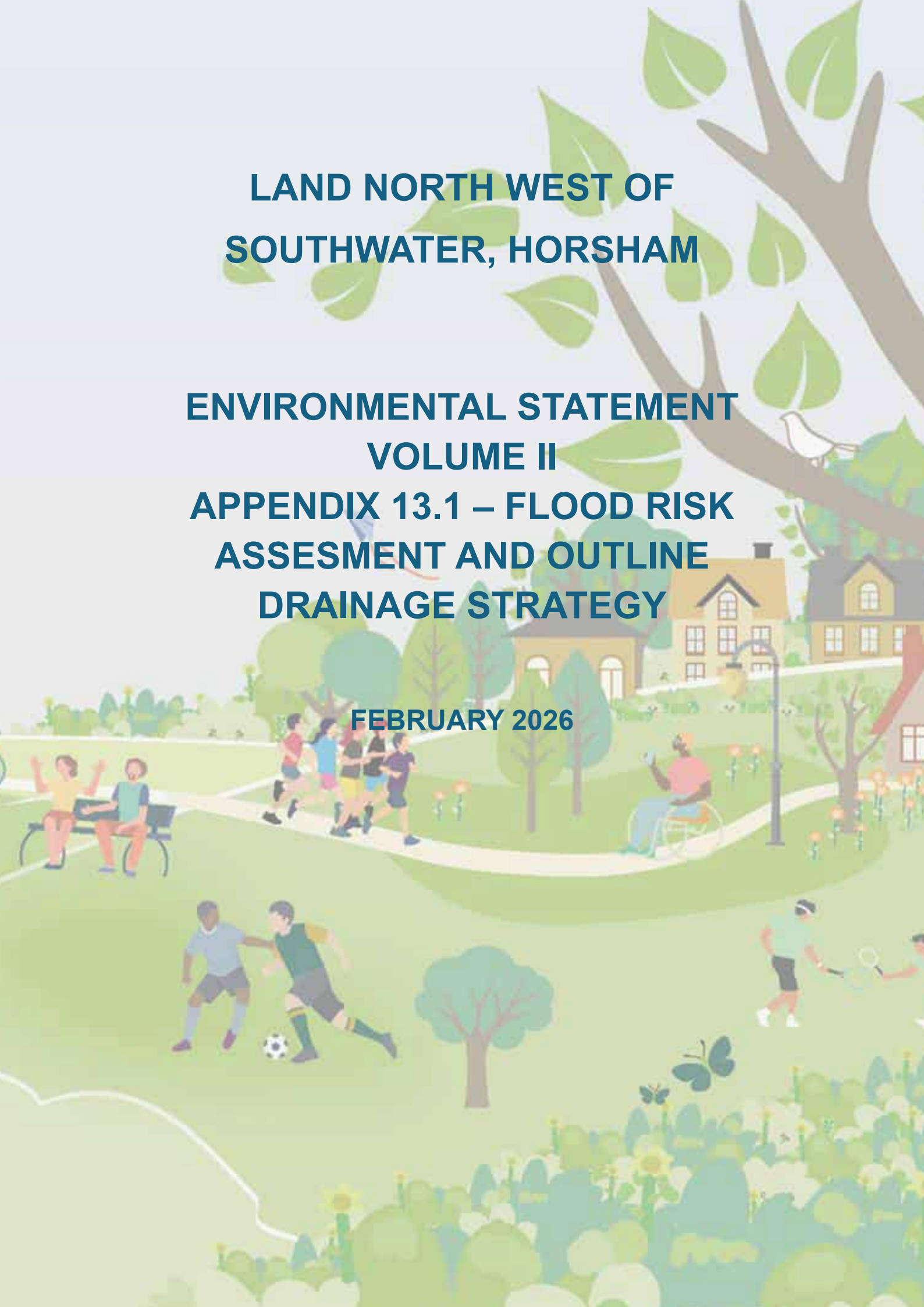
LAND NORTH WEST OF SOUTHWATER, HORSHAM

ENVIRONMENTAL STATEMENT VOLUME II APPENDIX 13.1 – FLOOD RISK ASSESMENT AND OUTLINE DRAINAGE STRATEGY

FEBRUARY 2026



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1 INTRODUCTION

1.1 APPOINTMENT & BRIEF

1.1.1. This Flood Risk Assessment and Outline Drainage Strategy (FRA and ODS) has been prepared by WSP on behalf of Berkeley Strategic Land Ltd to support the outline planning application for a new mixed-use development at the Land North-West of Southwater (the 'Proposed Development). The Site is located within land to the north west of and adjacent to Southwater, West Sussex, and is located within the administrative area of Horsham District Council (HDC).

1.1.2. The Proposed Development is a mixed-use strategic development to include:

- Approximately 1,000 homes, plus a care home of up to 80 beds (a mix of C2 and C3 use classes);
- An employment area (use class B2, B8, E(g));
- Mixed used neighbourhood centre (use class E & F);
- Sport and leisure facilities;
- Redevelopment of existing agricultural buildings including construction of a building for community use (use classes E and F2);
- Provision for a nursery, primary and secondary school (use class F1(a), E(f));
- Gypsy and traveller pitches;
- Landscaping, open space; and
- New road and Public Right of Way (PRoW) improvements.

1.2 OBJECTIVE OF STUDY

1.2.1. This report investigates flood risk in the vicinity of the Site from the various potential sources to ensure the sustainability and safety of the Proposed Development over its lifetime. Furthermore, this report outlines the proposed surface water and foul water drainage strategy for the Site.

1.2.2. This FRA and ODS has been produced in line with the requirements of the National Planning Policy Framework (NPPF, December 2024) and the Environment Agency's (EA) Standard Flooding Guidance, as well as through consultation with the EA, Southern Water (SW) and West Sussex County Council (WSCC) who act as the Lead Local Flood Authority (LLFA) within this area, and with HDC.

1.2.3. A desktop review of local drainage policies has also been undertaken to help inform the production of this Drainage Strategy.

1.3 STUDY METHODOLOGY

1.3.1. The appraisal process has comprised of a desktop study, data research and consultation with regulatory bodies and in accordance with third party standing advice. The following documents, policies and resources have been reviewed as part of the production of this FRA and ODS:

- Horsham District Planning Framework (2015);
- West Sussex County Council Preliminary Flood Risk assessment (2011);
- West Sussex County Council LLFA Policy for the Management of Surface Water (2018);
- West Sussex County Council Strategic Flood Risk Assessment (2010);
- West Sussex County Council Local Flood Risk Management Strategy (2025);
- Horsham District Council Strategic Flood Risk Assessment (2020);
- Horsham District Council Strategic Flood Risk Assessment Update (2024);
- Horsham District Council Sequential and Exception Flood Risk Tests (2024);
- Southwater Neighbourhood Development Plan (2021);
- Horsham District Local Plan Regulation 19 Draft 2023-2040 (2024)
- Shaping Development in Horsham District (2025);
- The National Planning Policy Framework (NPPF, 2024);
- National Standards for Sustainable Drainage Systems (SuDS, 2025)
- British Geological Society (BGS) Online Viewer, 1:50,000 Bedrock and Superficial deposits;
- Topographical Surveys by MK Surveys (Project Numbers 25205(2018) and 30859(2022));
- Southern Water Asset Records ‘872803’ (2022);
- Geo-Environmental ‘GE20620 - Preliminary Ground Investigation Report’ (2022);
- DEFRA’s Online Magic Map; and
- GOV.UK’s online Long-Term Flood Maps.

2 EXISTING SITE

2.1 SITE LOCATION

2.1.1. The Site is located to the north-west of and adjacent to Southwater, West Sussex. The Site is bounded by the A24 to the north, Worthing Road to the east, agricultural land and residential housing to the south, and both Marlpost Road and Two Mile Ash Road to the west.

2.1.2. The Site is centred at:

- **National Grid Reference:** TQ154274
- **Easting, Northing:** 515415, 127556
- **Nearest Postcode:** RH13 0LB

Figure 1 - Site Location Plan

2.2 SITE DESCRIPTION

2.2.1. The existing Site is located north west of the settlement of Southwater, approximately 1km from Southwater village centre. The Site lies within the administrative boundary of Horsham District Council and is bounded by the A24 to the north, Worthing Road to the east, agricultural land and residential housing to the south, and both Marlpost Road and Two Mile Ash Road to the west.

2.2.2. The Site comprises primarily agricultural land, with hedgerows, mature trees, areas of woodland, streams and land drains across the Site.

2.2.3. There are three areas of ancient woodland which are located within the Main Site. The largest Courtland Wood lies in the centre of the Site (which is continuous with an area of ancient woodland known as Two Mile Ash Gill). Smith's Copse is located approximately 200m north east of Courtland wood.

2.2.4. The Site is approximately 116.7 hectares (ha) in size.

2.2.5. Based on the topographical survey referenced above, the Site falls to the south and west. The Site level peaks at approximately at +59.57m above ordnance datum (AOD) and falls to approximately +52.56m AOD in the north west of the Site bordering Worthing Road, and to +42.00m AOD in the southern extent.

2.2.6. A topographical survey of the Site can be found in Annex B.

2.3 GEOLOGY AND HYDROGEOLOGY

2.3.1. This section of the report has been informed by mapping from the British Geological Survey (BGS) Geology of Britain viewer, DEFRA's Magic Map and the Preliminary Ground Investigation Report by Geo Environmental Services Limited, from 6th June 2022.

2.3.2. It is understood from the BGS 'Geology of Britain viewer' that the underlying bedrock geology for most of the Site comprises of the Horsham Stone Member - Sandstone. The north and south section of the Site consists of a bedrock geology of Weald Clay Formation – Mudstone. There are no superficial deposits recorded throughout the Site.

2.3.3. The Site bedrock formation is a designated as mostly a Secondary A aquifer with parts of unproductive strata, meaning part of the Site is capable of supporting water supplies at a local rather than strategic scale.

2.3.4. Due to its clay content, the Weald Clay Formation is likely to act as an aquitard to prevent vertical movement of groundwater from any groundwater sources below resulting in the unproductive strata areas in the Site. This offers negligible significance for water supply or river base flow.

2.3.5. BGS Borehole records show the nearest borehole is located to the north of the Site, borehole reference TQ12NE28 (please refer to Annex B) which notes the following ground conditions at the Site:

Table 1 - Summary of Ground Conditions

Stratum	Depth to Base of Strata (m bgl)	Thickness (m)	Typical Description
Topsoil	0.3	0.3	N/A
Clay with pieces of Sandstone	2.4	2.1	Orange-brown and grey clay with pieces of dark brown ferruginous sandstone.
Clay	3.0	0.6	Brown shaly clay.

Note: Brackets indicate maximum unproven depth or thickness

2.4 EXISTING WATERCOURSES

2.4.1. There are no Main Rivers in proximity to the Site.

2.4.2. There are two Ordinary Watercourses located within the Site which have been identified on the outline Surface Water Drainage Strategy drawing in Annex C. These are tributaries of the River Arun to the North and the River Adur to the South.

2.4.3. Southwater Country Park Lake, a reservoir, is located 1.25km southeast of the Site.

2.4.4. There are no other watercourses in the vicinity of the Site.

2.5 EXISTING SEWERS AND DRAINAGE

2.5.1. The Site comprises primarily agricultural land, with hedgerows, woodland, open watercourses and land drains and from a review of the sewerage undertaker (Southern Water Services (SWS)) asset management record plans, there are only two very short sections of existing SWS foul water sewers that cross within the Site boundary, in the north western area of the ite.

