

Flood Risk Assessment and Foul and Surface Water Drainage Strategy for Planning

June 2025

Prepared for:

Peter Reid

Location:

Sunte House

Birchen Lane

Haywards Heath

RH16 1RZ

Our reference:

95326-RichardParr-SunteHse_a



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Contents

1. Key Facts	5
Flood Risk Posed:.....	5
Flood Risk Mitigation:.....	5
Surface Water Drainage:.....	5
Foul Drainage:.....	5
2. Introduction	7
3. Existing Site.....	8
Site Topography:.....	9
Existing Ground Conditions:	9
Nearby Watercourses / Drainage Features:	11
4. Development Proposal.....	12
5. Flood Risk Assessment.....	16
EA Flood Zones:.....	16
Fluvial:.....	17
Detailed Flood Modelling:.....	17
Flood Storage Areas:.....	17
Flood Defences:.....	17
Residual Risk (breach or overtopping of flood defences):.....	17
Tidal Flooding:.....	18
Pluvial (Surface Water):.....	18
Groundwater:	20
Sewer:.....	20
Other Sources:.....	21
Historical Flood Events:.....	22
6. Flood Risk Management	23
Vulnerability to Flooding:.....	23
EA Standing Advice for Minor Extensions:	23
Physical Design Measures:.....	23
Safe Escape:	24
Flood Warning:	24
Flood Plan:.....	25
Off-Site Impacts:.....	26
Fluvial Floodplain Storage:	26
7. Sequential and Exception Test.....	27
8. Surface Water Drainage Strategy	28
Existing Drainage:.....	28

Drainage Hierarchy:.....	28
Infiltration Potential:.....	28
Proposed Discharge Rates and Locations:.....	29
Cellular Storage Soakaway – Pool-House:.....	29
Cellular Storage Soakaway – Covered Entrance Extension:	29
Water Butts:.....	30
Water Quality:.....	30
Design Exceedance:.....	31
Adoption and Maintenance:.....	31
Permeable Paving:.....	31
Cellular Storage:	32
Water Butts:.....	32
Pipework, Inspection Chambers and Catchpits:	33
9. Foul Drainage Strategy	34
Existing Drainage:.....	34
Foul Drainage Hierarchy:.....	34
Proposed Foul Drainage:	34
Adoption and Maintenance:.....	34
10. Discussion and Conclusion.....	35
Flood Risk Discussion:.....	35
Surface Water Drainage Discussion:	36
Foul Drainage Strategy:.....	37

1. Key Facts

Flood Risk Posed:

- The site is located within Flood Zone 1 (Low Probability), which means it is defined as land having a less than 1:1000 annual probability of river or sea flooding. The nearest drainage feature is a ditch located approximately 50m north of the site. The nearest EA Main River is the West Common Stream Extension located approximately 175m north.
- No Flood Storage Areas located in close proximity to the site.
- The EA Risk of Flooding from Surface Water Map suggests that the areas of the proposed development within the site are at "Very Low" risk of flooding at the present day and between 2040 and 2060.
- Risk to the site from groundwater, sewer surcharge and reservoir flooding would appear to be very low.
- No EA records of historic flooding having affected the site or surrounding area.

Flood Risk Mitigation:

- No increase in vulnerability classification.
- No new basement accommodation is proposed.
- 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.
- There will be no loss of fluvial floodplain storage.
- The applicant will register with the National Severe Weather Warning Service.

Surface Water Drainage:

- The existing site is understood to discharge its surface water predominantly to sewer at an unattenuated rate. Parts of the existing driveway discharge to the on-site pond. Some areas are believed to discharge to soakaway, however this is unconfirmed.
- Given the underlying strata, an assumed infiltration rate of 1×10^{-5} m/s has been utilised for this assessment.
- Runoff from the proposed Pool-House's roof area will be directed into the cellular storage soakaway located north of the Pool-House.
- Runoff from the roof area of the covered entrance extension will be directed into the cellular storage soakaway located east of the Dairy.
- The proposed infill extension to the Main House will cover an area of existing impermeable flagstone patio. Given this, the infill extension to the Main House will utilise the existing surface water drainage arrangements for the Main House and adjoining Dairy.
- All new ground surfaces will be of permeable construction, with permeable paving utilised for all trafficked areas.
- Water butts will be incorporated into the development.

Foul Drainage:

- The existing site is understood to discharge its foul to a Southern Water foul sewer north of the site via a private drainage system within the site.
- Post development, the Main House will continue to utilise its existing foul drainage arrangements.
- Foul water from the proposed Pool-House will be discharged to the private drainage system within the site via a connection to an existing manhole adjacent to the Main House. Proposed pipework will be sized to accommodate flows from the Pool-House.

This drainage strategy has been undertaken in accordance with the principles set out in NPPF. We can conclude that providing the development adheres to the conditions advised above, the said development

proposals can be accommodated without increasing flood risk within the locality in accordance with objectives set by Central Government and the EA. 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. This Flood Risk Assessment and Foul and Surface Water Drainage Strategy has been prepared by Unda Consulting Limited on behalf of Peter Reid, in support of a planning application for the refurbishment and extension of the Grade II* listed house and construction of new build pool-house. The proposed development is being undertaken at Sunte House, Birchen Lane, Haywards Heath, RH16 1RZ. This report assesses the flood risk and foul and surface water drainage strategy for the proposed development.
- 2.2. The proposed planning application is for the refurbishment and extension of the Grade II* listed house and construction of new build pool-house.
- 2.3. In order to mitigate flood risk posed by post development runoff, adequate control measures will be required within the site. This will ensure that surface water runoff is dealt with at source and the flood risk off site is not increased.

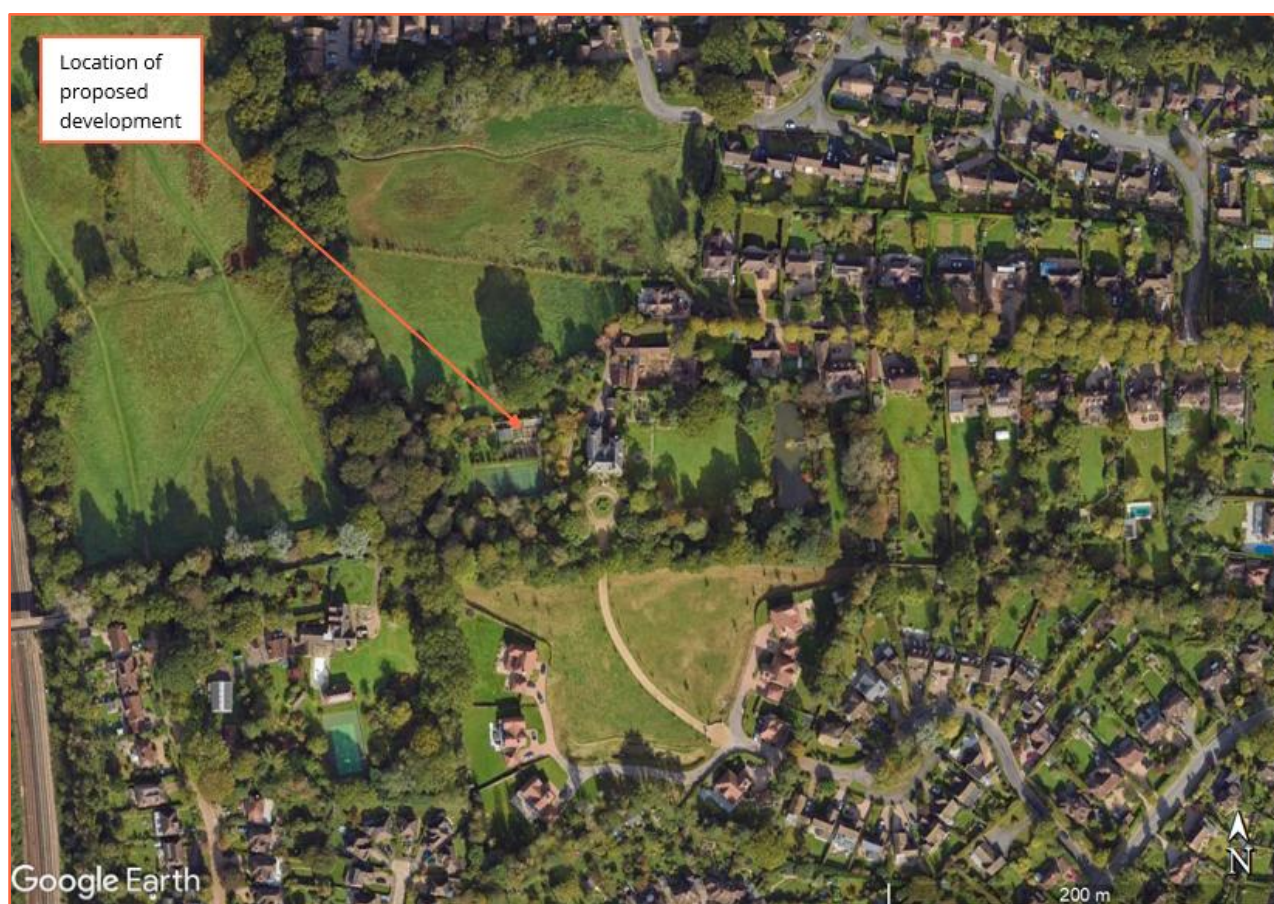


Figure 1: Aerial view of the site and surrounding area (Source: Google Earth)

3. Existing Site

- 3.1. The site is currently occupied by the Grade II* listed building Sunte House (the Main House), along with associated outbuildings and grounds.
- 3.2. The site is understood to have lawful planning permission for residential use.
- 3.3. The surrounding area is characterised by residential properties.
- 3.4. Existing plans are provided in the report Appendix.

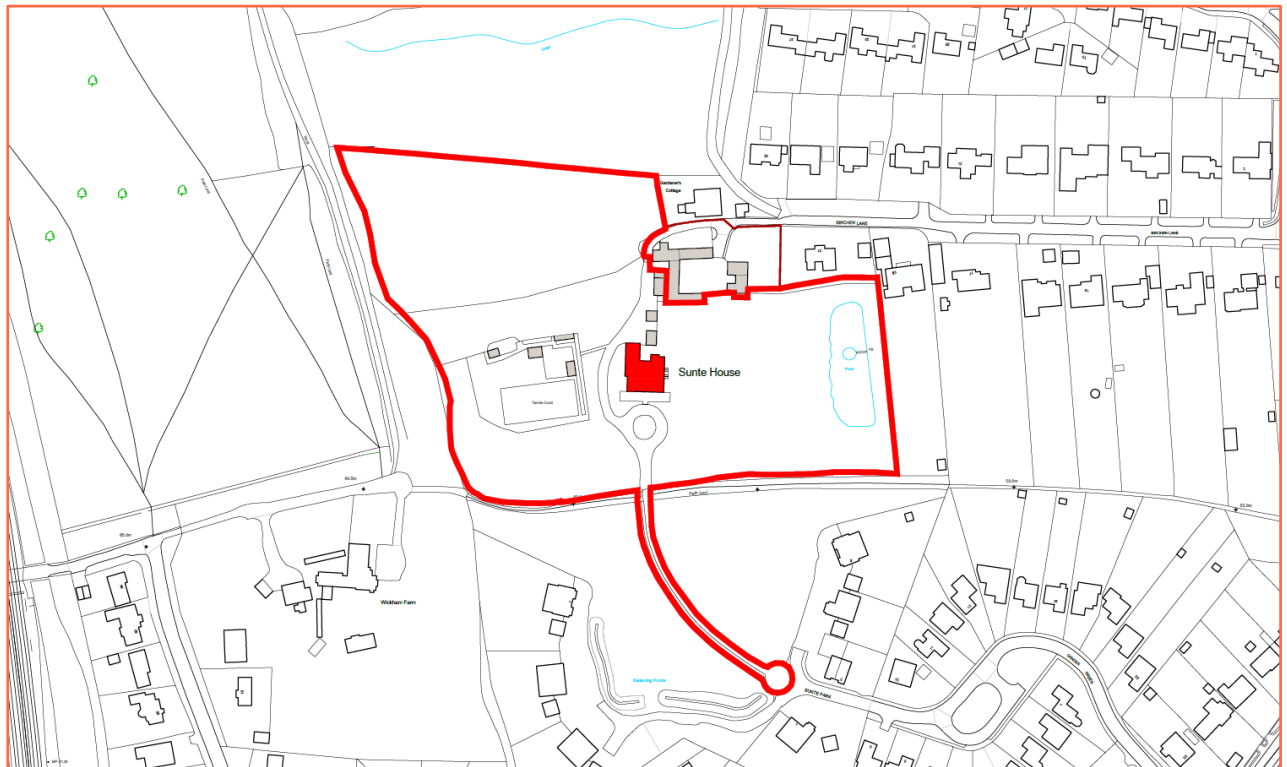


Figure 2: Site location plan (Source: Richard Parr Associates)

