Stonehouse Farm
Handcross Road, Horsham, RH13 6NZ

Flood Risk Assessment and Drainage Strategy

For

Lake Investments Limited

Document Control Sheet

Stonehouse Farm

Handcross Road, Horsham, RH13 6NZ

Lake Investments Limited

This document has been issued and amended as follows:

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26th February 2025	Final A	Phil Allen MCIWEM C.WEM	Neil Jaques
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Contents

Appendices

1.0 Introduction

1.1 This Flood Risk Assessment (FRA) and Drainage Strategy report has been produced by Motion on behalf of their client, Lake Investments Limited. It supports the planning application for three tranches of proposed development on the Stonehouse Farm site, which is located on Handcross Road, Plummers Plain, West Sussex.

1.2 The three tranches of development are on distinctly separate areas of the former farm, which is no longer viable. Each tranche of the mixed-use development will have its own red line boundary and are as follows:

- The 'Stonehouse Business Park' site will demolish 2no. redundant farm buildings (Unit 3 and Unit 5), with a single new commercial unit reserved for small-scale, rurally based enterprises being erected in place of Unit 3. Unit 5 will be replaced with an area that will be reserved for staff and visitor parking to the commercial site. An existing office building will also be refurbished and expanded to supplant office space currently provided on site by 2no. portacabins.
- 'Lot 8', which is an anaerobic digestion (AD) plant and livestock facility with permission to operate as a robotic dairy, will be sensitively converted to rural offices alongside a storage facility.
- 'Jackson's Ridge' seeks to replace two current redundant farm buildings with 3no. high quality residential dwellings designed to a high level of energy efficiency and built from sustainably sourced, low-impact materials.

1.3 A site location and layout plan for Stonehouse Farm, Stonehouse Business Park, Lot 8 and Jacksons Ridge can be found in Appendix A.

1.4 Alongside the above-named developments, the wider Stonehouse Farm site will look to renature much of the local landscape, with biodiversity-led habitat schemes, formed of newly planted woodland, hedgerows, scrubland, wildflower meadows, and wetland scrapes. This newly formed area of habitat will be available for recreation with nature walks accessed from the existing public rights of way across the land.

1.5 The existing and proposed site layouts for each of the three development tranches described above can be seen in Appendix B.

1.6 This FRA and Drainage Strategy will focus on the three tranches of development, ensuring that where there are to be changes to each of the development areas that need to be positively drained, that a sustainable drainage option is provided that supports all four SuDS pillars, where this applicable and suitable.

1.7 This will ensure that the proposed developments will not increase surface water runoff and flood risk in the area and will also provide a net reduction in surface water runoff over the existing situation.

1.8 According to the Environment Agency's (EA's) Flood Map for Planning, all sites are within Flood Zone 1 so are not at risk of fluvial (or tidal) flooding. The updated (January 2025) EA Risk of Flooding from Surface Water (RoFSW) mapping also shows no surface water flood risk within any of the redline boundaries of the three tranches of development. However, because of the combined scale of the three tranches of development, two of which are over 1ha in area, a review of flood risk will be prepared.

1.9 The drainage strategy will demonstrate how the development will manage and discharge surface water generated in all rainfall events up to and including the 1 in 100-year + 45% storm, as is required by the NPPF.

1.10 This FRA and drainage strategy follows the guidance set out in:

- West Sussex LLFA Policy for the Management of Surface Water (November 2018)
- National Planning Policy Framework (NPPF)

- Planning Practice Guidance (PPG) to the National Planning Policy Framework
- CIRIA SuDS Manual 2015 (C753)
- Environment Agency Rainfall Runoff Management for Developments
- Non-Statutory Technical Standards for SuDS (NSTSfS)

1.11 The proposed development falls within the administrative boundary of Horsham District Council (HDC) and West Sussex County Council (WSCC).

1.12 This FRA and drainage strategy report pertains only to the drainage strategy for the development. It does not provide details of how the site will be drained during the construction phase. This report is also not a drainage verification report, which can only be produced post-construction.

1.13 Similarly, this report does not provide information on how the drainage infrastructure will be protected during the construction phase of the project. The provision of this information is the responsibility of the appointed contractor.

2.0 Site Description

Table 2.1 – Site Summary

Site Name	Stonehouse Farm
Location	Handcross Road, Plummers Plain, West Sussex, RH13 6NZ
Grid Reference(s)	TQ232281 (Stonehouse Business Park) TQ227282 (Lot 8) TQ227287 (Jacksons Ridge)
Site Area	1.083 ha (Stonehouse Business Park) 2.294 ha (Lot 8) 0.477 ha (Jacksons Ridge)
Development Type	As described in Paragraphs 1.2 – 1.5
Flood Zone	1
Surface Water Flood Risk	Very Low
Local Water Authority	Southern Water
Local Planning Authority	Horsham District Council (HDC)
Lead Local Flood Authority	West Sussex County Council (WSCC)

Site Location and Description

2.1 A brief description of the three existing areas of the site that are being developed are as follows:

Stonehouse Business Park

2.2 The Stonehouse Business Park site is at the southern extent of Stonehouse Farm and is arranged around the primary access to the farm from Handcross Road, as can be seen in the site layout and location plan in Appendix A.

2.3 The Stonehouse Business Park site is made up of two redundant farm buildings that are in a poor state of repair (Units 3 and 5) and three relatively new and occupied commercial units (Units 1, 2 and 4). All buildings are loosely arranged a central tarmacked access with concreate aprons to the sides. Some areas are not formally surfaced and have used material akin to 6F2/6F5 as a running surface.

2.4 There are 2no. portacabins currently used as office space for the team managing and operating the Stonehouse Farm site.

2.5 An existing small office building exists near the site entrance, which is currently used for storage.

2.6 An existing site layout of Stonehouse Business Park can be seen in Appendix B and photos of the site can be seen in Appendix C.

Lot 8

2.7 Lot 8 is situated on the western side of Stonehouse Farm and possesses its own access from the B2110 Handcross Road. It contains two large commercial warehouses that were formally used as an AD plant and livestock facility. The warehouse units are now empty and some of the infrastructure associated with the AD plant still exists on site such as the rainwater harvesting tanks, which supplied water required in the AD process.

2.8 The site currently has a mixture of surfacing. A large tarmac apron exists to the south of the two units and the area between the two units is made up of concrete hardstanding. The rest of the site is informally surfaced with a mixture of compacted earth and vehicle tracks.

2.9 The existing site layout can be seen in Appendix B and site photos of Lot 8 can be seen in Appendix D.

Jacksons Ridge

2.10 Jacksons Ridge sits at the northern extent of Stonehouse Farm and is accessed from Hammerpond Road, which runs west-east from the B2110 Handcross Road towards Mannings Heath and Horsham.

2.11 The site is occupied by two redundant farm buildings that are in a poor state of repair and are surrounded by concrete hardstanding.

2.12 The existing site layout can be seen in Appendix B and site photos of Jacksons Ridge can be seen in Appendix E.

Topography

2.13 The topographic characteristics of each of the three sites and how they relate to the overall Stonehouse Farm topography is discussed below.

2.14 Stonehouse Farm spans a broad valley feature, with a watercourse in the bottom of the valley that runs east-west and is a tributary of the Goldings Stream, which itself is a tributary of the River Arun. This is highlighted in the site location and layout plan in Appendix A.

2.15 The Stonehouse Business Park and Lot 8 sites sit on the southern side of the valley, with Lot 8 being adjacent to the watercourse, and the Stonehouse Business Park site further away on the most elevated part of Stonehouse Farm on the southern side of the valley. Jacksons Ridge is at the northernmost extent of Stonehouse Farm and the topographically highest point within Stonehouse Farm's landholding.

Stonehouse Business Park

2.16 No topographical surveys are available for the Stonehouse Business Park site and so LiDAR data was used to review the site's topography. A LiDAR topography (contour) plan for Stonehouse Business Park can be seen in Appendix F.

2.17 The site entrance is at approximately 89 metres Above Ordnance Datum (mAOD). Levels remain at 88 mAOD or higher for much of the Stonehouse Business Park site. Levels fall from the centre of the site to a low point of approximately 85 mAOD on the northwestern extent of Stonehouse Business Park' red line boundary. Following this, land continues to fall to the north/northwest down towards the valley bottom and the watercourse, as denoted by the evenly spaced contour lines shown on the LiDAR contour plan.

Lot 8

2.18 A topographic survey has been provided for the Lot 8 site, and this can be seen in Appendix G. Lot 8 is in an area of Stonehouse Farm that falls from south to north, with the highest topographic levels being approximately 78 mAOD towards the gated entrance to Lot 8, and 70 mAOD on the northern red line boundary.

2.19 Where the existing hardstanding is located levels are maintained at 75.5 mAOD. To accommodate the change in levels across Lot 8, the finished floor levels (FFL's) of the two warehouse units and the hardstanding around them are stepped downwards to the north. Where there is not currently any hardstanding the levels fall more naturally to the north with even gradients.

2.20 The level of the valley and watercourse to the north of Lot 8 is approximately 65 mAOD.

Jacksons Ridge

2.21 As mentioned above, Jacksons Ridge is in an elevated position. It holds views across the valley to the south and the whole of Stonehouse Farm, including the Lot 8 and Stonehouse Business Park sites.

2.22 The topographic survey for Jacksons Ridge (Appendix H) shows that it sits on developed platform with a maintained level of approximately 105 mAOD across the concrete hardstanding. This level is marginally lower than that of Hammerpond Road to the north and the site access, which is at 105.5 mAOD to 106.0 mAOD.

2.23 Immediately south of the Jacksons Ridge site and red line boundary (where the concrete hardstanding stops) the land falls away to the valley bottom and the watercourse therein. As mentioned above, the watercourse is at approximately 65 mAOD. It is circa 400m south of Jacksons Ridge, so the gradient of the field between the southern boundary of Jacksons Ridge and the watercourse is 1 in 10.

Geology

2.24 The British Geological Survey (BGS) online 1:50,000 Geoindex maps show that the site's geology is in an area of Upper Tunbridge Wells Sand bedrock geology. This is described as interbedded mudstone, siltstone and sandstone. In the lowest part of the valley where the watercourse cuts through the landscape the geology is shown to be Weald Clay.

2.25 No BGS boreholes are available in the local area to confirm the geological horizons discussed above.

Hydrogeology and Groundwater

2.26 Groundwater Source Protection Zones (SPZ's) are defined around groundwater abstraction sources such as wells, boreholes and springs that are used for public drinking water supply.

2.27 SPZ's show the risk of contamination to groundwater from any activities that might cause pollution in the area. The closer the activity to the source of abstraction, the greater the risk. The maps show three main zones; inner – Zone 1; outer – Zone 2 and; total catchment – Zone 3.

2.28 Defra's Magic Map was reviewed, and none of the sites are within in any SPZ's.

2.29 Where the Upper Tunbridge Wells Sand is sandstone/siltstone the bedrock is described as being a 'Secondary A' Aquifer, which means that it comprises permeable layers that can support local water supplies, and may form an important source of base flow to rivers. The interbedded mudstone layers and Weald Clay are not a primary or secondary aquifer.

2.30 Groundwater levels are currently unknown, but noting the topography, land gradients, and location of surface water features, it is unlikely that groundwater is close to the surface where the developments are located.

Infiltration Potential

2.31 Because the site is underlain by interbedded sandstone, siltstone and mudstone and Weald Clay, and because of the presence of surface water features locally, the local soils are not expected to have infiltration coefficients that are conducive to the discharge of surface water to ground. On this basis, infiltration has not been explored at this stage of the development and the drainage strategy.

2.32 It is noted that WSCC as the Lead Local Flood Authority (LLFA) would ordinarily require site specific BRE365 soakage testing results to support the decision not to use infiltration but noting that soakage testing is unlikely to offer a solution for the drainage strategy, our client would be willing to accept a condition on this matter.

2.33 Defra's Magic Map confirms that the Secondary A aquiferous geology (sandstone/siltstone) has a high level of groundwater vulnerability. The non-aquiferous interbedded layers of mudstone and Weald Clay are described as hydraulically unproductive

Existing Drainage Regime

2.34 This section will present the existing drainage features and infrastructure that serve the three sites. The existing drainage systems will not be altered going forwards, nor will the areas or inflows that contribute to them, thus this is not presented for regulatory review. However, the existing drainage regime is discussed for full transparency of how the existing areas of the three sites manage both surface and foul water.

2.35 Prior to this discussion, it is worth highlighting that Southern Water's Asset Location Plans have been obtained and are included in Appendix I of this drainage strategy. They confirm that there is no public sewerage in the Stonehouse Farm area. All foul waste is managed through the use of packaged sewage treatment plants and the discharge of treated sewage effluent to a suitable receiving water body.

Stonehouse Business Park

2.36 The Stonehouse Business Park site has a compound drainage system that has evolved over time and been added to as the site and its environs has developed.

2.37 The existing drainage system also accommodates land drainage from the field that lies to the south of B2110 Handcross Road, as well as some highway drainage from the B2110 Handcross Road itself. The outflow from the field's land drainage crosses under the B2110 and joins the site drainage adjacent to the Stonehouse Farm site entrance. From here, surface water is piped northwest through the Stonehouse Business Park site and is joined by existing surface water drainage from the commercial units and hardstanding areas, as well as effluent from packaged sewage treatment plants that serve the foul waste needs of the occupied commercial units and Stonehouse Farmhouse.

2.38 All surface water and treated sewage effluent is directed to the northwest corner of the Stonehouse Business Park site towards a large pre-cast concrete (PCC) chamber, which also receives treated effluent from another sewage treatment plant that sits immediately to the south of the track in the northwest corner of the site. From here, all surface water and treated sewage effluent flows northwards in a single pipe towards an existing outfall to the watercourse that sits at the bottom of the valley.