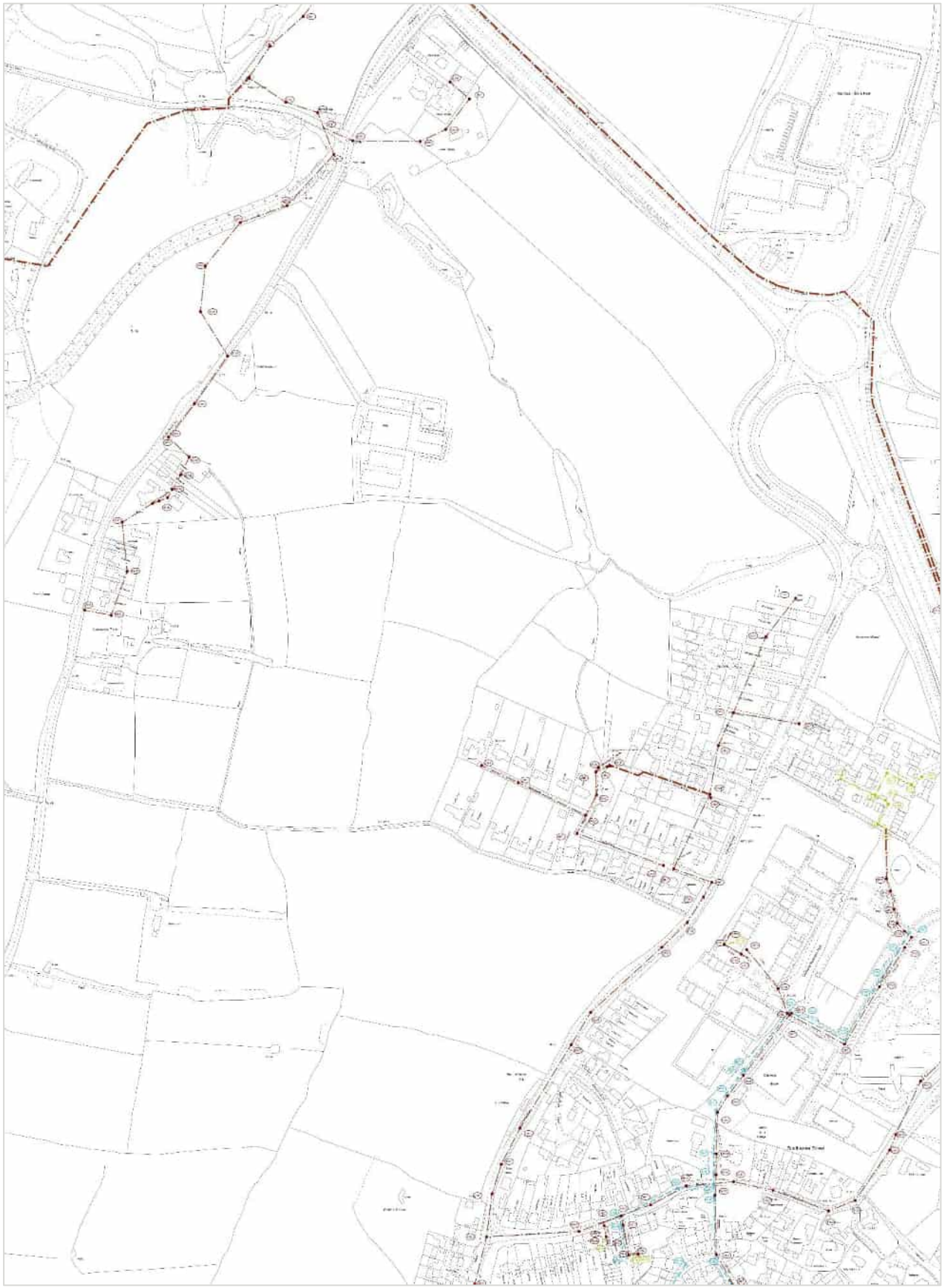
2.5.2. The SWS records indicate separate foul and surface water drainage networks draining the settlement of Southwater immediately to the east of the Site, including the recently developed site of Broadacres that connects to the separate sewer networks on Worthing Road.

2.5.3. To the immediate north and west of the Site the SWS records indicate a small foul sewer network on Two Mile Ash Road that drains northwards into a network that drains westwards, picking up the Christ's Hospital site.

2.5.4. The local Southern Water operated sewage treatment works, Horsham Water Treatment Works, is located 1.2km north west of the Proposed Development's northern boundary.

2.5.5. An extract from the SWS sewer records is provided in **Figure 2** below, while detailed asset records are provided in Annex B.

Figure 2 - Extract from Southern Water Asset Map (2022)



3 PROPOSED DEVELOPMENT

3.1 DEVELOPMENT PROPOSALS

3.1.1. The Proposed Development is a mixed-use strategic development to include:

- Approximately 1,000 homes, plus a care home of up to 80 beds (a mix of C2 and C3 use classes);
- An employment area (use class B2, B8, E(g));
- Mixed used neighbourhood centre (use class E & F);
- Sport and leisure facilities;
- Redevelopment of existing agricultural buildings including construction of a building for community use (use class F2);
- Provision for a nursery, primary and secondary school (use class F1(a), E(f));
- Gypsy and traveller pitches;
- Landscaping, open space; and
- New road and Public Right of Way (PRoW) improvements.

3.1.2. The development proposal also notes an emphasis will be placed on providing public open spaces and enhancing biodiversity on Site.

3.1.3. Please refer to Annex A for KPK masterplan drawing A019-014– Rev. Q (dated 21/01/2026).

3.2 VULNERABILITY CLASSIFICATION

3.2.1. As further detailed in Section 5, the EA flood mapping confirms that the Site lies entirely within Flood Zone 1, meaning that there is a probability of fluvial and tidal flooding of less than 0.1% every year, i.e. low risk.

3.2.2. As stated in the NPPF, a sequential risk-based approach is applied to determine the suitability of land for development in various flood risk areas, as detailed in **Table 2** below. This should be applied at all stages of the planning process to assess the suitability of land for development.

3.2.3. Being in Flood Zone 1, **Table 2** confirms that this development is appropriate.

Table 2 - Flood Risk Vulnerability and Flood Zone 'Compatibility'

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

✓ Development is appropriate ✗ Development should not be permitted

3.3 SEQUENTIAL TEST

3.3.1. The Proposed Development areas sit within Flood Zone 1 and surface water flooding areas where deemed to provide flow routes through the Site have also been taken into account in the development of the Masterplan. As such it has not been considered necessary to undertake sequential test as part of this FRA.

3.3.2. Horsham District Council's emerging Local Plan has conducted Sequential Testing for allocated Sites as part of the updated Strategic Flood Risk Assessment. The assessment indicates that the "HA3 - Land West of Southwater" Site has successfully passed the sequential test, with a ranking of 5 "The Site is classified as Flood Zone 1, and over 10% of its area intersects zones identified as having a low risk of flooding from surface water or areas designated as groundwater Class 3."

4 PLANNING POLICY AND GUIDANCE

4.1 INTRODUCTION

4.1.1. This section of the report summaries local policy and guidance relevant to this Flood Risk Assessment and Outline Drainage Strategy for the Site.

4.2 NATIONAL PLANNING POLICY FRAMEWORK (2024)

4.2.1. The National Planning Policy Framework (NPPF) was published in February 2019 (updated in December 2024) with the aim of protecting the environment and to promote sustainable growth. There is an overarching presumption in favour of sustainable development that should be the basis of every plan and every decision.

4.2.2. The following paragraphs/policies within the NPPF are considered relevant to this assessment:

- **Paragraph 170**: Requires that "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.";
- **Paragraph 172**: Explains that "the aim of the Sequential Test is to steer development to areas with the lowest probability of flooding";
- **Paragraph 181:** Explains that "When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere;
- **Paragraph 182:** Recommends that "major development should incorporate sustainable drainage systems which are proportionate to the nature and scale of the proposal. The systems used should:
  - take account of advice from the Lead Local Flood Authority;
  - have appropriate proposed minimum operational standards; and
  - have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.

SOUTHWATER NEIGHBOURHOOD DEVELOPMENT PLAN (2021)

4.2.3. Southwater Neighbourhood Development Plan has been prepared by Southwater Parish Council. This plan provides a clear framework to guide residents, local authorities, and developers as to how the community wish to shape future development from 2019-2031. The following policies have been deemed relevant to this assessment:

- Policy SNP17 – Site Levels:
  - **Policy SNP17.1**: States "*New development must utilise existing Site levels wherever practically possible*."
  - **Policy SNP17.4**: States "*In order to assess the above requirements, proposals for major development should provide the followings levels (as metres above Ordnance Datum) on the submitted plans, without this information it is likely that an application will not be able to demonstrate compliance with this policy:*
    - *Existing Site levels;*

- *Proposed Site levels;*
- *Finished internal floor level(s); and*
- *Ridge height(s) - new development must utilise existing Site levels wherever practically possible*."

- **Policy SNP17.5**: States "*Wherever possible, spoil resulting from development work should be retained on Site for use in landscaping works or for other requirements of the permitted developmen*t."

4.3 HORSHAM DISTRICT PLANNING FRAMEWORK (EXCLUDING SOUTH DOWNS NATIONAL PARK) (2015)

4.3.1. The Horsham District Planning Framework (excluding South Downs national Park) (HDPF) was adopted in 2015 and sets out the planning strategy for the years up to 2031 to deliver the social, economic, and environmental needs of the HDPF plan area. The following policies have been deemed relevant to this assessment:

- **Policy 1 - Sustainable Development:** States *"When considering development proposals, the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework*."
- **Policy 38 – Flooding:** Explains that "*This policy is designed to ensure development adapts to the likely changes in the future climate and flood risk is not increased*.

  - *Development proposals will follow a sequential approach to flood risk management, giving priority to development Sites with the lowest risk of flooding and making required development safe without increasing flood risk elsewhere. Development proposals will;*

    a) *take a sequential approach to ensure most vulnerable uses are placed in the lowest risk areas.*
    b) *avoid the functional floodplain (Flood zone 3b) except for water-compatible uses and essential infrastructure.*
    c) *only be acceptable in Flood Zone 2 and 3 following completion of a sequential test and exceptions test if necessary.*
    d) *require a Site-specific Flood Risk Assessments for all developments over 1 hectare in Flood Zone 1 and all proposals in Flood Zone 2 and 3.*

  - *Where there is the potential to increase flood risk, proposals must incorporate the use of sustainable drainage systems (SuDS) where technically feasible or incorporate water management measures which reduce the risk of flooding and ensure flood risk is not increased elsewhere.*
  - *Consider the vulnerability and importance of local ecological resources such as water quality and biodiversity when determining the suitability of SuDS.*
  - *Utilise drainage techniques that mimic natural drainage patterns and manage surface water as close to its source as possible will be required where technically feasible.*
  - *Be in accordance with the objective of the Water Framework Directive and accord with the findings of the Gatwick Sub Region Water Cycle Study in order to maintain water quality and water availability in rivers and wetlands and wastewater treatment requirements*."

- **Policy 35 – Climate Change:** States that "*Development must be designed so that it can adapt to the impacts of climate change, reducing vulnerability, particularly in terms of flood risk, water supply and changes to the district's landscape. Developments should adapt to climate change using the following measures:*

  - *Provision of appropriate flood storage capacity in new building development;*
  - *Use of green infrastructure and dual use SuDS to help absorb heat, reduce surface water runoff, provide flood storage capacity and assist habitat migration;*
  - *Use of measures which promote the conservation of water and/or grey water recycling; and*
  - *Use of Site layout, design measures and construction techniques that provide resilience to climate change (opportunities for natural ventilation and solar gain) [..]*".

4.4 HORSHAM DISTRICT LOCAL PLAN REGULATION 19 DRAFT 2023-2040

4.4.1. The emerging Local Plan has been prepared as the main planning document for Horsham District, outside the South Downs National Park (SDNP).

4.4.2. The emerging Horsham Local Plan 2023 – 2040 ('the Emerging Local Plan') was submitted to the Secretary of State for examination on 26 July 2024.

4.4.3. The Site is subject of a draft allocation in the emerging Local Plan under draft Policy HA3 for a mixed-use development.

4.4.4. The following policies are relevant to this assessment.

- **Strategic Policy 6 - Climate Change:**
  - Climate Change Adaptation
  - Sustainability Statement
- **Strategic Policy 10 - Flooding:**
  - Flood Risk Management.

4.5 WEST SUSSEX LLFA POLICY FOR THE MANAGEMENT OF SURFACE WATER (2018)

4.5.1. WSCC as LLFA is the risk management authority responsible for local flood risk defined as flooding from surface water, groundwater and ordinary watercourses.

4.5.2. West Sussex LLFA will work with the Local Planning Authorities to identify Areas of High Local Flood Risk for their districts. These areas will be based upon the Surface Water Management Plans that it has developed in partnership with other risk management authorities and on the Surface Water Flood Maps. Where these areas are identified, all planning applications with potential surface water management implications will need to be submitted with a more rigorous justification of the chosen drainage system and an assessment of its associated impact.