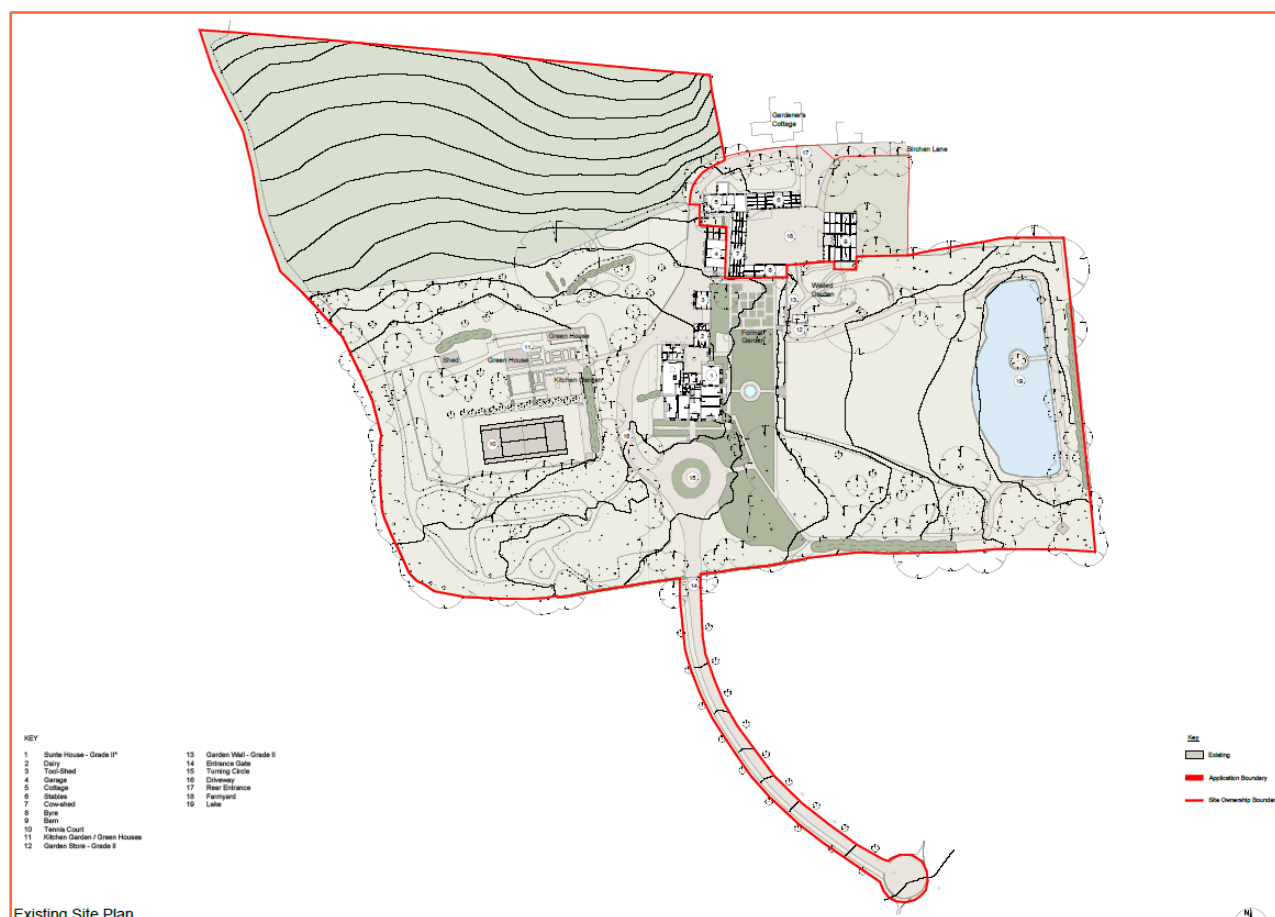


Figure 3: Existing site plan (Source: Richard Parr Associates)

Site Topography:

- 3.5. A topographic survey of the site undertaken in February 2024 by Midland Survey Ltd shows ground topography on site ranges between 58.10mAOD to 64.67mAOD.

Existing Ground Conditions:

- 3.6. The 1:50,000 BGS map shows that the bedrock underlying the site is Upper Tunbridge Wells Sand – sandstone and siltstone.
- 3.7. The BGS mapping shows there are no recorded superficial deposits underlying the site.
- 3.8. The soil type taken from the UKSO Soil Map Viewer, shows the site to be located upon deep-intermediate depth soils of sandstone and mudstone parent material with a soil texture of sandy loam to silty loam.
- 3.9. The published Environment Agency Groundwater Source Protection Zone map shows the site is not located within a Groundwater Source Protection Zone.

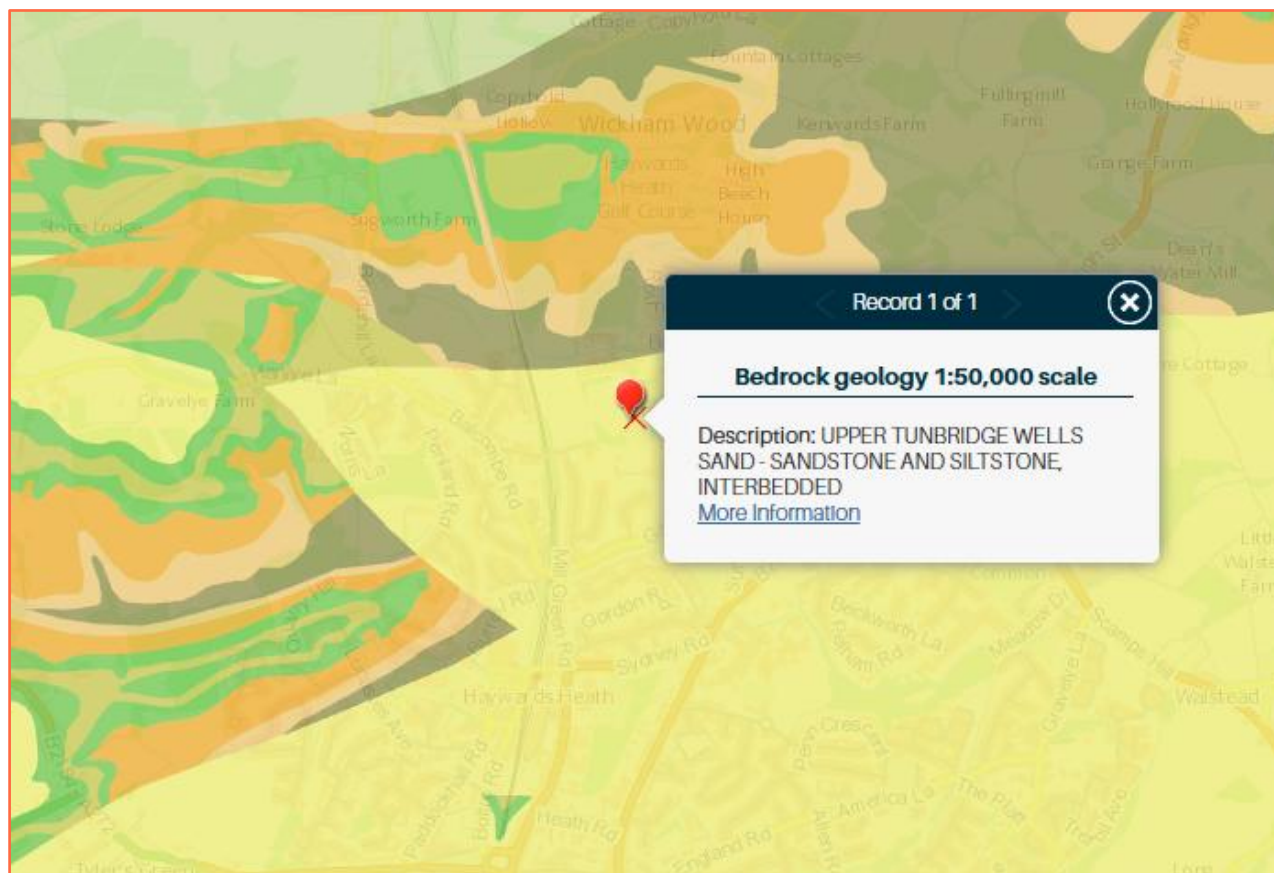


Figure 4: BGS Bedrock Geology (Source: BGS)

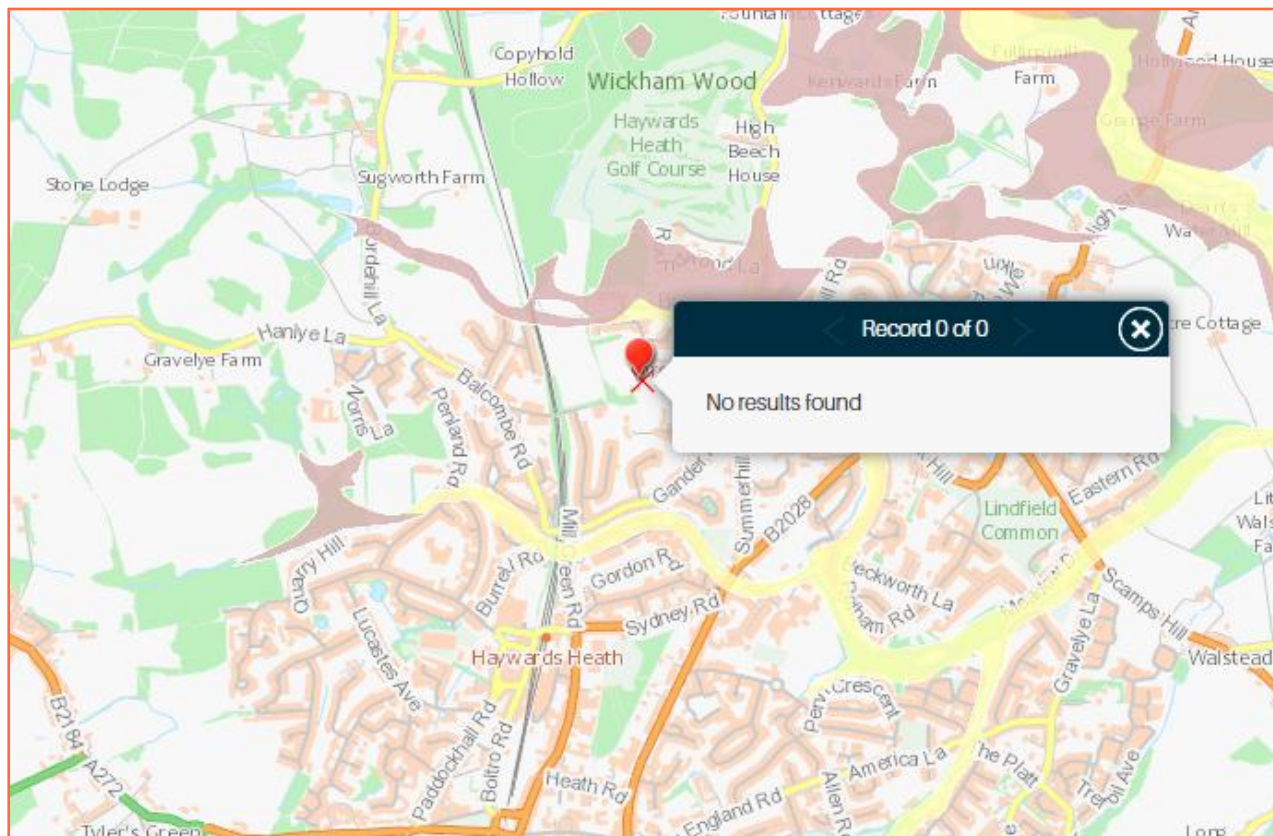


Figure 5: BGS superficial deposits (Source: BGS)



Figure 6: Soil map (Source: UK Soils, BGS)

Nearby Watercourses / Drainage Features:

- 3.10. The nearest drainage feature is a ditch located approximately 50m north of the site. The nearest EA Main River is the West Common Stream Extension located approximately 175m north.

