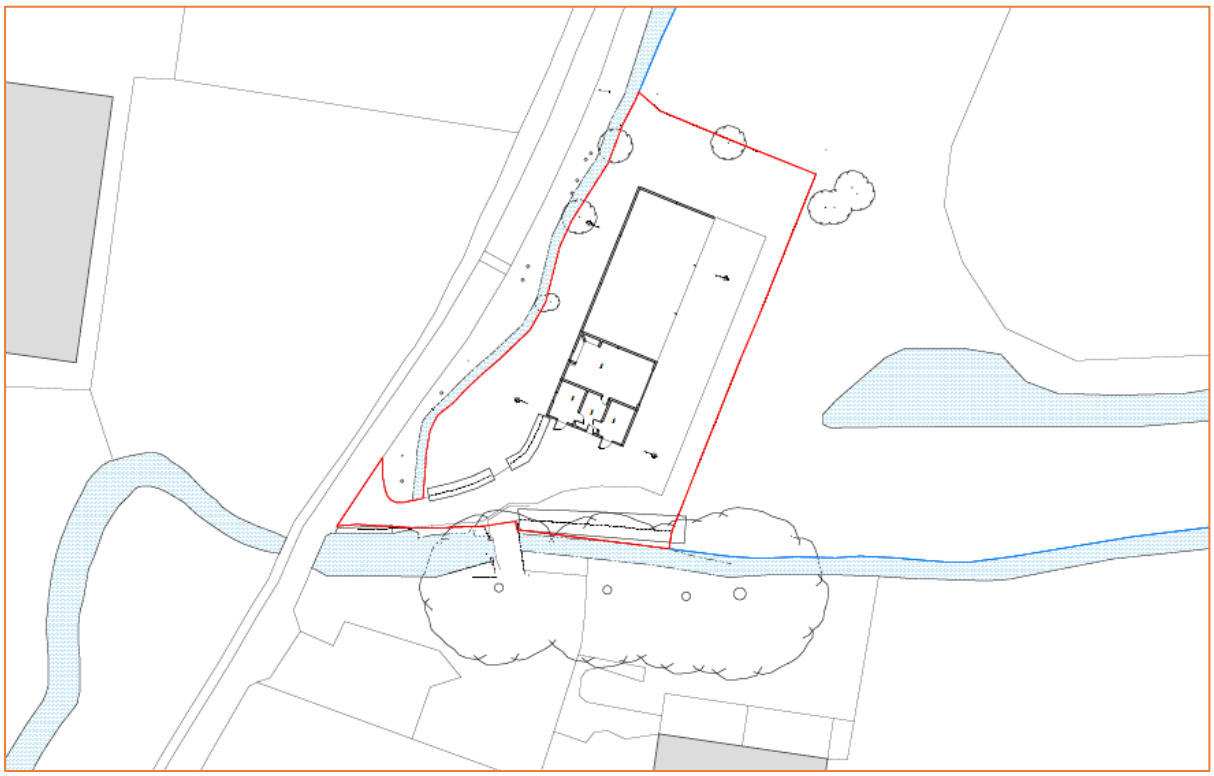

Figure 1: Existing Site Plan (Source: Studio Hudson Architects)

3.2. Topography:

The site is bordered by tributaries of the River Eden along its western and southern boundaries. The River Eden 'Main River' is approximately 220m to the north of the site at its closest proximity.

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 ±0.3m every 2m. This dataset is derived from a combination of the EA's 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.

Remotely sensed LiDAR data shows the site to be relatively flat, with the majority between 39.05mAOD and 39.20mAOD.

The existing plans provided by Studio Hudson Architects show an existing finished floor level of 39.29mAOD.

Figure 2: Aerial view of the site and immediate surrounding area (Source: Google Earth)

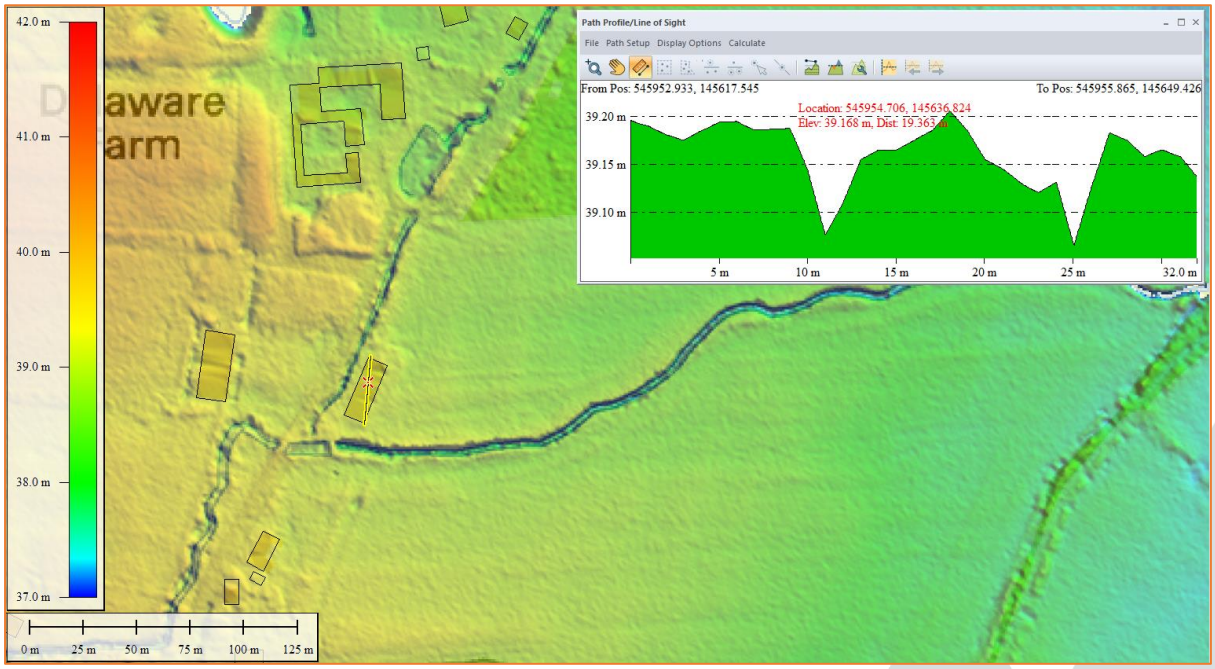

Figure 3: 1m LiDAR DTM showing topographic site levels. Transect runs from south to north (Source: EA 1m LiDAR, OS Mapping overlain)

3.3. Geography and Soil:

The British Geological Survey (BGS) Map indicates that the bedrock underlying the site is Weald Clay Formation – Mudstone, with Superficial Deposits of River Terrace Deposits, 1 – Sand and Gravel.

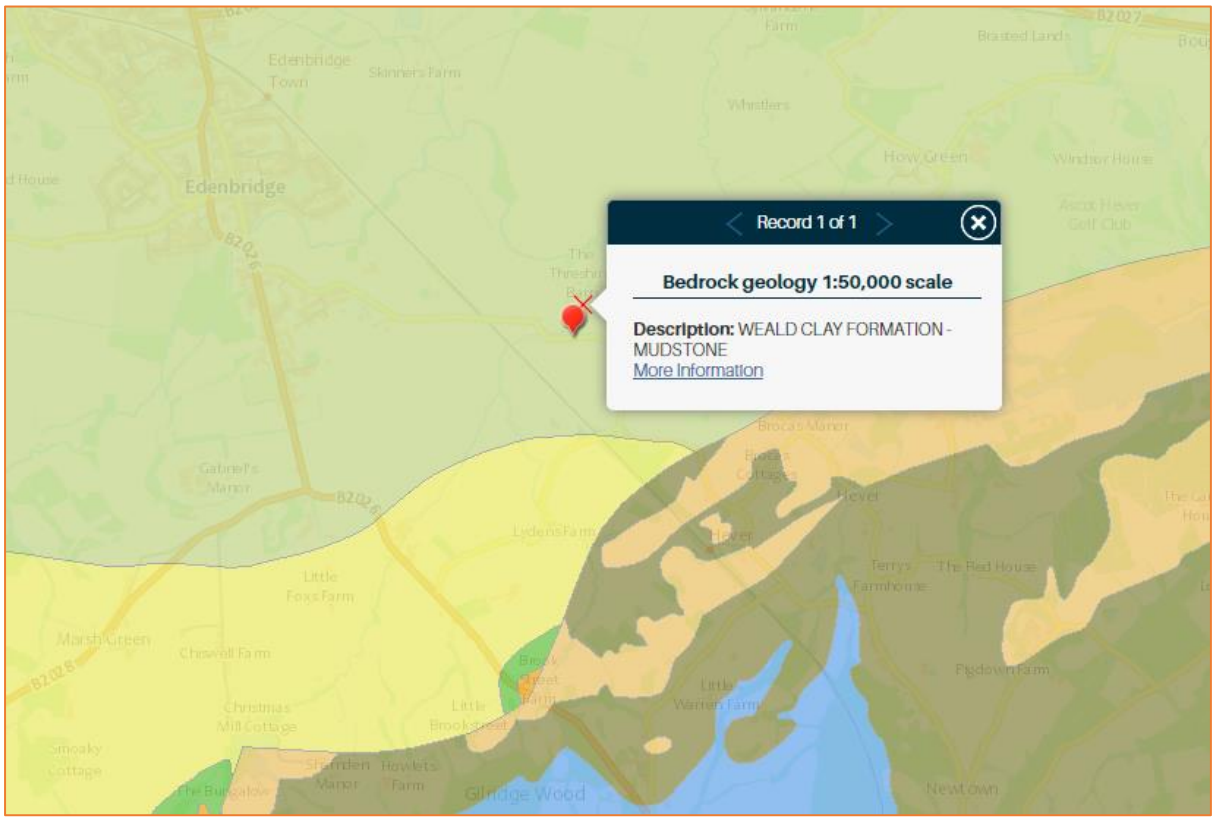

Figure 4: Bedrock geology (Source: BGS)

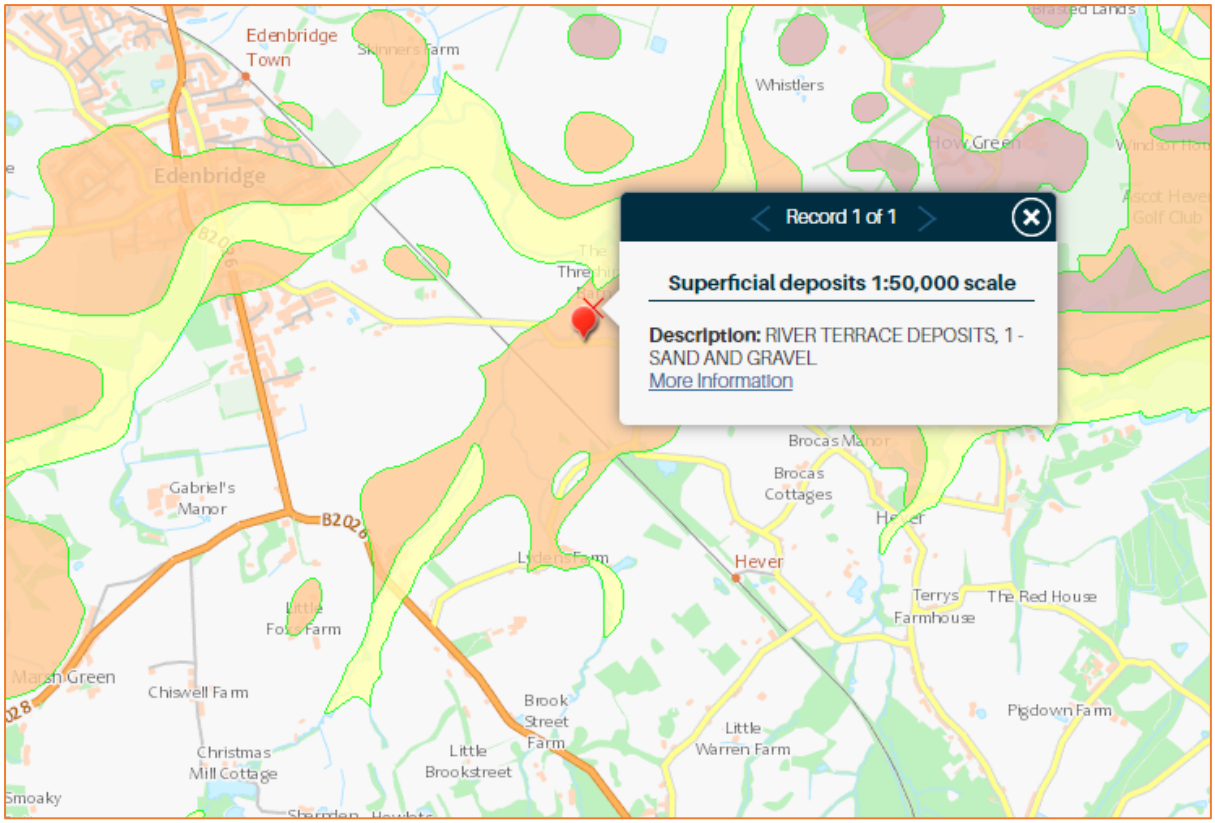

Figure 5: Superficial Deposits (Source: BGS)

The soil type in the area taken from the UKSO data is relatively deep soils of river terrace sand / gravel parent material, with a soil texture of sandy loam.