Lot 8

2.39 Lot 8 currently has a complex surface water system that relates to its erstwhile use as an AD plant. Large above-ground rainwater harvesting tanks were installed on the warehouse units to provide water for use as part of the AD process. Below ground concrete rainwater harvesting tanks are also present between the two warehouse units on Lot 8. When these rainwater harvesting tanks were functional and water was being drawn from them, these would have provided some surface water attenuation, but they are now redundant and will not be required by the rural offices and commercial storage.

2.40 The site also has a surface water attenuation 'pit' (it presents much like a concrete-sided open-topped storage tank) that was installed to store surface water emanating from the existing hardstanding areas and some of the roof areas of the warehouse units. The topographic and site survey in Appendix G shows that this tank measures approximately 16m x 14m x 1.2m (L x W x D) thus offers a significant amount of surface water storage (circa 270m^3). Outflow from the attenuation 'pit' drains to the north under the larger of the two warehouse units and has an existing outfall into the watercourse at the bottom of the valley, which is immediately to the north and downslope of Lot 8.

2.41 Lot 8 also has an existing sewage treatment plant that is situated to the north of the site adjacent to the watercourse. This sewage treatment plant discharges treated effluent to the watercourse via an existing outfall.

Jacksons Ridge

2.42 The two remaining farm buildings and the surrounding concrete hardstanding does not appear to have any existing or positive drainage systems. It is thought that the existing roof drainage falls onto the adjacent hardstanding, which drains off via surface flow to the field to the south.

Existing Runoff Rates

2.43 For comparison with the proposed drainage strategy for the areas of the site that are to be developed, it is worth setting out what the existing surface water runoff rates are likely to be from each of the sites.

2.44 While all areas of the sites that are to be developed will attenuate surface water to the equivalent greenfield runoff rate to be in accordance with the NPPF and WSCC's LLFA guidance, the existing runoff rates can be compared to those proposed in order to appreciate the 'betterment' that the drainage strategies for each of the developed areas will provide.

Stonehouse Business Park

2.45 The area of the Stonehouse Business Park site that is to undergo development totals 2,086m^2 (0.209 ha). This includes 2,039m^2 for the areas surrounding Units 3 and 5, and 47m^2 for the new office extension. These areas are shown in the proposed impermeable area plan in Appendix J by the areas highlighted.

2.46 Because there are existing buildings in this area of the site (Units 3 and 5), these can be considered as having a 'brownfield' runoff rate. Units 3 and 5 are 423m^2 in area and this is the area that will currently generate surface water runoff.

2.47 The areas surrounding Units 3 and 5, as described earlier in this report, are of informally surfaced ground with compacted material akin to 6F2/6F5. It is assumed that existing surface water runoff will be very little from these areas because of the open and unstructured nature of the material, thus it is most appropriate to treat these areas as greenfield and having greenfield runoff rates. These parts of the site total 1,663m^2 in area.

2.48 The brownfield runoff rates have been calculated using the Modified Rational Method with rainfall intensities for different return periods extracted from Table 1(a) of the Transport and Road Research Laboratory Report – Estimated Rainfall for Drainage Calculations in the United Kingdom (TRRL Report LR 595) by C. P. Young.

2.49 The Modified Rational Method Equation is:

$$Q_n = 2.78CiA$$

Where:

C = Runoff Coefficient (which is assumed to be '1' in this case to represent impermeable areas)

i_n = Rainfall intensity for a n return period (mm/hr) as prescribed by Table 1(a) of TRRL LR 595

A = Impermeable Area

Q_n = Runoff for n return period

The rainfall intensities for different return periods extracted from Table 1(a) of TRRL Report LR 595 are:

i_1 = 50.8 mm/hr

i_{30} = 113.02 mm/hr

i_{100} = 143.9 mm/hr

2.50 Using the above calculation and inputs, the brownfield runoff rate for the existing impermeable areas of 423m^2 are as follows in Table 2.2.

Table 2.2 – Brownfield Runoff Rate From Existing Impermeable Areas

Return Period	1 in 1	1 in 30	1 in 100
Discharge Rate (l/s)	5.97 l/s	13.29 l/s	16.92 l/s

2.1 The greenfield runoff rates have been calculated using FEH2022 QMED values in MicroDrainage using the catchment descriptors methodology, which includes the following input variables:

- Site Location
- SAAR – Standard Average Annual Rainfall 1961 – 1990 (mm)
- SPR Host - Standard percentage runoff derived from HOST soils data
- URBEXT - The extent of urban and suburban cover
- BFIHOST - Baseflow index derived from Hydrology of Soil Types (HOST) soils data
- FARL - Index of flood attenuation due to reservoirs and lakes
- Catchment Area - Hectares

2.2 The QMED calculation sheet from MicroDrainage can be seen in Appendix K, but the outputs for the 111 ha (1.11 km^2) catchment is summarised in Table 2.3, below.

Table 2.3 – QMED Runoff Rate

QMED Rural (l/s)	QMED Urban (l/s)
177.4	177.4

2.3 The calculated QMED Rural value of 177.4 l/s is equivalent to a rate of 1.59 l/s/ha over the 111 ha catchment.

2.4 1.59 l/s/ha is equivalent to 0.26 l/s for the 1,663m^2 (0.167 ha) of unmade ground on the existing site.

2.5 When the brownfield runoff and greenfield runoff rates for the separate areas of the Stonehouse Business Park site are combined, the existing total runoff from the areas that are to be developed are as in Table 2.4, below (note that QMED values are kept consistent across all storm events).

Table 2.4 – Total Existing Runoff Rates from Stonehouse Business Park Site

Return Period	1 in 1	1 in 30	1 in 100
Discharge Rate (l/s)	6.23 l/s	13.55 l/s	17.18 l/s

Lot 8

2.6 The same methodology has been used to understand existing runoff rates on the areas of Lot 8 that are to undergo development. It has been discussed that the existing units and hardstanding areas are to remain unchanged, so these positively drained areas are not included in current or future calculations of surface water runoff.

2.7 The areas of Lot 8 that are to undergo development total 4,411m^2 (0.441 ha). These areas are shown in the proposed impermeable area plan in Appendix J by the areas highlighted.

2.8 The existing areas covered by the impermeable area plan are predominantly unsurfaced tracks and ground. These areas are absent of vegetation and are compacted through vehicle use and, although they will not respond to surface water runoff as true greenfield land, these areas have been presumed as greenfield for the calculation of existing runoff rates in order to employ the precautionary principle.

2.9 Using the QMED runoff rate in Appendix K and discussed in Paragraphs 2.1 to 2.5 (1.59 l/s/ha), the 0.441 ha of areas to be surfaced and undergo development on Lot 8 have a greenfield runoff rate of 0.70 l/s.

Jacksons Ridge

2.10 The areas of Jacksons that are to undergo development encompass the entire site area of 0.477 ha. The areas highlighted in the proposed impermeable area plan in Appendix J represent the areas of the site that will be impermeable following development, but they don't represent the total areas of the site that are currently contributing to surface water runoff. Indeed, the entire site area of 0.477 ha is currently either surfaced with concrete hardstanding or covered by the roof areas of the redundant farm buildings. As such, the existing runoff rate for Jacksons Ridge has been calculated for the full site area of 0.477 ha using the Modified Rational Method for brownfield runoff and the results of this calculation are in Table 2.5, below.

Table 2.5 – Brownfield Runoff Rates From Jacksons Ridge

Return Period	1 in 1	1 in 30	1 in 100
Discharge Rate (l/s)	67.36 l/s	149.87 l/s	190.82 l/s

2.11 These runoff rates are significant, even in the 1 in 1-year rainfall event, and the proposed drainage strategy will represent a substantial improvement over these figures.

3.0 Flood Risk Legislative and Policy Framework

3.1 As of April 2015, the LLFA became a statutory consultee on all major planning applications. The LLFA is required to assess planning applications in respect of surface water drainage and sustainable drainage systems. WSCC is the LLFA for the Stonehouse Farm and Horsham area.

3.2 LLFA's including WSCC have a responsibility under the FWMA to develop, maintain, apply and monitor the application of a strategy for local flood risk in their area. Local flood risk is defined as flood risk arising from local sources, such as surface water run-off, groundwater and ordinary watercourses (i.e. non main rivers). The EA plays a role in managing the watercourses designated as 'main rivers'.

3.3 The only watercourse within the overall landholding of Stonehouse Farm is an ordinary watercourse, thus matters relating to flood risk from or to this water body is within the regulatory responsibility of WSCC as the LLFA.

The Environment Agency Flood Map for Planning

3.4 The Environment Agency's Flood Map for Planning gives an indicative prediction of areas at risk of fluvial and tidal flooding. The mapping is an amalgamation of modelled flood levels and historical flood event outlines.

3.5 The Flood Map is split into 'Flood Zones', which demarcate the extent of flooding from rivers or the sea for different return periods. The Flood Map for Planning shows the extent of the natural floodplain if there were no defences or other man-made structures. They do not provide a definitive picture of where flooding would occur; rather, they provide an indicative prediction of areas at risk.

3.6 Table 3.1, below, lists the flood zone categories and explains the flood risk probabilities they represent.

Table 3.1 – Flood Zone Categories

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 tidal 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 tidal flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water must flow or be stored in times of flood, which is typically the 1 in 30-year flood event or greater. Local planning authorities should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map, but may be distinguished in Product 4 information, for example)

The National Planning Policy Framework

3.7 The NPPF sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The Planning Practice Guidance (PPG) to the NPPF provides further information on the policies set out in the NPPF. It encourages development to take place in areas of lower flood risk wherever possible and stresses the importance of preventing increases in flood risk off-site to the wider catchment area. This includes ensuring that flood risk is considered at all stages of the planning process, avoiding inappropriate development in areas at risk of flooding and directing development away from those areas where risks are highest.

3.8 The process of directing development away from those areas where risks are highest is the sequential test. It covers all forms of flooding, and this is covered in Paragraphs 23 and 24 of the NPPF. Following the December 2024 update to the NPPF, Paragraph 175 was added that states that development can be appropriate on sites with flood risk "*in situations where a site-specific flood risk assessment demonstrates that no built development within the site boundary, including access or escape routes, land raising or other potentially vulnerable elements, would be located on an area that would be at risk of flooding from any source, now and in the future*". This essentially means that if a sequential approach is applied within the site boundary, and areas of flood risk now and in the future are avoided, that flood risk should not prevent the development coming forward.

3.9 A site-specific FRA is required for proposals of 1ha or greater in Flood Zone 1, all proposals for development in Flood Zones 2 and 3, or in an area within Flood Zone 1 that has critical drainage problems (as notified to the local planning authority by the EA). Stonehouse Business Park and Lot 8 are greater in size than 1ha and, therefore, an FRA is required, and all three sites will be discussed.

3.10 An FRA should identify and assess the risks of all forms of flooding and demonstrate how these flood risks will be managed so that a development remains safe throughout its lifetime, taking climate change into account.

3.11 Within each Flood Zone, a key factor in determining planning applications for development is the flood risk vulnerability of a development. Table 2 of the PPG to the NPPF categorises different development types according to their vulnerability to flooding. These categories are:

- Essential infrastructure;
- Highly vulnerable development;
- More vulnerable development;
- Less vulnerable development, and;
- Water-compatible development.

3.12 Within the different Flood Zones each of the above development categories are considered appropriate or not permissible. The Technical Guidance to the NPPF lists these as:

Flood Zone 1:

- All the development categories listed above are appropriate.

Flood Zone 2:

- Water-compatible, less vulnerable development, more vulnerable development and essential infrastructure is appropriate in this zone.

Flood Zone 3a:

- Water-compatible and less vulnerable development is appropriate in this zone. Highly vulnerable development should not be permitted in this zone.

Flood Zone 3b:

- Only water-compatible development and essential infrastructure that must be there should be permitted in this zone.

3.13 The above information sets out the basis by which developments must be assessed in terms of flood risk.

3.14 Each of the development sites will be reviewed against the Flood Zone in which they are locate and an assessment will be made of the appropriateness of the proposed developments, as per the advice within

the PPG to the NPPF, and taking account of the proposed site layouts for each development area shown in Appendix B.

4.0 Current Flood Risk

4.1 Flooding can arise from a variety or combination of sources. These may be natural or artificial and may be affected by climate change. These are discussed, below, in the following two sections and summarised in Table 6.1. The probability of any likely impacts is also assessed, where necessary.

Flooding from Rivers and the Sea

4.2 The Environment Agency's Flood Map for Planning (Appendix L) for each of the three site shows that they are all within Flood Zone 1. Consequently, it can be summarised that each of the proposed developments is not within a fluvial flood risk area, now or in the future, and the residual flood risk to the site is zero.

Fluvial Flood Risk and the Appropriateness of the Development in this Location

4.3 The proposed residential development on Jacksons Ridge is considered to be 'more vulnerable' according to the classifications in the NPPF. The commercial developments on Stonehouse Business Park and Lot 8 are 'less vulnerable'.

4.4 Table 3 of the PPG to the NPPF (see below) states that 'more vulnerable' and 'less vulnerable' development are both appropriate in Flood Zone 1, thus the proposed developments are appropriate in their proposed locations with the current and future level of flood risk.

Table 3 of the NPPF - Flood Risk Vulnerability and Flood Zone Compatibility

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 *	✗	✗	✗	✓*

Key:

✓ Development is appropriate

✗ Development should not be permitted.

Surface Water Flooding

4.5 Surface water, or pluvial flooding, results from rainfall-generated overland flow, where rainwater has not yet reached a watercourse or sewer and where the local drainage systems become overwhelmed. Pluvial flooding often occurs during short, very intense storms, but can also occur during longer periods of rainfall when the ground is already saturated, or where land has low permeability due to development.