4. Development Proposal

- 4.1. The proposed planning application is for the *refurbishment and extension of the Grade II* listed house and construction of new build pool-house.*
- 4.2. Post development the newly introduced roof area of the infill extension to the Grade II* Main House will cover approximately 41m². The covered entrance extension linking the Dairy and Tool Shed will cover approximately 18m². The roof area of the proposed Pool-House will cover approximately 255m².
- 4.3. It should be noted that the infill extension to the Main House will cover an area of existing impermeable flagstone patio.
- 4.4. All new ground surfaces will be of permeable construction, with permeable paving utilised for all trafficked areas.
- 4.5. In light of this, SuDS storage sizing within the strategy has been based on attenuating the proposed Pool-House's roof area of approximately 255m² and covered entrance extension of approximately 18m².
- 4.6. Proposed plans are provided in the report Appendix.

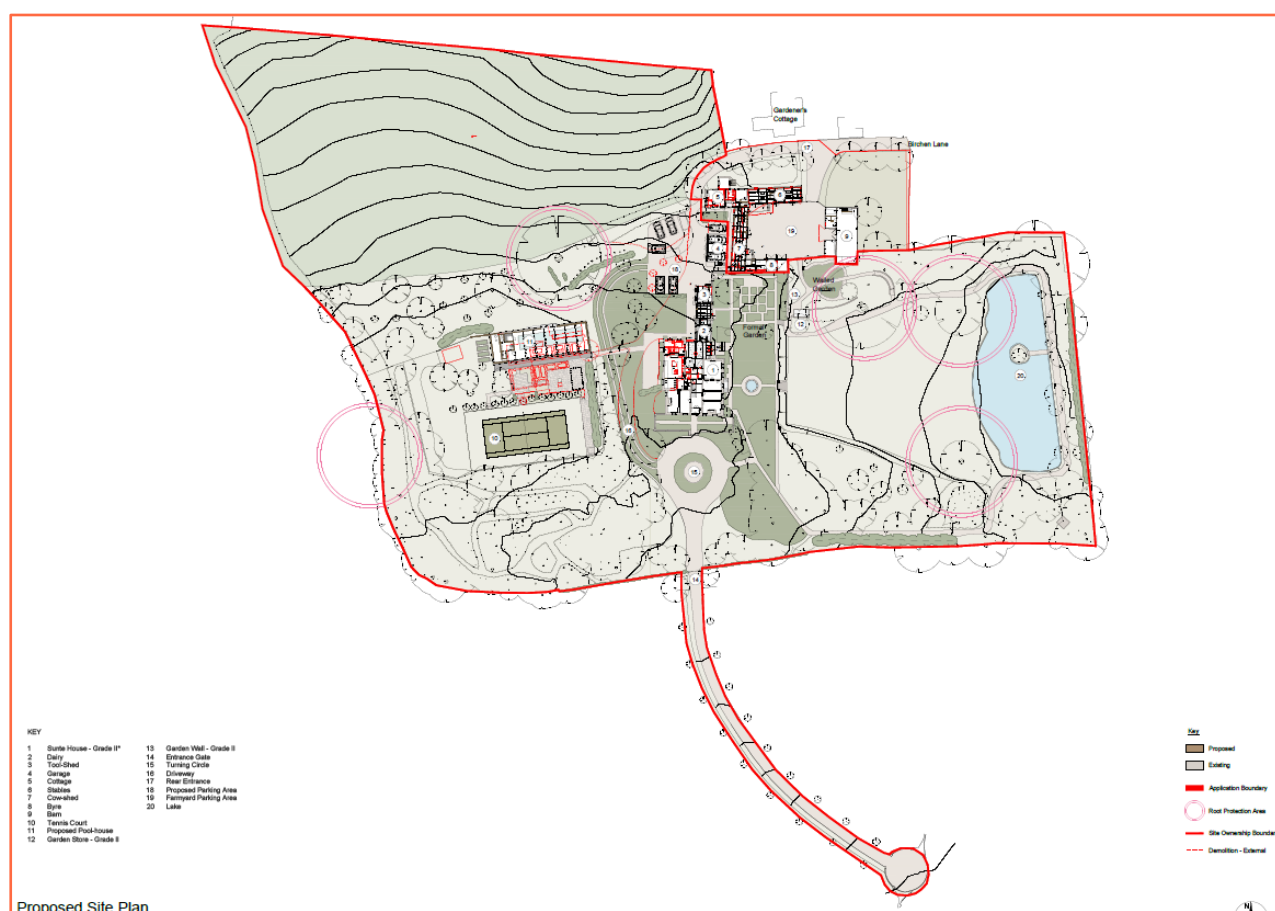


Figure 7: Proposed site plan (Source: Richard Parr Associates)

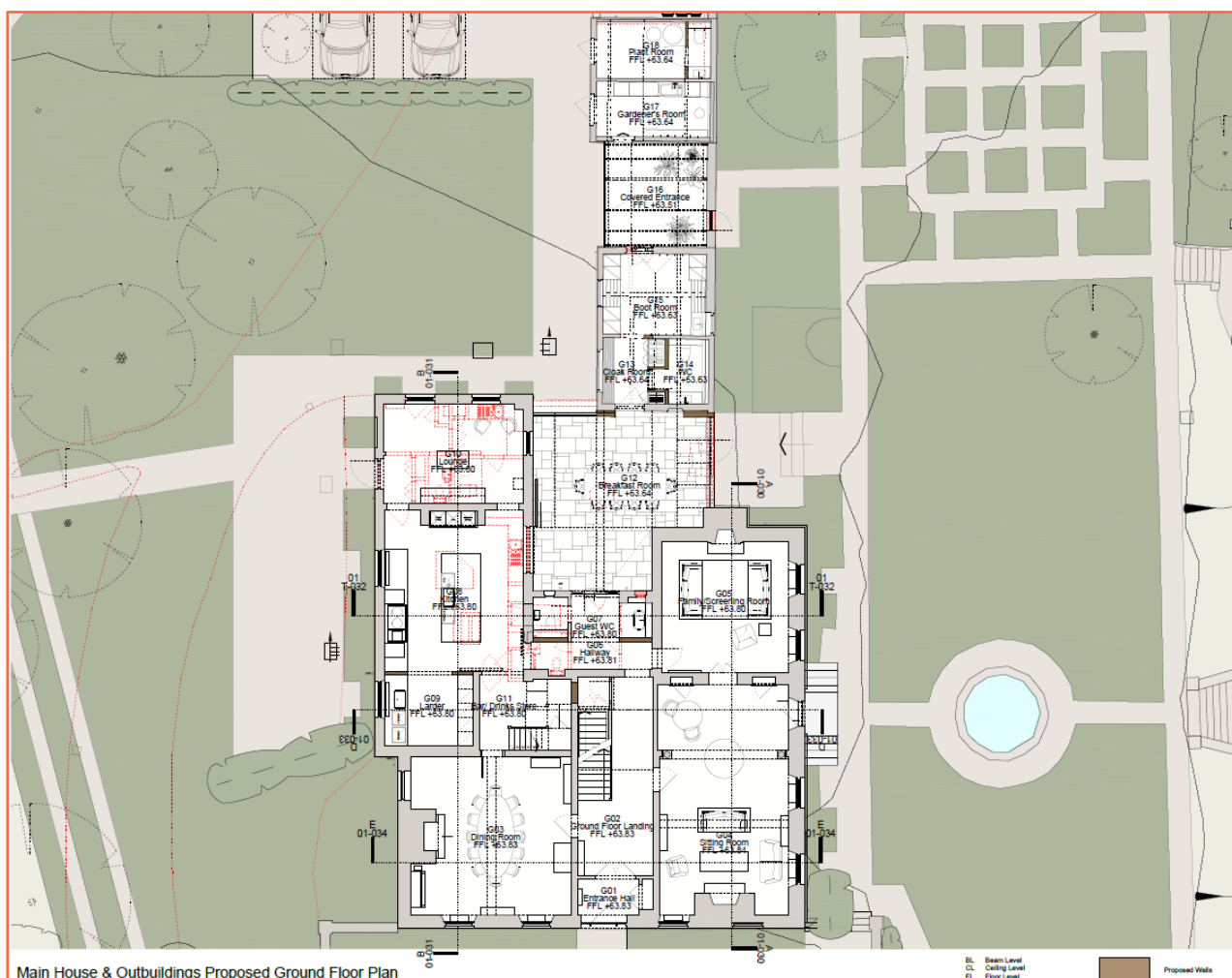
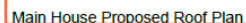


Figure 8: Proposed Main House ground floor plan (Source: Richard Parr Associates)



BL Beam Level
CL Ceiling Level
FL Floor Level
PS Plenum Space

 Proposed Value

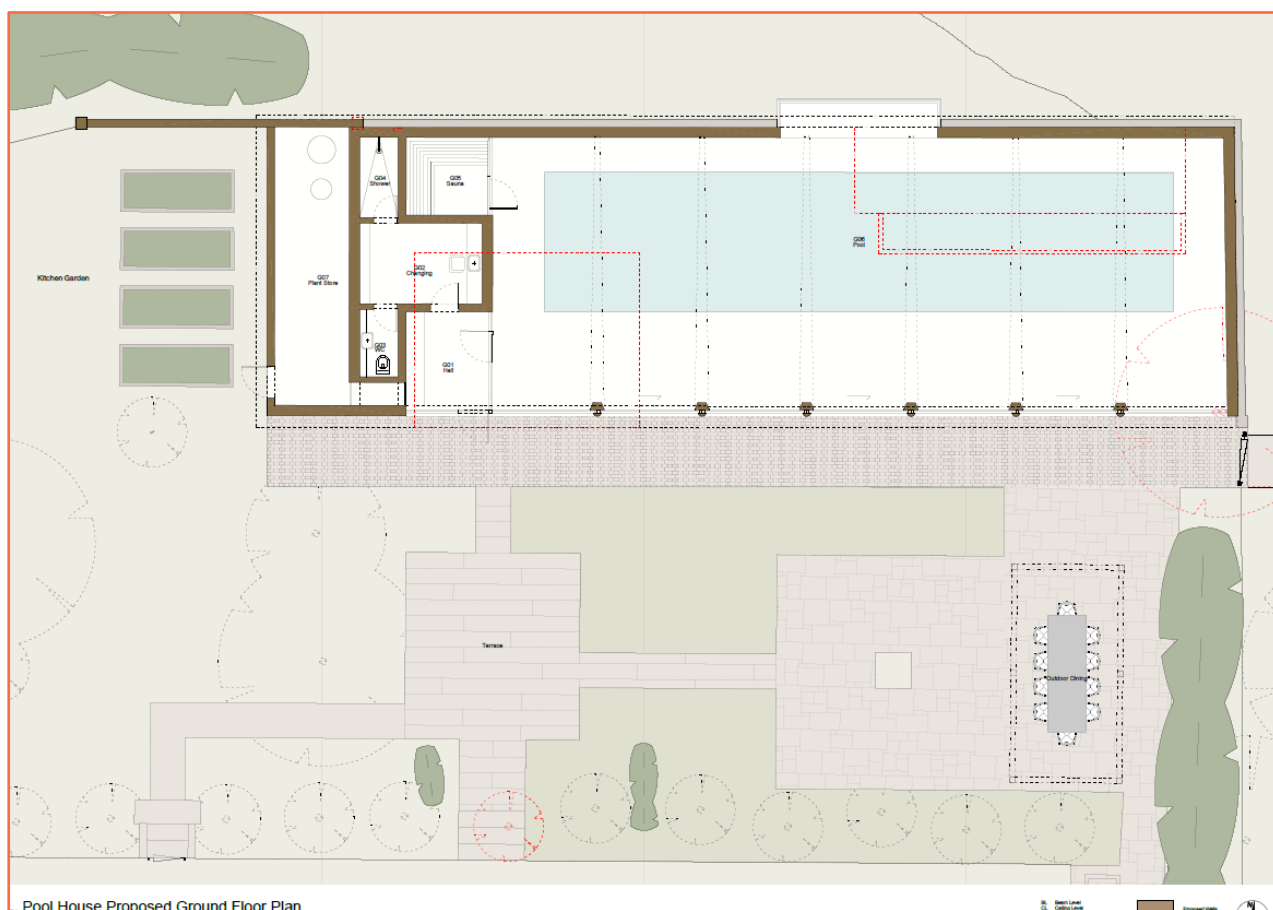


Figure 10: Proposed Pool-House ground floor plan (Source: Richard Parr Associates)