Figure 6: Local soil types (Source: UKSO)

4. Proposed Development

The proposed application is for Conversion of existing barn into a 3-bed detached dwelling.

Proposed plans can be found in the report Appendix.

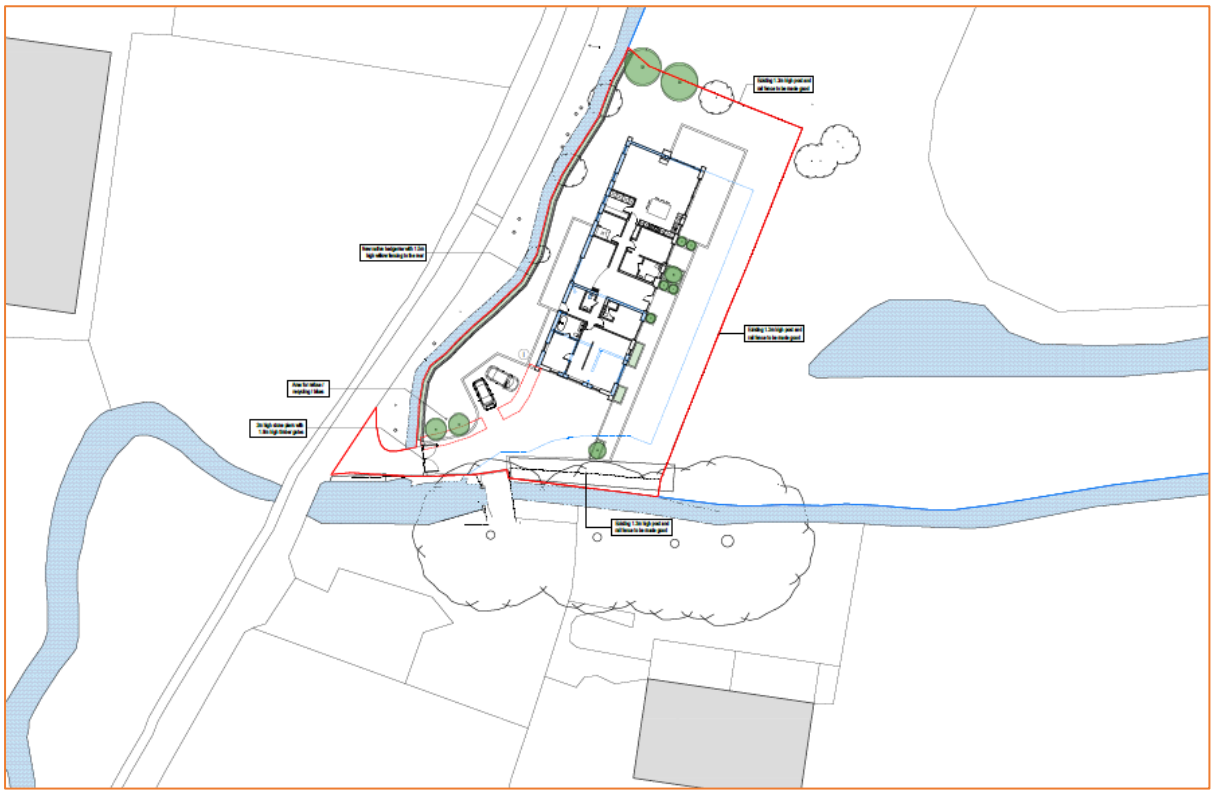

Figure 7: Proposed Site Plan (Source: Studio Hudson Architects)

5. Assessment of Flood Risk

5.1. Flood Zones:

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 web site.

Flood Zone	Definition
Zone 1 **Low Probability**	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 **Medium Probability**	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a **High Probability**	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b **The Functional Floodplain**	This zone comprises land where water has to flow or be stored in times of flood. 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: Flood Zones

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.

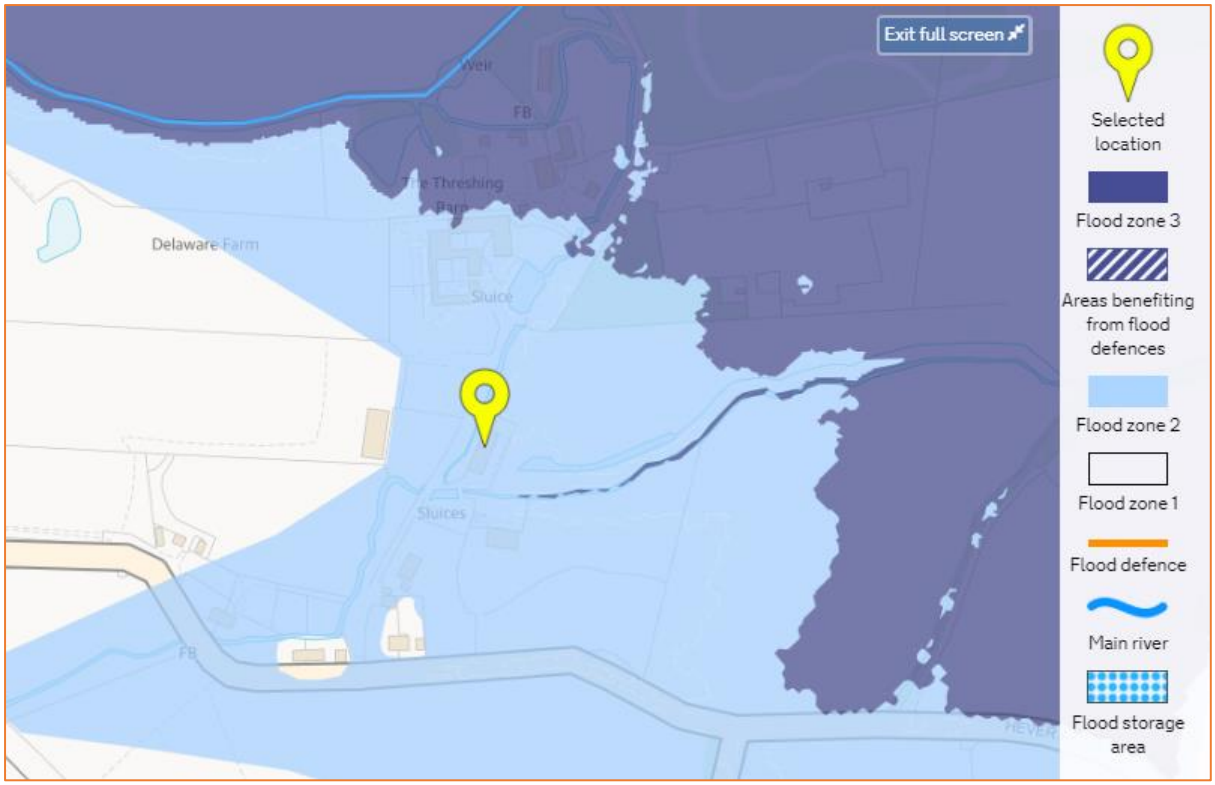

Figure 8: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

The site is located within Flood Zone 2 (Medium Probability), which means it is defined as land having between a 1:1000 and a 1:100 annual probability of fluvial flooding.

The risk would appear to be predominantly fluvial, and originate from the Eden Brook and its tributaries.

5.2. Fluvial (Eden Brook and its tributaries):

5.2.1. Modelled flood levels and extents:

Modelled flood data has been received from the EA as part of a 4 data request (Ref KSL 184765 AC).

Modelled flood data has been provided from the River Medway Mapping and Modelling Study, completed by JBA, in 2015, with climate change modelling completed in December 2016.

Both undefended and defended modelled flood levels have been provided for a variety of return periods. The undefended modelled flood levels are very slightly higher than the defended levels, and as such the undefended levels will be used for this assessment.

Node E-67AWJU is upstream of the site of the main River Eden. Modelled 1:100 year and 1:1000 year undefended flood levels of 38.662mAOD and 39.229mAOD have been provided. Comparison of these modelled flood levels with topographic site levels (which range between 39.05mAOD and 39.20mAOD) shows that the entire site is above the modelled 1:100 year level, but could flood with up to 0.179m of floodwater for the 1:1000 year event.

The site is located within the Thames River Basin District, and is “More Vulnerable” development located within Flood Zone 2. The Flood Risk Assessment Climate Change Guidance states that the Higher Central and Upper End climate change allowances should be applied – which are a 35% and 70% increase in flows respectively.

A modelled 1:100 year flood level with Higher Central climate change (35%) of 38.85mAOD and Upper End

climate change (70%) of 39.03mAOD has been provided. Comparison of these modelled flood levels with topographic site levels (39.05mAOD to 39.20mAOD) shows that the site is above both the modelled 1:100 year climate change flood levels provided.

The modelled flood extent maps provided by the EA show that the site is entirely outside of all the maximum defended and undefended flood extents – including the 1:1000 year extent.

No modelled flood levels or extents are available for the Tributaries of the River Eden that border the site along its western and southern boundaries.

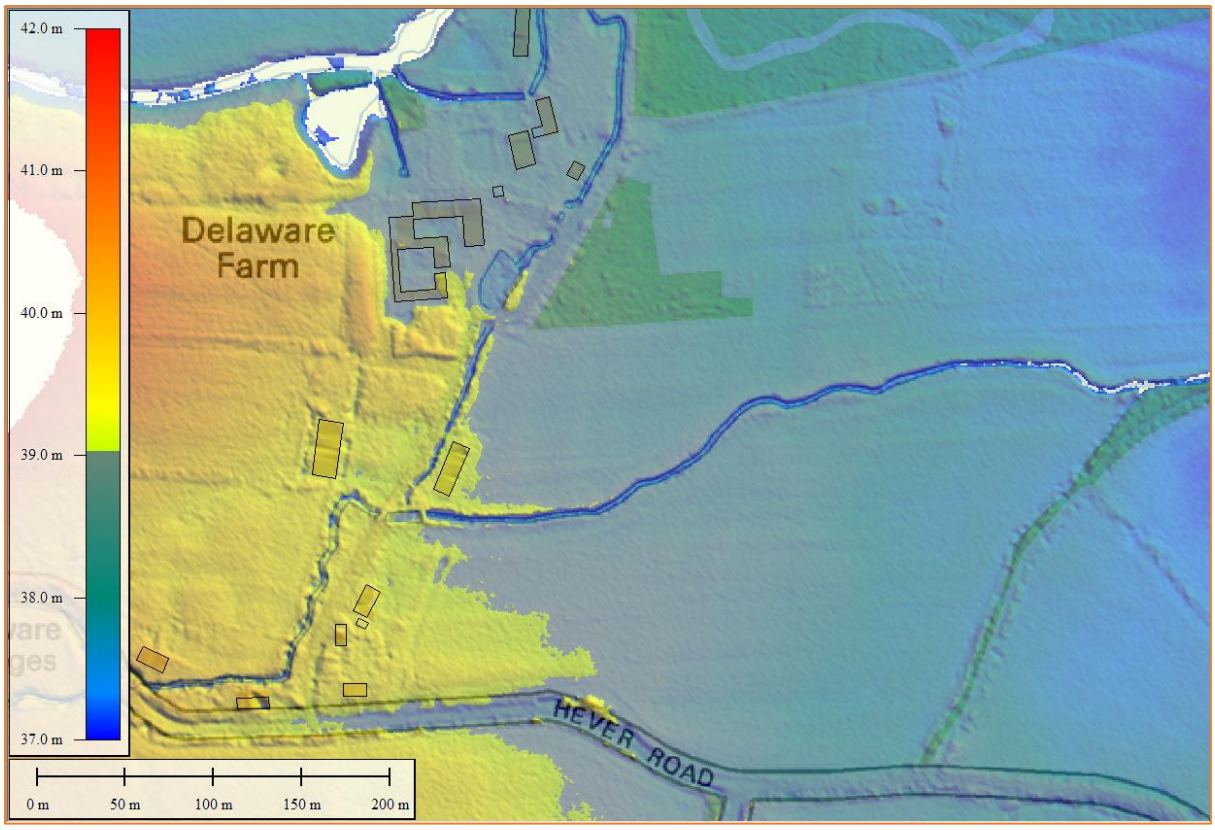

Figure 9: 1m LiDAR DTM with land below 1:100yr+70% climate change flood level (39.03mAOD) shaded blue (Source: EA LiDAR, OS Mapping)

5.2.2. Flood defences:

The EA has confirmed that there are no formal flood defences owned or maintained by the EA in the area of the site.