4.5.3. The following SuDS Policies have been deemed relevant to this development:

- SuDS Policy 1 - Follow the drainage hierarchy
- SuDS Policy 2 - Manage Flood Risk Through Design
- SuDS Policy 3 - Mimic Natural Flows and Drainage Flow Paths
- SuDS Policy 4 - Seek to Reduce Existing Flood Risk

- SuDS Policy 5 - Maximise Resilience
- SuDS Policy 6 - Design to be Maintainable
- SuDS Policy 7 - Safeguard Water Quality
- SuDS Policy 8 - Design for Amenity and Multi-Functionality
- SuDS Policy 9 - Enhance Biodiversity
- SuDS Policy 10 - Link to Wider Landscape Objectives

4.6 NATIONAL SUDS STANDARDS 2025

4.6.1. The National Standards for sustainable drainage systems (SuDS) was published by Government in July 2025. These standards are emerging and have not been fully implemented into planning policy at this time. However, discussions with the LLFA have indicated that these will be expected to be addressed within the Proposed Development.

4.6.2. The standards contain seven core elements;

- Runoff Destination Hierarchy – prioritise reuse, infiltration, and surface water discharge.
- Everyday Rainfall – manage the first 5mm of rainfall onsite.
- Extreme Rainfall – design for safe exceedance pathways.
- Water Quality – apply pollution risk-based treatment.
- Amenity – integrate SuDS into public realm and landscape.
- Biodiversity – support habitat connectivity and net gain.
- Lifecycle Design – ensure ease of maintenance and adoption.

5 LLFA ENGAGEMENT

5.1 PRE-APPLICATION ADVICE

5.1.1. Pre-Application Advice was sought from the LLFA. A meeting with West Sussex County Council was held on 11th November 2025 to discuss the proposals for the Site.

5.1.2. Following the meeting WSCC issued a statement outline the expectations of the formal submission of the Outline Application (See Annex E). These were:

- Drainage layout showing labelled attenuation features and any proposed outfall locations. This shall include any required easements, as this could have impacts on the parameter plan.
- Catchment plan to demonstrate natural catchments within the Site are being followed. It was discussed that there are 2 catchments within the Site.
- Evidence that the hierarchy has been followed.
- Quick storage estimates and runoff rates for the attenuation requirements. The labelling of features in calculations must match the outline drainage strategy.
- We require proposals to follow the National Standards for SuDS. For an outline application, it needs to be demonstrated that Standard 1 (Run-off destinations/hierarchy) has been followed there is a viable method of draining the Site. It also needs to be demonstrated that 1% AEP plus climate change event can be managed on Site, without increasing flood risk elsewhere (Standard 3 (Management of Extreme Rainfall and Flooding)). This is because this is the Standard which affects the parameter plan the most significantly, therefore it must be demonstrated at outline stage that there is enough space for the required attenuation.
- For Standards 2, 4, 5, 6 and 7, a high-level overview of the use of multi-functional SuDS and who it is thought will be responsible for the maintenance of the SuDS and ordinary watercourses (under riparian ownership) within the Site boundary is required. This is because the application is outline – we will condition the detailed information.

5.1.3. The Outline Drainage Strategy has been developed with the LLFA response in mind and further details of this are outlined in **Section 8** of this report.

6 DEFINITION OF FLOOD HAZARD

6.1 SOURCES AND MECHANISMS OF FLOODING

6.1.1. Reference to gov.uk ‘Flood Map for Planning’ and ‘long term flood risk information’ maps (which makes use of EA data) is made where appropriate, along with reference to the HDC documents referenced in **Section 1.3** of this report.

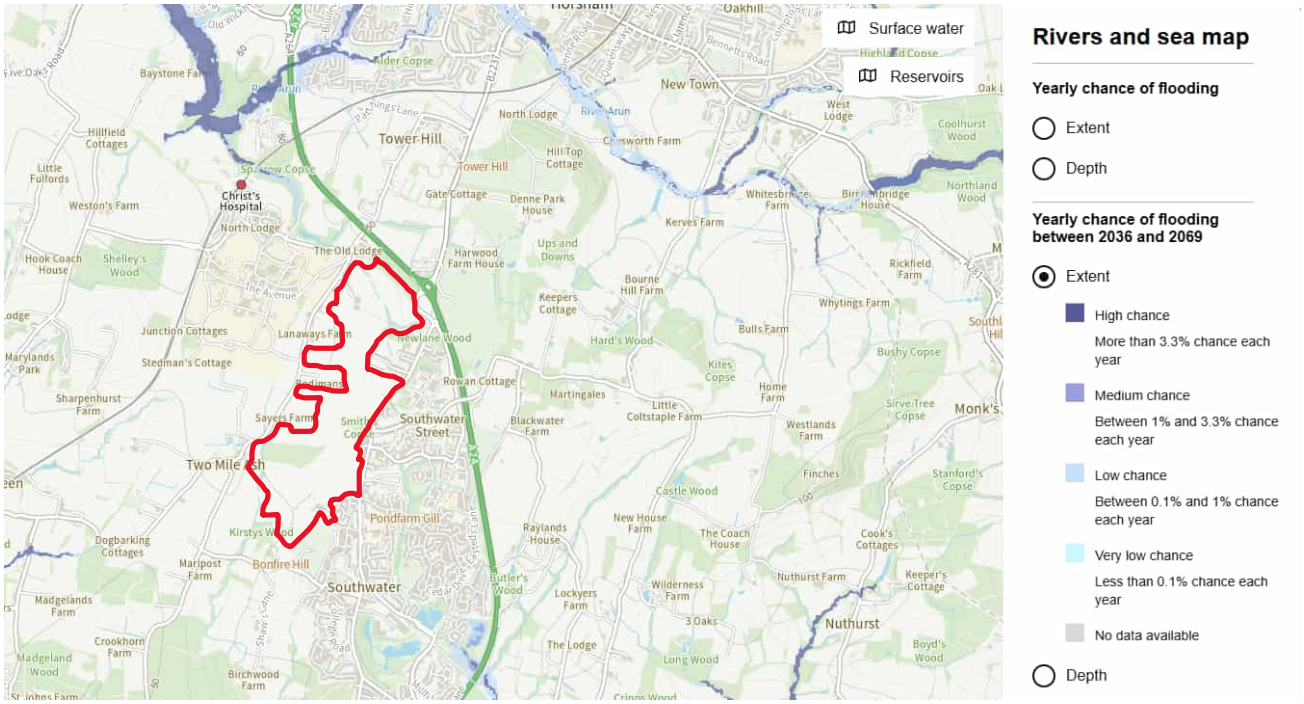
6.2 FLUVIAL AND TIDAL FLOODING

6.2.1. Fluvial flooding is caused by rivers, watercourses or ditches overflowing. Tidal flooding is caused by elevated sea levels or overtopping by wave action.

6.2.2. Based on the Flood Map for Planning response from the EA and the online GOV.UK Flood Map for Planning, shown in **Figure 3**, the Site is located entirely within Flood Zone 1. Flood Zone 1 is classified as land having a less than 0.1% annual probability of river (fluvial) or sea (tidal) flooding (1 in 1000-year return period event). In consistency with the above, the Site is classified as having a ‘very low’ probability of flooding from fluvial or tidal sources.

6.2.3. Therefore, the risk of fluvial/tidal flooding at the Site has been assessed as Low.

Figure 3 - Extract from EA's Flood Map for Planning - Flood Zones



6.3 GROUNDWATER FLOODING

6.3.1. Groundwater flooding occurs as a result of water rising up from underlying rocks, typically after long periods of sustanained rainfall. It is most likely to occur in low-lying areas underlain by aquifers.

6.3.2. DEFRA's Magic Map indicates that the Site is not located within a groundwater Source Protection Zone.

6.3.3. DEFRA's Magic Map notes that the Site is partially located within an area designated as High Groundwater Vulnerability and partially located within unproductive strata. The Groundwater Vulnerability Maps show *"the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a single square kilometre."*

6.3.4. Further available information on the groundwater across the Site area is limited to the GESL Preliminary Ground Appraisal report dated 26th June 2022. This report details groundwater depths ranging from 1.95 to 3m, with some shallower depths recorded from three subsequent return visits. However, the comments in the report are that the water recorded in the monitoring wells is most likely an accumulation of perched water seepages or surface water run-off rather than a groundwater table.

6.3.5. Horsham SWRA 2024 Update indicates that the majority of the Site is within the Class 4 Zone which indicates "There is a negligible risk of groundwater flooding in this area and any groundwater flooding incidence has a chance of less than 1% annual probability of occurrence."

6.3.6. A small area in the northern part of the Site is designated as Class 2 Zone, which denotes "*There is a moderate risk of groundwater flooding in this area with a likelihood exceeding 1% annual probability*." The Masterplan has been developed to exclude residential uses from this zone by proposing employment-related development instead. Additionally, raising the ground levels for this plot is necessary to ensure access to the parcel and to further mitigate the risk of groundwater flooding.

Figure 4 - Groundwater Flooding Extract

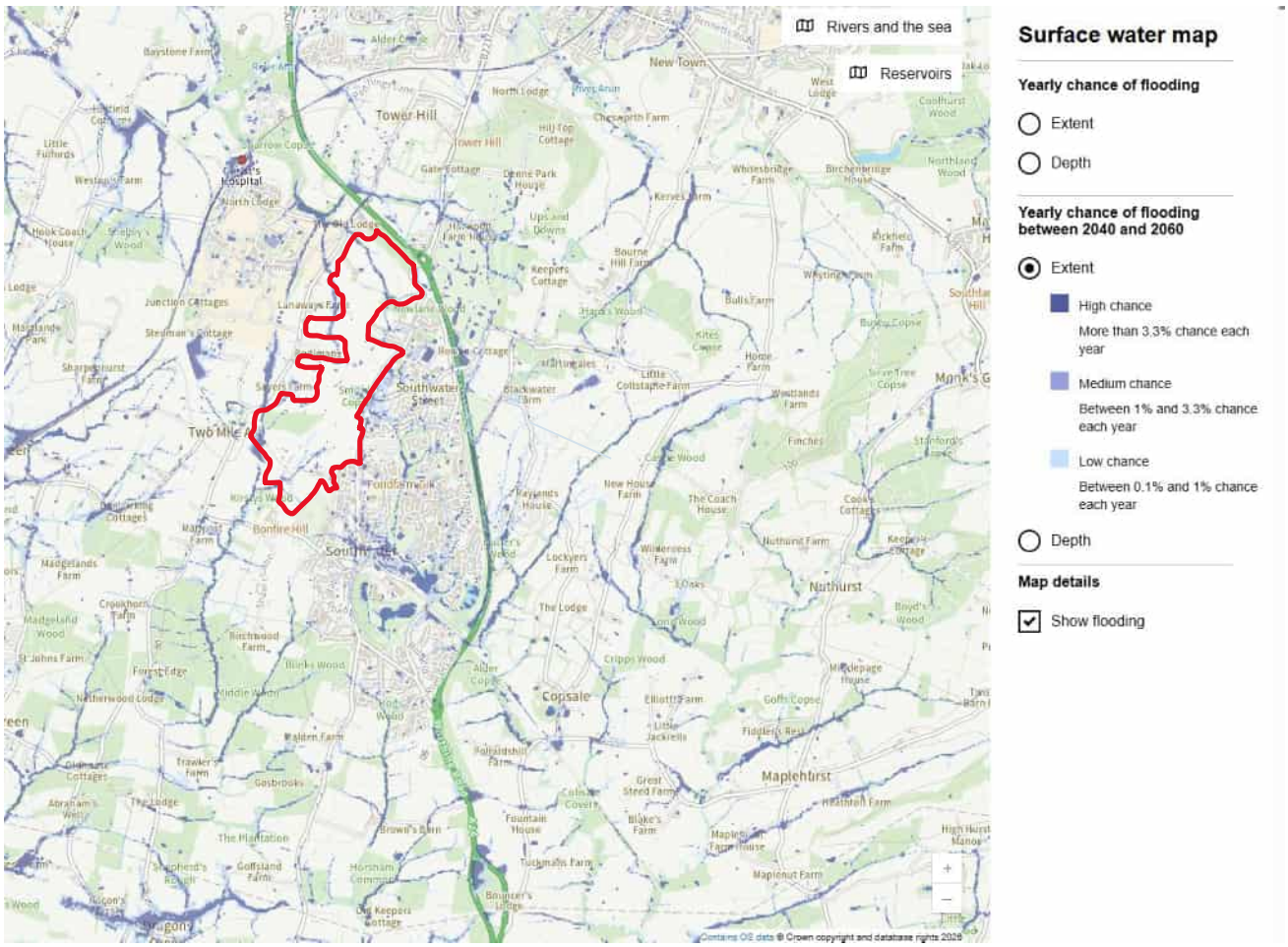
6.4 SURFACE WATER FLOODING

6.4.1. Surface water flooding occurs when intense rainfall or overland flow is unable to drain away by traditional means such as into drainage systems or infiltrating into the ground. This excess water could run off quickly off land and result in localised flooding.