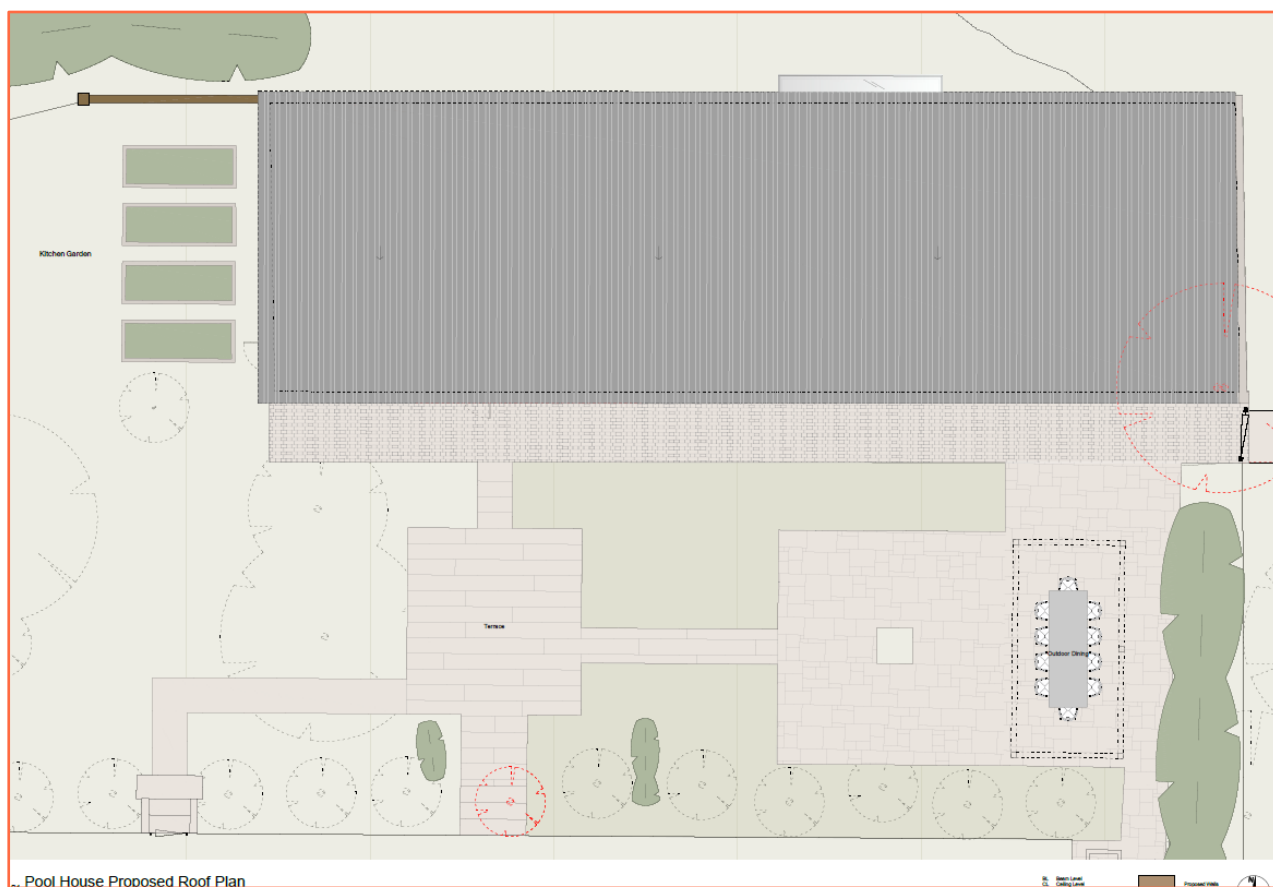


Figure 11: Proposed Pool-House roof plan (Source: Richard Parr Associates)

Commercial in Confidence

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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 flooding. (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.

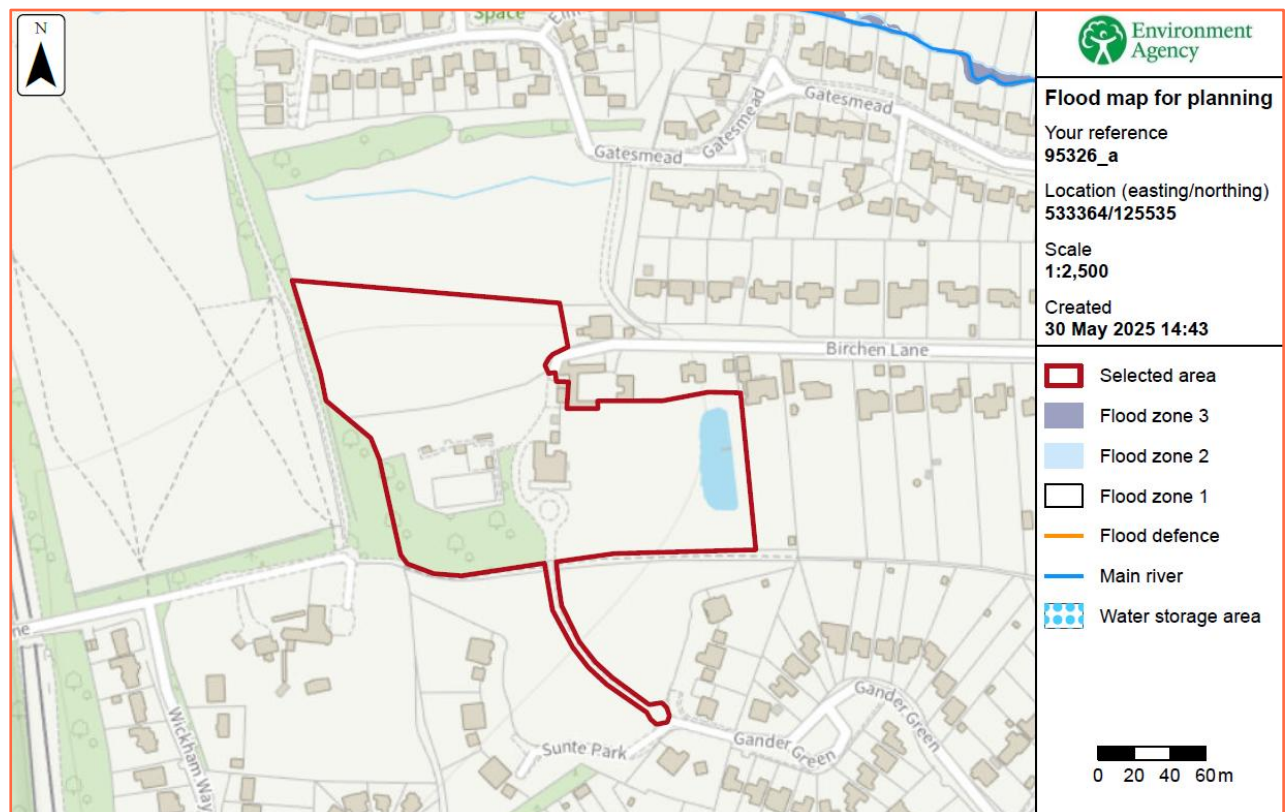


Figure 12: Environment Agency Flood Map for Planning (Rivers and Sea) (Source: EA)

- 5.3. The site is located within Flood Zone 1 (Low Probability), which means it is defined as land having a less than 1:1000 annual probability of river or sea flooding.

Fluvial:

- 5.4. 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.
- 5.5. The nearest drainage feature is a ditch located approximately 50m north of the site. The nearest EA Main River is the West Common Stream Extension located approximately 175m north.

Detailed Flood Modelling:

- 5.6. Product 4 modelled flood levels and extents have been requested from the Environment Agency for use within this report.

Flood Storage Areas:

- 5.7. 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.
- 5.8. According to EA data, there are no Flood Storage Areas located in close proximity to the site.

Flood Defences:

- 5.9. 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.
- 5.10. 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.
- 5.11. 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.
- 5.12. According to the EA, there are no formal raised flood defences owned or operated by the EA protecting the site. The West Common Stream Extension approximately 175m north of the site is, however, flanked by natural high ground with a 1:25 year design standard of protection.

Residual Risk (breach or overtopping of flood defences):

- 5.13. 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.

- 5.14. 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.
- 5.15. The site is not shown to benefit from formal flood defences.

Tidal Flooding:

- 5.16. 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):

- 5.17. 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.
- 5.18. The mapping below shows the Risk of Flooding from Surface Water (RoFSW). 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. This information tells you the flood risk of the land around a building, not the building itself.
- 5.19. The RoFSW products are an assessment of where surface water flooding may occur.
- 5.20. 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.
- 5.21. 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.
- 5.22. 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.
- 5.23. 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.

- 5.24. It should be noted that the area of "Low" to High" risk on the site is associated with the pond. The areas of the proposed development are at "Very Low" risk of flooding at the present day and between 2040 and 2060.