5.2.3. Residual risk (breach or overtopping of flood defences):

There are no raised defences which offer protection to the site, as such the residual risk of failure or overtopping of flood defences is considered to be negligible.

5.2.4. Historical flood events:

The EA has provided records of historic flood events in the area in September 1958, November 1960, September 1968 and December 2013. The site is shown to be within the September 1968 and November 1960 flood extents.

Anecdotal records from neighbours however state that the site has not flooded in the past 50 years. The river has flooded adjacent agricultural fields, and the public road sometimes experiences flash flooding (assumed to be surface water), however there are no known issues of flooding at the site. In 1967 there was widespread flooding and the main farmhouse at Delaware Farm was flooded up to around a depth of 1m, however the site and existing barn was entirely unaffected by this food event.

Two anecdotal flood extents have been provided by neighbours, one for the maximum flooded extent within the past 60 year and the other for 2013. The site is shown to be entirely outside of these flood extents.

The anecdotal records (two letter, and two flood extent maps) have been provided in the Appendix.

5.3. Pluvial (Surface Water):

Pluvial (surface water) flooding happens 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.

In 2013 the EA, working with Lead Local Flood Authorities (LLFAs), produced an updated Flood Map for Surface Water. It is considered to represent a significant improvement on the previous surface water flood maps available, both in terms of method and representation of the risk of flooding. The modelling techniques and data used and considerably improved, and also incorporated locally produced mapping where this is available to represent features best modelled at a local scale.

The Flood Map for Surface Water assesses flooding scenarios as a result of rainfall with the following chance of occurring in any given year (annual probability of flooding is shown in brackets):

- 1:30 (3.3%)
- 1:100 (1%)
- 1:1000 (0.1%)

The mapping below shows the Risk of Flooding from Surface Water centred on the site. Please note that the EA do not consider this information suitable to be used to identify the risk to individual properties or sites. It is useful to raise awareness in areas which may be at risk and may require additional investigation.

The EA Risk of Flooding from Surface Water Map suggests that the barn itself lies in an area of “Very Low” to “Low” risk of flooding from surface water.

The Sevenoaks District Council SFRA (2017) shows no records of surface water flooding at the site.

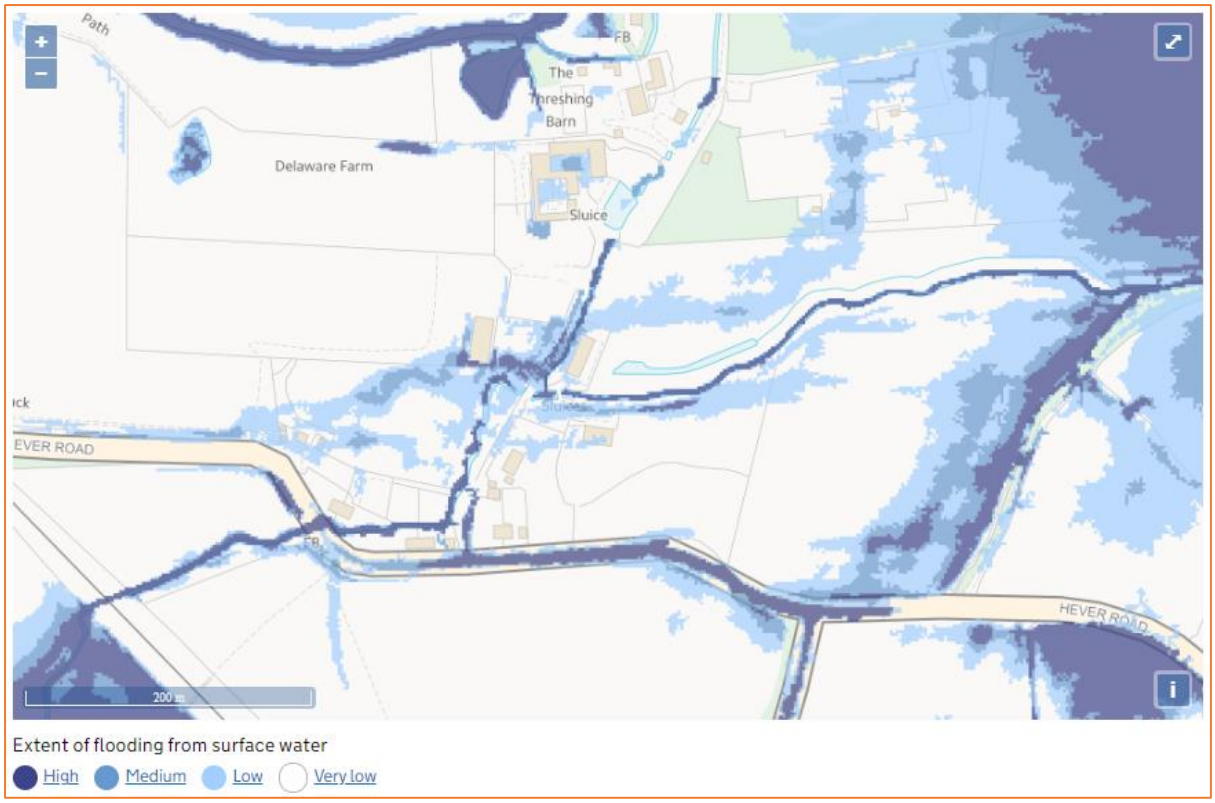

Figure 10: Extract from EA Risk of Flooding from Surface Water Map (Source: EA)

5.4. Groundwater:

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.

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.

No information has been provided to suggest that the site is susceptible to groundwater flooding. The Sevenoaks District Council SFRA (2017) shows no records of groundwater flooding at the site, and shows the site to be located within an area with >=25% <50% susceptibility to groundwater flooding.

5.5. Sewer Surcharge:

Sewer flooding events are usually the result of overloaded sewers following heavy rainfall or blockages caused by misuse of the sewerage system.

No information has been provided to suggest that the site is susceptible to sewer surcharge flooding

5.6. Other Sources:

The site is outside of the inundation extent on the EA Reservoir Inundation Map. The EA also advise on their website that reservoir flooding is extremely unlikely. All major reservoirs have to be inspected by specialist dam and reservoir Engineers. 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 flooding to occur.

There do not appear to be any further artificial (man-made) sources of flood risk (such as raised canals) in the vicinity of the site.

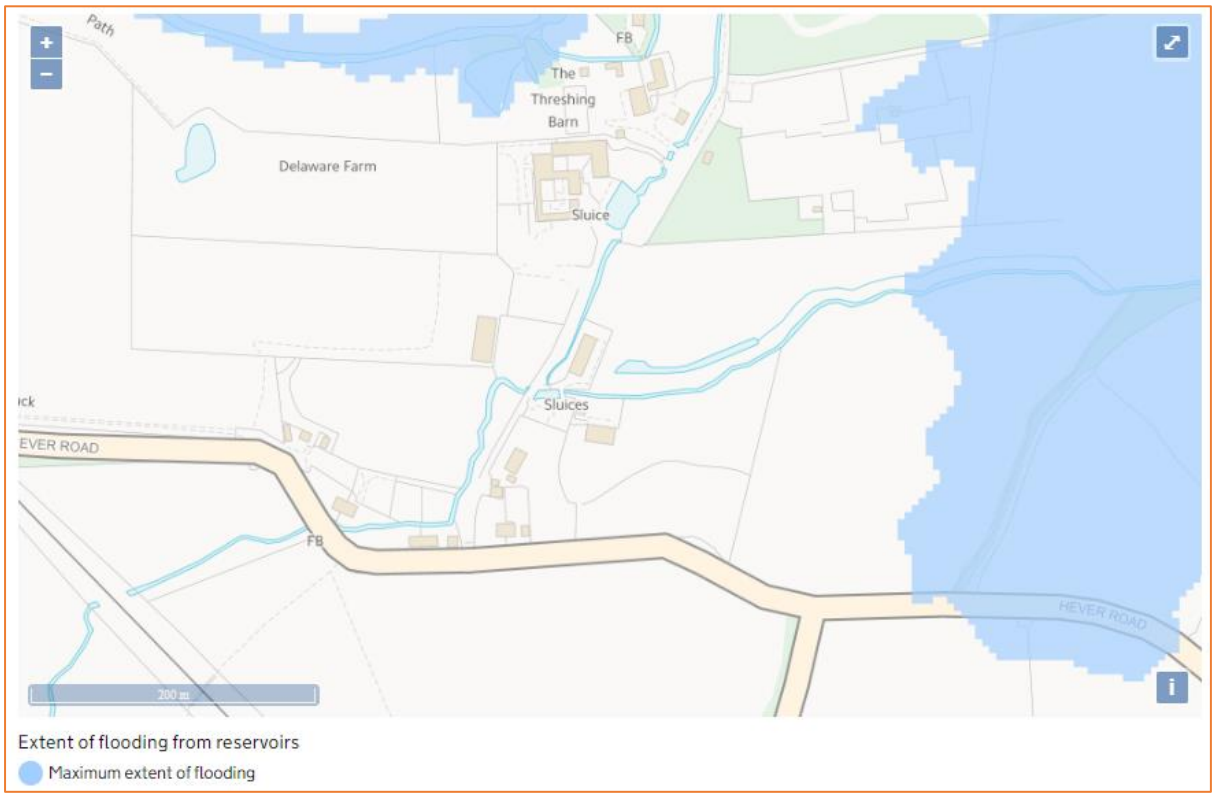

Figure 11: Extract from Environment Agency Risk of Flooding from Reservoirs Map (Source: EA)

6. Flood Risk Management Measures

6.1. Vulnerability to flooding:

The NPPF classifies property usage by vulnerability to flooding.

The existing site is an agricultural barn, and is therefore classified as "less vulnerable" under the NPPF.

Post development, the site will become "more vulnerable", as the application is for Conversion of existing barn into a 3-bed detached dwelling. Accordingly, it is considered that the vulnerability of the site as a whole is increased post development, as there will be introduction of an additional residential unit.

6.2. EA Standing Advice:

The 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 annex or additional commercial unit.

6.3. Physical Design Measures:

A modelled 1:100 year flood level with Upper End climate change (70%) of 39.03mAOD has been provided. Comparison of this modelled flood levels with topographic site levels (39.05mAOD to 39.20mAOD) shows that the site is above the modelled 1:100 year plus 70% climate change flood level provided. As such, all residential uses are above the modelled design flood level.

Based on the plans provided, the finished floor level will be set at 39.440mAOD. This is 0.41m above the 1:100 year flood level with Upper End climate change (70%) of 39.03mAOD.

To help protect against flooding during extreme events, the applicant has agreed to implement flood resistant design measures into the development, in consultation with the Local Authority building control department.

These measures can include the following:

- Solid concrete ground floor slab, with waterproof membrane;
- Waterproof screed used on floors;
- Closed-cell foam used in wall cavities;
- Waterproof ground floor internal render;
- External walls rendered resistant to flooding to first floor level;
- Exterior ventilation outlets, utility points and air bricks fitted with removable waterproof covers;
- Ground floor electrical main ring run from first floor level; and on separately switched circuit from first floor;
- Electrical incomer and meter situated at first floor level or above;
- Boilers, control and water storage / immersion installed at first floor level or above;
- Gas meter installed at first floor level or above;
- Plumbing insulation of closed-cell design;
- Non-return valves fitted to all drain and sewer outlets;
- Manhole covers secured;
- Anti-syphon fitted to all toilets;
- Kitchen units of solid, water resistant material;
- 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.