4.6 In these conditions surface water can build up where the topography allows it to converge or pond. Where it gathers it will travel down prevailing gradients. Pluvial flooding then occurs at locations where significant surface water flow paths converge, at localised low points and/or due to overland obstructions.

In urban areas pluvial flooding often occurs where the built environment channels overland flow routes (down roads that are bounded by kerbs, for example) or where there are obstacles to the natural overland flow routes. Boundary walls and buildings are often the main causes and, hence, the likelihood of pluvial flooding to impact property and gardens.

4.7 Pluvial flooding is exacerbated in many cases by the mistreatment or failure of the below ground infrastructure (including partial or full blockages of gullies and/or within the combined sewers and the accumulation of fats, oils and greases within the sewer networks).

4.8 The EA's Risk of Flooding from Surface Water (RoFSW) map was updated and refined in January 2025. The map uses improvements in data, technology and modelling and includes information and input from LLFAs, where this is available. This New National Model (NNM) for surface water represents a significant improvement over previous national-scale models and, generally speaking, has shown a reduction in overall surface water flood risk (when compared with the previous RoFSW mapping) with more targeted risk areas that tie in better with local land features and overall topography.

4.9 The updated RoFSW mapping includes a present-day risk prediction as well as one for the 2040 – 2060 scenario, i.e., with an inclusion for climate change. Only the 2040 – 2060 scenario maps are included in Appendix M so that current and future surface water flood risk is fully considered.

4.10 It can be seen that Stonehouse Business Park and Jacksons Ridge have no surface water flood risk with their red line boundaries and, therefore, are at very low risk from surface water flood risk now and in the future.

4.11 Lot 8 is also predominantly at very low risk of surface water flooding. The 2040 – 2060 scenario shows a small area of 'low' (1 in 1,000-year) surface water flood risk on the northern side of the existing, smaller commercial unit.

4.12 The areas of Lot 8 where new access and hardstanding is proposed are at very low surface water flood risk in the 2040 – 2060 scenario, which means that surface water is not a constraint to the proposed development. Moreover, the proposed drainage strategy will manage all surface water generated in the developed areas up to and including the 1 in 100-year + 45% rainfall event, so surface water flood risk will not increase.

4.13 On that basis, surface water cannot be an impediment to any of the developments as they are all within areas of 'very low' risk, now and in the future.

Groundwater Susceptibility

4.14 There are no flood risk maps for groundwater, as stated by the Environment Agency in their 2011 guidance note 'flooding from groundwater'. Mapping products currently available only show areas where the geological and hydrogeological conditions *may* combine to cause groundwater flooding, but they should not be considered as groundwater flood risk maps. They only show *susceptibility* to groundwater flooding.

4.15 There are several mapping products that depict areas that may be susceptible to groundwater flooding, but they are not comparable in detail to the risk maps developed for fluvial, tidal and surface water, such as those scrutinised above and used to support planning decisions. The mapping does not show the likelihood of groundwater flooding occurring and can only be considered as a hazard, but not a risk-based dataset.

4.16 As such, the mapping products can be viewed as indicative at best and should only be used as a prompt to review site-based information to determine whether groundwater is a risk factor that should be considered. Indeed, the Environment Agency state that:

"*The susceptibility data should not be used on its own to make planning decisions at any scale and, in particular, should not be used to inform planning decisions at the site scale. The susceptibility data cannot be used on its own to indicate risk of groundwater flooding*."

4.17 To investigate groundwater flooding susceptibility, this FRA will review groundwater flooding susceptibility mapping, which can be seen in Appendix N. There are three different forms of groundwater susceptibility mapping, which are discussed in turn, below.

BGS Geological Indicators of Flooding

4.18 The BGS Geological Indicators of Flooding map shows that all three sites are not within an area considered to have any geological indicators of groundwater flooding.

BGS Groundwater Flooding Susceptibility

4.19 The BGS Groundwater Flooding Susceptibility map shows that Stonehouse Business Park and Jacksons Ridge are in areas with limited potential for groundwater flooding to occur at the surface. Lot 8 appears to be in an area with no groundwater flooding susceptibility.

Geosmart Information Groundwater Flood Map

4.20 The Geosmart Information Groundwater Flood Map places the site in an area of 'negligible' risk.

Groundwater Flooding Susceptibility Summary

4.21 The overall picture created by the three groundwater flooding susceptibility maps is one of low susceptibility to groundwater flooding across all three sites. Therefore, it can be concluded that none of the sites needs to consider groundwater flood risk any further.

Flooding from Infrastructure Failure

4.22 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or because of a reduction in capacity due to collapse, siltation, blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.

4.23 Typically, sewer systems are constructed to accommodate rainstorms with a 30-year return period or less, depending on their age. Consequently, rainstorm events greater than 1 in 30-years would be expected to result in surcharging of some parts of the sewer system. In fact, due to most gullies being poorly maintained and often partially blocked with silt, leaves and other debris, their capacity is often estimated to be closer to the 1 in 10-year storm.

4.24 Each of the sites and the areas within them that are to be developed will be designed to attenuate the 1 in 100-year + 45% rainfall event, thus they will be at very low risk of flooding from infrastructure failure due to the capacity and design standard of proposed systems.

4.25 Moreover, a drainage management and maintenance plan will also be provided, which will prescribe how the onsite drainage infrastructure should be looked after so that it works at optimum capacity. This will ensure that residual flood risks to the site from its internal drainage systems will be minimised.

Flooding from Artificial sources

4.26 The EA provides a map showing the maximum potential flood extent should all reservoirs with a capacity of greater than 25,000 cubic metres fail and release the water they hold.

4.27 The map shows that all parts of Stonehouse Farm would not experience flooding in this scenario.

4.28 There are no canals in the local area to create flood risk either.

5.0 Future Flood Risk & Climate Change

5.1 The NPPF and the supporting Planning Practice Guidance document sets out how flood risk should be considered over the lifetime of a development. This requires an increase in flood risk due to climate change to be taken into account. Both peak river flows and rainfall intensity should be assessed.

Peak River Flows

5.2 The site is within Flood Zone 1 and there are no significant watercourses within or on the site boundary. Therefore, the site will continue to be at low risk of fluvial flooding in the future and peak river flows do not need to be discussed any further.

Peak Rainfall Intensity and Climate Change

5.3 With climate change, peak rainfall intensities are expected to increase, which would result in increased surface water flows and, potentially, flooding.

5.4 The discussion of surface water flooding in this report referred to the future surface water flood risk scenarios and the data in the updated RoFSW mapping shows that surface water flood risk on the site is not expected to increase. Therefore, future peak rainfall intensity has already been addressed in terms of surface water flood risk.

5.5 The drainage strategy for the development will also be designed to fully account for future peak rainfall intensities. A climate change increase for the 1 in 30-year and 1 in 100-year rainfall events will be applied to the hydraulic model and drainage design, plus additional hydraulic inputs due to urban creep will be included on the Jacksons Ridge development, to ensure that all surface water loads, for the lifetime of the development, are fully considered.

5.6 This approach ensures that the development will not be at risk of flooding from surface water now or in the future.

6.0 Summary of Flood Risk

6.1 Table 6.1, below, summarises the level of flood risk to the three site.

Table 6.1: Summary of Flood Risk

Flood Source	Risk Level				Comment
	High	Medium	Low	Very Low	
Fluvial				X	Flood Zone 1 (present day and in the future)
Tidal				X	Not within a tidal flood risk area
Groundwater				X	Groundwater susceptibility mapping indicates very low risk
Surface Water				X	Sites all at very low risk of surface water flooding. Areas of low surface water flood risk are away from development
Canals				X	There are no canals in the vicinity
Reservoirs				X	The Reservoir Flood Risk Map places the site well outside a maximum extent of flooding
Infrastructure Failure				X	The site's infrastructure will be properly managed and maintained, as per the prescription in the drainage management and maintenance plan, which will minimise the risk of flooding due to infrastructure failure.
Increase due to Climate Change				X	Future fluvial flood risk has been discussed, and the drainage strategy will accommodate surface water generated in the 1 in 100 + 45% rainfall event.

7.0 Surface Water Drainage Strategy

Sustainable Drainage Overview

7.1 Current planning policy and Environment Agency guidance requires developments to employ SuDS (Sustainable Drainage Systems) techniques wherever feasible. Careful design of SuDS features can ensure that a development's surface water drainage closely reflects the natural hydrology of the pre-developed site.

7.2 SuDS will attenuate and treat surface water run-off quantities at the source (source control) in line with current guidance and best practice.

7.3 Source control systems treat surface water close to the point of origin, in features such as soakaways, permeable paving and swales, to name a few.

7.4 The key benefits of SuDS are as follows:

- Improving water quality over a conventional piped system by removing pollutants from diffuse pollutant sources (e.g., roads);
- Improving amenity through the provision of open green space;
- Improving biodiversity through increased areas for wildlife habitat; and
- Enabling a natural drainage regime that recharges groundwater (where possible).

7.5 SuDS provide a flexible approach to drainage, with a wide range of components from soakaways to large-scale basins or ponds. The individual techniques should be used where possible in a management train that mimics the natural pre-developed pattern of drainage.

Target Runoff Rates for the Developments

7.6 The greenfield runoff rates for each of the developments need to be calculated using the QMED runoff rate, which has already been discussed and presented in Appendix K of this report.

7.7 The calculated QMED Rural value of 177.4 l/s is equivalent to a rate of 1.59 l/s/ha over the 111 ha catchment. The value of 1.59 l/s/ha has been applied to the impermeable area plans presented in Appendix J of this report to determine that greenfield runoff rates for each of the developable areas within each site and these are as per Table 7.1, below.

Table 7.1 – Greenfield Runoff Rates for Each Development Area

Development Area	Impermeable Area (ha)	Current Runoff Rate (1 in 1-year)	Greenfield Runoff Rate
Stonehouse Business Park	0.209 ha	6.23 l/s	0.33 l/s
Lot 8	0.441 ha	0.70 l/s	0.70 l/s
Jacksons Ridge	0.203 ha	67.36 l/s	0.32 l/s

7.8 The calculated greenfield runoff rates from each of the development areas are very low – too low to realistically be achieved in open flowing systems and where small-aperture, very low flow control devices would carry an excessive blockage risk. With this in mind, the proposed development will not prescribe any flow control device for surface water runoff with individual discharge rates of less than 1 l/s in order to reduce future flood risk.

Drainage Strategy Overview

7.9 The drainage strategies for the proposed developments on Stonehouse Farm will use a mixture of SuDS features. These have been selected according to what is most appropriate to the commercial/residential site requirements and the geoenvironmental and topographical characteristics of each area to be developed.

7.10 The proposed drainage strategies for each area of Stonehouse Farm to be developed are discussed below and should be read in conjunction with the drainage strategy plans in Appendix O of this report.

Stonehouse Business Park

7.11 The area of the Stonehouse Business Park site that is to be developed includes a new commercial unit to replace the existing Unit 3 and the demolition of Unit 5, which will be replaced by a staff and visitor parking area. The existing small office unit near the Stonehouse Business Park site entrance is also to be extended.

7.12 This development requires the provision of a formal access for commercial vehicles around the new Unit 3. With this in mind, permeable surfaces such as porous asphalt and permeable paviours are not appropriate due to the detrimental effect that commercial vehicles (with standard axles of 7.5 tonnes or more) turning from lock to lock would have on them. The accesses and parking areas will therefore be surfaced with tarmacadam and positively drained to a SuDS basin located in the northwest of the Stonehouse Business Park site.

7.13 Water butts have been considered for use, but due to the commercial nature of the site and the fact that there would be no external water uses on site, these would be unlikely to be used or positively contribute to a reduction in surface water runoff. Consequently, water butts are not recommended on the Stonehouse Business Park site.

7.14 The drainage strategy plan for Stonehouse Business Park in Appendix O shows that the SuDS basin is located in the field to the northwest of the Stonehouse Business Park site. This SuDS basin will be 250m^2 in area, 1.2m deep and will have side slopes of 1 in 4. This SuDS basin provides 182m^3 of attenuation, which allows surface water generated from the developed area in the 1 in 100-year + 45% rainfall event to be attenuated, without flooding.

7.15 The SuDS basin will discharge by gravity to the northeast and will join the existing discharge from the Stonehouse Business Park site to the watercourse. This approach minimises excavation and disturbance of greenfield land and also means that the bank of the watercourse does not have another headwall installed, which causes the least degradation to the natural watercourse corridor.

7.16 As stated in Paragraph 7.8, the discharge rate from the attenuation basin will be a maximum of 2 l/s to ensure that the open flowing (up- and downstream) system works efficiently and with a minimum blockage risk. While 2 l/s is greater than the greenfield runoff rate for the Stonehouse Business Park site, it is only 32% of the current 1 in 1-year runoff rate 6.23 l/s, thus offers significant betterment.

7.17 The SuDS basin compliments the overall landscaping strategy and supports the aspirations to renature much of the local landscape. It also provides a SuDS solution to the drainage strategy that provides all four SuDS pillars (quantity, quality, amenity and biodiversity). On this matter, a proprietary treatment device is required to fully mitigate the pollution hazards that may be generated through the site use, alongside the SuDS basin. This is discussed further in Section 9 of this report.

Lot 8

7.18 Much like the Stonehouse Business Park site, the development at Lot 8 is for access and aprons that will be used for commercial vehicles. This requires a robust surface that can withstand being used and manoeuvred upon by commercial vehicles with minimal maintenance or damage. This means that, like

the Stonehouse Business Park site, the hardstanding areas on Lot 8 must be surfaced with tarmac to ensure an appropriate running surface and its longevity.