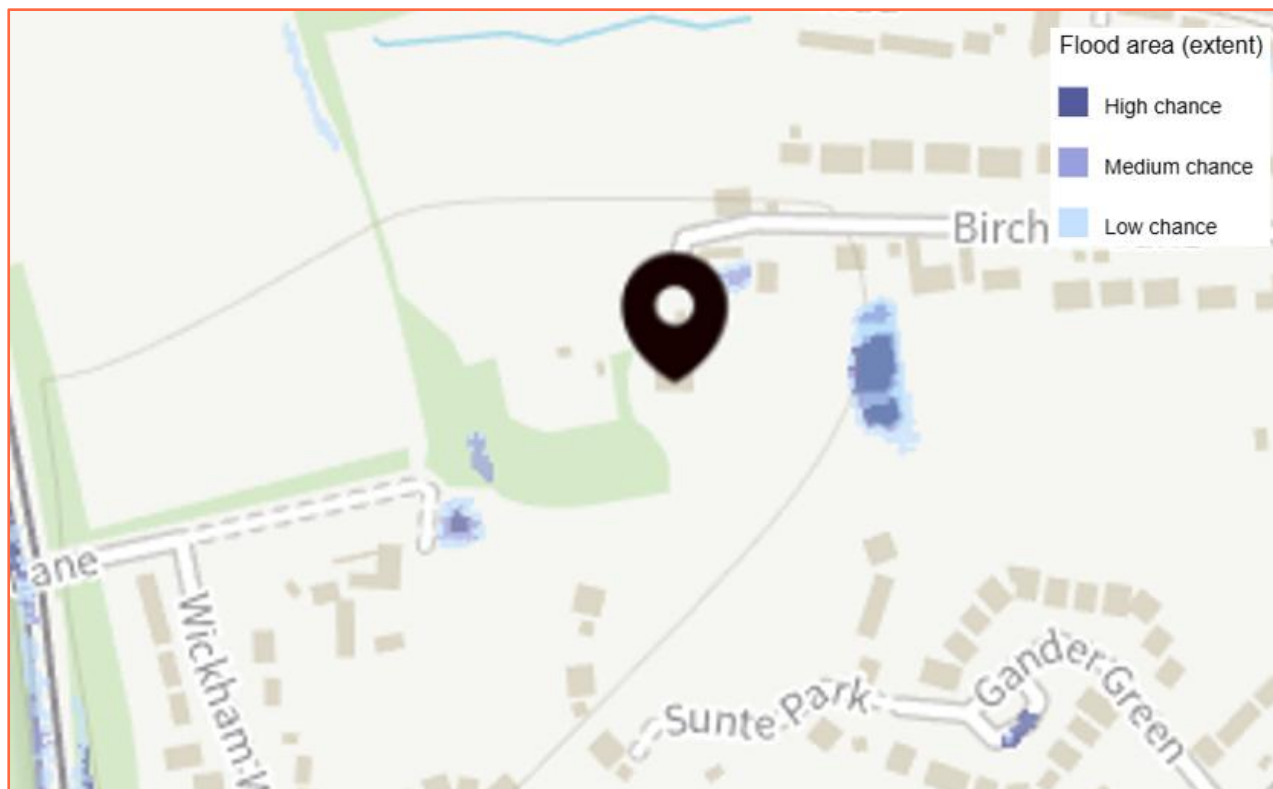


Figure 13: Extract from EA Risk of Flooding from Surface Water mapping – present day (Source: EA)

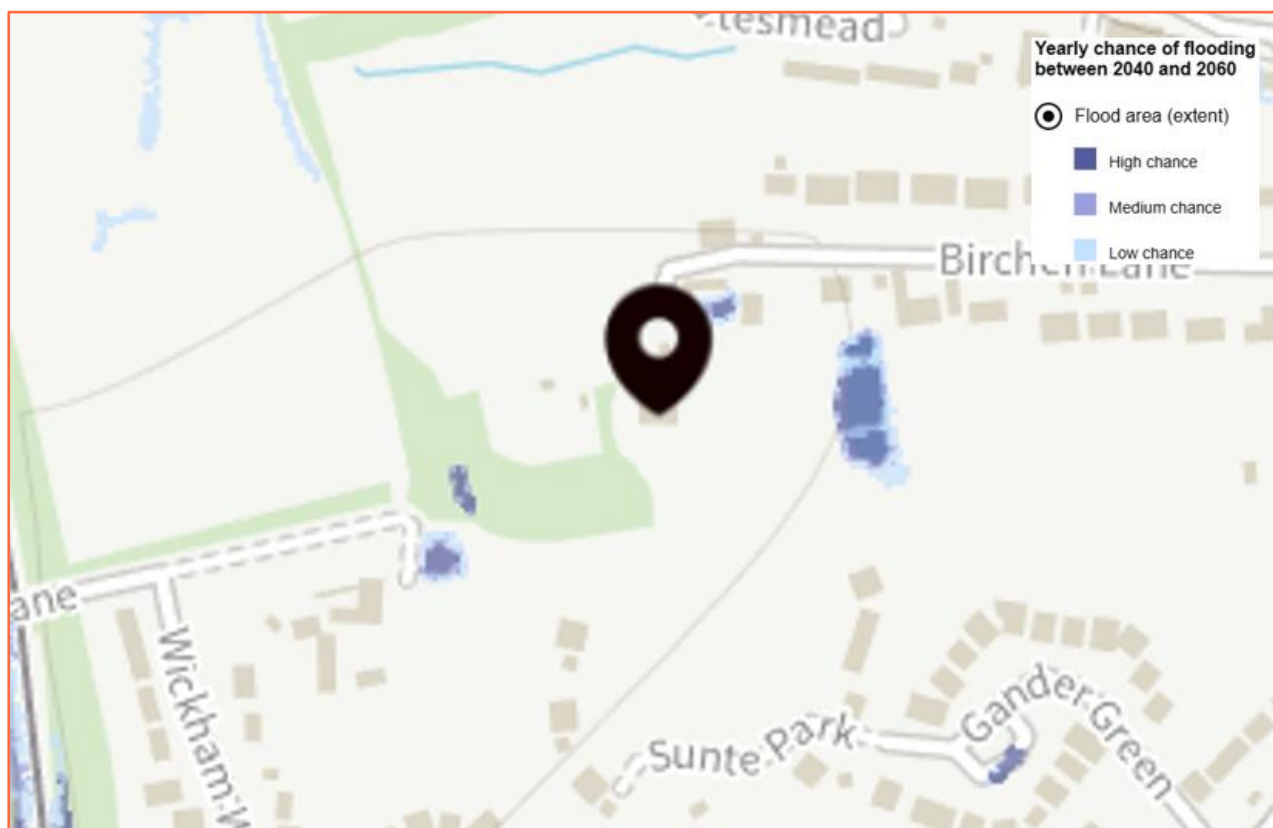


Figure 14: Extract from Environment Agency RoFSW map – between 2040 and 2060 (Source: EA)

- 5.25. The 2024 Mid Sussex District Council SFRA categorises areas of “Low” surface water flood risk as being the equivalent of Flood Zone 2, whilst areas of “Medium” and “High” risk are equivalent to Flood Zones 3a and 3b, respectively.
- 5.26. EA mapping shows the areas of the proposed development within the application boundary to be at “Very Low” risk of surface water flooding.
- 5.27. The 2024 Mid Sussex District Council SFRA also provides guidance on accommodating future climate change within assessments of surface water flood risk. Areas at “Low” risk at the present day are classed as Future Flood Zone 3, whilst areas of “Medium” and “High” risk are classed as Future Flood Zone 3b (functional floodplain).
- 5.28. The areas of the proposed development are not shown to be located within Future Flood Zones 3a or 3b.

Groundwater:

- 5.29. 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.
- 5.30. 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.
- 5.31. 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.

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. According to the 2024 Mid Sussex District Council SFRA the site's postcode area (RH16 1) has had 5 internal and 27 external incidents of sewer flooding recorded by Southern Water.
- 5.36. No further information has been presented to suggest that the site itself is susceptible to sewer flooding.

Other Sources:

- 5.37. 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 of 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.
- 5.38. 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.
- 5.39. 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.
- 5.40. No information has been provided to suggest that the site is susceptible to flooding from other sources.

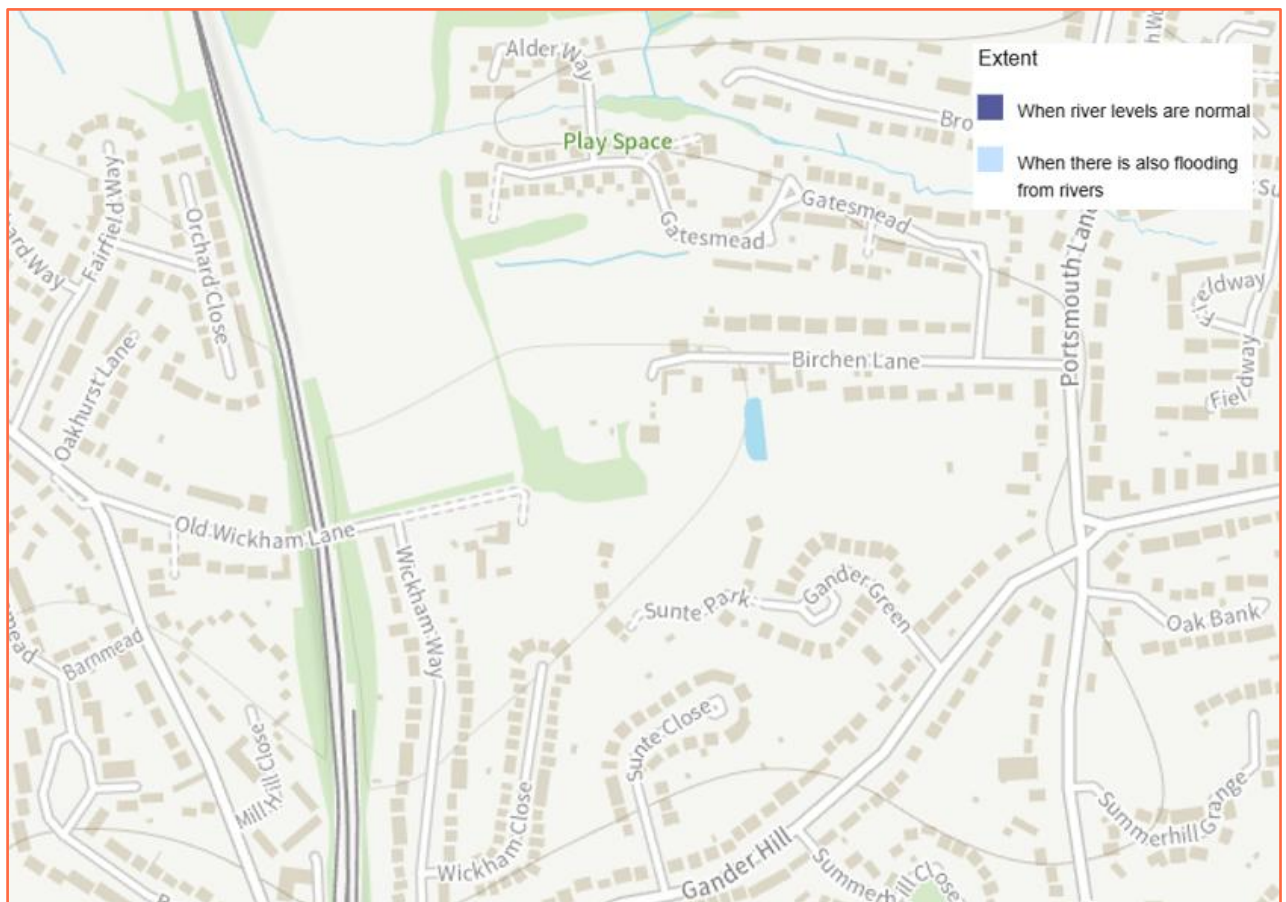


Figure 15: Extract from Environment Agency Reservoir Flood Map (Source: EA)

Historical Flood Events:

- 5.41. 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.
- 5.42. The EA hold no records of historic flooding having affected the site or surrounding area.
- 5.43. 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 is classified as “more vulnerable” (residential).
- 6.3. Post development, the site will remain as “more vulnerable”, as the application is for the refurbishment and extension of the Grade II* listed house and construction of new build pool-house. No new basement accommodation is proposed.
- 6.4. Accordingly, it is considered that the vulnerability of the site as a whole will remain the same 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 250m². It should not be applied if an additional dwelling is being created, e.g. a self-contained annexe or additional commercial unit.
- 6.6. No additional residential units will be created as part of the development. The proposed application is for residential extensions which exceed 250m². Therefore, the application does not fit within EA Standing Advice.

Physical Design Measures:

- 6.7. The site lies entirely outside of Flood Zone 3 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 the areas of the proposed development within the site are at “Very Low” risk of flooding at the present day and between 2040 and 2060.
- 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 ground floor external doors and windows.

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 entirely within Flood Zone 1. The areas of the proposed development within the site are at "Very Low" risk of flooding from surface water at the present day and between 2040 and 2060.
- 6.13. Residents will follow the Flood Warning and Evacuation Plan detailed in the following section.

Flood Warning:

- 6.14. 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.
- 6.15. 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.
- 6.16. 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>.
- 6.17. 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.