The applicant should also consider the use of demountable flood defence barriers to defend ground level doorways and low windows.

6.4. Safe Escape:

The NPPF requires a route of safe escape for all residents and users to be provided from new residential properties. Safe escape is usually defined as being through slow moving flood water no deeper than 25cm during the 1:100 year plus 70% allowance for climate change flood event.

Comparison of modelled flood levels with topographic site levels shows the barn is above the 1:100yr plus 70% Climate Change flood level for the main River Eden. Site users should exit the site and travel south along the site access and then west along Hever Road. This route is shown to be entirely outside of Flood Zone 3. The site access route is within Flood Zone 2, however Hever Road is entirely within Flood Zone 1.

This is escape route is entirely above the 1:100yr plus 70% Climate Change flood level (39.03mAOD).

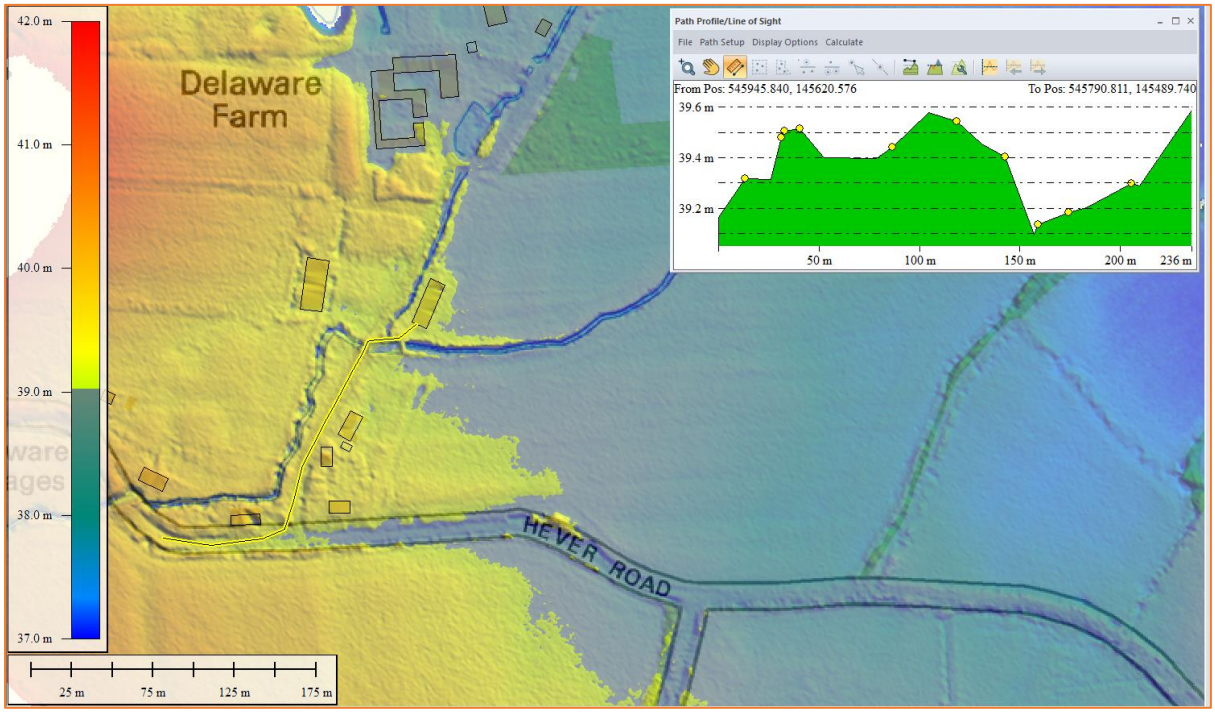

Figure 12: 1m LiDAR DTM with land below 1:100yr+70% climate change flood level (39.03mAOD) shaded blue. Yellow line shows proposed escape route, with topographic levels along proposed route shown in transect inset. (Source: EA LiDAR, OS Mapping)

6.5. Flood Warning:

To further conform to the EA Standing Advice, the applicant has agreed to implement a flood warning and evacuation plan post development, and subscribe to the EA's flood warning service.

The site lies within the Rivers Eden and Eden Brook from Crowhurst and Blindley Heath to Penshurst Flood Warning Area.

The flood warning service has three types of warnings that will help you prepare for flooding and take action:

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

6.6. Flood Plan:

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

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

The site lies in an Environment Agency Flood Warning Area. The EA issue flood warnings to specific areas when flooding is expected. It is recommended that the applicant registers online with the free Environment Agency Floodline Warnings Direct service at https://fwd.environment-agency.gov.uk/app/olr/register to receive flood warnings by phone, text or email.

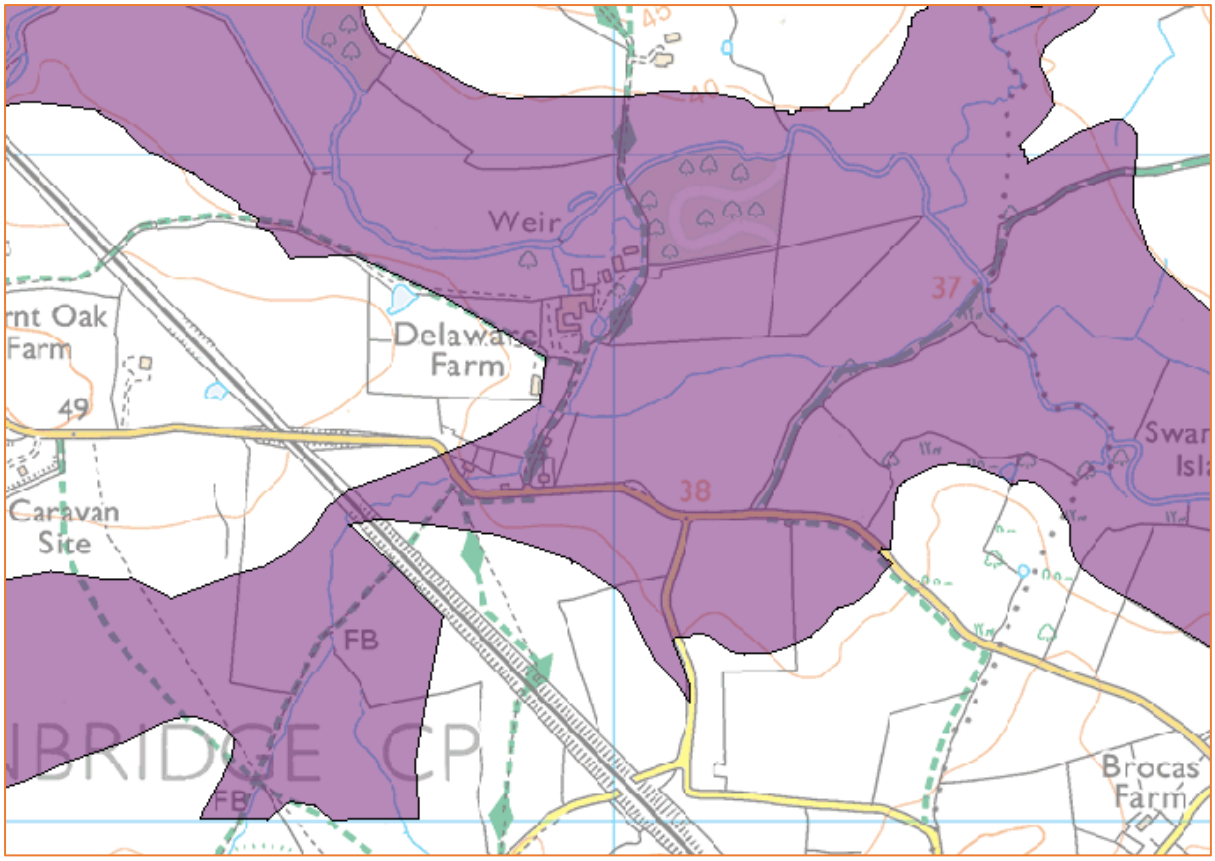

Figure 13: Extract from the Environment Agency Flood Warning Areas Map (Source: EA)

6.7. Off-Site Impacts

6.7.1. Fluvial floodplain storage:

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.

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.

The proposed development is for Conversion of existing barn into a 3-bed detached dwelling, as such there will be no increase in built footprint. In addition the barn is shown to be entirely outside of the modelled 1:100 year flood extent with 70% allowance for climate change.

6.7.2. Surface Water Drainage Strategy:

The development will utilise Sustainable Urban Drainage (SuDs) design in accordance with the NPPF for Planning Applications 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;
7. Attenuation of rainwater in ponds or open water features with controlled discharge into the local watercourse.

The existing concrete and hardstanding are proposed to be reduced in favour of a new lawn area to east, north, and western areas of immediate amenity (Source: Studio Hudson Architects Design & Access Statement).

7. Sequential and Exception Test

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. The site is situated in Flood Zone 2 when using the Environment Agency Flood Map for Planning (Rivers and Sea). Post development, the site will become "more vulnerable" (residential).

Flood Zones	**Flood Risk Vulnerability Classification**				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a	Exception Test required	✗	Exception Test required	✓	✓
Zone 3b	Exception Test required	✗	✗	✗	✓

Table 2: Flood risk vulnerability and flood zone 'compatibility'

Using the table above, the proposed application is considered to be suitable within Flood Zone 2. Minor development and Change of Use applications are not required to pass the Sequential and Exception Tests.

8. Conclusion

Unda Consulting Limited have been appointed Keeley Dixon to undertake a Site Specific Flood Risk Assessment (FRA) for Planning on Delaware Farm, Hever Road, Edenbridge, Kent, TN8 7LD. The FRA has been undertaken in accordance with the National Planning Policy Framework (NPPF) and the associated technical guidance.

The proposed development is for Conversion of existing barn into a 3-bed detached dwelling.

The site is currently an agricultural barn with integral stables.

The site has the benefit of a previous prior notification in place with reference 18/02174/PAC for a similarly presented 3-bedroom residential dwelling (Source: Studio Hudson architects, Design & Access Statement).

The existing site is an agricultural barn, and is therefore classified as "less vulnerable" under the NPPF.

Post development, the site will become "more vulnerable", as the application is for Conversion of existing barn into a 3-bed detached dwelling. Accordingly, it is considered that the vulnerability of the site as a whole is increased post development, as there will be introduction of an additional residential unit.

The site is located within Flood Zone 2 as defined by the Environment Agency (EA) on their Flood Map for Planning. The risk would appear to be predominantly fluvial, and originate from the River Eden and its tributaries / drains.

Comparison of the modelled Higher Central (35%) and Upper End (70%) 1:100 year plus climate change flood levels with topographic site levels (39.05mAOD to 39.20mAOD) shows that the site is above both the modelled 1:100 year climate change flood levels provided.

The modelled flood extent maps provided by the EA show that the site is entirely outside of all the maximum defended and undefended flood extents – including the 1:1000 year extent.

No modelled flood levels or extents are available for the Tributaries of the River Eden that border the site along its western and southern boundaries.

Safe escape can be provided entirely outside of Flood Zone 3. The site access route is within Flood Zone 2, however Hever Road is entirely within Flood Zone 1.

Based on the plans provided, the finished floor level will be set at 39.440mAOD. This is 0.41m above the 1:100 year flood level with Upper End climate change (70%) of 39.03mAOD.

In summary:

- EA Flood Zone 2 (Medium Risk).
- Fluvial flood risk originating from the River Eden and its tributaries / drains.
- Barn above the modelled 1:100 plus allowance for climate change flood levels for the main River Eden.
- Site entirely outside all modelled flood extents provided by the EA.
- Finished floor levels set at 39.440mAOD. This is 0.41m above the 1:100 year flood level with Upper End climate change (70%) of 39.03mAOD.
- Safe escape is provided entirely outside of Flood Zone 3.
- Flood proofing of the building will be incorporated as appropriate.
- A flood warning and evacuation plan will be implemented post development.
- Risk of pluvial flooding would appear to be low.
- Risk of groundwater and sewer surcharge flooding would appear to be low.

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

Appendix

- Existing and proposed development plans.
- Anecdotal maximum flood extent from past 50 years.
- Anecdotal 2013 maximum flood extent.