6.4.2. The EA's surface water flood risk mapping shows the Site to contain areas assessed at Very Low to High risk of surface water flooding (refer to **Figure 5**). The EA's Likelihood of Flooding from Surface Water Map indicates the following classifications:

- Very low risk = less than a 0.1% (1 in 1000 year) chance of flooding in any given year.
- Low risk = between a 0.1% (1 in 1000 year) and a 1% (1 in 100 year) chance of flooding in any given year.
- Medium risk = between 1% (1 in 100 year) and a 3.3% (1 in 30 year) chance of flooding in any given year.
- High risk = Greater than 3.3% (1 in 30 year) chance of flooding in any given year.

Figure 5 - Extract from EA mapping 'Surface Water Flood Risk' Frequency



6.4.3. The majority of the Site can be assessed as having very low or low surface water flood risk.

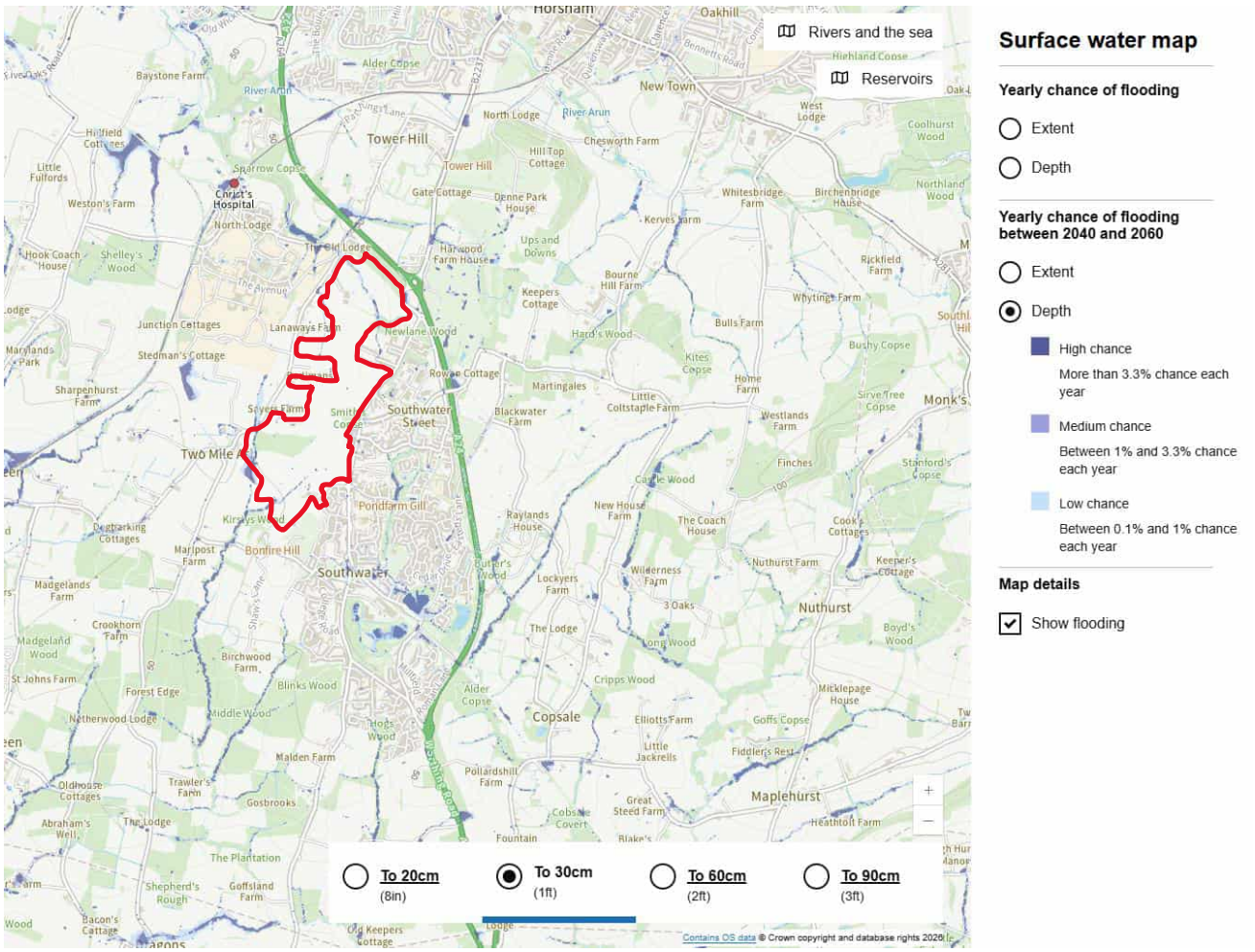
6.4.4. The Site contains multiple small areas of medium and high surface water flood risk flow path adjacent to the ordinary watercourses, to the North and Southwest of the Site.

6.4.5. Further assessment shows the depth of High-Risk flooding ranging from 300mm-900mm (refer to **Figure 6**), which has been deemed not significant if suitable mitigation methods are applied.

6.4.6. Therefore, the risk of surface water flooding across the Site has been assessed to be low.

6.4.7. The proposed drainage strategy will detail how the design will manage surface water flood risk resulting from the Proposed Development through the development of a SuDS strategy.

Figure 6 - Extract from EA mapping 'Surface Water Flood Risk – High Risk:Depth



6.5 SEWER FLOODING

6.5.1. Sewer flooding is caused when a blockage occurs or by excess surface water entering the drainage network, exceeding available capacity. This generally occurs during periods of heavy rainfall when the drainage network becomes overwhelmed.

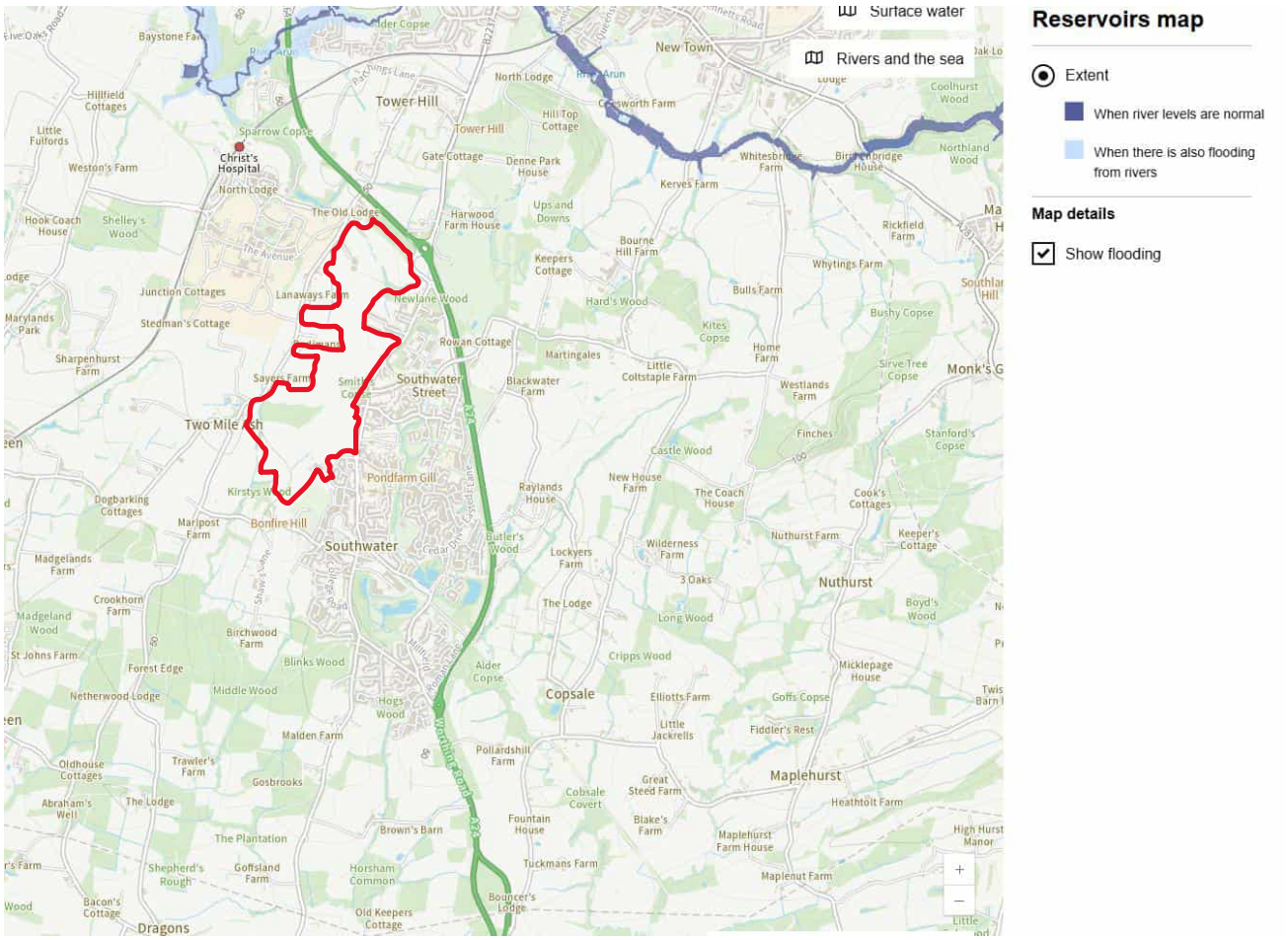
6.5.2. As there are only a limited number of localised foul sewers crossing the north west part of the Site, sewer flooding risk is considered low, and there are no records of any issues from this network.

6.6 RESERVOIR AND ARTIFICIAL SOURCES OF FLOODING

6.6.1. Areas which lie within the maximum extent of flooding by an uncontrolled release of water from a reservoir are considered to be areas where lives could be threatened.

6.6.2. Based on the gov.uk online maps, seen in **Figure 7**, the Site has not been identified as within the extent of flooding from reservoirs. Based on the information available, the probability of flooding from reservoir and artificial watercourses at the Site is considered to be negligible.

Figure 7 - Extract from EA mapping 'Flood risk from reservoirs



7 CLIMATE CHANGE

7.1 BACKGROUND INFORMATION

7.1.1. As detailed in the Climate Change Adaptation Sub-Committee Progress Report 2014, increased flood risk is the greatest threat to the UK from climate change. Models of the climate system suggest floods of the type experienced in England and Wales in autumn 2000, and between December 2013 and February 2014, have become more likely as a consequence of increased concentrations of greenhouse gases in the atmosphere.

7.1.2. More frequent short-duration, high intensity rainfall and more frequent periods of long-duration rainfall could be expected. Sea levels are also expected to continue to rise.

7.1.3. New EA guidance "Flood risk assessments: climate change allowances" issued on the 19th February 2016 (and subsequent minor updates) provides up to date information on expected changes in rainfall, river flows and sea level rise as a consequence of climate change.

7.1.4. A key change from the previous guidance is that the climate change allowances for peak river flows now are shown as variable on a regional basis; allowances are also now based on percentiles, whereby a percentile is a measure used in statistics to describe the proportion of possible scenarios that fall below an allowance level (e.g., a 50% percentile means that the allowance has 50% chances of not being exceeded).