7.19 The new tarmacadam hardstanding areas on Lot 8 will be positively drained and attenuated in a number of drainage features across the site. Two SuDS basins will be located in the greenspaces created within the access/parking areas, and geocellular attenuation tanks will be located in the corridor to the north of the hardstanding and the existing larger warehouse. Swales were considered in this space, but they are unable to provide the requisite attenuation once design depth, side slope requirements, and maintenance easements were built into the design.

7.20 Please refer to the drainage strategy layout plan in Appendix O to see the location, form and details of the SuDS basins and attenuation tanks.

7.21 The discharge rate from the western side of the site will be controlled to 2 l/s and the discharge rate from the eastern side of the site will be controlled to 1 l/s, which means that the total discharge rate from the areas to be developed on Lot 8 will be 3 l/s, which is the practicable minimum for the site. The runoff rate from the western side of the site cannot be reduced further, because lower flow rates meant much greater half drain times for the system, which would fail the LLFA requirement for it to be under 24-hours.

Jacksons Ridge

7.22 Water butts are recommended for the three residential properties. These will reduce the reliance on potable water supplies during activities such as gardening and car washing. Water butts can also provide small amounts of storage for surface water and can often assist in achieving zero discharge for rainfall depths up to 5mm, which covers 50% of annual rainfall events (according to the EA's Rainfall Runoff Management for Developments report – SC030219).

7.23 It has been described that Jacksons Ridge lies on an elevated and topographically level platform to the south of Hammerpond Road. This allows permeable paviours to be specified for the driveway and accesses to the three units, which provides useful attenuation and pollution mitigation opportunities for the drainage system

7.24 The driveway areas are constrained by Root Protection Areas (RPA's) associated with the trees that line the southern side of Hammerpond Road. This means that the areas where permeable paviours and excavations are possible is limited, but the drainage strategy will continue to use permeable paviours where possible outside of the RPA constraints. This allows surface water falling directly onto the driveways areas to be attenuated at source, as well as surface water falling onto northwards-draining roof areas and pathways/patios to be stored within the permeable paviours.

7.25 Outflow will be restricted from each area of permeable paviours, and will drain to the south via piped systems and be joined by surface water from the southwards-facing roof areas, the balconies and patios of each of the three properties.

7.26 Because of the limited extent of permeable paviours on each property, further attenuation is required. The areas to the south of each property and within the red line boundary are gardens and because of this it would not be suitable to locate surface level SuDS features in these privately-owned spaces.

7.27 It has been decided to place geocellular tanks below each of the patio areas, which provide the residual attenuation requirements for each property following the permeable paviours.

7.28 The attenuation requirements of each property are defined by the maximum outflow from each plot, which will be set at 1 l/s. This means that the maximum overall discharge from the site will be 3 l/s, which is just 4.5% of the 1 in 1-year brownfield runoff rate from the site (67.36 l/s). This will reduce flood risk locally and within the Goldings Stream/River Arun catchments.

7.29 The Jacksons Ridge development will discharge directly to the south and to the watercourse at the bottom of the valley.

7.30 The drainage strategy proposed for the Jacksons Ridge development can be seen in the drainage strategy layout in Appendix O.

Design Criteria

7.31 Each of the drainage strategies have been designed in accordance with the design criteria outlined in West Sussex County Council's LLFA Policy for the Management of Surface Water[1].

7.32 This ensures that the drainage strategies accord with local policy requirements (as well as those of the NPPF). In brief, this includes:

- Using FEH 2022 Annual Maximum Catchment data rather than FSR data. It should be noted that the dropdown menu in MicroDrainage's Network module only allows the choice of 1999 data and 2013 data but allows the upload of any data – including FEH 2022. Therefore, the user can use FEH 2022 data but is forced to do it under the label of 2013 data. As such, the MicroDrainage results included with this report state that FEH 2013 data has been used, but we would like to assure that LLFA that FEH 2022 has been used. The LLFA are aware of this issue as it has been discussed with them on a number of other sites.
- Using a runoff coefficient (CV) value of 1.0 in all hydraulic modelling (for both summer and winter storms)
- Reducing the MADD Factor (which assumes $10m^3$ of pipe storage per hectare) to zero.
- Urban Creep at a rate of 10% has been included on the Jacksons Ridge residential development. It has not been applied to the developments on the Stonehouse Business Park and Lot 8 sites because Urban Creep is not relevant to commercial developments.
- The full suite of rainfall events has been used (up to the 5,760-minute storm, which is maximum allowable when using FEH data).
- The maximum rainfall intensity has been raised to 550mm/hr to ensure that the full hydrograph is included in the hydraulic calculations.
- The maximum half-drain times for each of three drainage strategies do not exceed the 1,440-minute (24-hour) requirement for this metric for the 1 in 30-year + 40% storm. Paragraphs 13.4.1 and 25.7 of the CIRIA C753 SuDS Manual state that, for systems with very low discharge rates, the half drain time for the 1 in 30-year rainfall event should be less than 24-hours, but it is appropriate to allow longer half-drain times in the 1 in 100-year + CC rainfall event to avoid excessively large storage requirements. Indeed, because the Lot 8 is utilising a runoff rate of 2 l/s for the larger of the two catchments, it would require an unfeasibly large attenuation volume to get the half-drain times down below 24-hours (1,440 minutes) in the 1 in 100-year plus 45% rainfall event. As noted above, where low flow rates increase the half drain time to unsatisfactory levels, the flow rates have been increased so that half drain times stay within the acceptable range.

Urban Creep

7.33 As stated above, Urban Creep has been applied to the residential development at Jacksons Ridge. This ensures that an appropriate allowance is made for increases in impermeable areas that occur over time on privately owned land, as per 'BS 8582:2013 Code of Practice for Surface Water Management for Developed Sites'.

7.34 WSCC have produced their own guidance on the percentage of urban creep that should be applied. They state that the consideration of urban creep should be assessed on a site-by-site basis but is limited to individual residential development only. The allowances set out in Table 5.2 of WSCC LLFA Policy for the

[1] https://www.horsham.gov.uk/__data/assets/pdf_file/0019/65017/West-Sussex-Surface-Water-Management-Policy.pdf

Management of Surface Water must be applied to the impermeable area within the property curtilage according to the proposed development density. Table 5.2 of WSCC LLFA Policy is shown below.

Table 5.2 of WSCC LLFA Policy for the Management of Surface Water

Residential development density (Dwellings per hectare)	Change allowance (% of impermeable area)
≤25	10
30	8
35	6
45	4
≥50	2
Flats & Apartments	0

7.35 A full increase of 10% has been used as a precautionary approach, especially because the dwellings cannot expand their driveways further and already have extensive patio areas.

7.36 The 10% uplift has been applied to the proposed private impermeable areas in the Jacksons Ridge MicroDrainage model, and how they have been uplifted is detailed in Table 7.2, below. This has been presented in terms of which pipes in the hydraulic model the uplift has been applied.

Table 7.2 – Urban Creep Increases Applied in Jacksons Ridge Hydraulic Model

Pipe No.	Private Impermeable Areas (ha)	10% of Private Impermeable Areas (ha)	Increased Impermeable Area Applied to Pipe (ha)
1.001	0.033	0.003	0.036
1.004	0.028	0.003	0.031
2.001	0.039	0.004	0.043
2.004	0.034	0.003	0.037
3.001	0.042	0.004	0.046
3.004	0.028	0.003	0.031

Summary

7.37 The approach to the layout and design of the three surface water drainage strategies has been outlined and presented in Appendix O of this report. With specific reference to the drainage hierarchy, the proposed drainage strategies are discussed, below.

The Drainage Hierarchy

7.38 The NPPF states that opportunities to reduce overall flood risk should be sought and achieved through sustainable development and careful drainage design. This can be achieved through the layout and form of development, including green infrastructure and the appropriate application of sustainable drainage systems (SuDS). SuDS are designed to control surface water runoff close to where it falls and mimic natural drainage as closely as possible. They provide opportunities to:

- Reduce the causes and impacts of flooding;
- Remove pollutants from urban run-off at source;

- Combine water management with green space with benefits for amenity, recreation and biodiversity.

7.39 To deliver SuDS benefits and ensure that a development reduces overall flood risk, there is an established hierarchy of surface water drainage methods that should be considered. The most preferable and sustainable are at the top and the least preferable and least sustainable at the bottom.

7.40 The drainage hierarchy is a sequential check that intends to ensure that all practical and reasonable measures are taken to manage surface water as high up the hierarchy (with '1' being the highest) as possible, and that the amount of surface water managed at the bottom of the hierarchy is minimised. The Planning Practice Guidance to the National Planning Policy Framework (NPPF) states that "*Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable*".

7.41 The drainage hierarchy presented in the NPPF presents only four tiers of drainage options. This has been expanded on and adopted by others and now can be viewed as the following:

1. Store rainwater for later use
2. Use infiltration techniques, such as porous surfaces in non-clay areas
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release
5. Discharge rainwater direct to a watercourse
6. Discharge rainwater to a surface water sewer/drain
7. Discharge rainwater to the combined sewer
8. Discharge rainwater to the foul sewer

7.42 Developers should not choose the method that is the most convenient or represents the lowest cost. LPA's, LLFA's and Water Authorities may enforce the surface water drainage hierarchy and demand that the highest practicable tier of the hierarchy is used before accepting the use of lower, less sustainable tiers.

7.43 The first two tiers of the drainage hierarchy ensure that surface water is retained within the site boundary and does not increase flood risk to others. This is always the most preferable method of surface water management.

7.44 The next six tiers of the hierarchy provide regional control, but with decreasing levels of pollution removal and reduced potential for amenity and habitat creation.

7.45 Within the lower six tiers of the drainage hierarchy, there must be some form of flow restriction, so that off-site surface water discharge is reduced, as much as is reasonably practicable. This requires on-site storage facilities, which may include ponds, swales, subsurface storage tanks and System C (non-infiltration) permeable paviours with flow control devices. Again, methods that provide the most potential for amenity and pollution removal should be favoured.

7.46 With regards to the proposed developments, the tiers of the drainage hierarchy that have been achieved are outlined in Table 7.3, below:

Table 7.3 - Compliance with the Drainage Hierarchy

Tier	Discharge Method	Stonehouse Business Park	Lot 8	Jacksons Ridge
1	Store rainwater for later use	û (n/a)	û (n/a)	ü
2	Use infiltration techniques	û (n/a)	û (n/a)	û (n/a)
3	Attenuate rainwater in ponds or open water features	ü	ü	ü
4	Attenuate rainwater by storing in tanks or sealed water features	û	ü	ü
5	Discharge rainwater direct to a watercourse	ü	ü	ü
6	Discharge rainwater to a surface water sewer/drain	û	û	û
7	Discharge rainwater to the combined sewer	û	û	û
8	Discharge rainwater to the foul sewer	û	û	û

Summary

7.47 Because infiltration is not viable, the drainage strategies use the highest available tiers of the drainage hierarchy for both attenuation and surface water discharge, with the drainage strategy for Jacksons Ridge also using the 1st and highest tier of the drainage hierarchy through water butts.

MicroDrainage Hydraulic Modelling

7.48 The drainage strategies for each development area have been designed in MicroDrainage's Network hydraulic modelling module.

7.49 The results of the MicroDrainage hydraulic modelling for each development can be seen in Appendices P, Q and R.

7.50 The results of the hydraulic modelling confirm that the drainage strategies as outlined above can attenuate and discharge all surface water generated in the 1 in 100-year + 45% rainfall event, inclusive of all LLFA requirements and design criteria, without flooding.

8.0 Foul Water Drainage

8.1 It has been discussed earlier in this report that there is no public sewerage in the Stonehouse Farm area and all the site's foul waste is treated and discharged as treated effluent via packaged sewage treatment plants.

8.2 There are currently three packaged sewage treatments plant within Stonehouse Farm; two on the Stonehouse Business Park site and one serving Lot 8.

8.3 These sewage treatment plants are functioning well and the most recent service record for all three packaged sewage treatment plants can be seen in Appendix S.

8.4 The watercourse that receives treated effluent from these packaged sewage treatment plants has baseflow on a year-round basis, thus is a suitable receptor.

8.5 While the existing surface water drainage on the Stonehouse Business Park and Lot 8 sites will be unaffected and unchanged by the proposed development, the foul waste outputs of the two sites may change because of the number of staff/personnel on site. Because of this, the requirements of the existing packaged sewage treatment plants are currently under review. The outputs of this review will be made available in a separate report from this one, but it can be stated at this time that the future capacity of all sewage treatment plants will be in accordance with the requirements of British Water's Flows and Loads. The packaged sewage treatment plants will also meet the requirements of BS EN:12566 (small wastewater treatment systems for up to 50 PT), as well as the General Binding Rules for small sewage discharges to surface waters, which means that a consent will not be required from the Environment Agency.

8.6 This applies to the existing packaged sewage treatment plants on site, as well as those that will be installed to serve the Jacksons Ridge development. It is proposed to have three packaged sewage treatment plants, one serving each property, and a combined outflow that takes treated effluent to the watercourse at the bottom of the valley. As per design guidance, the proposed surface water discharge from Jacksons Ridge and the foul effluent outflow will maintain separate pipework until the final discharge to the watercourse.

9.0 Surface Water Runoff Quality

9.1 The NPPF states that development should not have a detrimental impact on the environment, including the water environment. The technical guidance to the NPPF provides further advice on the benefits of ensuring runoff quality is to an appropriate standard.

9.2 The CIRIA SuDS Manual provides guidance on the treatment of surface water runoff. The expected pollution hazards and what is required to mitigate them has been reviewed for each of the development sites and is discussed below.