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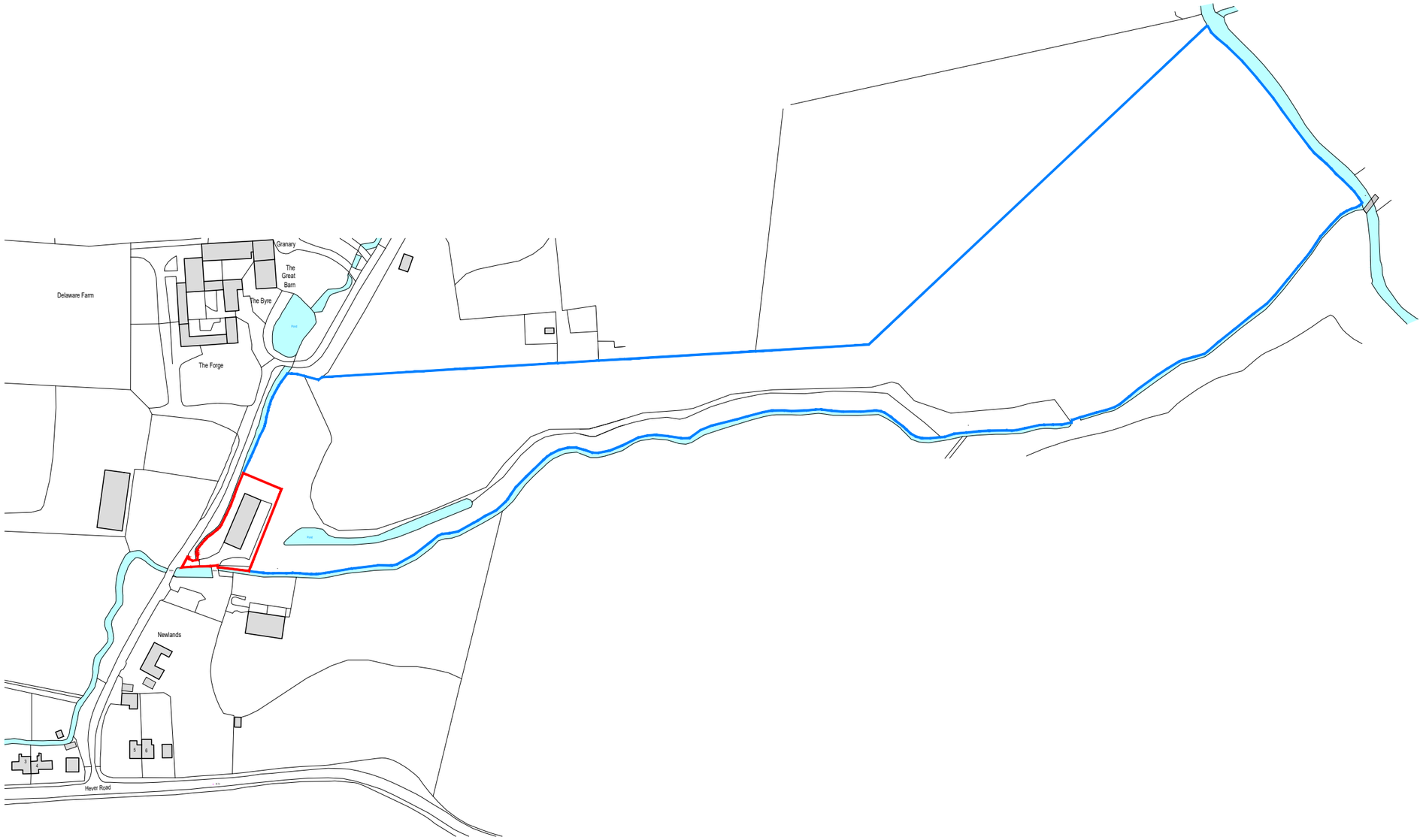
Key

- Planning Application Boundary 0.13Ha
- Site Ownership Boundary



1 PLAN
LOCATION PLAN

SCALE 1:2500
0m 25 50 125 250

	A Issued for discussion		March 2021
STUDIO HUDSON architects	Project: Newlands, Delaware Farm Hever Road, Edenbridge.TN8 7LD	Date: Oct 2020	N
	Drawing Title: Location Plan	Scale Noted @A3	
	Drawing Number: 20017-E-100	Rev A	

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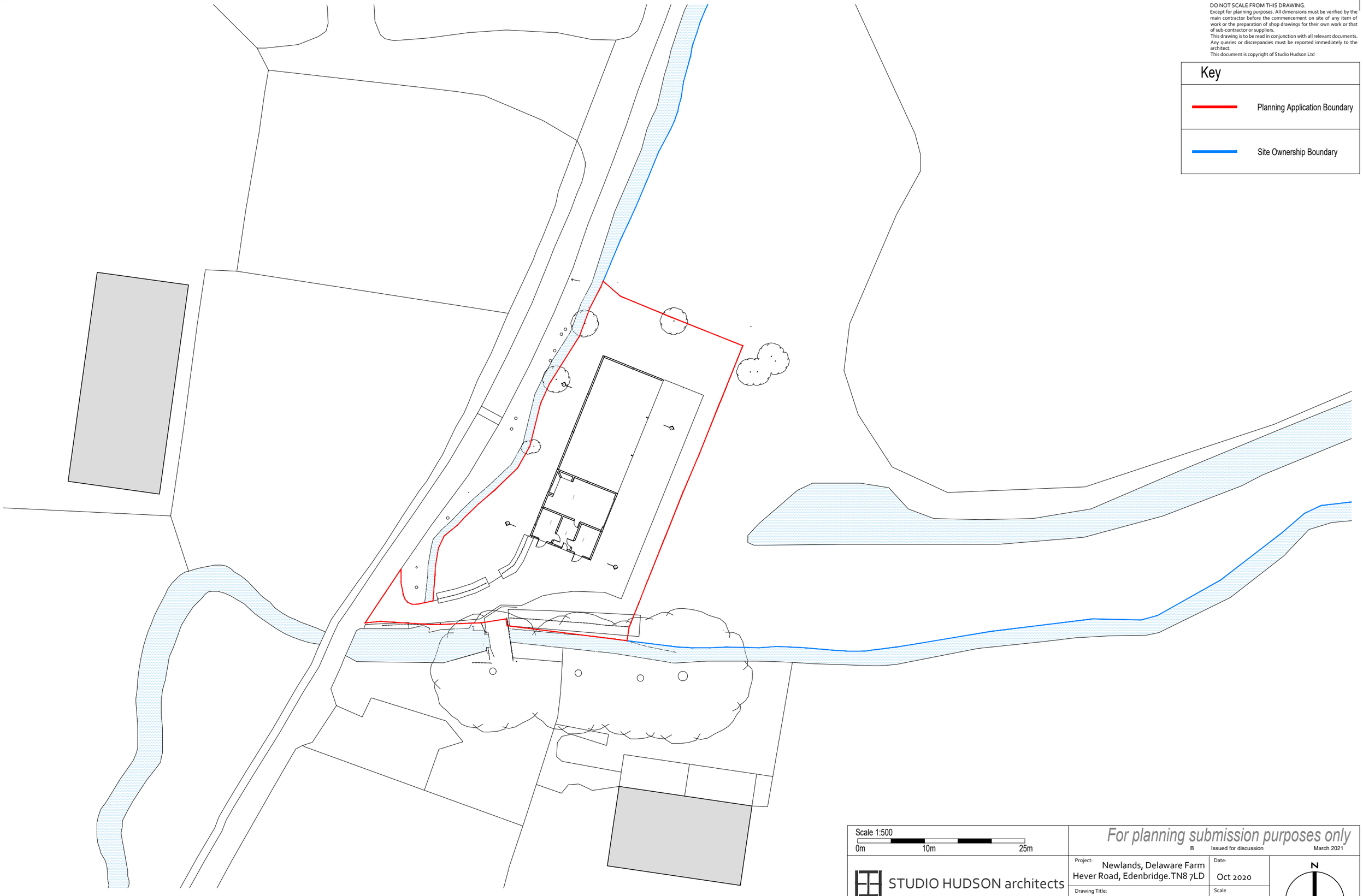
Key

- Planning Application Boundary
- Site Ownership Boundary



1 PLAN
Existing Site Plan

Scale 1:500
0m 10m 25m

For planning submission purposes only

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Date: Oct 2020

Drawing Title: Existing Site Plan

Scale: Noted @A3

Drawing Number: 20017-E-200

Rev: B

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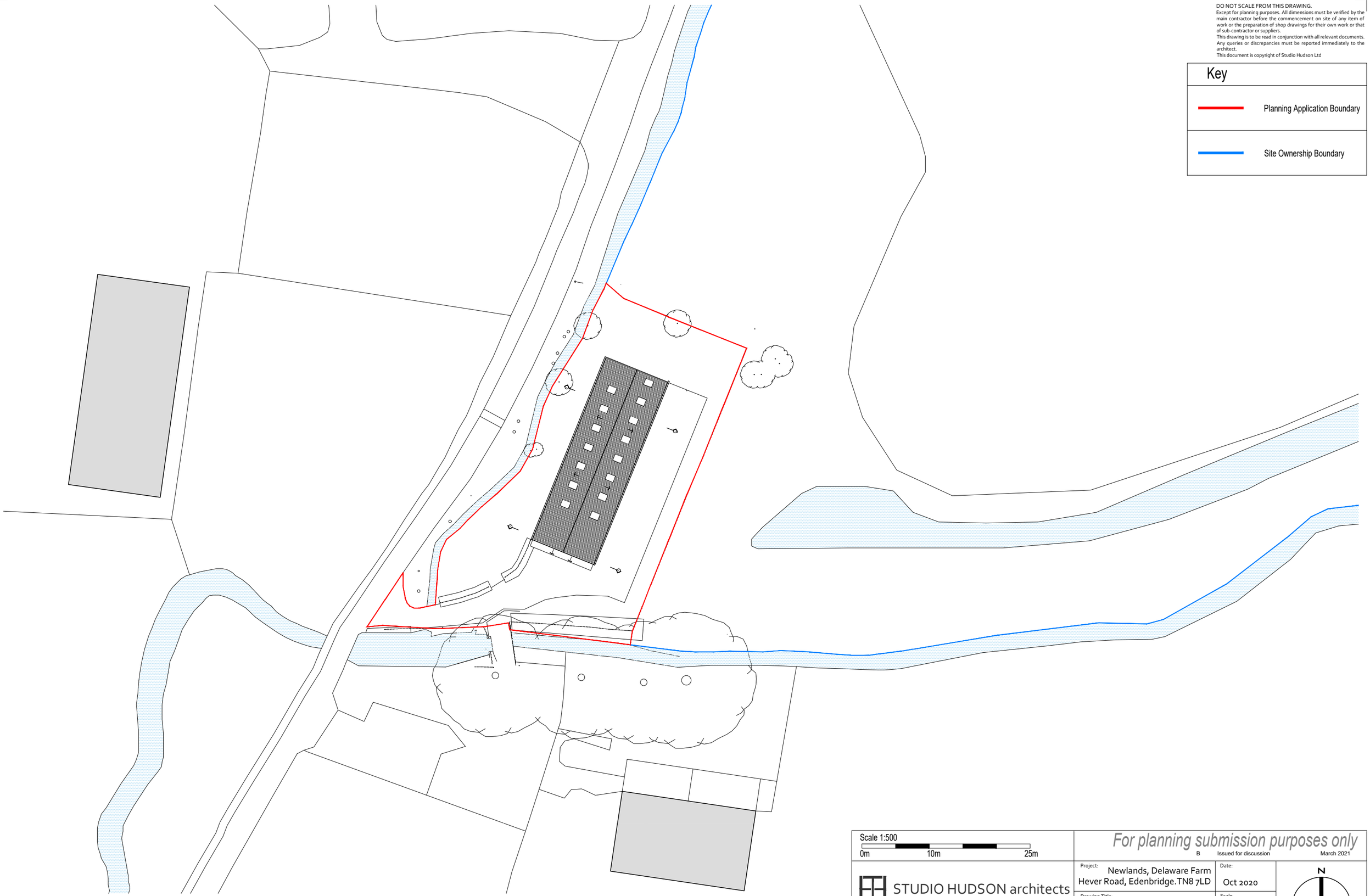
Key