7.1.5. Sea levels allowances reflect the previous guidance and vary on a regional basis and for each epoch as shown in Table 3 of the EA guidance.

7.1.6. The EA have provided guidance to assess the impact of climate change on fluvial flooding. Technical assessment of climate change impacts on fluvial flooding appropriate for new developments depending on their scale and location (see following section).

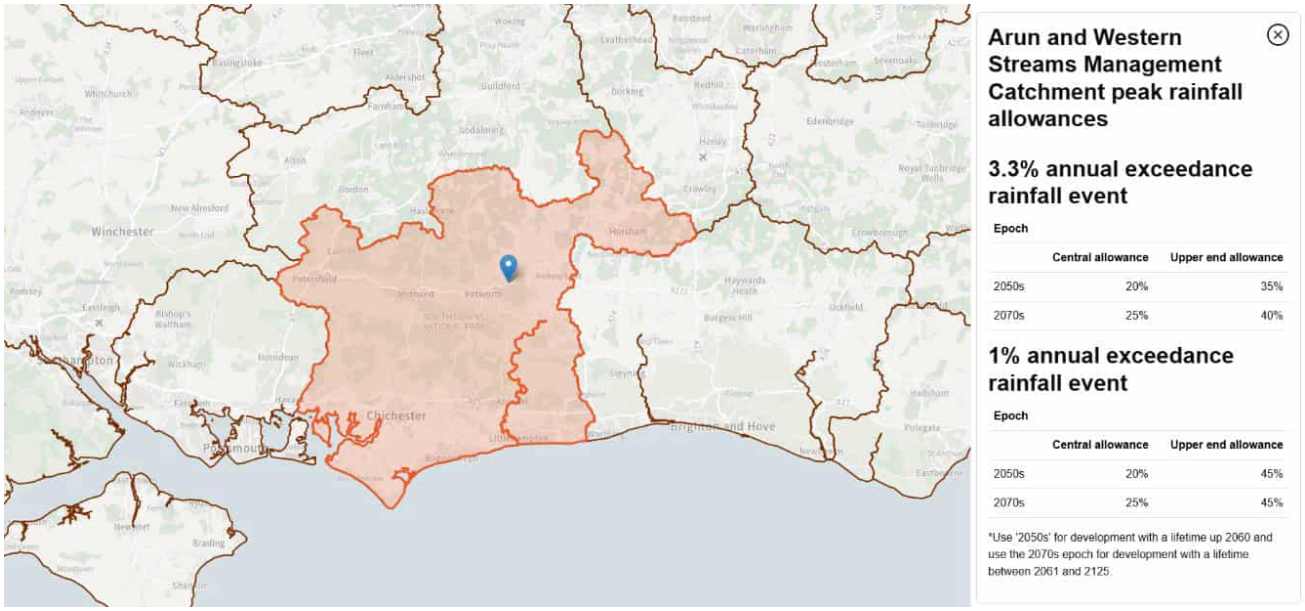
7.1.7. For peak rainfall the EA Guidance provides an upper end and central allowance depending on epoch; the guidance recommends assessing both the central and upper end allowances to understand the range of possible impacts.

7.1.8. On 10th May 2022 the peak rainfall allowances in 'Flood risk assessments: climate change allowances' were updated so they reflect the latest projections in UKCP Local (2.2km) and subsequent research 'FUTURE-DRAINAGE: Ensemble climate change rainfall estimates for sustainable drainage' (referred to as 'FUTURE-DRAINAGE herein). Peak rainfall allowances are provided for management catchments rather than a single set of national allowances for England.

7.1.9. Based on the EA's Climate Change Allowances 'Hydrology Data Explorer, the Site is located within both the Arun & Western and Adur & Ouse Streams Management Catchments. The rainfall allowance for the Site is provided in **Figures 8 and 9** below. Both catchments have a 25% Central and a 45% Upper allowances for the 1% annual exceedance rainfall event.

Figure 8 - Peak rainfall allowance for Adur & Ouse Streams Management Catchment

Figure 9 - Peak rainfall allowance for Arun and Western Streams Management Catchment



7.2 DEVELOPMENT LIFESPAN

7.2.1. A typical lifespan for a predominantly residential development such as this one is 60 years. The EA's Climate Change Allowances 'Hydrology Data Explorer' mapping notes that the 2070s epoch should be used for a development with a horizon between 2061 and 2125.

7.2.2. Based on this, the contingency peak rainfall allowances for climate change that are potentially applicable to this Site are as set out in Table 2 of the EA's "Flood risk assessments: climate change allowances". The advice is as follows:

- Upper End – 45% increase in peak rainfall by 2070s; and
- Central – 25% increase in peak rainfall by 2070s.

7.2.3. When undertaking the drainage strategy, the surface water attenuation calculations will be determined using the upper end estimates to prevent potential exceedance flows off Site.

7.3 IMPACT OF CLIMATE CHANGE ON THE DEVELOPMENT

7.3.1. Surface water runoff could in theory represent a risk to the Site, especially when the effects of climate change are considered. The Surface Water Drainage Strategy produced as part of this study considers the potential impacts of climate change.

7.3.2. The Surface Water Drainage Strategy (set out in **Section 7**) demonstrates that the surface water drainage provision for the Site will be designed to accommodate surface water run-off for all events up to and including the 100-year return period plus 45% climate change allowance.

8 SURFACE WATER DRAINAGE STRATEGY

8.1 OVERVIEW

8.1.1. A Surface Water Drainage Strategy is essential for any new development to ensure that surface water is managed effectively limiting the risk offsite as well as onsite and ensuring compliance with local / national policy and best practice.

8.1.2. This section of the report discusses the principles of the proposed Surface Water Drainage Strategy with appropriate design calculations and drainage maintenance requirements provided thereafter. The general principles of the Outline Drainage Strategy and drainage calculation methodology for the Proposed Development are also discussed.

8.1.3. All proposed drainage will be designed in accordance with local policy, local SuDS guidance, national standards and best practice where applicable during detailed design stages. This Surface Water Drainage Strategy identifies the principles of drainage management at the Site and all agreements, permits and applications for connections to the public sewer network will be made post discharge of the Planning Conditions through engagement with Horsham District Council and West Sussex County Council as the LLFA.

8.1.4. The risk to the Site from all sources of flooding has been demonstrated to be negligible to low. Therefore, a SuDS strategy will be developed to manage flood risk from the new development alongside adherence to best practice measures such as:

- Ensuring ground levels are profiled to fall away from building entrances / thresholds in order to mitigate against surface water runoff entering the ground floor during extreme storm events.
- Provision of appropriately set building thresholds.

8.2 PROPOSED SURFACE WATER DISCHARGE METHOD

SUDS OPTION APPRAISAL

8.2.1. National SuDS guidance relating to flood risk and coastal change in the planning process states that there is a hierarchy of surface water disposal options for new developments, detailed below, and the aim should be, wherever possible, to target the strategy as high up the hierarchy as reasonably practicable:

- Priority 1: collected for non-potable use;
- Priority 2: infiltrated to ground;
- Priority 3: discharged to an above ground surface water body;
- Priority 4: discharged to a surface water sewer, or another piped surface water drainage system; and
- Priority 5: discharged to a combined sewer.

8.2.2. The possibility of collecting water for non-potable use has been assessed. However, at present, the installation and ongoing maintenance costs of such systems are considered impractical, and available technologies are not yet suitable for individual residential properties. This approach should be revisited during the detailed design phase as a potential improvement to the current strategy, provided it proves feasible.

8.2.3. The use of infiltration techniques is not considered viable due to the geology of the Site. The baseline ground conditions comprise of low permeability associated with the Weald Clay Formation and limited other permeable layers. Historical borehole records on Site (TQ12NE28) found clay to a depth of 3.0m, therefore it is assumed that infiltration is unlikely to be feasible for the development.

8.2.4. In line with the drainage hierarchy, the development should look next to discharge to a surface water body. On this Site this is the selected approach for surface water disposal, with the proposals being to discharge at restricted rates into the onsite watercourses that are tributaries of the River Arun and the River Adur, subject to the necessary consents with the LLFA which would be secured as part of the detailed design. Specifically, it is proposed to restrict discharge from the Site during the 2 year, 30 year and 100 year return period rainfall events, including allowances for climate change, at the greenfield rate for the equivalent event, through the use of surface water attenuation features across the Site, in line with National SuDS Standards and as agreed with the LLFA.

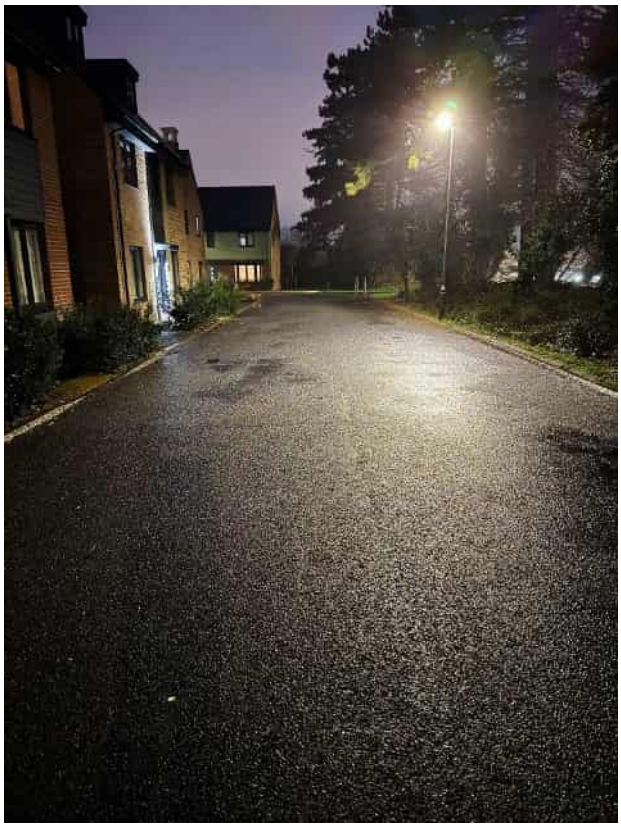
8.2.5. Surface water should be managed as near to its source as reasonably practicable, following best practice guidelines. For each development parcel, surface water runoff will be attenuated through the use of SuDS features designed to provide interception storage in accordance with Standard 2 of the National SuDS Standards. In order to show how this strategy could be delivered, an assessment of an indicative parcel has been conducted to demonstrate the potential locations for interception storage within each area (refer to Annex C). This demonstrates the deliverability of a strategy which aligns with the recent SuDS guidance, with the details to be identified and agreed with Reserved Matters Applications for each parcel(s) as they come forwards and evaluated in relation to the entire Site to optimise compliance with Standard 2 throughout the development.

8.2.6. The strategic SuDS features incorporate a series of attenuation basins to provide attenuation storage volume for flood risk management. These basins will then discharge to existing drainage networks at restricted rates. These basins are to be located within or nearby to the development parcels as practically possible, in some instances with multiple parcels discharging to the same basins. All strategic basins base areas within the development will be finished 25mm below the outfall to allow some infiltration of the everyday rainfall to provide a portion Standard 2 interception storage. These SuDS features also provide enhanced amenity values, as well as water quality control.

8.2.7. SuDS features such as rain gardens, Bio retention areas and permeable paving will be required within individual development parcels so to meet the National SuDS Standard 2 requirements. The interception of the first 5mm of rainfall for the majority of rainfall events will be required to be restricted from discharging off Site.

Figure 10 - Rain Garden Examples

Figure 11 - Permeable Paving Examples



8.2.8. All surface water runoff will be channelled via open conveyance channels and surface water drainage sewers where necessary, to discharge into the allocated pond or basin and into the ordinary watercourses. It is anticipated that the Site will discharge surface water entirely under gravity.

8.2.9. Filter strips may be appropriate and will be considered at detailed design to enhance biodiversity and help improve water quality of the surface water runoff.

8.2.10. The details of SuDS location, depth, and discharge routing, and storage volumes have been shown on the Outline Drainage Strategy plan (WSP Drawing- NSW-WSP-XX-XX-DR-DR-0001), found within Annex C.

8.2.11. Further detailing of this ODS will be undertaken at the post planning stage, to ensure adherence to principles, pursuant to planning condition.