9.3 Because the site uses (in terms of pollution hazard) and the drainage strategies for Stonehouse Business Park and Lot 8 are the same, these two sites will be considered together. The different site use and drainage strategy for Jacksons Ridge means it will be considered separately.

Stonehouse Business Park and Lot 8

9.4 With regards to these two proposed developments, Table 4.3 of the CIRIA SuDS Manual rates the pollution hazard from roof water runoff as 'very low'. The only requirement for roof water runoff is the removal of gross solids and sediments, which would be achieved using catchpits placed strategically within the drainage network, but especially ahead of any flow control structures.

9.5 With regards to the access roads and aprons of these commercial (light industrial) sites, Table 26.2 of the CIRIA SuDS Manual rates the pollution hazard from "*commercial yards and delivery areas, non-residential car parking with frequent change*" as 'medium'. To mitigate 'medium' pollution hazards, the CIRIA SuDS Manual recommends using a simple index approach in line with Section 26.7.1. This is discussed, below.

9.6 Table 26.2 of the CIRIA SuDS Manual provides pollution hazard indices for different land use classifications. The land use classification that requires consideration for 'commercial yards and delivery areas and non-residential parking with frequent change' is in Table 9.1 below.

Table 9.1 - Excerpt from Table 26.2 of CIRIA SuDS Manual

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Commercial yards and delivery areas, non-residential car parking with frequent change.	Medium	0.7	0.6	0.7

9.7 To deliver adequate pollution treatment and mitigation, the CIRIA SuDS Manual recommends using a SuDS component that has a total pollution mitigation index (for each contaminant type) that equals or exceeds the pollution hazard index (for each contaminant type).

9.8 Table 26.3 of the CIRIA SuDS Manual provides indicative SuDS mitigation indices for each SuDS type when discharging to surface waters. Table 9.2, on the next page, which is an excerpt from Table 26.3, shows the mitigation index for SuDS (Detention) basins.

Table 9.2 - Pollution Mitigation Indices for SuDS (Detention) Basins

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS (Detention) Basins	0.5	0.5	0.6

9.9 The mitigation indices for SuDS (Detention) basins do not meet the pollution hazard index figures from Table 9.1. Consequently, another pollution removal device will be required in the system to ensure that all pollutants are removed from the surface water load prior to its discharge to the watercourse.

9.10 It is proposed to precede the SuDS basins on Stonehouse Business Park and Lot 8 with a proprietary pollution removal device such as an SDS Aqua-Swirl.

9.11 SDS's Aqua-Swirls use hydrodynamic separation, which operate under gravity flow, to maximise the removal of pollutants that are typically found attached to silts and debris within surface water runoff. Details and the pollution mitigation indices of SDS's Aqua-Swirl can be seen in Appendix T.

9.12 Where two mitigation components are used in series, the C753 SuDS manual states that:

Total SuDS mitigation index = mitigation index (component one) + 0.5 mitigation index (component two)

9.13 Thus, the SuDS basins when they follow an SDS Aqua-Swirl will provide the below mitigation indices as in Table 9.3:

Table 9.3 - Pollution Mitigation Indices for Secondary SuDS Feature (SuDS Basin)

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
SuDS Basin	0.25 (0.5 ÷ 2)	0.25 (0.5 ÷ 2)	0.30 (0.6 ÷ 2)

9.14 And the total mitigation indices for the Stonehouse Business Park site is as per Table 9.4, below:

Table 9.4 - Total Pollution Mitigation Offered by SuDS Aqua-Swirl and SuDS Basin:

Contaminant Type	Pollution Hazard Index	Pollution Mitigation Index	Difference
Total Suspended Solids	0.5	1.05 (0.8 + 0.25)	+ 0.45
Metals	0.4	0.75 (0.5 + 0.25)	+ 0.45
Hydrocarbons	0.4	1.00 (0.7 + 0.30)	+ 0.60

9.15 The above evidence shows how the SDS Aqua-swirls and the SuDS Basins combine to ensure all pollution hazards on the Stonehouse Business Park and Lot 8 sites are completely mitigated.

Jacksons Ridge

9.16 The Jacksons Ridge site has a lower pollution hazard rating than the commercial sites. Table 9.5 on the next page shows the pollution hazard indices for 'Low' risk sites.

Table 9.5 – Pollution Hazard Indices at Jacksons Ridge

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, homezones and general access roads) with less than 300 traffic movements per day.	Low	0.5	0.4	0.4

9.17 The Jacksons Ridge development will use permeable paviours and a geocellular tanks. Table 9.6 shows the mitigation index for permeable paviours.

Table 9.6 - Pollution Mitigation Indices for Permeable Pavements

Type of pollution removal component	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Permeable Pavements	0.7	0.6	0.7

9.18 Permeable pavements exceed the 'Low' pollution hazard indices of the driveway, and there is no need for pollution mitigation to the rear of the properties as it is only roof and patio water draining in this direction, thus all possible pollution hazards are mitigated no further pollution mitigation is required at Jacksons Ridge.

10.0 Residual Risk

10.1 Whilst the drainage strategies for the three developments have been designed to attenuate surface water from the 1 in 100-year plus 45% rainfall event (plus an inclusion for urban creep on Jacksons Ridge), there could be a small residual risk of flooding due to blockage or failure or poor performance of on-site infrastructure. Therefore, appropriate and regular maintenance of the drainage infrastructure should be undertaken by Lake Investments Limited or their site management agents.

10.2 To assist with this process, a Drainage Management and Maintenance Plan has been prepared, which sets out the principles for the long-term management and maintenance of the proposed surface water drainage components specified across the three developments. The Drainage Management and Maintenance Plan can be seen in Appendix U.

10.3 The purpose of this document is to ensure that there is a robust inspection and maintenance plan going forwards. This will help ensure the optimum operation of the surface water drainage systems and that they will be regularly maintained for the lifetime of the developments. This will contribute to reducing the risk of surface water flooding both on- and off-site.

11.0 Exceedance Events

11.1 Exceedance events are those greater than the design rainfall event (i.e., greater than the 1 in 100-year rainfall event plus 45% for climate change).

11.2 Any rainfall events greater than the design rainfall event may cause flooding due to them 'exceeding' the capacity of the drainage system. In this situation it is imperative to check whether flooding would occur and, if so, whether it needs to be contained on site. Exceedance flows should not ingress into any properties on site and should not cause nuisance to any neighbouring sites or buildings.

11.3 The drainage system as designed has a large attenuation capacity available and, because of the LLFA's design criteria, it assumes zero losses due to vegetation interception, evaporation and surface roughness, and cannot include for storage/conveyance within the pipes around/between the plots and the main drainage system. Therefore, the drainage system, as designed, represents an *extremely* conservative strategy that, in a real-world scenario, would not receive the surface water that has been catered for in the MicroDrainage hydraulic model. As such, the designed drainage system would, in operation, have capacity for events beyond that of the 1 in 100-year rainfall event plus 45% for climate change, i.e. 'exceedance events'.

11.4 Notwithstanding this, a high-level plan of exceedance flows has been produced to show the pathways exceedance flows would take across each of the development areas. These can be seen in Appendix V.

12.0 Summary and Conclusion

12.1 This Flood Risk Assessment (FRA) and Drainage Strategy report has been produced by Motion on behalf of their client, Lake Investments Limited. It supports the planning application for three tranches of proposed development on the Stonehouse Farm site.

12.2 The EA's Flood Map for Planning shows that all development sites are within Flood Zone 1 and are not at risk of fluvial (or tidal) flooding. The updated 2025 RoFSW mapping also show that the development sites are at 'very low' risk of surface water flooding. All other forms of flooding do not show that any site is at an elevated risk and, therefore, all the developments can be concluded as not being at risk of flooding, from any source, and are appropriate in their locations.

12.3 The drainage strategies for the proposed developments have been produced in line with the drainage hierarchy, the NPPF, and WSCC's LLFA design criteria. A mixture of SuDS features have been proposed to provide attenuation, source control and pollution mitigation, and are discharging at the lowest practicable rates to surface waters via established private drainage outfalls from the site.

12.4 The drainage strategies for the three developments have been hydraulically modelled in MicroDrainage's Network module. The modelling has shown that the proposed drainage strategies can attenuate the 1 in 100-year + 45% rainfall event without flooding, with an inclusion for urban creep where this is applicable.

12.5 A drainage management and maintenance plan has been produced that shows how the drainage components proposed in the drainage strategies will be maintained in perpetuity.

12.6 Exceedance flows have been considered and an exceedance plan for each site has produced. Because of the rural nature of the developments and because there are no downslope receptors, exceedance flows are not a constraint on the developments.

12.7 Stonehouse Business Park and Lot 8 will reuse the existing method of foul waste treatment and disposal, which is packaged sewage treatment plants. These units currently discharge their treated effluent to the watercourse and will continue to do so. The capacity of the units has been formalised against BS EN:12566 and the discharges are in accordance with the General Binding Rules. Jacksons Ridge will also use packaged sewage treatment plants for each property and will also discharge the treated effluent to the watercourse. A consent is not required for any of the discharges.

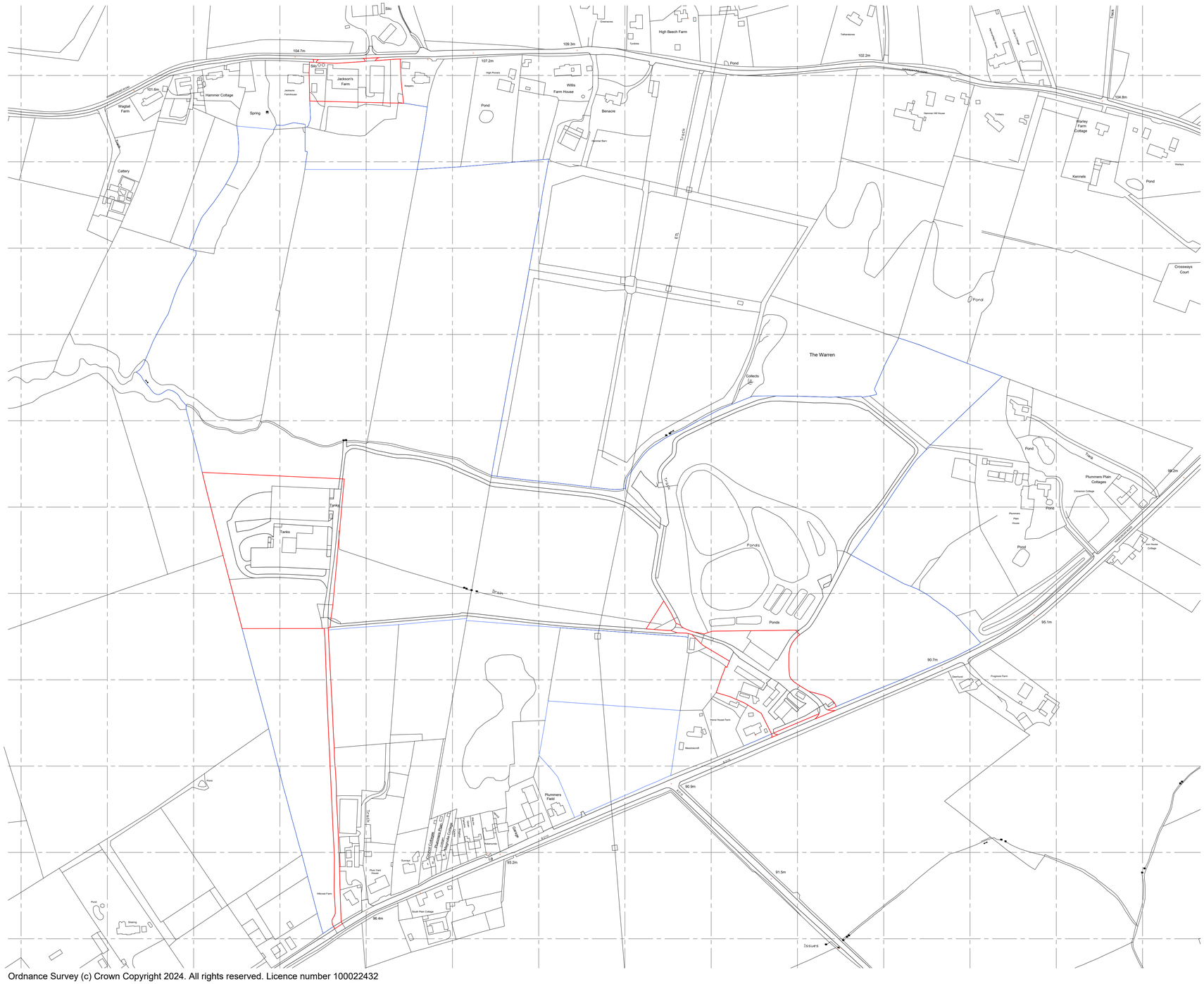
12.8 In conclusion, the drainage strategies for each development area have used the highest available and practicable tiers of the drainage hierarchy. The surface water attenuation and discharge proposals are in accordance with the NPPF and WSCC's local policies, and can attenuate surface water generated up to and including the 1 in 100-year + 45% rainfall event without flooding while discharging at the lowest viable rates to the watercourse. Pollution hazards can be suitable mitigated, exceedance flows have been considered, urban creep has been included on Jacksons Ridge and a drainage management and maintenance plan has been produced.

12.9 The proposed sustainable drainage strategies and the very low flood risk from all sources means that the proposed developments are appropriate in their locations and flood risk and drainage should not be an impediment to their progress.

Appendix A

Site Location Plan

comply with ALL standards as required by the relevant Trade Associations, British Standards, Codes of Practice, Manufacturers Specifications (BBA Certification, etc). All works to be carried out fully in accordance with any Engineer's Calculations, Details, & Instructions, as and where applicable.