- Planning Application Boundary
- Site Ownership Boundary



1 PLAN
Existing Roof Plan

Scale 1:500
0m 10m 25m

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Date: Oct 2020

Drawing Title: Existing Roof Plan

Scale: Noted @A3

Drawing Number: 20017-E-201

Rev: B

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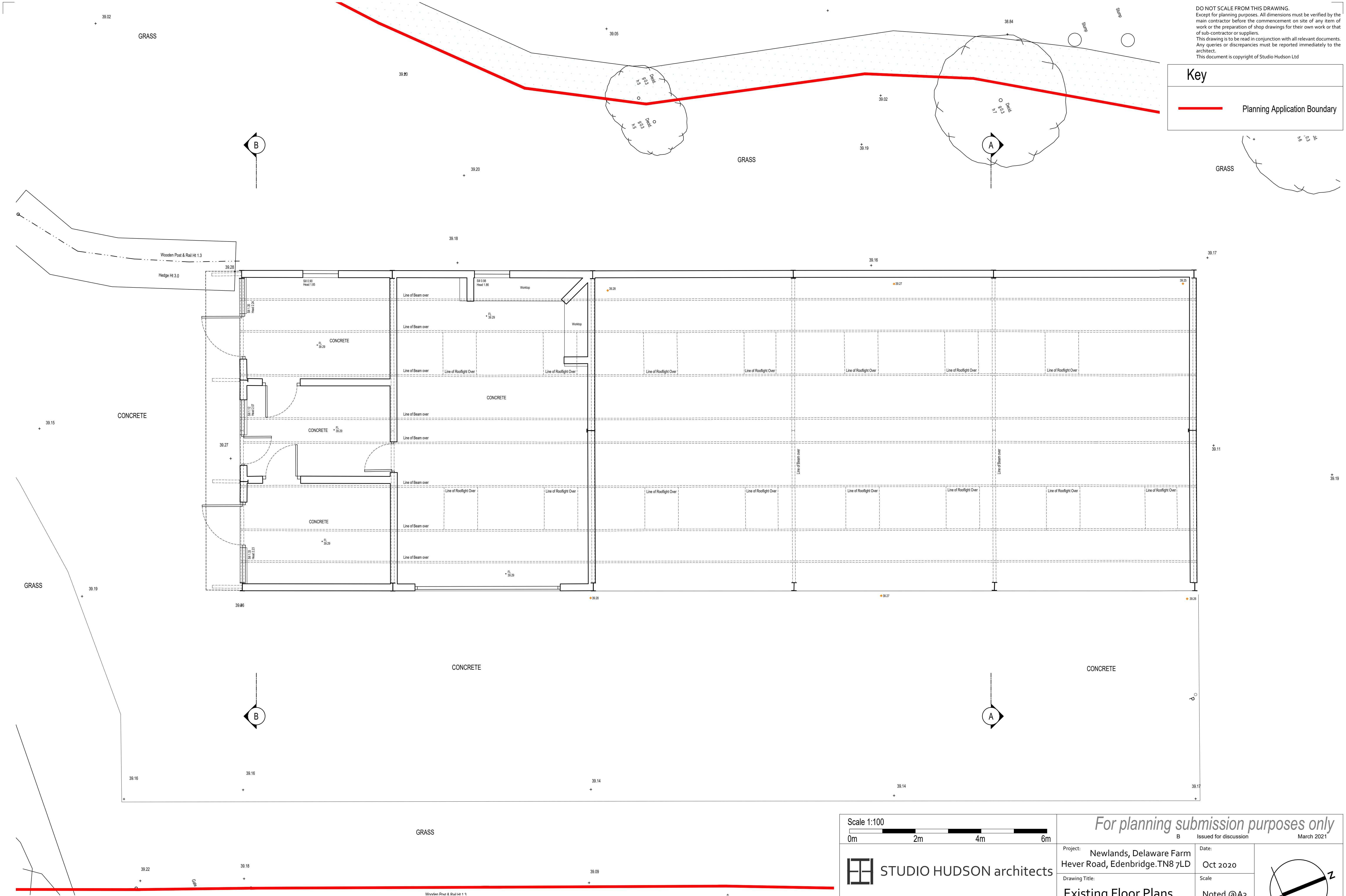
Key

Planning Application Boundary



1 **PLAN**
Existing Ground Floor Plan

Scale 1:100
0m 2m 4m 6m

For planning submission purposes only

Rev	Description	Date
B	Issued for discussion	March 2021

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Date: Oct 2020
Drawing Title: Existing Floor Plans
Scale: Noted @A3
Drawing Number: 20017-E-300
Rev: B

N

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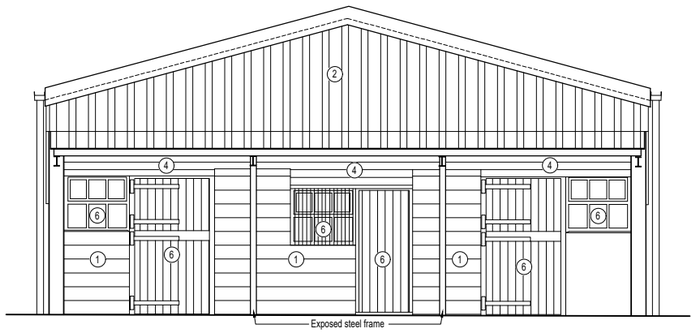
Key

Planning Application Boundary

Materials Key

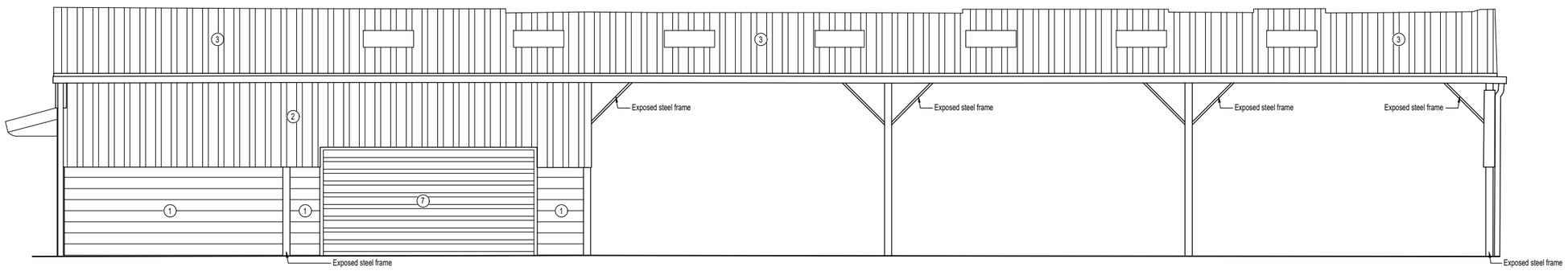
1. Fair-faced Blockwork
2. Metal Wall Cladding
3. Metal Roof Covering
4. Stained Timber Shiplap Boarding
5. Green painted timber windows
6. Stained timber windows and doors
7. Green metal garage door



1 ELEVATION

Existing Front Elevation

B



B

2 ELEVATION

Existing East Elevation

A

Scale 1:100

0m 2m 4m 6m

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Drawing Title: Existing Elevations	Scale: Noted @A3
Drawing Number: 20017-E-800	Rev: -

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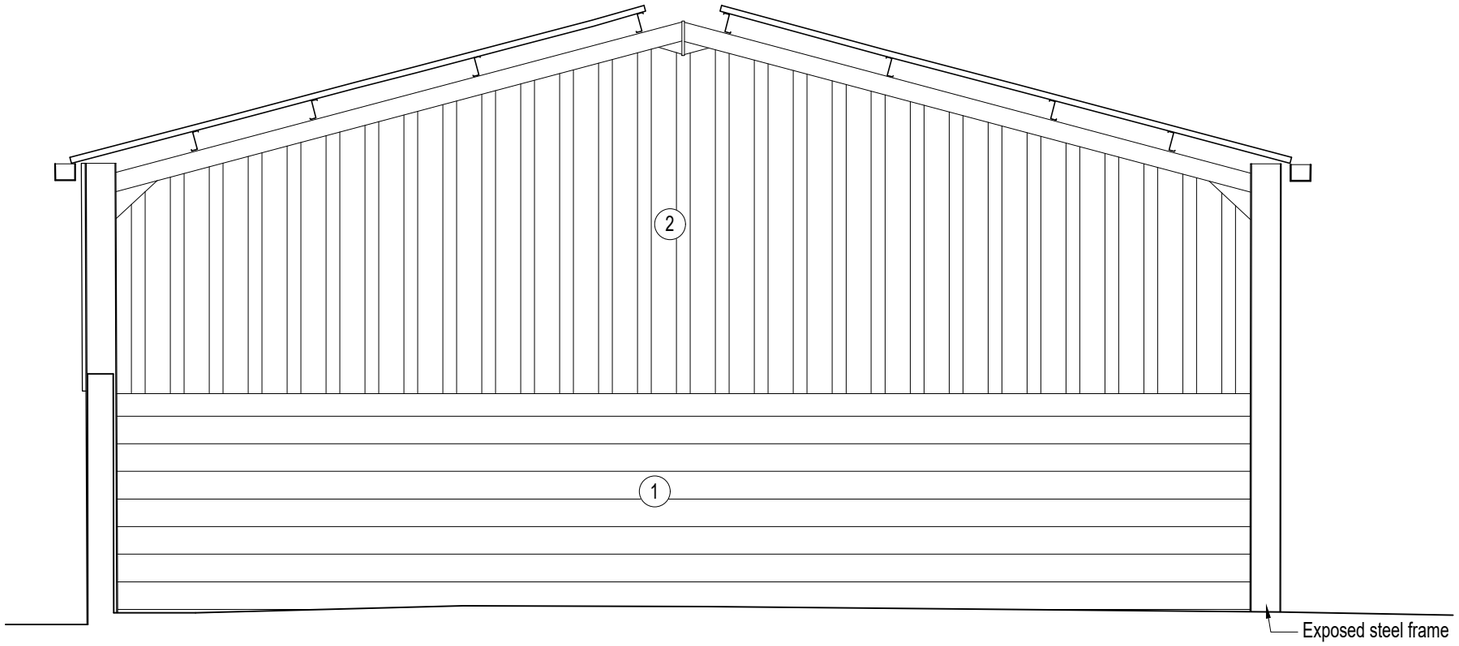
Key

Planning Application Boundary

Materials Key

1. Fair-faced Blockwork
2. Metal Wall Cladding
3. Metal Roof Covering
4. Stained Timber Shiplap Boarding
5. Green painted timber windows
6. Stained timber windows and doors
7. Green metal garage door



AA SECTION
Existing Section AA

BB SECTION
Existing Section BB

Scale 1:50
0m 1m 2m 3m

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Drawing Title: Existing Sections

Scale: Noted @A3

Drawing Number: 20017-E-700

Rev: -

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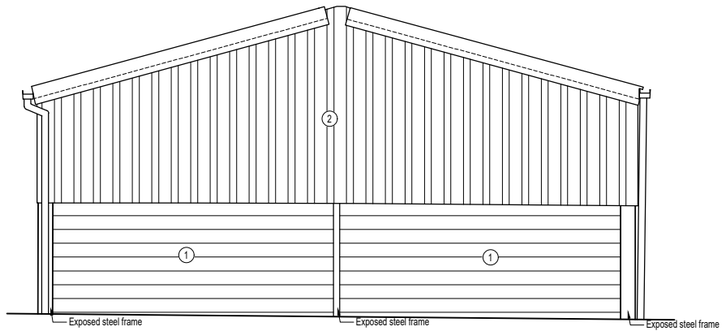
Key

Planning Application Boundary

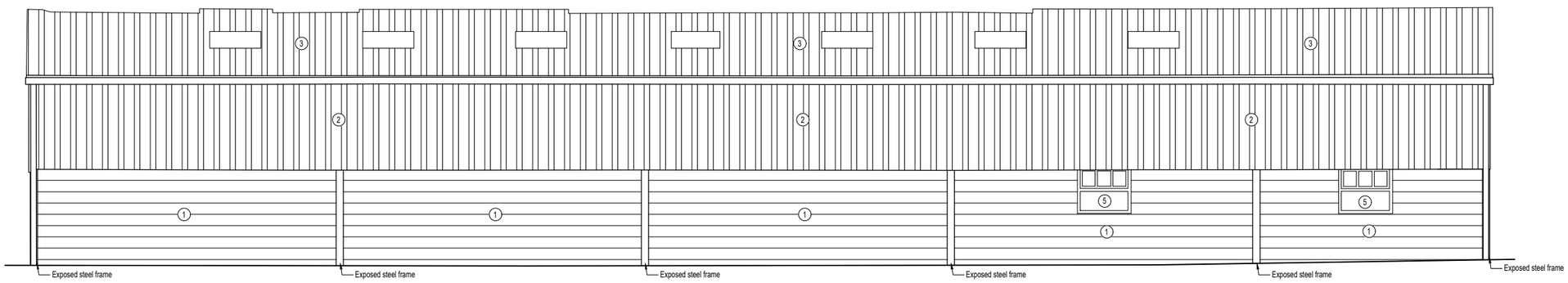
Materials Key

1. Fair-faced Blockwork
2. Metal Wall Cladding
3. Metal Roof Covering
4. Stained Timber Shiplap Boarding
5. Green painted timber windows
6. Stained timber windows and doors
7. Green metal garage door