8.3 SURFACE WATER MODELLING AND RESULTS

8.3.1. When undertaking the modelling for the surface water drainage strategy the following assumptions were made:

- The existing Site is predominately greenfield agricultural land. There is a dairy farm to the north of the Site and ancillary barn building to the south adjacent to Great House Farmhouse, which are proposed to be demolished and / or converted.
- HR Wallingford Greenfield Runoff Rate Estimation Tool (www.uksuds.com) was used to determine the proposed greenfield runoff rates.
- The proposed drainage network has been modelled and designed to restrict discharge from the Site during the 2 year, 30 year and 100 year return period rainfall events at the greenfield rate for the equivalent event, through the use of surface water attenuation features across the Site, in line with SuDs best practice and designed to balance flows for all flows generated from events up to the 1 in 100-year plus 45% climate change event.

PROPOSED SURFACE WATER RUNOFF RATES

8.3.2. The existing greenfield run-off rate has been calculated using the FEH method of calculating greenfield run-off using HR Wallingford's www.UKSUDS.com online tool. An assessment of the greenfield runoff rate for the proposed Site, a total of 116.7 ha, is tabulated in **Table 3**. Please find full greenfield calculations in Annex D.

Table 3 - Calculated Greenfield Runoff Rates

Drainage Catchment	Area (ha)	Greenfield Return Period	Greenfield Runoff Rate (l/s)	Greenfield Runoff Rate (l/s/ha)
Total Site	116.7	1 in 2 year	744.9	6.38
		Q bar	846.2	7.25
		1 in 30 year	1946.2	16.68
		1 in 100-years	2699.3	23.13

8.3.3. Discharge rates for each land parcel (hereafter referred to as sub-catchments) have been calculated using a pro-rata method to target the agreed restricted discharge rates. Please refer to Table 5 and Table 6 below.

PROPOSED ATTENUATION REQUIREMENTS

8.3.4. Based on the sub-catchments outlined above, hydraulic modelling has been undertaken using Infodrainage to calculate attenuation requirements for the for the Site using the following parameters and assumptions:

- Infodrainage software has been used for all hydraulic design;
- Urban Creep factor of 10% has been incorporated in calculations relating to residential catchments;
- FEH 2022 point rainfall data has been used;
- CV values are set at 0.75 (75%) for summer and 0.84 (84%) for winter within Infodrainage.
- The proposed surface water storage has been designed to contain flows up to the 1 in 100-year return period plus 45% climate change event, with discharge rates restricted to the existing 1 in 100 year return period rainfall event;

8.3.5. The results of this modelling are summarised in **Table 4**. For detailed modelling attenuation calculations, please refer to Annex D.

Table 4 - Summary of Attenuation Volume Requirements per Catchment

Drainage Catchment	Impermeable Area (ha)	Maximum Required Attenuation Volume (m3)	Provided Attenuation Volume (m3)
North Catchment	10.21	4,320	4,400
South Catchment	25.83	9,985	10,100
Total	36.04	14,305	14,500

8.4 PROPOSED SURFACE WATER DRAINAGE STRATEGY

8.4.1. As mentioned previously, it is proposed to store surface water prior to discharge at a restricted rate via storage basins/ponds located within or nearby to the parcel as practically possible, in some instances with multiple parcels discharging to the same basins. Where land use constraints are such that additional on plot attenuation is required, this has also been identified.

8.4.2. Each basin will collect surface water runoff from its designated sub-catchment and discharge directly to their final discharge locations which include existing watercourses and an existing land drainage ditch.

8.4.3. Based on its topography, the Site has been divided into 2 surface water catchments, with all storage ponds and detention basins located in the North Catchment discharging to the River Arun, and those located in the South Catchment discharging to the River Adur.

8.4.4. A summary of the ponds and basins in the northern catchment is detailed in **Table 5**.

Table 5 - Summary of Drainage Features - North Catchment

Reference	Drained Catchment Area (ha)	Storage Volume (m3)	Catchment Maximum Discharge Rate (l/sec)	Pass Through Maximum Discharge Rate (l/sec)	Total Maximum Discharge Rate (l/sec)
Detention Basin 1	4.705	1,850	70.4	0.0	70.4
Detention Basin 2	3.315	1,550	64.8	0.0	64.8
Detention Basin 3	1.146	425	15.8	0.0	15.8
Detention Basin 10	0.304	150	5.9	14.4	20.3
Tank 1	0.735	345	14.4	0.0	14.4
TOTAL	**10.205**	**4320**	**171.3**		

8.4.1. The Northern Catchment contains four detention basins and a geocellular tank as detailed in **Table 5**.

8.4.2. Basin 1 discharges directly to its final discharge location, the ordinary watercourse to the North of the Site via surface water pipes and sections of swale.

8.4.3. Basin 2 discharges directly to an existing land drainage ditch located adjacent to the drainage sub-catchment via surface water pipes and sections of swale.

8.4.4. Basin 3 discharges directly to the ordinary watercourse to the West of the Site via surface water pipes and sections of swale.

8.4.5. Tank 1 is to be located under proposed parking/service yard areas within the catchment storing rainfall prior to discharging to Basin 10. From here the catchment discharges via surface water pipes and sections of swale to the ordinary watercourse to the North of the Site.

8.4.6. The Southern Catchment contains six detention basins as detailed in **Table 6.**

8.4.7. Basin 4 discharges via surface water pipes and sections of swale to an existing land drainage ditch located to the West of the Site, adjacent to the drainage sub-catchment.

8.4.8. Basin 5 discharges via surface water pipes and sections of swale to the ordinary watercourse to the South West of the Site.

8.4.9. Basin 6 discharges via surface water pipes and sections of swale into Basin 7. Here both catchments then discharge via surface water pipes and sections of swale to an existing land drainage ditch located to the South West of the Site, adjacent to the drainage sub-catchment.

8.4.10. Basin 8 discharges via surface water pipes and sections of swale to the ordinary watercourse to the South West of the Site.

8.4.11. Basin 9 discharges via surface water pipes and sections of swale to the ordinary watercourse to the South of the Site.

Table 6 - Summary of Drainage Features - South Catchment

Reference	Drained Catchment Area (ha)	Storage Volume (m3)	Catchment Maximum Discharge Rate (l/sec)	Pass Through Maximum Discharge Rate (l/sec)	Total Maximum Discharge Rate (l/sec)
Detention Basin 4	6.103	2,400	87.7	0.0	87.7
Detention Basin 5	7.304	2,855	104.3	0.0	104.3
Detention Basin 6	2.425	960	36.6	0.0	36.6
Detention Basin 7	1.414	535	19.5	36.6	56.1
Detention Basin 8	3.677	1,400	50.7	0.0	50.7
Detention Basin 9	4.905	1,835	67.7	0.0	67.7
TOTAL	**25.828**	**9985**	**366.5**		

8.4.12. At detailed stage, subject to final plot layouts the strategic detention basins may need to be supplemented by ‘on-plot’ attenuation storage requirements that will be designed within development parcels as they come forward.

8.4.13. For the purposes of this assessment a portion of this storage has been allowed for. This additional storage has been summarised in **Table 7**.

Table 7 - Summary of Additional 'On-Plot' Storage Allowance

Catchment	Sub-Catchments	Drained Catchment Area (ha)	Storage Volume (m3)
North	Secondary School	1.5	1000
South	Primary School	0.8	500

8.4.14. As mentioned earlier, the Site will be discharging at equivalent greenfield runoff rates in accordance with best practice guidance. The proposed rates have been detailed in **Table 5** and **Table 6** above and the sub-catchments have been hydraulically modelled to understand attenuation requirements set against this design criteria. A detailed assessment of the total volume of attenuation provided per SuDS feature and the sub-catchments draining to each feature is also provided in Annex D.

8.4.15. The detailed dimensions and specific locations of the intended SuDS and storage system requirements shall be reconfirmed at a detailed design stage.

8.5 WATER QUALITY CONTROL

8.5.1. SuDS provide natural variability in their ability to remove contamination from surface water runoff which drains across a Site; therefore the management of water quality is founded on a risk-based approach. The current SuDS Manual (C753) suggests a risk-based approach based on land use type and specific contaminants.

8.5.2. The SuDS Manual (C753), Table 26.1 (refer to **Table 8**) suggests a Simple Index Approach (SIA) for low risk developments, which follows a three-step process, namely:

- Allocate suitable pollution hazard indices for the proposed land use.
- Select SuDS with a total pollution mitigation index that equals or exceeds the pollution hazard index.
- Where the discharge is protected surface waters or groundwater, consider the need for a more precautionary approach.

8.5.3. To successfully deliver adequate treatment, the chosen SuDS components should have a total pollution mitigation index that equals or exceeds the pollution hazard index.

Total SuDS mitigation index ≥ Pollution hazard index

8.5.4. Where the mitigation index of an individual component is insufficient, two components (or more) in series will be required, where:

Total SuDS mitigation index = mitigation index1 + 0.5 (mitigation index2)

Where: *Mitigation Index n = mitigation index for component n*

Table 8 - SuDS Mitigation Index

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Liquid Hydrocarbons (Free Floating Oils)
Residential Roofs	Very Low	0.2	0.2	0.05
Other Roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from roof)	0.05
Individual Property driveways, residential car parks. Low traffic roads (e.g. cul-de-sacs, homezones and general access roads) and non-residential car parks with infrequent change (e.g. schools, offices) – i.e. <300 traffic movements/day.	Low	0.5	0.4	0.4
Commercial Yard and delivery areas, non-residential parking with frequent change (e.g. hospitals/retail); all roads except low traffic roads and trunk roads/ motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste Sites); Sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial Site; trunk roads and motorways.[1]	High	0.8[2]	0.8[2]	0.9[2]

1. Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).
2. These should only be used if considered appropriate as part of a detailed risk assessment –required for all these land use types (see also SuDS manual Table 4.3). When dealing with high hazard Sites, the environmental regulator should first be consulted for pre-permitting advice. This will help to determine the most appropriate treatment approach to the development of a design solution

Source: SuDS Manual CIRIA C753

8.5.5. A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentration.

8.5.6. WSP considers that the pollution hazard indices are as shown in **Table 9** below.

Table 9 - Pollution Hazard Indices

Area	Pollution Hazard Level	TSS	Metals	Liquid Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Other Roofs	Low	0.3	0.2	0.05
Individual Property driveways, residential car parks. Low traffic roads etc.	Low	0.5	0.4	0.4
Commercial Yards	Medium	0.7	0.6	0.7
Total Pollution Hazard Index		**1.7**	**1.4**	**1.2**

Source: SuDS Manual CIRIA C753

8.5.7. The surface water runoff from the roofs, pedestrian areas and areas subject to low vehicular traffic volumes has a low pollution hazard level. The surface water runoff from residential roofs has a very low pollution hazard. This assessment of pollution hazard levels is subject to confirmation and review of the design proposals as the land uses are more clearly defined.

8.5.8. Different SuDS Mitigation Indices for each type of SuDS component are identified in **Table 10** below (reproduced from Table 26.3 in C753).

Table 10 - SuDS Mitigation Indices

Type of SuDS Component	TSS	Metals	Liquid Hydrocarbons
Bioretention System	0.8	0.8	0.8
Filter Strip	0.4	0.4	0.5
Permeable Paving	0.7	0.6	0.7
Detention Basin	0.5	0.5	0.6
Swale	0.5	0.6	0.6

8.5.9. **Table 11** below gives examples of how Mitigation treatment should be assessed

Table 11 – Indicative Treatment Requirements

	Pollution Indices			Primary Mitigation Indices (Filter Strip)			Secondary Mitigation Indices (Detention Basin)			Tertiary Mitigation Indices (Swale)		
Area	TSS	Metals	Liquid Hydrocarbons	TSS	Metals	Liquid Hydrocarbons	TSS	Metals	Liquid Hydrocarbons	TSS	Metals	Liquid Hydrocarbons
Residential Roofs	0.2	0.2	0.05	0.4	0.4	0.5	X	X	X	X	X	X
Other Roofs	0.3	0.2	0.05	0.4	0.4	0.5	X	X	X	X	X	X
Individual Property driveways, residential car parks. Low traffic roads etc.	0.5	0.4	0.4	0.4	0.4	0.5	0.25	0.25	0.3	X	X	X
Commercial Yards	0.7	0.6	0.7	0.4	0.4	0.5	0.25	0.25	0.3	0.25	0.3	0.3

X = No further Treatment Required

For Secondary and Tertiary Mitigation indices values are 0.5 of the Primary value.