Site Layout Plan (1:2500)

0 20 40 60 80 100

Scale bar measured in meters

PLANNING

3-D Architecture Limited
15 Horsted Square, Bellbrook Industrial Estete,
Uckfield, East Sussex. TN22 1QG
Tel: 01825 764455 Fax: 01825 764455
Email: info@3d-architecture.co.uk

CLIENT

Lee Goossens

PROJECT

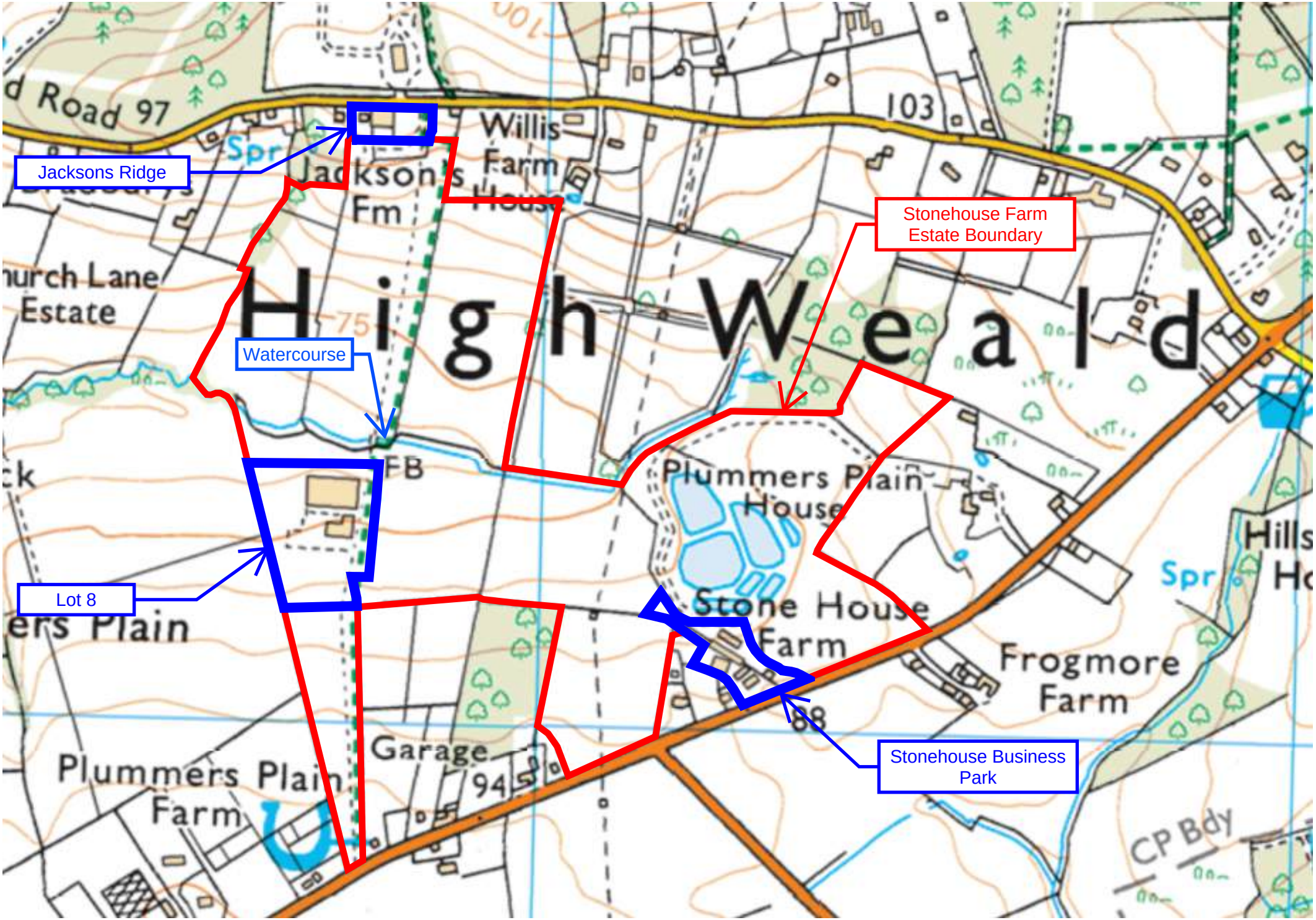
Stonehouse Farm
Handcross Road, Plummers Plain,
Horsham, West Sussex
RH13 6NZ

DRAWING TITLE

Site Location Plan

SCALE	DATE	DRAWN BY
1:2500	February 2025	ANH

DRAWING NO.	REVISION
2025/PL1	-


Jacksons Ridge
Stonehouse Farm Estate Boundary
Watercourse
Lot 8
Stonehouse Business Park
High Weald
Road 97
103
Willis Farm
Jacksons Fm
Estate
Plummers Plain House
Stone House Farm
Frogmore Farm
Plummers Plain Farm
Garage
94
88
FB
Spr
CP Bdy

Appendix B

Existing and Proposed Site Layouts

A1

Contractor to CHECK all dimensions & report any discrepancies. All works and materials used are to fully comply with ALL standards as required by the relevant Trade Associations, British Standards, Codes of Practice, Manufacturers Specifications (BBA Certification, etc). All works to be carried out fully in accordance with any Engineer's Calculations, Details, & Instructions, as and where applicable.

Site Location Plan - As Proposed (1:1250)

0 10 20 30 40 50
Scale bar measured in meters

Site Location Plan - As Existing (1:1250)

0 10 20 30 40 50
Scale bar measured in meters

0 1 2 3 4 5
Scale bar measured in meters

PLANNING

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CLIENT

Lee Goossens

PROJECT

Stonehouse Farm
Handcross Road, Plummer Plain,
Horsham, West Sussex
RH13 6NZ

DRAWING TITLE

Site Location Plans
As Existing & As Proposed

SCALE	DATE	DRAWN BY
1:1250 @ A1	January 2024	ANH

DRAWING NO.	REVISION
2024/PL11	A

A1

Site Location Plan - As Existing (1:1250)

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Scale bar measured in meters

Site Location Plan - As Proposed (1:1250)

0 10 20 30 40 50

Scale bar measured in meters

0 2 4 6 8 10

Scale bar measured in meters

PLANNING

3-D Architecture Limited
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Uckfield, East Sussex. TN22 1QG
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Email: info@3d-architecture.co.uk

CLIENT

Lee Goossens

PROJECT

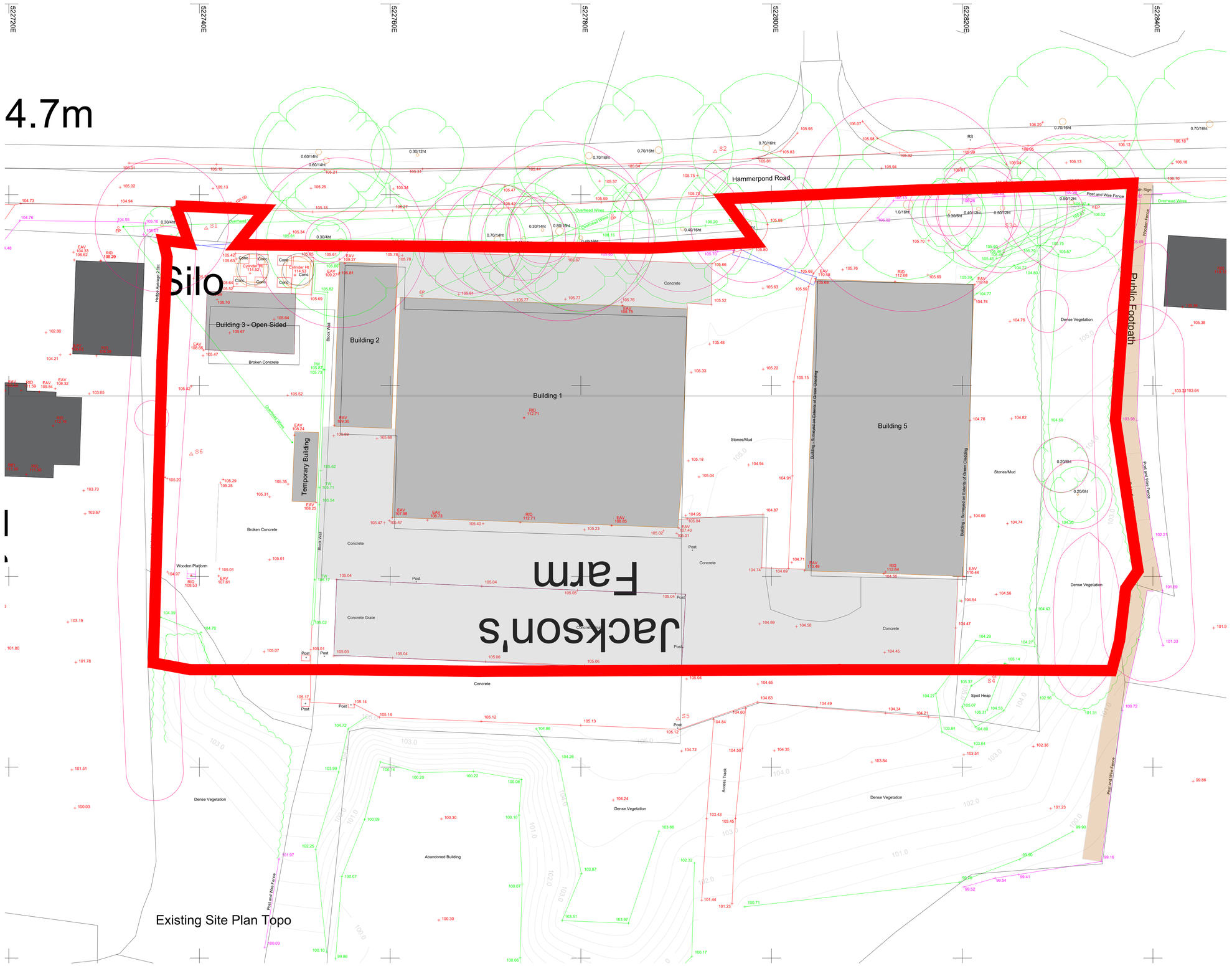
Stonehouse Farm
Handcross Road, Plummer Plain,
Horsham, West Sussex
RH13 6NZ

DRAWING TITLE

Site Location Plans
As Existing & As Proposed

SCALE	DATE	DRAWN BY
1:1250	October 2024	ANH

DRAWING NO.	REVISION
2024/PL8	A



LLOYD HARDEN

Design • Planning • Architecture

N

REV	BY	DATE	DETAILS
--			

SCALE @ A1 -1:200

0 2.5m 5m 7.5m 10m 1:200

CLIENT
Lee Goossons
Hammerpond Lane, Horsham, RH13 6PE

PROJECT
Jackson's Farm - Demolition of Barns - 3 new Build Houses

DRAWN BY	CHECKED BY
LKH	LKH

PLANNING

DRAWING TITLE
Existing Site Plan - Topo

DATE	DRAWING NUMBER	REVISION
05.01.24	259101-108	--

+44 (0)116 482 9284 www.lloydharden.co.uk

N

522740E 522760E 522780E 522800E 522820E 522840E

Hammerpond Road

T1 -B1
T2 -C1
T3 -C1
T4 -B1
T5 -B2
T6 -B2
T7 -B2
T8 -B2
T9 -B2
T10 -B2
T11 -B2
T12 -B2
T13 -B2
T14 -C1
T15 -B2
T16 -B2
T17 -C1
T18 -B2
T19 -C1
T20 -B1
H1 -B2
H2 -C2
H3 -B2
G1 -B2
G2 -C1

C B A

Public Footpath
Overhead Wires
Wooden Fence
Post and Wire Fence
Access Track
Dense Vegetation
Abandoned Building
Patio
Balcony
Awning

Proposed Site Plan

LLOYD HARDEN
Design • Planning • Architecture

- Proposed Grass
- Proposed Wild Flowers and Grass
- Existing Grass Verge
- Proposed Permeable Paviours - SUDS Refer To Drainage drawing
- Patio and Paths
- Existing Footpath to remain
- Retaining Walls
- Balconies
- Proposed Trees
- Existing Trees To Remain
- Proposed Bushes
- Proposed Estate Fencing
- Proposed Sliding Gate
- Proposed Inward Opening Gate

REV BY DATE DETAILS

SCALE @ A1 -1:200

0 2.5m 5m 7.5m 10m 1:200

CLIENT
Lee Goossons
Hammerpond Lane, Horsham, RH13 6PE

PROJECT
Jackson's Farm - Demolition of Barns - 3 new Build Houses

DRAWN BY LKH
CHECKED BY LKH

PLANNING

DRAWING TITLE
Proposed Site Plan

DATE 05.01.24
DRAWING NUMBER 259101-110
REVISION --

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Appendix C

Stonehouse Business Park Site Photos

Plate 1: Aerial view of Stonehouse Business Park site looking northwest. The Office Building is in the foreground and Building 5 is in the middle picture with the rusted corrugated iron roof and semi-clad walls. The portacabins that will be replaced by the refurbished and extended office can be seen.

Plate 2: Aerial view of Stonehouse Business Park site looking west. The office can be seen in the left of the picture and Unit 5 is in the centre of the view. Building 3 is visible behind the green, pent-roofed structure to the right of the picture. The surfacing around Unit 5 can be seen in this picture.

Plate 3: View of the southern end of Unit 3. The material used to make the surface can be seen, which is akin to 6F2/6F5 capping material

Plate 4: The northern edifice of Unit 5, which is to be demolished with parking for staff and visitors in its place.

Appendix D

Lot 8 Site Photos

Plate 1: Aerial view of Lot 8 looking west. The layout and external form of the units is not changing. The current surfacing can be seen around the units, which is a mixture of tarmac and concrete.