1 ELEVATION

Existing Rear Elevation



A

B

2 ELEVATION

Existing West Elevation

Scale 1:100

0m 2m 4m 6m

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Drawing Title: Existing Elevations	Scale: Noted @A3
Drawing Number: 20017-E-801	Rev: -

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1 PLAN
Proposed Site Plan

Home Electric Vehicle charger point

Rolec Type 2, Mode 3 charging sockets are to be installed in locations shown and to be installed in accordance with manufacturer's requirements:

i. BASICCHARGE : EV — By Rolec or Similar
Freestanding pedestal charging unit
3.6kW, 16A with built-in 20A, 30mA Type A (DC Sensitive) RCBO

ii. WALLPOD: EV — By Rolec or Similar
Wall mounted charging unit
3.6kW, 16A with built-in 20A, 30mA Type A (DC Sensitive) RCBO

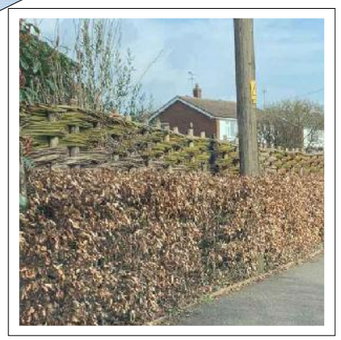
The base of the pedestal charging post features a cut out at surface level.The cut out is sufficient to allow suitably sized and rated Steel Wire Armoured (SWA) cable to access the Mount to supply the charging unit. SWA to be ducted below ground to the internally located isolator or as required by the Electrical Engineer

Wall mounted unit to be located as illustrated on the layouts and ducted via the sub-floor from the internal consumer unit.

The electrical supply shall be provided from the proposed plots installation consumer unit incorporating 30mA RCD protection in locations illustrated on the electrical layouts.

Key

	Planning Application Boundary
	Site Ownership Boundary
	Outline of existing trees to be retained
T1, T2 etc	Outline of tree to be removed
	Outline of new proposed hedge and tree screening



Example of hedge screening and woven willow fencing

Scale 1:500
0m 10m 25m

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Date: March 2021

Drawing Title: Proposed Site Plan

Scale: Noted @A3

Drawing Number: 20017-P-200

Rev: A

N

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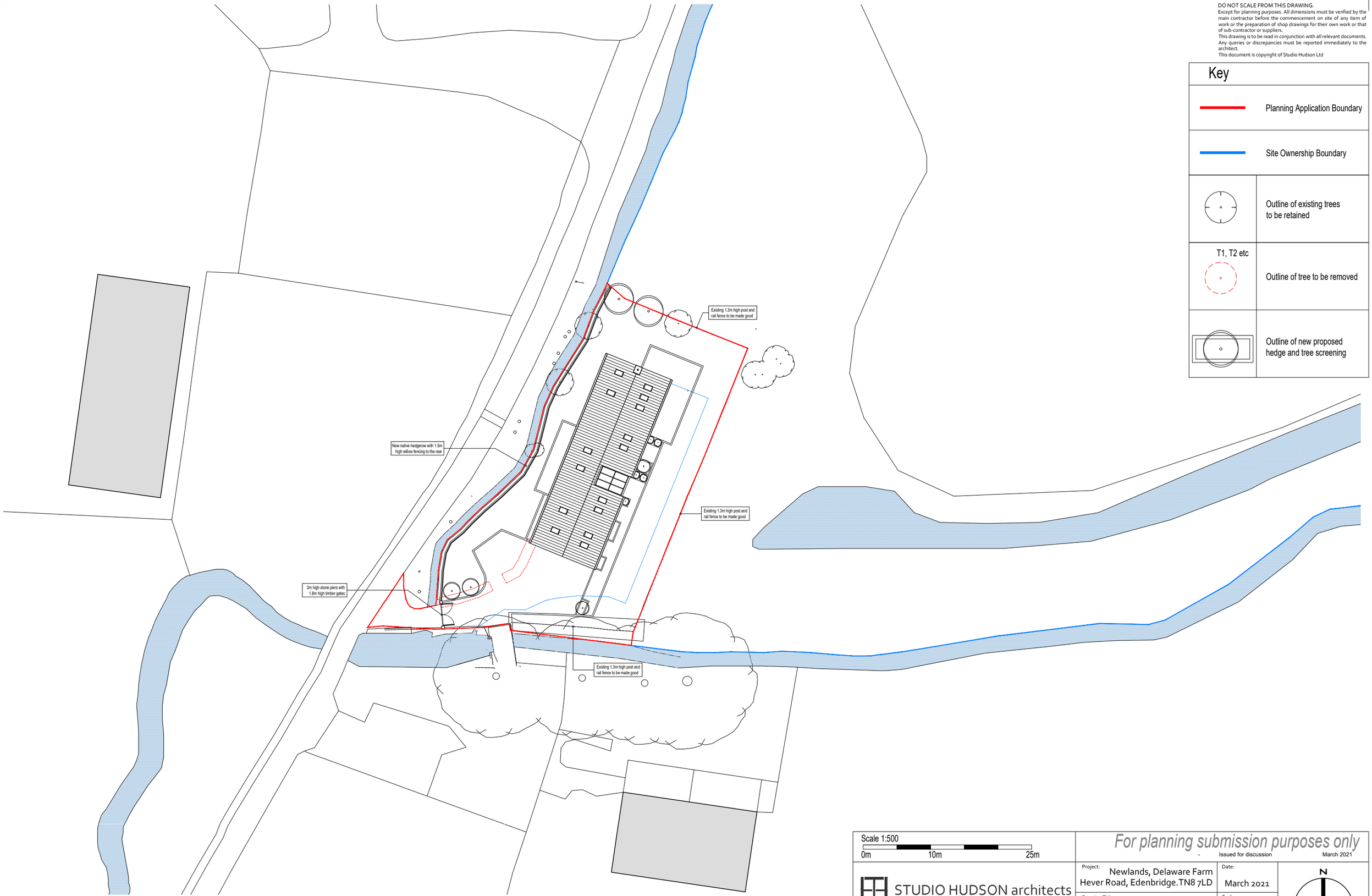
Key

	Planning Application Boundary
	Site Ownership Boundary
	Outline of existing trees to be retained
T1, T2 etc	Outline of tree to be removed
	Outline of new proposed hedge and tree screening



1 PLAN
Proposed Roof Plan

Scale 1:500
0m 10m 25m

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Hever Road, Edenbridge.TN8 7LD

Date: March 2021

Drawing Title: Proposed Roof Plan

Scale: Noted @A3

Drawing Number: 20017-P-201

Rev: -

N

1 PLAN
Proposed Ground Floor Plan SCALE 1: 100

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Key

- Planning Application Boundary
- Site Ownership Boundary
- Line of existing building
- Outline of existing trees to be retained
- Outline of root protection zone As identified in Tree Survey Ref: tbc
- T1, T2 etc — Outline of tree to be removed
- Outline of new proposed hedge and tree screening

Home Electric Vehicle charger point

Rolec Type 2, Mode 3 charging sockets are to be installed in locations shown and to be installed in accordance with manufacturer's requirements:

i. BASICCHARGE : EV — By Rolec or Similar
Freestanding pedestal charging unit
3.6kW, 16A with built-in 20A, 30mA Type A (DC Sensitive) RCBO

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Wall mounted charging unit
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Wall mounted unit to be located as illustrated on the layouts and ducted via the sub-floor from the internal consumer unit.

The electrical supply shall be provided from the proposed plots installation consumer unit incorporating 30mA RCD protection in locations illustrated on the electrical layouts.

Example of hedge screening and woven willow fencing

SCALE 1:100
0m 1 2 5 10

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Project: Newlands, Delaware Farm Hever Road, Edenbridge.TN8 7LD	Date: March 2021
Drawing Title: Proposed Layouts	Scale Noted @ A1
Drawing Number: 20017-P-300	Rev A

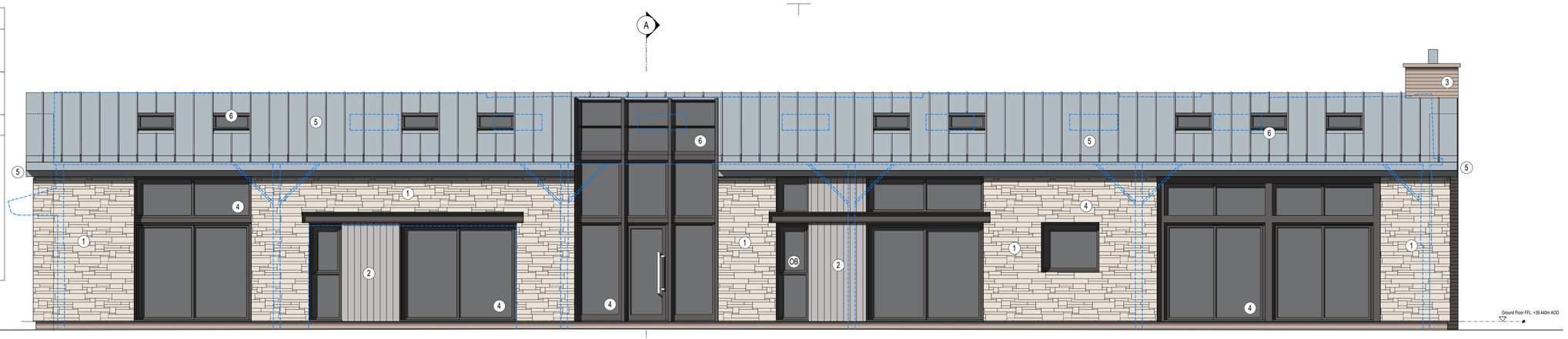
Key

- Planning Application Boundary
- Line of existing building

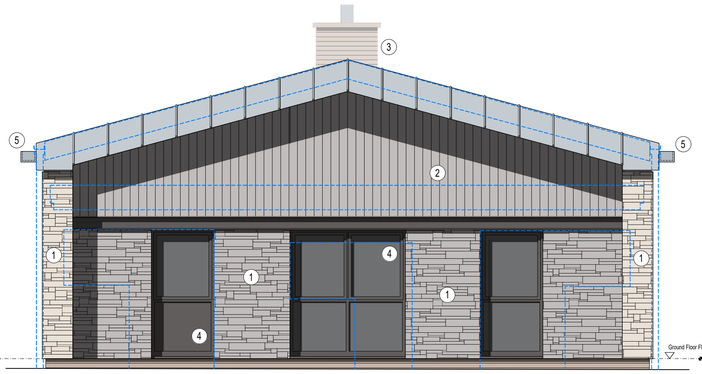
Materials Key

1. Quartz style stone cladding / outer leaf
2. Silver Birch / Larch timber cladding
3. Facing brickwork
4. Bronze Coloured PPC Aluminium windows and feature horizontal channels
5. Seamed Zinc Roofing and matching PPC aluminium fascias, guttering, dowpipes
6. Inline roof lights