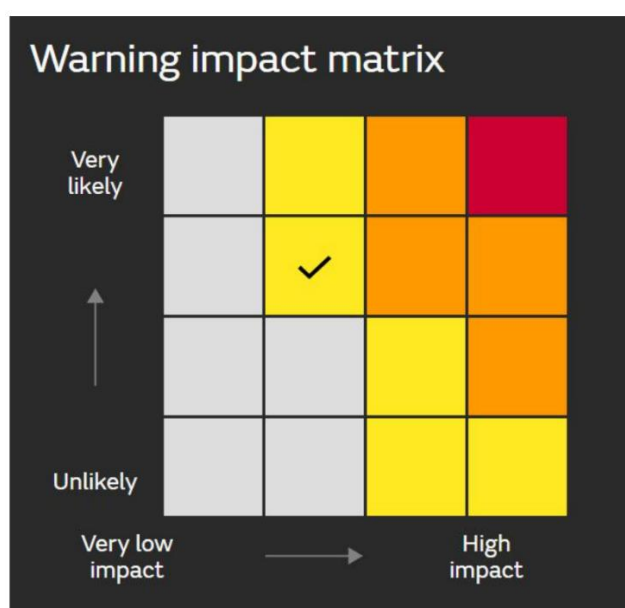


Figure 16: Met Office Weather Warning Impact Matrix (Source: Met Office)

- 6.18. **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.
- 6.19. **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.
- 6.20. **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:

- 6.21. It is recommended that the applicant and future owners, occupiers and Landlords of the property 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.

Action	
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:**

- 6.22. 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.
- 6.23. 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.
- 6.24. 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.
- 6.25. The site is located within Flood Zone 1 entirely outside of the functional floodplain. Therefore, no fluvial floodwater would be displaced by the proposed development.

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 situated within Flood Zone 1 when using the Environment Agency Flood Map for Planning (Rivers and Sea). The areas of the proposed development within the site are at "Very Low" risk of flooding from surface water at the present day and between 2040 and 2060. The proposed development is considered to be '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	X	Exception Test required	✓	✓
Zone 3b	Exception Test required	X	X	X	✓

Table 3: Flood risk vulnerability and flood zone 'compatibility' (Source: NPPF Table 3 Technical Guidance)

- 7.5. Using the above table, the proposed application ('more vulnerable') is considered to be suitable within Flood Zone 1. The sequential test does not need to be applied for minor developments and changes of use – this application is for the refurbishment and extension of the Grade II* listed house and construction of new build pool-house.

8. Surface Water Drainage Strategy

Existing Drainage:

- 8.1. The existing site is understood to discharge its surface water predominantly to sewer at an unattenuated rate. Parts of the existing driveway discharge to the on-site pond. Some areas are believed to discharge to soakaway, however this is unconfirmed.
- 8.2. Refer to drainage survey in Appendix.

Drainage Hierarchy:

- 8.3. In order to mitigate flood risk posed by post development runoff, adequate control measures will need to be considered within the site. This will ensure that surface water runoff is dealt with at source and flood risk is not increased elsewhere.
- 8.4. The drainage strategy for the site has been prepared according to the drainage discharge hierarchy from CIRIA C753 The SuDS Manual, as follows:
1. Infiltration to the maximum extent that is practical;
 2. Discharge to surface waters;
 3. Discharge to surface water sewer;
 4. Discharge to combined sewer.

Infiltration Potential:

- 8.5. The 1:50,000 BGS map shows that the bedrock underlying the site is Upper Tunbridge Wells Sand – sandstone and siltstone. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon deep-intermediate depth soils of sandstone and mudstone parent material with a soil texture of sandy loam to silty loam. Therefore, infiltration SuDS are considered to be viable at the site.
- 8.6. In the absence of in-situ testing, an assumed infiltration rate has been utilised based on the below coefficients. Table 25.1 of CIRIA C753 The SuDS Manual 2015 provides typical infiltration coefficients based on soil texture:

Soil type/texture	ISO 14688-1 description (after Blake, 2010)	Typical infiltration coefficients (m/s)
Good infiltration media - Gravel - Sand - Loamy sand - Sandy loam	Sandy GRAVEL Slightly silty slightly clayey SAND Silty slightly clayey SAND Silty clayey SAND	$3 \times 10^{-4} - 3 \times 10^{-2}$ $1 \times 10^{-5} - 5 \times 10^{-5}$ $1 \times 10^{-4} - 3 \times 10^{-5}$ $1 \times 10^{-7} - 1 \times 10^{-5}$
Poor infiltration media - Loam - Silt loam - Chalk (structureless) - Sandy clay loam	Very silty clayey SAND Very sandy clayey SILT N/A Very clayey silty SAND	$1 \times 10^{-7} - 5 \times 10^{-6}$ $1 \times 10^{-7} - 1 \times 10^{-5}$ $3 \times 10^{-8} - 3 \times 10^{-6}$ $3 \times 10^{-10} - 3 \times 10^{-7}$
Very poor infiltration media - Silty clay loam - Clay - Till	– Can be any texture of soil described above	$1 \times 10^{-8} - 1 \times 10^{-6}$ $< 3 \times 10^{-8}$ $3 \times 10^{-9} - 3 \times 10^{-6}$
Other Rock* (note mass infiltration capacity will depend on the type of rock and the extent and nature of discontinuities and any infill)	N/A	$3 \times 10^{-9} - 3 \times 10^{-5}$

Table 3: Typical infiltration coefficients based on soil texture (Source: Table 25.1 of CIRIA C753)

- 8.7. Given the underlying strata, an assumed infiltration rate of 1×10^{-5} m/s has been utilised for this assessment. However, given the underlying bedrock geology the true infiltration rate is likely to be greater than that used within this assessment.

Proposed Discharge Rates and Locations:

- 8.8. The greenfield runoff rates for the area of the Pool-House being attenuated has been calculated as 0.1 l/s for the 1:1 annual runoff event, 0.4 l/s for the 1:30 year event and 0.5 l/s for the 1:100 year event. Refer to calculations in Appendix.
- 8.9. Runoff from the proposed Pool-House's roof area will be directed into the cellular storage soakaway located north of the Pool-House.
- 8.10. The greenfield runoff rates for the area of the covered entrance extension linking the Dairy and Tool Shed has been calculated as 0.0 l/s for the 1:1 annual runoff event, 0.0 l/s for the 1:30 year event and 0.0 l/s for the 1:100 year event. Refer to calculations in Appendix.
- 8.11. Runoff from the roof area of the covered entrance extension will be directed into the cellular storage soakaway located east of the Dairy.
- 8.12. The proposed infill extension to the Main House will cover an area of existing impermeable flagstone patio. Given this, the infill extension to the Main House will utilise the existing surface water drainage arrangements for the Main House and adjoining Dairy.
- 8.13. All new ground surfaces will be of permeable construction, with permeable paving utilised for all trafficked areas.

Cellular Storage Soakaway – Pool-House:

- 8.14. The roof area of the proposed Pool-House that will be directed into the cellular storage soakaway amounts to approximately 255m².
- 8.15. In order to comply with CIRIA C753 The SuDS Manual, a 10% allowance will be added to the impermeable area to take into account future urban creep. Applying a 10% allowance to the area being attenuated gives a value of 280.5m². Therefore, all drainage calculations within this assessment have been made based on a total area of 280.5m².
- 8.16. Preliminary calculations indicate that cellular storage with dimensions 42m² x 0.66m deep x 0.95 (voids) will be sufficient to accommodate all runoff from 280.5m² of roof area arising from the critical 1:100 year + 45% climate change event.
- 8.17. Preliminary calculations indicate that some 26.33m³ of storage is required to attenuate the runoff from all storms up to and including the 1:100 year + 45% climate change event.
- 8.18. *Please note that the levels and locations of the cellular storage within the Causeway calculations are arbitrary for modelling purposes.*
- 8.19. All preliminary surface water drainage calculations have been undertaken using Causeway software. Refer to appendix.

Cellular Storage Soakaway – Covered Entrance Extension:

- 8.20. The roof area of the proposed covered entrance extension linking the Dairy and Tool Shed that will be directed into the cellular storage soakaway amounts to approximately 18m².

- 8.21. In order to comply with CIRIA C753 The SuDS Manual, a 10% allowance will be added to the impermeable area to take into account future urban creep. Applying a 10% allowance to the area being attenuated gives a value of 19.8m². Therefore, all drainage calculations within this assessment have been made based on a total area of 19.8m².
- 8.22. Preliminary calculations indicate that cellular storage with dimensions 5m² x 0.36m deep x 0.95 (voids) will be sufficient to accommodate all runoff from 19.8m² of roof area arising from the critical 1:100 year + 45% climate change event.
- 8.23. Preliminary calculations indicate that some 1.71m³ of storage is required to attenuate the runoff from all storms up to and including the 1:100 year + 45% climate change event.
- 8.24. *Please note that the levels and locations of the cellular storage within the Causeway calculations are arbitrary for modelling purposes.*
- 8.25. All preliminary surface water drainage calculations have been undertaken using Causeway software. Refer to appendix.

Water Butts:

- 8.26. Water butts will be incorporated into the development to reduce household water consumption, providing further betterment on the existing situation. Rainwater collected by the water butts will be for garden use.
- 8.27. Overflows from the water butts will be directed into the surface water drainage arrangements for the associated rainwater downpipe.

Water Quality:

- 8.28. Water quality has been assessed in line with the Simple Index approach from Chapter 26 of CIRIA C753 The SuDS Manual:

Step 1 – Allocate suitable pollution hazard indices for the proposed land use.

Step 2 – Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index.

- 8.29. The highest pollution hazard level for the proposed land use is Low (residential car parks). The pollution hazard indices for this land use are shown in the table below.

Land Uses	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential car parks and low trafficked roads	Low	0.5	0.4	0.4

Table 4: Pollution hazard indices for the proposed site (from Table 26.2 of CIRIA C753 The SuDS Manual)

- 8.30. All SuDS components are assessed for their effectiveness in pollutant removal prior to discharge in Table 26.3 in CIRIA C753 The SuDS Manual. The pollution mitigation indices for permeable pavements are shown in the Table below.

SuDS Component	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Pavement	0.7	0.6	0.7

Table 5: Pollution mitigation hazard indices for permeable pavements

- 8.31. The Pollution Mitigation Indices for permeable pavement are greater than the Pollution Hazard Indices for residential car parks. Therefore, permeable pavements will provide sufficient water quality treatment.
- 8.32. Roof water and runoff from untrafficked ground surfacing will contain negligible contaminant concentrations and does not warrant treatment. Nevertheless, it is suggested to include debris / sediment traps on any new drainage.

Design Exceedance:

- 8.33. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. In the event of the drainage system failure, the runoff flow can be managed through detailing the new external levels to direct water away from structures.

Adoption and Maintenance:

- 8.34. It is proposed that all SuDS facilities will be maintained privately by the end users.
- 8.35. A draft Maintenance Schedule is outlined below.
- 8.36. In addition, it is recommended that all drainage elements are inspected following the first storm event and monthly for the first 3 months following commissioning.

Permeable Paving:

- 8.37. Permeable surfaces should be maintained with the following actions at the specified intervals to preserve their infiltration capacity and structural integrity, or in line with the manufacturer's recommendations.

Maintenance Schedule	Action	Frequency
Routine Maintenance	- Clean of silt and other sediments using a brush and vacuum. - Remove any other debris.	Three times a year: - End of winter - Mid-summer - After autumn leaf fall Or as required.
Occasional Maintenance	- Removal of weeds manually or with weedkiller. - Stabilise adjacent landscaped areas to prevent sediment spills onto surface.	Action as required.
Remedial Actions	- Replace damaged or lost blocks. - Level depressions in the surface. - Apply pure rock salt de-icer free from additional sand or grit.	Action as required.
	Rehabilitation of upper substructure by remedial sweeping of joints and reapplication of jointing material.	Every 10 – 15 years or as required (if infiltration performance is reduced due to clogging of joints).
Monitoring	Initial inspection.	Monthly for 3 months post-installation.
	Inspect for poor infiltration performance or structural damage and take remedial action as necessary.	Every three months 48hrs after storm events.
	Visually inspect for blocked joints between pavers.	Annually.
	Monitor inspection chambers.	Annually.