Plate 2: Aerial view of Lot 8 looking north. The tarmac apron can clearly be seen, and Jacksons Ridge can be seen in the distance.

Plate 3: View of Lot 8 looking south. The informal/compacted earth surfacing and the rainwater harvesting tanks can be seen in the foreground

Appendix E

Jacksons Ridge Site Photos

Plate 1: Aerial view of Jacksons Ridge looking north. The two existing redundant farm buildings can be seen as well as the external concrete hardstanding.

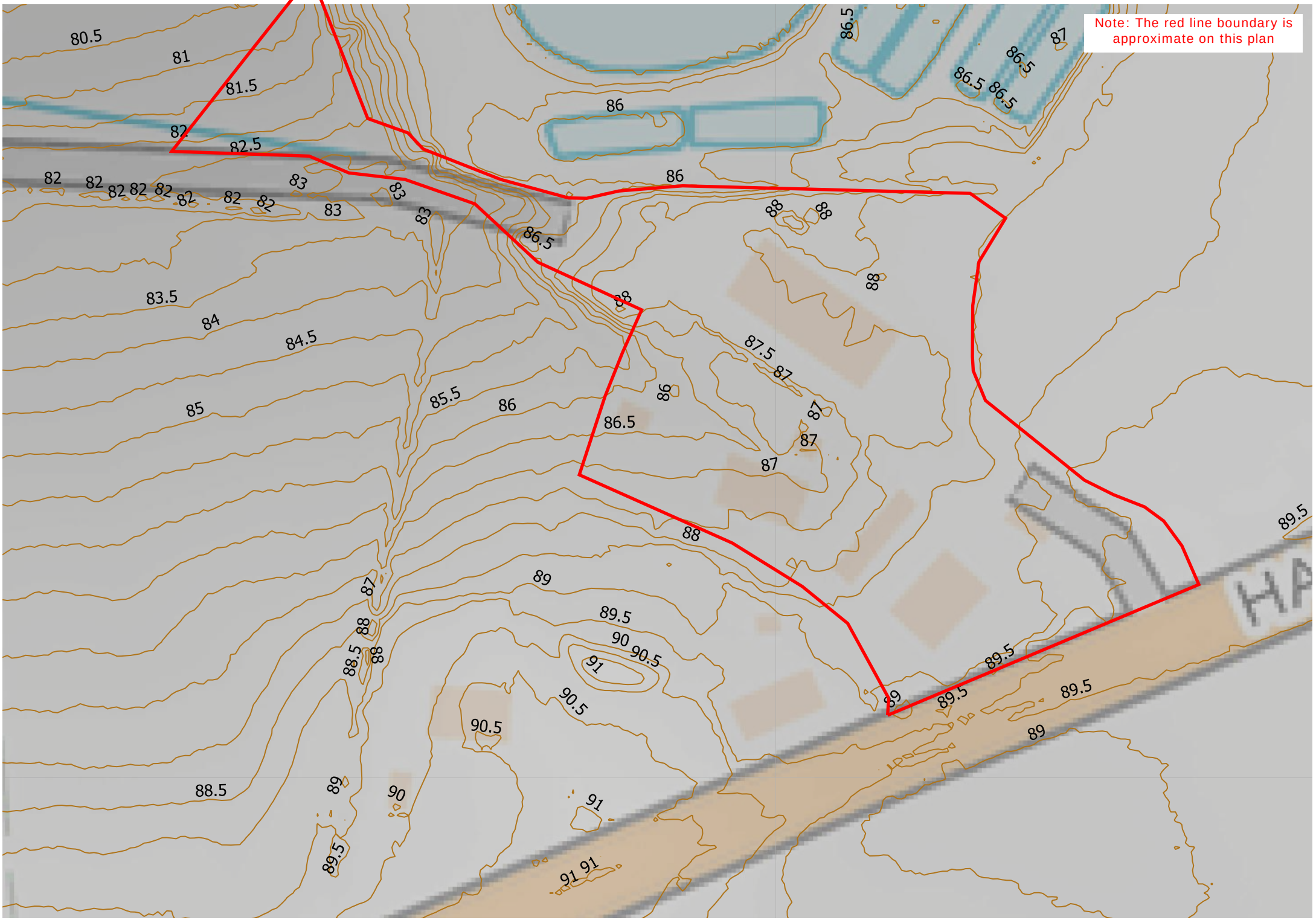
Plate 2: View of the western redundant farm building and the concrete hardstanding.

Plate 3: View of the eastern redundant farm building and the concrete hardstanding

Plate 4: View of the concrete hardstanding on Jacksons Ridge looking southeast back towards Stonehouse Business Park

Appendix F

Stonehouse Business Park LiDAR Topography Plan


Note: The red line boundary is approximate on this plan

Appendix G

Lot 8 Topographic Survey

A1

Contractor to CHECK all dimensions & report any discrepancies. All works and materials used are to fully comply with ALL standards as required by the relevant Trade Associations, British Standards, Codes of Practice, Manufacturers Specifications (BBA Certification, etc). All works to be carried out fully in accordance with any Engineer's Calculations, Details, & Instructions, as and where applicable.

N

0 1 2 3 4 5

Scale bar measured in meters

PLANNING

3-D Architecture Limited
15 Horsted Square, Bellbrook Industrial Estete,
Uckfield, East Sussex. TN22 1QG
Tel: 01825 764455 Fax: 01825 764455
Email: info@3d-architecture.co.uk

CLIENT

Lee Goossens

PROJECT

Stonehouse Farm
Handcross Road, Plummer Plain,
Horsham, West Sussex
RH13 6NZ

DRAWING TITLE

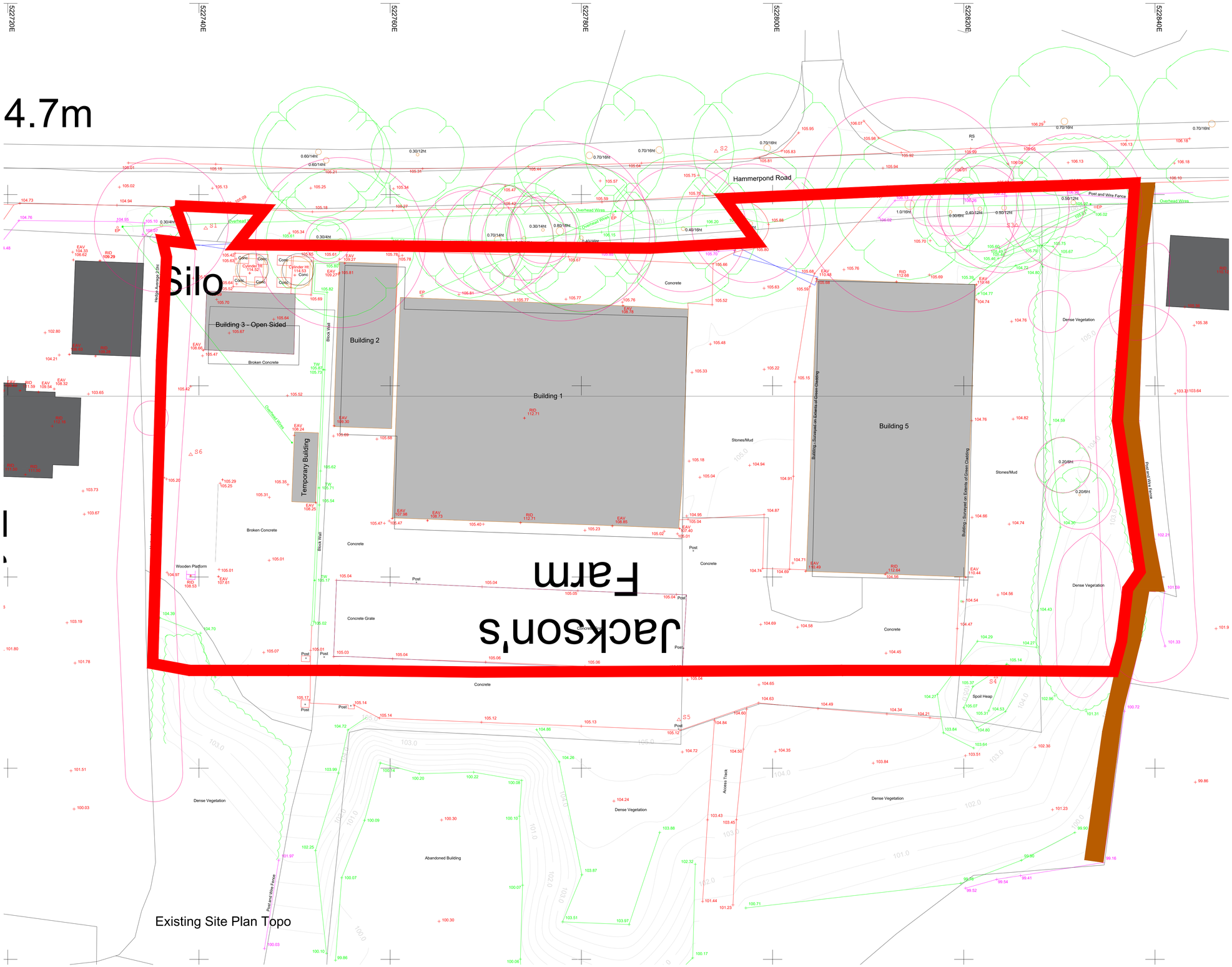
Topographical Survey
As Existing

SCALE	DATE	DRAWN BY
1:200	October 2024	ANH

DRAWING NO.	REVISION
2024/PL1	-

Appendix H

Jacksons Ridge Topographic Survey



N

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REV	BY	DATE	DETAILS

SCALE @ A1 -1:200

0 2.5m 5m 7.5m 10m 1:200

CLIENT
Lee Goossons
Hammerpond Lane, Horsham, RH13 6PE

PROJECT
Jackson's Farm - Demolition of Barns - 3 new Build Houses

DRAWN BY	CHECKED BY
LKH	LKH

PLANNING

DRAWING TITLE
Existing Site Plan - Topo

DATE	DRAWING NUMBER	REVISION
05.01.24	259101-108	--

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Appendix I

Southern Water Asset Location Plans

Date: 12/02/25

Scale: 1:1250

Map Centre: 523250,128043

Data updated: 21/01/25

Our Ref: 1688365 - 1

Wastewater Plan A0
Powered by digdat

lagaiela@motion.co.uk

1ecsl3 - Lot 8 C

Lot 8 and Commercial

WATER for LIFE

from Southern Water.

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Appendix J

Impermeable Area Plans


Impermeable Areas: 0.209 ha
Stone House Farm

A1

Site Layout Plan

0 5 10 15 20

Scale bar measured in meters

PLANNING

3-D Architecture Limited
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Uckfield, East Sussex, TN22 1QG
Tel: 01825 764455 Fax: 01825 764455
Email: info@3d-architecture.co.uk

CLIENT

Lee Goossens

PROJECT

Stonehouse Farm
Handcross Road, Plummer Plain,
Horsham, West Sussex
RH13 6NZ

DRAWING TITLE

Site Layout Plan
As Proposed

SCALE	DATE	DRAWN BY
1:500	October 2024	ANH

DRAWING NO.	REVISION
2024/PL7	C

LLOYD HARDEN

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Garden Area

Existing Grass Verge

Existing Footpath to remain

Proposed Resin Gravel Drives

Retaining Walls

Patio and Paths

Balconies

Proposed Wild Flowers and Grass

Proposed Trees

Proposed Bushes

Existing Trees To Remain

Proposed Estate Fencing To Front and Closed Board Fencing To Rear
Proposed Sliding Gate

Proposed Inward Opening Gate

REV	BY	DATE	DETAILS

SCALE @ A1 -1:200

CLIENT
Lee Goossons
Hammerpond Lane, Horsham, RH13 6PE

PROJECT
Jackson's Farm - Demolition of Barns - 3 new Build Houses

DRAWN BY	CHECKED BY
LKH	LKH

PLANNING

DRAWING TITLE
Proposed Site Plan

DATE	DRAWING NUMBER	REVISION
05.01.24	259101-110	–

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Appendix K

QMED Calculation

FEH Mean Annual Flood

Input

QMED Method	2008	URBEXT (1990)	0.0000
Site Location	GB 522650 128400 TQ 22650 28400	SPRHOST	26.650
Area (ha)	111.000	BFIHOST	0.734
SAAR (mm)	823	FARL	1.000

Results

QMED Rural (l/s) 177.4 QMED Urban (l/s) 177.4

Appendix L

Environment Agency Flood Map for Planning

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**523230/128114**	**26 Feb 2025 9:08**

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

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

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

Notes

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

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

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
523230/128114

Scale
1:2500

Created
26 Feb 2025 9:08

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

0 20 40 60m

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**522692/128248**	**26 Feb 2025 9:10**