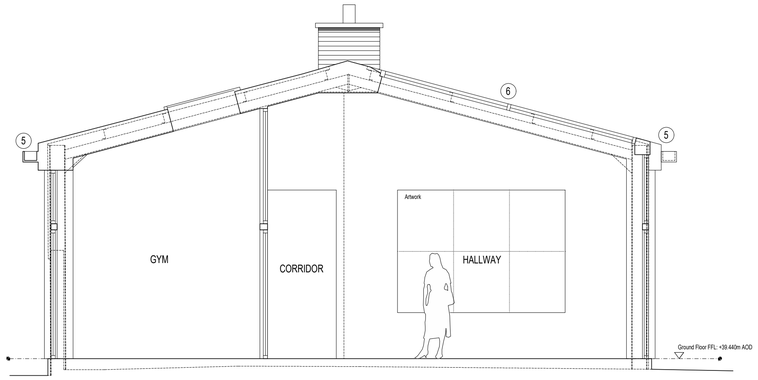
OB Obscured glazing to window



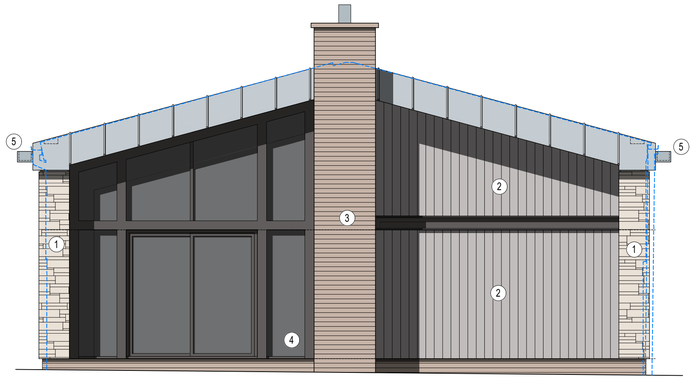
1 ELEVATION
Proposed Garden Elevation — SCALE 1: 50



2 ELEVATION
Proposed Entrance Gable Elevation — SCALE 1: 50

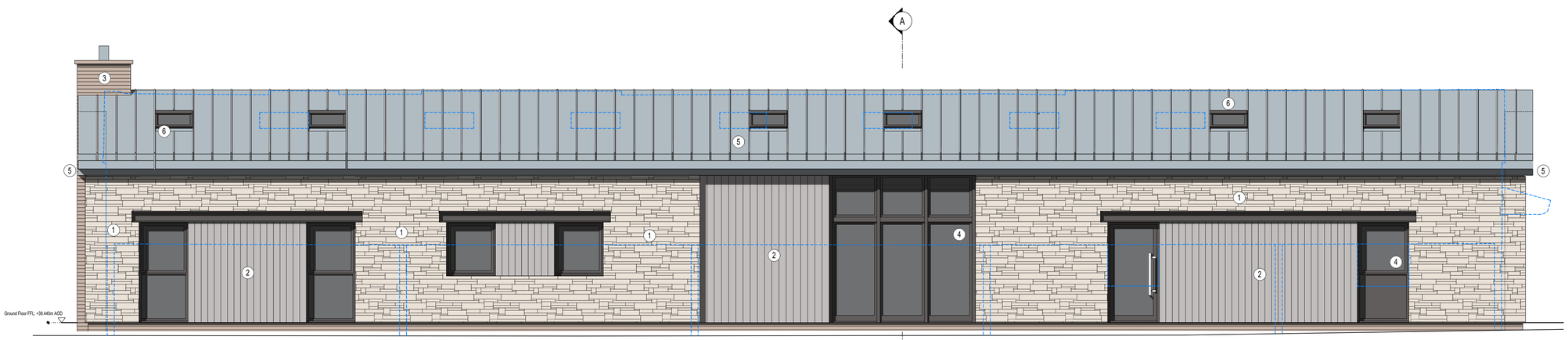


AA SECTION
Proposed Section AA — SCALE 1: 50



3 ELEVATION
Proposed Garden Gable Elevation — SCALE 1: 50

Precedent images of similar projects



4 ELEVATION
Proposed Streetside Elevation — SCALE 1: 50

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1. Facing Material
Type: Natural Stone Facing
Colour: Quartz
Reference: Decarock or similar

2. Facing Material
Type: Birch / Larch Cladding
Colour: Natural Finish
Supplier: Vincent Timber or similar

3. Facing Material
Type: Facing Brickwork
Colour: Forum Smoked Cromo
Supplier: Wienerberger or similar

4. Windows / Sliding Doors
Type: PPC Aluminum (High Performance)
Colour: Bronze
Reference: Sieger Systems or similar

5 - 6. Roofing
Type: Zinc seamed roofing
Colour: Patina Grey
Reference: Rheinzink with IQ Glass or similar

SCALE 1:50
0m 0.5 1 2 2.5 5

For Planning Submission Purposes
- Issued for discussion — March 2021

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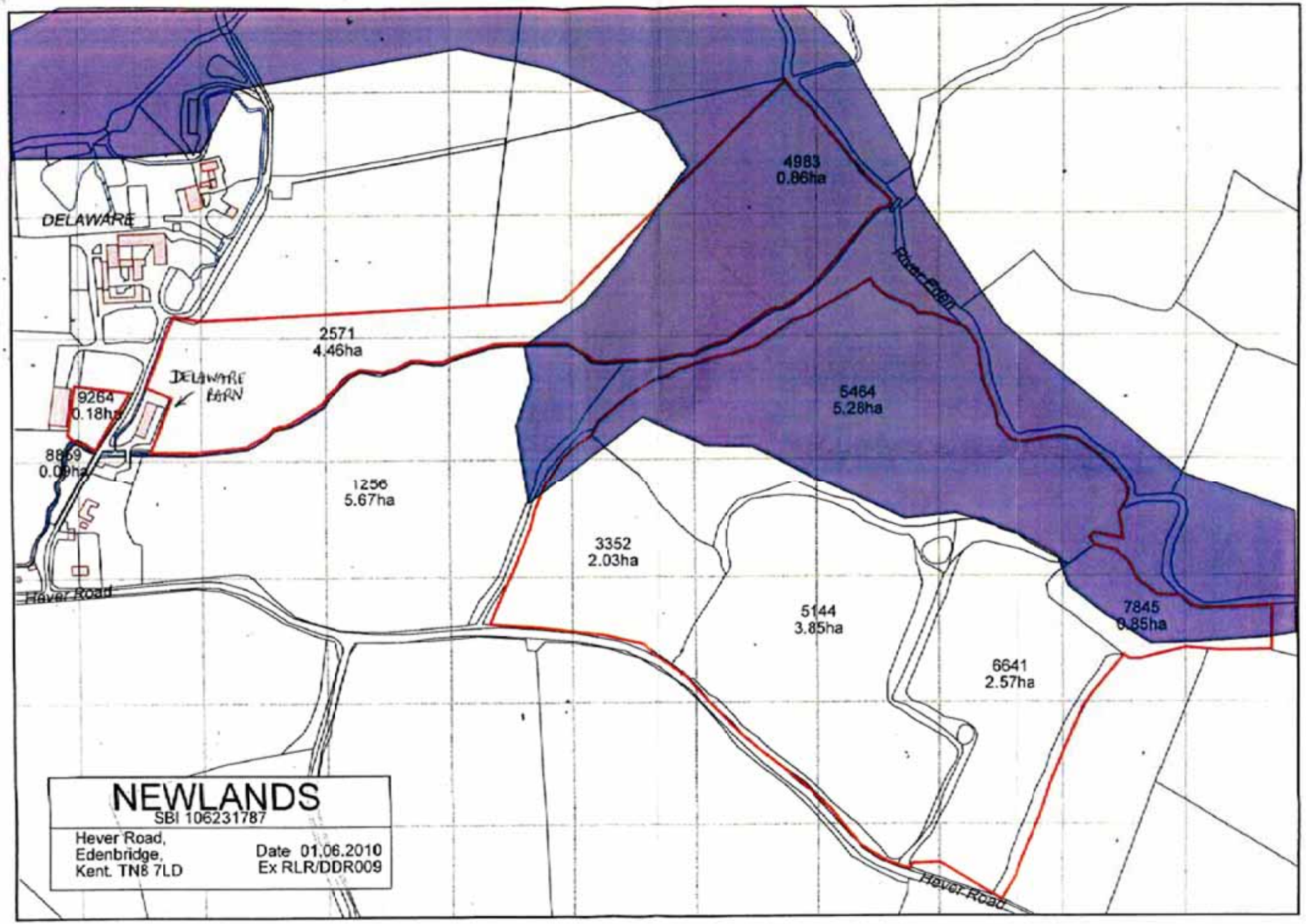
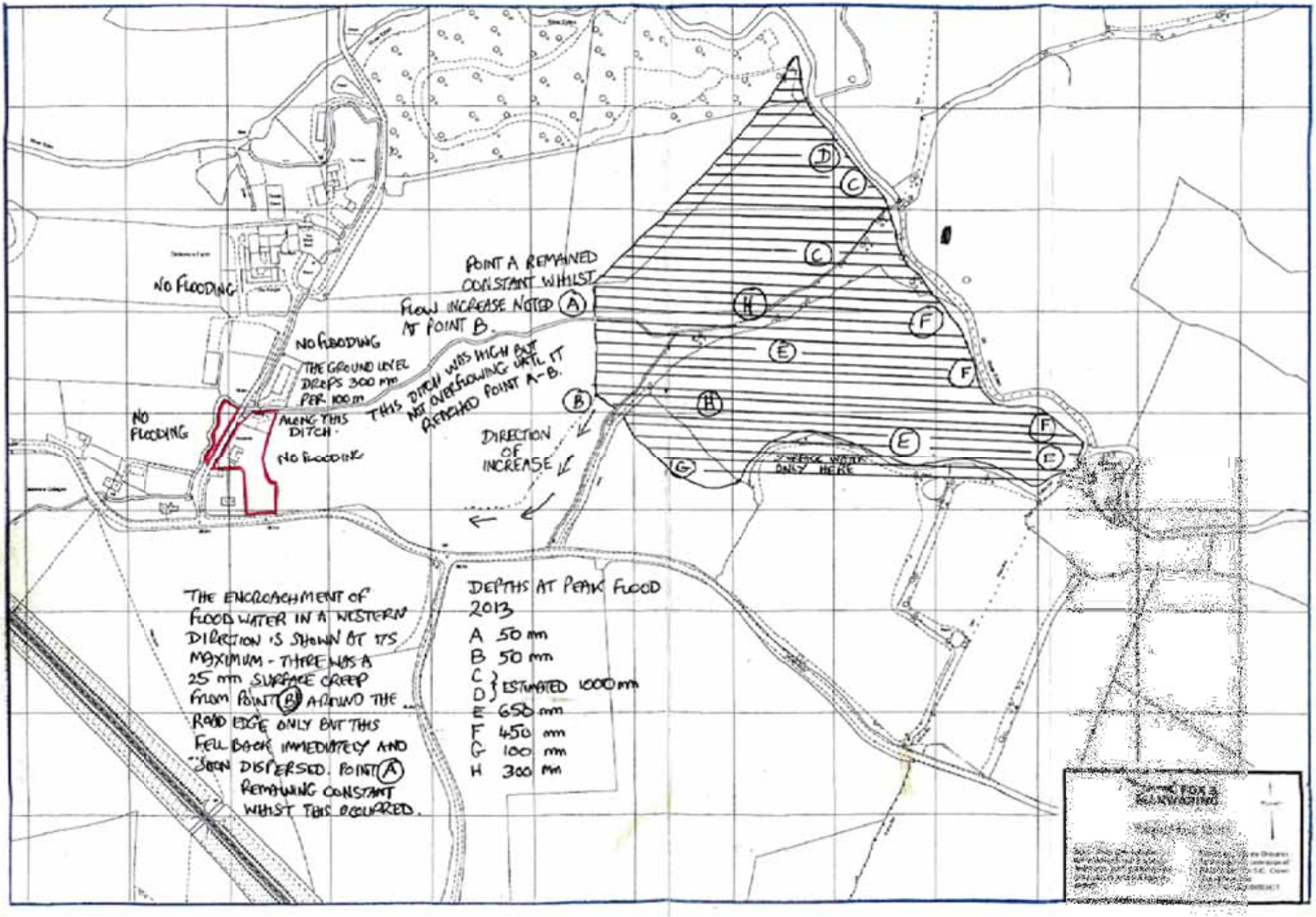
Drawing Title: Proposed Layouts	Scale: Noted @ A1
Drawing Number: 20017-P-800	Rev: -


DELAWARE
DELAWARE BARN
4983
0.86ha
2571
4.46ha
9264
0.18ha
8859
0.09ha
5464
5.28ha
1256
5.67ha
3352
2.03ha
5144
3.85ha
7845
0.85ha
6641
2.57ha
Hever Road
Hever Road
NEWLANDS
SBI 106231787
Hever Road,
Edenbridge,
Kent. TN8 7LD
Date 01.06.2010
Ex RLR/DDR009

FLOODS 2013 AT MAXIMUM HEIGHT WITNESSED AND RECORDED BY P.J. HOWE ON THE GROUND WHILST IT OCCURRED AND CERTIFIED A TRUE STATEMENT OF FACT.