Table 6: Suggested maintenance regime for permeable paving

- 8.38. Materials removed from the voids or the layers below the surface of the paving may contain hazardous substances such as heavy metals and hydrocarbons which may need to be disposed of as controlled waste.

Cellular Storage:

- 8.39. It is not envisaged that silt build up within the cellular crate systems will require a rigorous maintenance regime so long as silt is removed from upstream catch pits and inspection chambers on a regular basis. Notwithstanding this, a suitable maintenance regime is outlined in the table below.

Maintenance Schedule	Action	Frequency
Routine Maintenance	• Remove silt build-up from system.	Action as required.
	• Remove debris from catchment surface if it may cause risks to performance.	Action as required.
Remedial Actions	• Repair inlets, outlets and overflows.	Action as required.
Monitoring	• CCTV inspection of crates for silt build-up to establish silt removal frequencies.	Following first storm event and every five years thereafter.
	• Inspection of inlet, outlet and overflow pipework for silt accumulation to establish silt removal frequencies.	Monthly for first 3 months and annually thereafter.
	• Inspection of inlets, outlets and overflows to ensure they are functioning correctly.	Annually.

Table 7: Suggested maintenance regime for cellular storage

- 8.40. Inspection and maintenance access can be gained via inspection chambers and inlet pipework.
- 8.41. Jetting should be undertaken in accordance with current jetting guidelines, particularly the Sewer Jetting Code of Practice published by The Water Research Centre. Jetting at 150 bar at 300 l/min should be more than adequate in removing any build-up of material. However, unlike regular jetting which relies heavily on high pressure to remove hardened deposits on the inner bore of pipes, effective cleansing of a crate system relies more on the delivery flow rate to flush solids back through the system.
- 8.42. A standard jet head with rear facing nozzles should be used. The head should be fed to the far end of the crate tunnel via the nearest inspection chamber, activated and retracted. As the nozzle is removed, debris will be swept back into the inspection chamber where it can then be removed with the use of a standard gully sucker. This method will ensure the effective removal of gross solids (carrier bags, cans, leaf litter etc.) from the system. Whilst 100% removal cannot be guaranteed, it has been shown that this jetting method will also remove an element of finer material which would otherwise be 'lost' within the system.

Water Butts:

- 8.43. Water butts should be maintained in line with manufacturer's guidance. However, some general maintenance and checks are outlined in the following table.

Maintenance Schedule	Action	Frequency
Routine Maintenance	• Clean debris or sediment build-up from inlets/outlets.	Every three months.
	• Remove and clean filter by soaking in a mixture of vinegar and water.	Every three months.
Occasional Maintenance	• Wash exterior with soapy water, a coarse brush and jet hose.	Annually.
	• Clean interior of water butt with disinfectant.	
	• Descale using a mixture of vinegar and water.	Action as required.
Remedial Actions	• Replace lid if not fitting tightly.	Action as required.
Monitoring	• Monitor interior for evidence of stagnation, algae formation or limescale.	Every three months.
	• Inspect for signs of damage or cracking.	Every three months.
	• Ensure lid is fitting correctly.	

Table 8: Suggested maintenance regime for water butts**Pipework, Inspection Chambers and Catchpits:**

- 8.44. It is not envisaged that silt build up within the pipework systems will require a rigorous maintenance regime so long as silt is removed from upstream catch pits on a regular basis. Notwithstanding this, a suitable maintenance regime for the systems is outlined in the table below.

Maintenance Schedule	Action	Frequency
Routine Maintenance	• Remove silt and debris from inspection chambers and catchpits.	Annually or as required.
	• Cleaning of gutters and downpipe filters.	
	• Remove root ingress.	Action as required.
Monitoring	• Inspect for silt and debris.	Every three months.
	• CCTV survey of drainage system to identify alignment issues, cracked pipes or leaking joints.	Every 10 years.

Table 9: Suggested maintenance regime for pipework, inspection chambers and catchpits

9. Foul Drainage Strategy

Existing Drainage:

- 9.1. The existing site is understood to discharge its foul to a Southern Water foul sewer north of the site via a private drainage system within the site.
- 9.2. Refer to drainage survey in Appendix.

Foul Drainage Hierarchy:

- 9.3. The drainage strategy for the site has been prepared according to the drainage discharge hierarchy from the NPPF, as follows.
 - 1. Connection to public sewer;
 - 2. Installation of a package sewage treatment works;
 - 3. Installation of a septic tank.

Proposed Foul Drainage:

- 9.4. Post development, the Main House will continue to utilise its existing foul drainage arrangements.
- 9.5. Foul water from the proposed Pool-House will be discharged to the private drainage system within the site via a connection to an existing manhole adjacent to the Main House. Proposed pipework will be sized to accommodate flows from the Pool-House.

Adoption and Maintenance:

- 9.6. The sewers will be designed to an adoptable standard (where feasible).

10. Discussion and Conclusion

- 10.1. This Flood Risk Assessment and Surface Water Drainage Strategy has been prepared by Unda Consulting Limited on behalf of Peter Reid, in support of a planning application for the *refurbishment and extension of the Grade II* listed house and construction of new build pool-house*. The proposed development is being undertaken at Sunte House, Birchen Lane, Haywards Heath, RH16 1RZ. This report assesses the flood risk and foul and surface water drainage strategy for the proposed development.
- 10.2. The site is currently occupied by the Grade II* listed building Sunte House (the Main House), along with associated outbuildings and grounds.
- 10.3. A topographic survey of the site undertaken in February 2024 by Midland Survey Ltd shows ground topography on site ranges between 58.10mAOD to 64.67mAOD.
- 10.4. The 1:50,000 BGS map shows that the bedrock underlying the site is Upper Tunbridge Wells Sand – sandstone and siltstone.
- 10.5. The BGS mapping shows there are no recorded superficial deposits underlying the site.
- 10.6. The soil type taken from the UKSO Soil Map Viewer, shows the site to be located upon deep-intermediate depth soils of sandstone and mudstone parent material with a soil texture of sandy loam to silty loam.
- 10.7. The published Environment Agency Groundwater Source Protection Zone map shows the site is not located within a Groundwater Source Protection Zone.

Flood Risk Discussion:

- 10.8. The site is located within Flood Zone 1 (Low Probability), which means it is defined as land having a less than 1:1000 annual probability of river or sea flooding.
- 10.9. The nearest drainage feature is a ditch located approximately 50m north of the site. The nearest EA Main River is the West Common Stream Extension located approximately 175m north.
- 10.10. According to EA data, there are no Flood Storage Areas located in close proximity to the site.
- 10.11. According to the EA, there are no formal raised flood defences owned or operated by the EA protecting the site. The West Common Stream Extension approximately 175m north of the site is, however, flanked by natural high ground with a 1:25 year design standard of protection.
- 10.12. 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.
- 10.13. 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.
- 10.14. It should be noted that the area of “Low” to “High” risk on the site is associated with the pond. The areas of the proposed development are at “Very Low” risk of flooding at the present day and between 2040 and 2060.
- 10.15. The areas of the proposed development are not shown to be located within Future Flood Zones 3a or 3b as defined by the 2024 Mid Sussex District Council SFRA.
- 10.16. Risk to the site from groundwater, sewer surcharge and reservoir flooding would appear to be very low. No records have been provided to suggest that the site itself has experienced flooding from these sources.

- 10.17. The EA hold no records of historic flooding having affected the site or surrounding area.
- 10.18. The existing site is classified as “more vulnerable” (residential). Post development, the site will remain as “more vulnerable”. Accordingly, it is considered that the vulnerability of the site as a whole will remain the same post development.
- 10.19. 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.
- 10.20. The site is located within Flood Zone 1 entirely outside of the functional floodplain. Therefore, no fluvial floodwater would be displaced by the proposed development.

Surface Water Drainage Discussion:

- 10.21. The existing site is understood to discharge its foul to a Southern Water foul sewer north of the site via a private drainage system within the site.
- 10.22. The 1:50,000 BGS map shows that the bedrock underlying the site is Upper Tunbridge Wells Sand – sandstone and siltstone. The soil type taken from the UKSO Soil Map Viewer, shows the site to located upon deep-intermediate depth soils of sandstone and mudstone parent material with a soil texture of sandy loam to silty loam. Therefore, infiltration SuDS are considered to be viable at the site.
- 10.23. Given the underlying strata, an assumed infiltration rate of 1×10^{-5} m/s has been utilised for this assessment. However, given the underlying bedrock geology the true infiltration rate is likely to be greater than that used within this assessment.
- 10.24. The greenfield runoff rates for the area of the Pool-House being attenuated has been calculated as 0.1 l/s for the 1:1 annual runoff event, 0.4 l/s for the 1:30 year event and 0.5 l/s for the 1:100 year event. Refer to calculations in Appendix.
- 10.25. Runoff from the proposed Pool-House’s roof area will be directed into the cellular storage soakaway located north of the Pool-House.
- 10.26. The greenfield runoff rates for the area of the covered entrance extension linking the Dairy and Tool Shed has been calculated as 0.0 l/s for the 1:1 annual runoff event, 0.0 l/s for the 1:30 year event and 0.0 l/s for the 1:100 year event. Refer to calculations in Appendix.
- 10.27. Runoff from the roof area of the covered entrance extension will be directed into the cellular storage soakaway located east of the Dairy.
- 10.28. The proposed infill extension to the Main House will cover an area of existing impermeable flagstone patio.
- 10.29. The infill extension to the Main House will utilise the existing surface water drainage arrangements for the Main House and adjoining Dairy.
- 10.30. All new ground surfaces will be of permeable construction, with permeable paving utilised for all trafficked areas.
- 10.31. The roof area of the proposed Pool-House that will be directed into the cellular storage soakaway amounts to approximately 255m².

- 10.32. In order to comply with CIRIA C753 The SuDS Manual, a 10% allowance will be added to the impermeable area to take into account future urban creep. Applying a 10% allowance to the area being attenuated gives a value of 280.5m². Therefore, all drainage calculations within this assessment have been made based on a total area of 280.5m².
- 10.33. Preliminary calculations indicate that cellular storage with dimensions 42m² x 0.66m deep x 0.95 (voids) will be sufficient to accommodate all runoff from 280.5m² of roof area arising from the critical 1:100 year + 45% climate change event.
- 10.34. Preliminary calculations indicate that some 26.33m³ of storage is required to attenuate the runoff from all storms up to and including the 1:100 year + 45% climate change event.
- 10.35. The roof area of the proposed covered entrance extension linking the Dairy and Tool Shed that will be directed into the cellular storage soakaway amounts to approximately 18m².
- 10.36. In order to comply with CIRIA C753 The SuDS Manual, a 10% allowance will be added to the impermeable area to take into account future urban creep. Applying a 10% allowance to the area being attenuated gives a value of 19.8m². Therefore, all drainage calculations within this assessment have been made based on a total area of 19.8m².
- 10.37. Preliminary calculations indicate that cellular storage with dimensions 5m² x 0.36m deep x 0.95 (voids) will be sufficient to accommodate all runoff from 19.8m² of roof area arising from the critical 1:100 year + 45% climate change event.
- 10.38. Preliminary calculations indicate that some 1.71m³ of storage is required to attenuate the runoff from all storms up to and including the 1:100 year + 45% climate change event.
- 10.39. Water butts will be incorporated into the development to reduce household water consumption, providing further betterment on the existing situation. Rainwater collected by the water butts will be for garden use.
- 10.40. Overflows from the water butts will be directed into the surface water drainage arrangements for the associated rainwater downpipe.
- 10.41. The highest pollution hazard level for the proposed land use is Low (residential car parks). The Pollution Mitigation Indices for permeable pavement are greater than the Pollution Hazard Indices for residential car parks. Therefore, permeable pavements will provide sufficient water quality treatment.
- 10.42. Roof water and runoff from untrafficked ground surfacing will contain negligible contaminant concentrations and does not warrant treatment. Nevertheless, it is suggested to include debris / sediment traps on any new drainage.
- 10.43. It is proposed that all SuDS facilities will be maintained privately by the end users. A draft Maintenance Schedule is outlined within the report.
- 10.44. Should the onsite drainage system fail under extreme rainfall events or blockage, flooding may occur within the site. In the event of the drainage system failure, the runoff flow can be managed through detailing the new external levels to direct water away from structures.