8.5.10. Based on the preceding tables, the SuDS mitigation index across the Site exceeds the pollution hazard index, thereby fulfilling the SIA requirements outlined in CIRIA C753. This will undergo further assessment during the detailed design phase to verify compliance within each individual parcel. Incorporating on-parcel systems to deliver Standard 2 interception storage is expected to meet the necessary treatment standards, in conjunction with the downstream strategic basins and swales.

9 OFF SITE IMPACTS

9.1.1. The Flood Risk Assessment & Drainage Strategy demonstrates that the drainage network at the Site will be designed to restrict surface water runoff from the development to greenfield rates while accommodating runoff during all events up to and including the 100-year return period plus 45% climate change allowances with attenuation storage to reduce the flood risk in the downstream network.

9.1.2. As such, the Proposed Development will not have a negative impact on surface water flooding offsite.

9.1.3. The SuDS proposed will provide suitable treatment prior to entering the ordinary watercourse and will provide a benefit to the water quality at outfall.

10 RESIDUAL FLOOD RISK

10.1.1. Based upon the flood risk assessments carried out in previous sections, the Site is at a negligible/low residual risk from the majority of sources of flooding.

10.1.2. The Surface Water Drainage Strategy demonstrates that the drainage network at the Site is designed to accommodate runoff from all events up to and including the 100 year plus 45% climate change allowance storm event. Therefore, any residual risk from surface water flooding due to the climate change at the Site is deemed to be appropriately mitigated by these design measures such that the increase in residual risk from surface water is negligible.

10.1.3. In extreme rainfall events exceeding the 100 year plus 45% climate change storm event drainage exceedance routes have also been considered and allowed for as part of the development. These ensure that any surface water runoff exceeding the drainage network capacity would naturally flow away from the buildings to the less sensitive areas i.e., soft landscaped areas.

These exceedance routes will generally follow the existing topography and are indicated on the Outline Drainage Strategy drawing in Annex C.

11 PROPOSED FOUL WATER DRAINAGE STRATEGY

11.1 PROPOSED DRAINAGE STRATEGY

11.1.1. Foul water runoff from the development will be collected by new gravity drainage networks and conveyed via a series of intermediate gravity and pumped drainage networks to two terminal pumping stations from where they will be pumped off Site to adjacent SWS foul sewer networks, at points of connection currently proposed / identified and to be agreed with SWS. The Site is divided into two catchments (north and south) following the natural topography of the Site, with a terminal pumping station located in each.

11.1.2. The northern catchment will discharge into SWS Manhole Reference 5602 and the southern catchment will discharge into SWS Manhole Reference 6903, subject to the final Southern Water approval.

11.1.3. A pre-planning enquiry has been submitted to SWS to understand the impact of development proposals on the public networks. Southern Water have identified that the proposed points of connection would require offsite upgrade works to accept the proposed flows. These upgrades would be undertaken by Southern Water and would take around 24 months to deliver post planning approval. The nearest point of connection with capacity currently is some 2km South West of the Site at Barns Green WWTW. A copy of this response is included in Annex H.

11.1.4. Final details of the pumping station design and configurations will be confirmed at detailed design stages of the project.

11.1.5. Foul water shall be conveyed via gravity, where possible. Where foul water appliances are located too low to allow for a gravity discharge, the foul water runoff shall convey towards a pumped drainage system.

11.1.6. Please refer to the Foul Outline Drainage Strategy plan (WSP Drawing- NSW-WSP-XX-XX-DR-DR-0002), found within Annex C.

11.1.7. The discharge rates from different land uses have been calculated based on the guidance from the Design and Construction Guidance 2020. The relevant values used can be found in **Table 12**.

Table 12 - Land use and Foul Flow

Land Use	Unit	Flow per Unit	Source
Residential	l/dwelling/day	4000	Design and Construction Guidance (Cl B3.1.1b 4000/l/dwelling/day) Southern Water Foul Sewerage Modelling Criteria
Commercial	/l/s/Ha	0.6	Design and Construction Guidance (Cl B3.1.2a “domestic”) (Cl B3.1.2b “normal industry”)
Education	/l/s/Ha	0.6	Design and Construction Guidance (Cl B3.1.2a “domestic”) assumed unlikely to generate Trade Effluent

11.2 FOUL WATER FLOW RATE CALCULATIONS

11.2.1. **Table 13** below details the estimated flows generated by each catchment areas and the proposed discharge rate from the northern and southern terminal pumping stations to SWS public network.

11.2.2. Incoming flow rates and sub-catchment flow rates have been determined based on a pro-rata density method. These have been calculated using sub-catchment areas and the density categories for each sub-catchment provided in drawing ‘A019-011 Revision Q’ (dated 21/01/2026) provided by KPK Architects.

11.2.3. Outgoing flow rates from all pumping stations have been calculated based on advice provided in Design and Construction Guidance 2020. Based on this, outgoing flow rates for preliminary sizing of the pumping stations have been calculated based on 50% of the incoming peak design flow rate.

11.2.4. Foul flow allowance for the Primary School and Secondary School have been based on the commercial foul flow allowance provided in Design and Construction Guidance 2020 and in accordance with ‘BS EN 12056-2 System II’. This states that a value of 0.6 l/s/ha of developable land should be used to calculate the domestic design flow for commercial developments in the absence of appropriate information and this has been used to calculate foul flows for the development..

Table 13 - Summary of Catchment Foul Flow Rates and Final Discharge Rates

Catchment	Catchment Area (Ha)	Total Generated Foul Flow Rate (l/s)	Pumped Flow Rate at Terminal Pumping Stations (l/s)
North	34.17	14.3	7.15
South	41.22	34.4	17.2
Total Site	75.39	48.7	24.35

11.2.5. In order to reduce the depths of the terminal pumping stations and minimise health and safety risks associated with deep underground structures, interim parcel pumping stations are proposed in southern and northern catchments. The individual pumping stations will need to be linked via telemetry to ensure the capacity of the terminal pumping stations are not exceeded.

11.2.6. All pumping stations are proposed to be Type 3 Pumping Stations in line with the Design and Construction Guidance 2020. No habitable buildings are proposed within 15m radius of the pumping stations.

11.2.7. In order to ensure that sewerage flooding does not occur at, or upstream of the pumping station during plant or power failure, emergency storages are proposed for each pumping station. According to the Design and Construction Guidance 2020, the emergency storages are calculated based on 160 litres per dwelling for residential development and one hour of peak design flow rate for commercial developments (Cl. D5.5.3).

11.2.8. **Table 14** indicates details of the incoming and outgoing flow rate and the estimated emergency storage for each pumping station. The estimated pumped flow rate and emergency storage will be refined in the detailed stages in consultation with the pump manufacturers.

Table 14 - Summary of Pumping Stations

Drainage Catchment	Pumping Station	Number Of Dwellings	Non-Resi Flow (l/s)	Incoming Flow Rate (l/s)	Pumped Flow Rate (l/s)	Estimated Emergency Storage (m3)
North	Northern Terminal	125	8.05	14.3	7.15	46
South	Southern Terminal	450	11.9	34.4	17.2	110
	Parcel Pumping Station 1	325	0	16.2	8.1	52
	Parcel Pumping Station 2	100	0	5.0	2.5	16

12 SURFACE WATER AND FOUL WATER DRAINAGE MAINTENANCE AND MANAGEMENT STRATEGY

12.1.1. The following drainage maintenance and management strategy (**Table 15**) has been produced and builds on information provided within the SuDS Manual; it is expected that the maintenance for the Proposed Development SuDS will be under the residential management company of the development, in which a suitably qualified maintenance specialist will undertake the work for the entire development.

Table 15 - Drainage Maintenance Requirements

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
Manholes / Inspection Chambers	Inspection chambers will be checked every 6 months for the accumulation of debris and silt and cleaned as necessary.	Clean as necessary. All manhole and inspection chamber covers and frames to be replaced as necessary.	Inspect every 6 months or after large storm.
Drainage Channels / Gullies (where required)	Inspections will be frequent and regular and will include gratings; covers including their locking bolts; sumps and sump buckets; exposed concrete surround and adjacent paving. Channels will be flushed with water or high-pressure jetting (no boiling water or cleaning agent will be used). All silt buckets and sumps will be cleaned out replaced back into the units ensuring they are correctly fitted.	All channel surfaces and joints will be checked and repaired as necessary.	Inspect every 6 months or after large storm.
Detention Basin	Litter and debris removal. Grass cutting – for spillways and access routes. Tidy all dead growth before start of growing season.	Grass cutting – meadow grass in and around basin. Manage other vegetation and remove nuisance plants.	Remove sediment from inlets, outlet and forebay. Manage wetland plants in outlet pool.
Swales	Litter and debris removal and grass cutting. Inspect and manage vegetation coverage and remove nuisance plans. Inspect inlets and outlets for overflow and blockages.	Reseed areas of poor vegetation growth. Alter plant types to better suite conditions.	Monthly maintenance to be reduced as required.

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
	Inspect infiltration for ponding.		
Filter Strip	Removal of litter and debris. Mowing to retain grass length of 75mm – 150mm across the main treatment surface. Inspect filter strip for evidence of erosion, poor vegetation growth, compaction, ponding or sedimentation. Inspect silt accumulation rates and establish appropriate removal frequencies.	Occasional removal of sediments if deposits exceed 25mm. Reseed areas of poor vegetation growth. Alter plant types to better suite conditions.	Monthly monitoring, to be reduced to every 6 months when required.
Permeable Paving	Litter Removal: Clear debris and leaves to prevent joint clogging. Visual Inspections: Check for signs of clogging, standing water, or sediment accumulation. Weed Control: Remove any vegetation growing in the joints. Joint Inspection: Check the grit in the joints. Inspection of Inlets/Outlets: If the system connects to other SuDS, check these for debris.	Brushing and Vacuuming: Perform a thorough cleaning, ideally 3 times per year (end of winter, mid-summer, after autumn leaf fall) or at minimum once a year. Use a vacuum road sweeper to remove sediment from the surface. Joint Refilling: Replace any jointing material lost during brushing.	Rehabilitation: If severe clogging occurs, the top surface layer and bedding material may need to be replaced (typically every 10–25 years). Repairs: Replace damaged, broken, or sunken blocks to maintain structural integrity. Winter Care: Remove snow with care, setting plow blades 10–25mm (0.5 to 1 inch) above the surface to prevent damage.
Rain Gardens	Litter and debris removal and grass cutting. Inspect and manage vegetation coverage and remove nuisance plans. Inspect inlets and outlets for overflow and blockages. Inspect infiltration for ponding.	Reseed areas of poor vegetation growth. Alter plant types to better suite conditions.	Monthly maintenance to be reduced as required.

Drainage Feature	Regular Maintenance	Occasional Maintenance	Monitoring
Bioretention Areas	Litter and debris removal and grass cutting. Inspect and manage vegetation coverage and remove nuisance plans. Inspect inlets and outlets for overflow and blockages. Inspect infiltration for ponding.	Reseed areas of poor vegetation growth. Alter plant types to better suite conditions.	Monthly maintenance to be reduced as required.

13 CONCLUSIONS

13.1.1. This FRA and ODS has been prepared by WSP on behalf of Berkeley Strategic Land Ltd to support an outline Planning Application for a new mixed-use development. The Site is located West of Southwater, West Sussex and is located within the administrative area of Horsham District Council (HDC).

13.1.2. The Proposed Development involves the outline application for a mixed-use strategic development to include:

- Approximately 1,000 homes, plus a care home of up to 80 beds (a mix of C2 and C3 use classes);
- An employment area (use class B2, B8, E(g));
- Mixed used neighbourhood centre (use class E & F);
- Sport and leisure facilities;
- Redevelopment of existing agricultural buildings including construction of a building for community use (use class F2);
- Provision for a nursery, primary and secondary school (use class F1(a), E(f));
- Gypsy and traveller pitches;
- Landscaping, open space; and
- New road and Public Right of Way (PRoW) improvements.