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

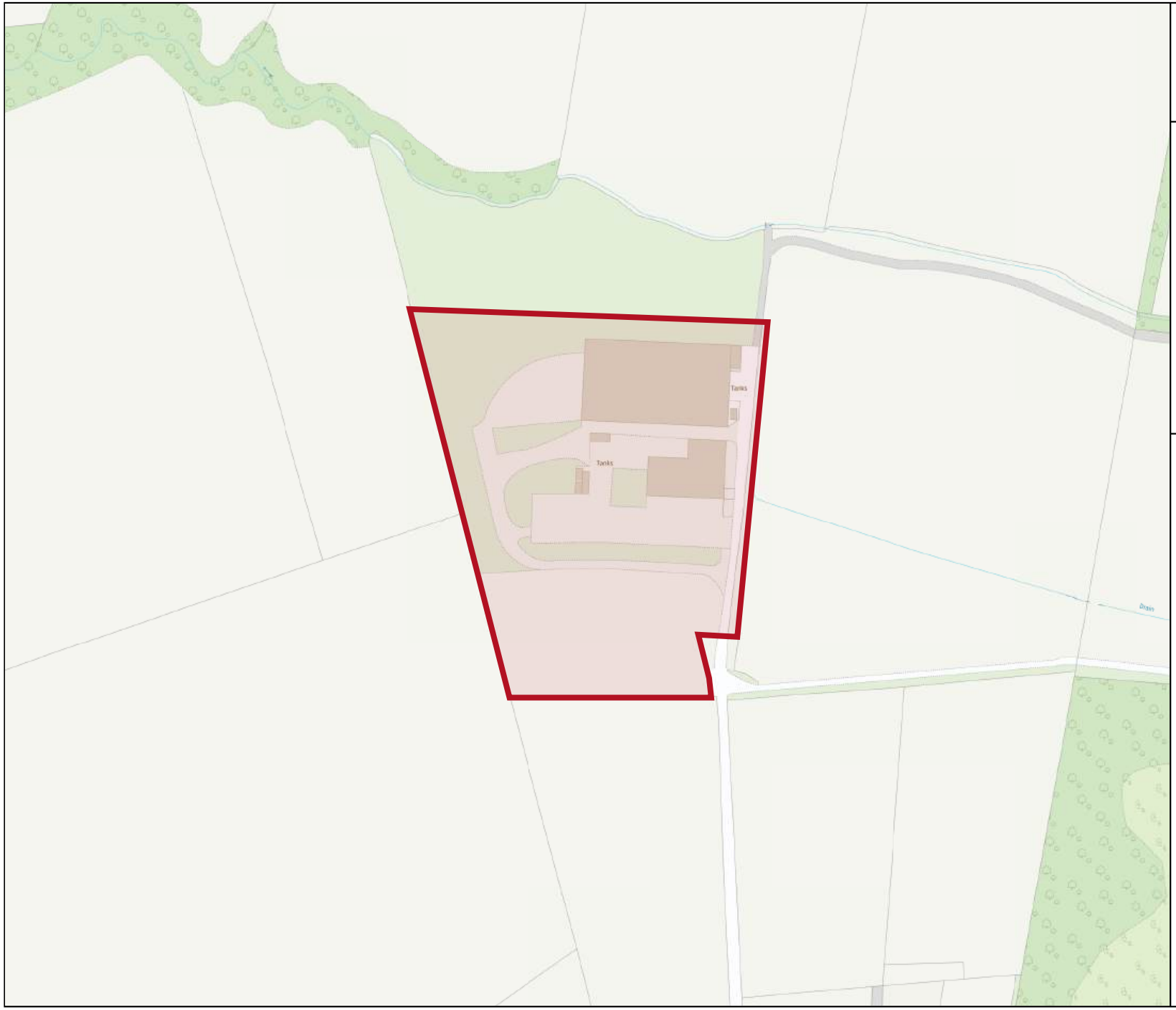
You will need to do a flood risk assessment if your site is **any of the following:**

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

Notes

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

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



Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
522692/128248

Scale
1:2500

Created
26 Feb 2025 9:10

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

0 20 40 60m

Flood map for planning

Your reference	Location (easting/northing)	Created
<Unspecified>	**522781/128791**	**16 Feb 2025 17:04**

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

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

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

Notes

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

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

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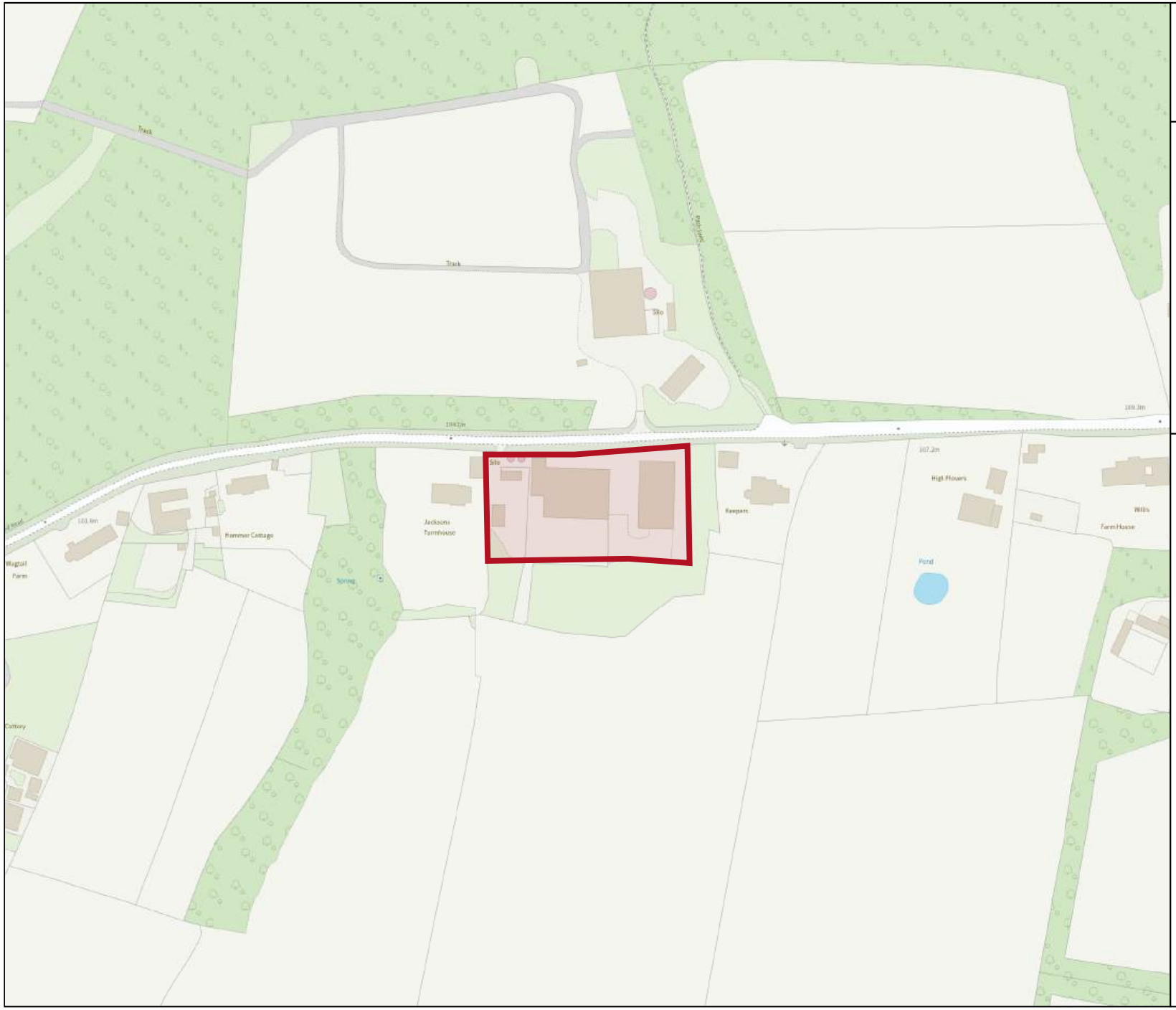


Environment Agency

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
522781/128791

Scale
1:2500

Created
16 Feb 2025 17:04

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

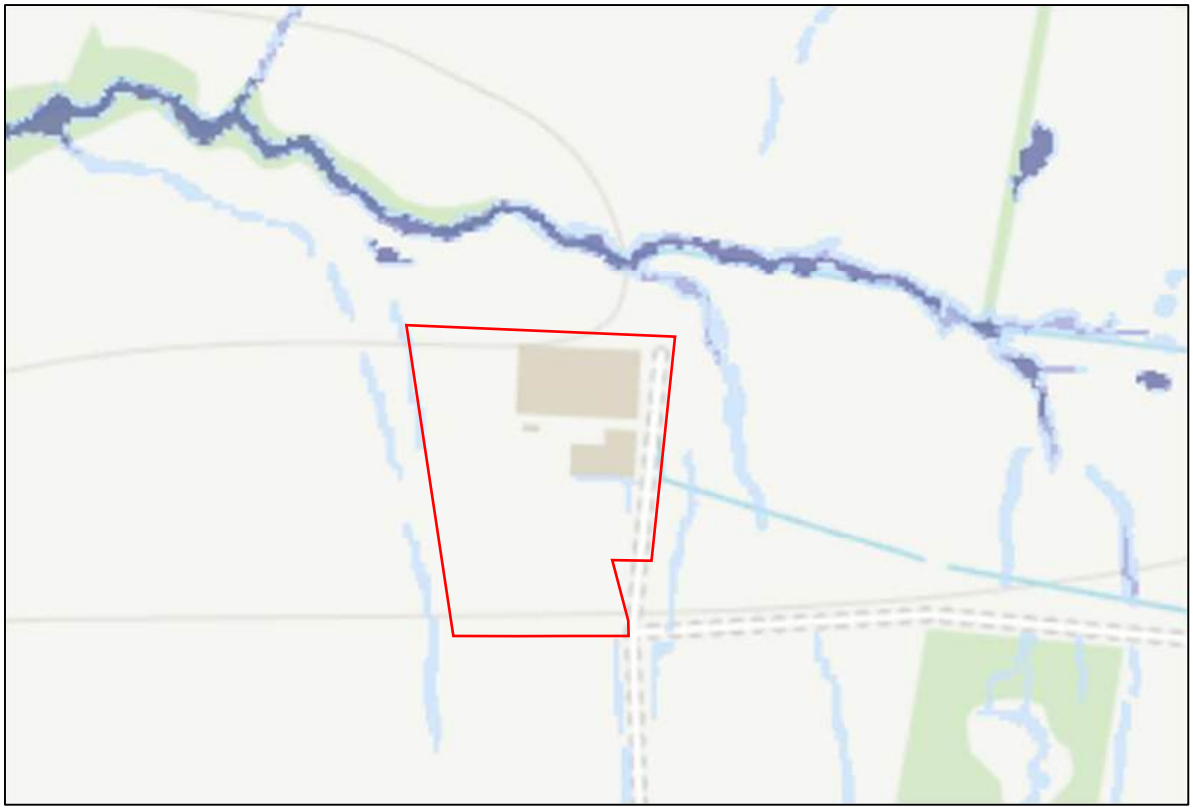
0 20 40 60m

Appendix M

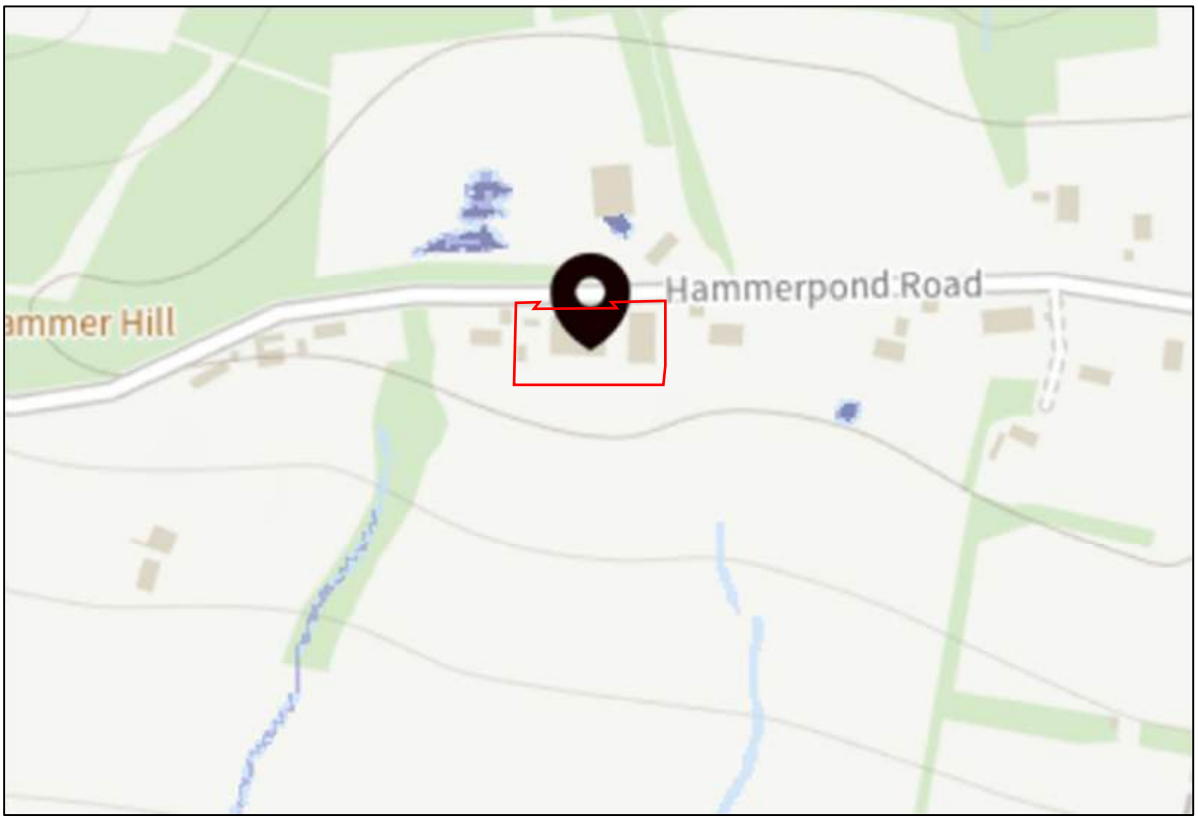
2025 Risk of Flooding from Surface Water (RoFSW) Map

Surface Water Flood Risk on Stonehouse Business Park Site

Surface Water Flood Risk on Lot 8



Surface Water Flood Risk on Jacksons Ridge



Appendix N

Groundwater Susceptibility Mapping