Foul Drainage Strategy:

- 10.45. The existing site is understood to discharge its foul to a Southern Water foul sewer north of the site via a private drainage system within the site.
- 10.46. Post development, the Main House will continue to utilise its existing foul drainage arrangements.

- 10.47. Foul water from the proposed Pool-House will be discharged to the private drainage system within the site via a connection to an existing manhole adjacent to the Main House. Proposed pipework will be sized to accommodate flows from the Pool-House.

This drainage strategy has been undertaken in accordance with the principles set out in NPPF. We can conclude that providing the development adheres to the conditions advised above, the said development proposals can be accommodated without increasing flood risk within the locality in accordance with objectives set by Central Government and the EA.

**Unda Consulting Limited
June 2025**

Appendix

A – Development Plans:

- Site location, existing and proposed plans – Richard Parr Associates.

B – Causeway Calculations:

Cellular Storage Soakaway – Pool-House:

- IH124 Pre-Development Greenfield Runoff Calculations for the area of the site being attenuated;
- Cellular Storage Soakaway (Depth/Area Storage Structure) Calculations.

Cellular Storage Soakaway – Covered Entrance Extension:

- IH124 Pre-Development Greenfield Runoff Calculations for the area of the site being attenuated;
- Cellular Storage Soakaway (Depth/Area Storage Structure) Calculations.

C – Drainage Layout Plans:

- Proposed Drainage Layout [94853-01].

D – CCTV Drainage Survey:

- CCTV Drainage Survey – Johnny's Drains.

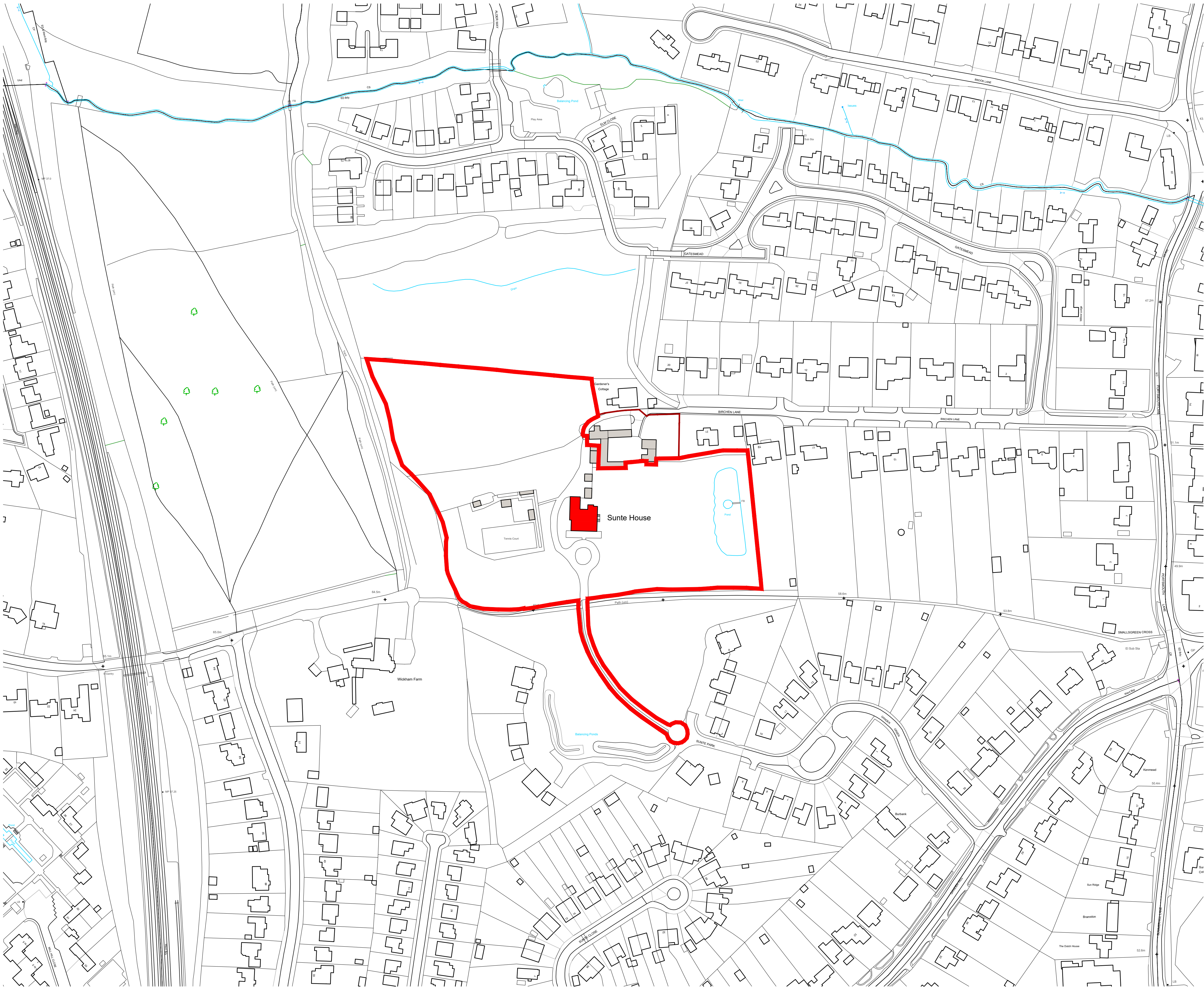
E – EA Flood Map for Planning:

- Flood Map for Planning – Environment Agency.

F – NPPF Annex 3:

- NPPF Annex 3: Flood risk vulnerability classification table.

Appendix A



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Description
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DRAFT

Job No
335

Project
Sunte House

Title
Existing Site Location Plan

Dwg No
335_XX_DR_01_101

Scale
1:1250 @ A1

Date of First Issue
-

Rev
P01

Status
Planning

- Key
- Sunte House
 - Outbuildings
 - Site Ownership Boundary
 - Application Boundary

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Gloucestershire GL10 3UL

TOWN
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Great Western Studios
65 Alfred Road
London W2 9EU

01

Existing Site Plan
1:500 @ A1; 1:1000 @ A3

020406080100 M

KEY

1 Sunte House - Grade II*

2 Dairy

3 Tool-Shed

4 Garage

5 Cottage

6 Stables

7 Cow-shed

8 Byre

9 Barn

10 Tennis Court

11 Kitchen Garden / Green Houses

12 Garden Store - Grade II

13 Garden Wall - Grade II

14 Entrance Gate

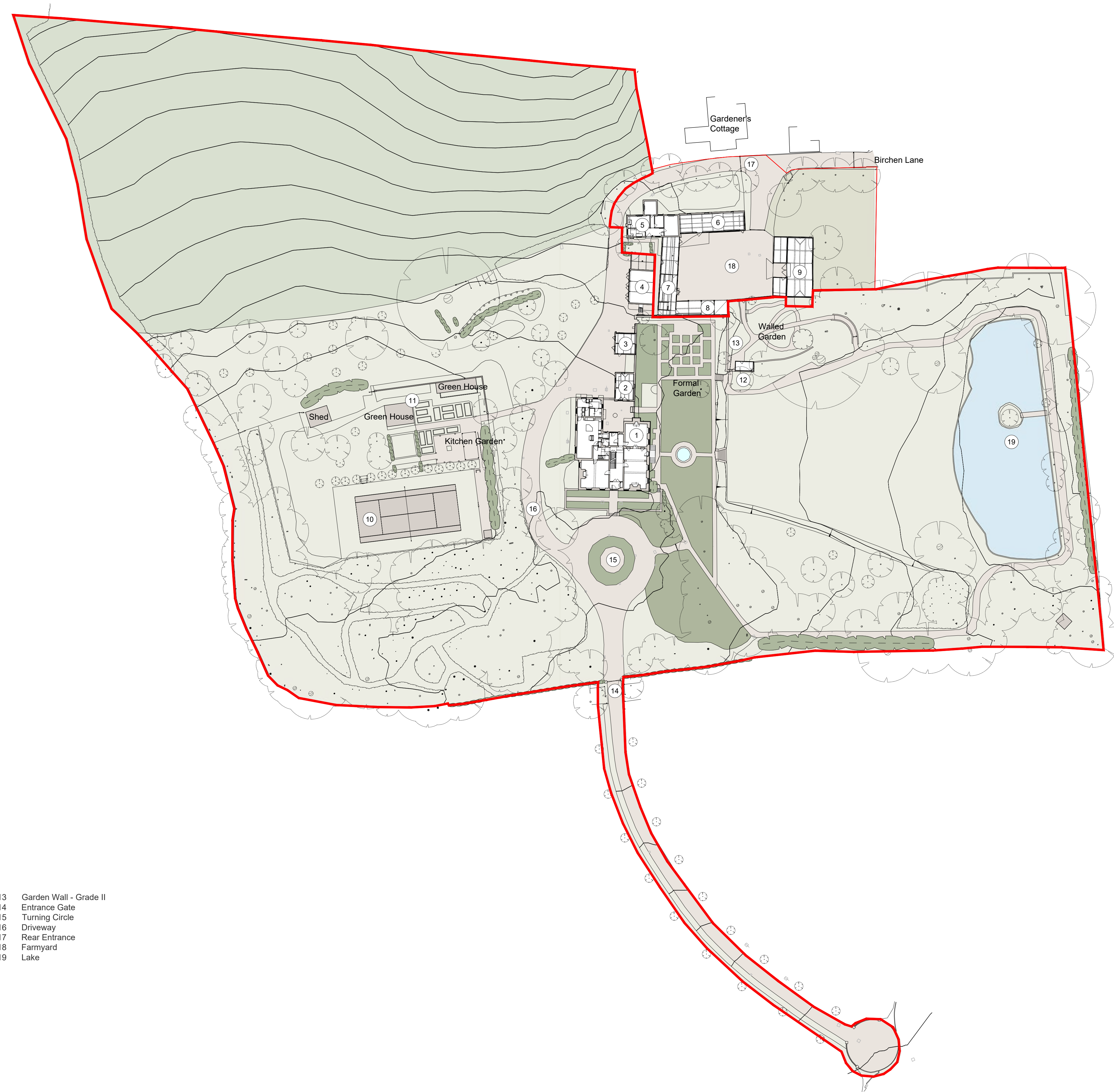
15 Turning Circle

16 Driveway

17 Rear Entrance

18 Farmyard

19 Lake

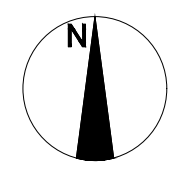


Key

Existing

Application Boundary

Site Ownership Boundary



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Job No
335

Project
Sunte House

Title
Existing Site Plan

Drg No
335_XX_DR_01_101

Scale
1:500 @ A1; 1:1000 @ A3

Date of First Issue
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KEY

- | | | | |
|----|-------------------------|----|------------------------|
| 1 | Sunte House - Grade II* | 13 | Garden Wall - Grade II |
| 2 | Dairy | 14 | Entrance Gate |
| 3 | Tool-Shed | 15 | Turning Circle |
| 4 | Garage | 16 | Driveway |
| 5 | Cottage | 17 | Rear Entrance |
| 6 | Stables | 18 | Proposed Parking Area |
| 7 | Cow-shed | 19 | Farmyard Parking Area |
| 8 | Byre | 20 | Lake |
| 9 | Barn | | |
| 10 | Tennis Court | | |
| 11 | Proposed Pool-house | | |
| 12 | Garden Store - Grade II | | |

Key

- Proposed
- Existing
- Application Boundary
- Root Protection Area
- Site Ownership Boundary
- Demolition - External

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Job No

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Project

Sunte House

Title

Proposed Site Plan

Drg No

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Scale

1:500 @ A1; 1:1000 @ A3

Date of First Issue

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Rev

P01

Status

Planning