13.1.3. In addition, the development proposal also noted there would be an emphasis to enhance open spaces, wildlife and provide biodiversity improvements.

13.1.4. The Proposed Development Site is bounded by the A24 to the north, Worthing Road to the east, agricultural land and residential housing to the south, and Marlpost Road and Two Mile Ash Road to the west. The Site is centred at:

- National Grid Reference: TQ15415 27556
- Easting, Northing: 515415, 127556
- Nearest Postcode: RH13 0LB

13.1.5. Flood risk has been assessed at the development from a number of sources with the Site in terms of topography, geology, hydrogeology and climate change by reviewing the available information, and aims to identify the potential sources of flooding and how residual flood risk will be managed without causing flood risk elsewhere. The site-specific FRA has been prepared in accordance with national, reginal and local planning policies and in consultation with the EA, HDC, WSCC as the LLFA as well as Southern Water (SW). The FRA can be summarised as follows:

- The EA mapping confirms that the proposed Site is within Flood Zone 1 (fluvial/tidal).
- The flood risk from rivers and the sea is assessed as **Low.**
- The flood risk from groundwater is assessed as **Low.**
- The flood risk from surface water is assessed as **Low.**
- The flood risk from reservoir has been assessed as **Negligible.**
- The flood risk from surface and foul water sewers has been assessed as not relevant.

13.1.6. The drainage strategies for the Site have been designed in accordance with both national and local planning guidance.

13.1.7. The proposed Surface Water ODS discharges surface water in line with the drainage hierarchy. Infiltration is not feasible at the Site therefore surface water will discharge into two onsite watercourses at the restricted equivalent to greenfield rates, up to the 1 in 100 year event with climate change allowance. The required volume of attenuation at the development is proposed to be provided by implementing attenuation storage basins with permanently wet volumes to enhance biodiversity potential, with the surface water flow being carried by gravity using conveyance channels, where necessary, to the ultimate point of discharge, the onsite ordinary watercourses.

13.1.8. The proposed Foul Water Drainage Strategy will drain foul water via a mix of gravity and pumped drainage networks to two terminal pumping stations, located in the north and south of the Site. The two terminal pumping stations will ultimately discharge offsite to the existing SWS sewer network at points of connection agreed with Southern Water see Annex H for details.

Annex A

SITE LOCATION PLAN

Public

General Notes

The contractor is responsible for checking dimensions, tolerances and references. Any discrepancy to be verified with the Architect before proceeding with the works. Where an item is covered by drawings to different scales the larger scale drawing is to be worked to.

Do not scale drawing. Figured dimensions to be worked to in all cases.

CDM REGULATIONS 2015. All current drawings and specifications for the project must be read in conjunction with the Designer's Hazard and Environment Assessment Record.
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KEY

Proposed Application Boundary

100m 200m 300m 400m 500m

REV	DATE	NOTES	INT
Q	21.01.2026	Issued for information	BF

STATUS
For Information

PROJECT TITLE
Land North West of Southwater

DRAWING TITLE / LOCATION
Proving Layout Plan

DRAWN BY	CHECKED	SCALE
BF	SK	1:5000 @ A1

PROJECT	DRAWING NUMBER	REVISION
A019	0014	Q

KPK Studios Limited, London

DO NOT SCALE

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REV	DATE	BY	DESCRIPTION	CHK	APP
P01	08/12/2025	DSB	FIRST ISSUE	DSB	SAP

DRAWING STATUS:
S0 - WORK IN PROGRESS

Unit 9 The Chase, John Tate Road, Foxholes Business Park, Hertford, SG13 7NN, UK
T+ 44 (0) 1992 526 000, F+ 44 (0) 1992 526 001
wsp.com

CLIENT:
BERKELEY STRATIGIC LAND LIMITED

ARCHITECT:
KPK STUDIOS

SITE/PROJECT:
LAND WEST OF SOUTHWATER

TITLE:
SITE LOCATION PLAN

SCALE @ A1:	CHECKED:		APPROVED:
1:10000	DSB		SAP
PROJECT NO:	DESIGNED:	DRAWN:	DATE:
UK0043490,9681	DSB	DSB	January 26

DRAWING No: NSW-WSP-00-XX-SK-CE-0000-001 REV: P01

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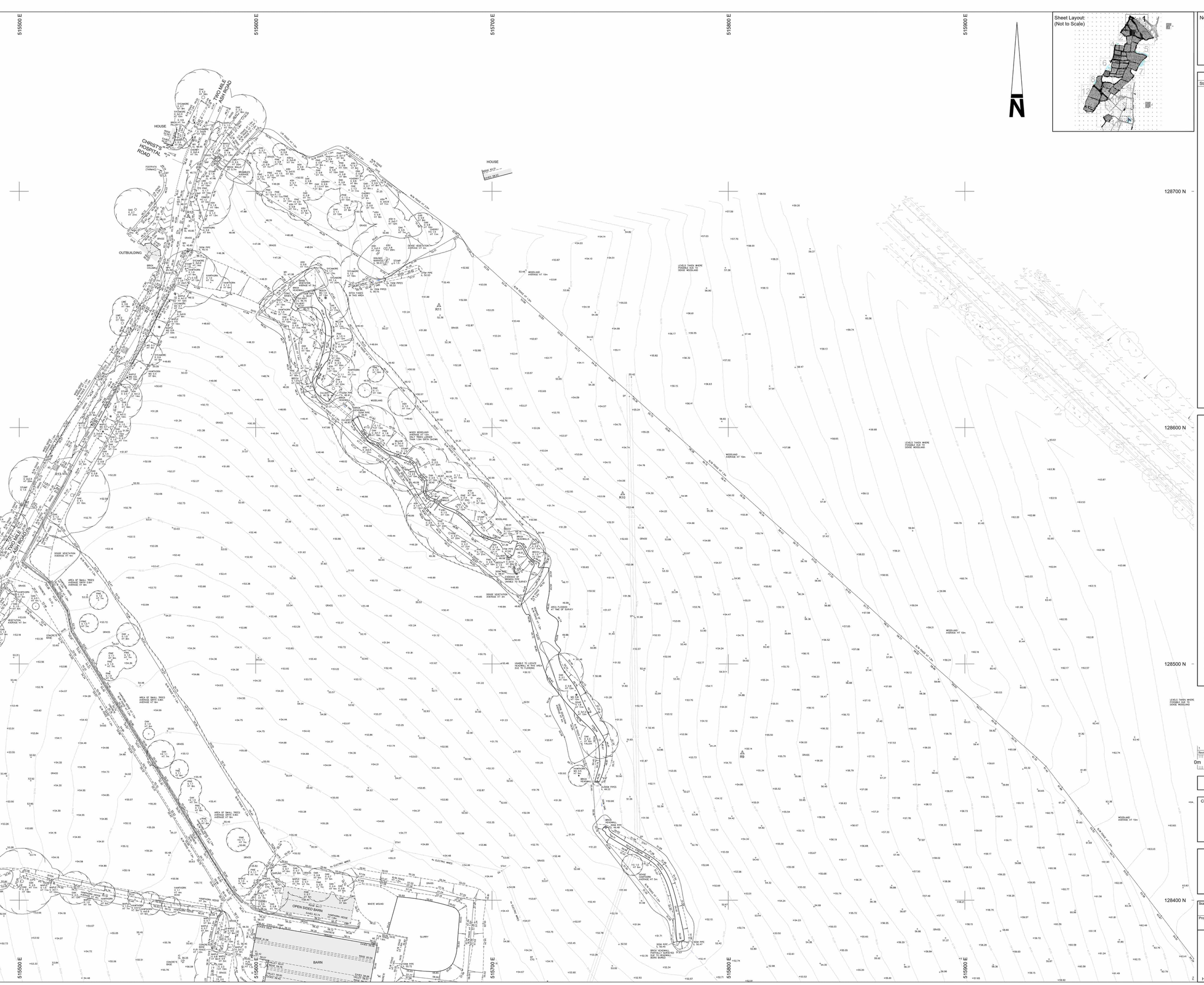
0 500 metres

File name:\\UK\WSPGROUP.COM\CENTRAL DATA\PROJECTS\70091XXX\70091497 - NORTH SOUTHWATER, PHASE 2\03 WIP\DR DRAINAGE ENGINEER\15 SKETCHES\NSW\NSP-00-XX-SK-CE-0000-001.DWG, printed on 08 January 2026 10:47:15, by Brown, Darren

Annex B

TOPOGRAPHICAL SURVEY AND ASSET RECORDS

Public



Notes:

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3. BACKGROUND INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY PRODUCED BY MEON SURVEY PARTNERSHIP. JOB NO: M1353 REV A. DATE: OCTOBER 2013.
4. ORDNANCE SURVEY DIGITAL DATA SHOWN IN BLUE.

Coordinate Table

Station	Description	Easting	Northing	Level
J1	PEG	514691.545	126904.857	48.375
J2	PEG	514738.299	127028.478	49.788
J3	PEG	514873.506	126936.579	44.561
J4	PEG	514860.781	126846.095	44.249
J5	PEG	514650.581	126783.345	46.687
J6	PEG	514611.425	126696.924	45.151
J7	PEG	514702.832	126583.647	41.775
J71	PEG	514667.859	126537.860	40.945
J72	PEG	514577.668	126568.667	42.358
J8	PEG	514782.725	126688.008	43.024
JH1	PEG	515165.382	126980.212	51.020
JH2	PEG	515036.197	126954.748	50.261
JH3	PEG	515528.172	127482.063	58.105
JH4	PEG	515625.221	127592.340	59.167
JH5	PEG	515802.296	127727.424	59.933
JH6	PEG	515646.852	127810.914	58.843
R1	PEG	515527.671	127941.282	57.534
R2	PEG	515625.583	127921.873	58.712
R3	PEG	515673.722	128047.706	58.375
R4	PEG	515690.232	128175.594	57.553
R5	PEG	515668.626	128310.047	58.644
R6	PEG	515798.416	128268.231	55.626
R7	PEG	515914.345	128235.732	57.126
R8	PEG	515870.784	128359.459	55.931
R9	PEG	515805.953	128462.300	55.164
R10	PEG	515755.301	128571.988	53.859
R11	PEG	515677.545	128651.588	52.408
R12	PEG	515571.585	128689.367	46.069
R13	PEG	515519.391	128580.672	50.872
R14	PEG	515474.700	128506.521	51.408
R15	PEG	515397.634	128413.328	49.763
R16	PEG	515330.091	128324.648	52.542
R17	ROAD NAIL	515284.485	128247.736	55.269
R18	PEG	515259.016	128123.964	56.440
S1	PEG	515216.987	127995.138	56.639
S2	PEG	515211.494	127867.368	55.938
S3	PEG	515181.808	127752.826	55.271
S4	PEG	515131.439	127664.492	54.848
S5	PEG	515062.952	127577.959	53.833
S6	PEG	514945.583	127372.101	49.240
S20	PEG	515281.042	127852.201	56.598
S21	PEG	515402.519	127829.679	56.616
S22	PEG	515425.017	127732.489	57.616
S23	PEG	515350.482	127706.732	57.577
S24	PEG	515436.784	127659.275	57.691
S25	PEG	515461.161	127589.953	58.200
S26	PEG	515395.734	127460.775	56.932
S27	PEG	515213.497	127362.873	55.386
S28	PEG	515040.593	127403.982	54.309
SW1	ROAD NAIL	514734.034	127127.839	50.150
SW2	ROAD NAIL	514792.096	127067.072	49.971
SW3	PEG	514860.321	127069.953	46.825
SW4	PEG	514842.798	127200.269	49.842
SW5	PEG	514926.589	127326.585	49.794
SW6	PEG	515451.292	127311.551	57.104
SW7	PEG	515362.811	127175.751	54.847
SW8	PEG	515182.862	127133.993	52.498
SW9	PEG	514989.372	127031.281	50.785
SW20	ROAD NAIL	514852.876	127012.106	49.788
SW21	ROAD NAIL	514903.477	126969.283	49.645
SW22	ROAD NAIL	514958.572	126918.169	49.860
SW23	ROAD NAIL	514998.633	126883.808	50.058
SW24	ROAD NAIL	515054.515	126837.542	49.957

TOPOGRAPHICAL KEY

GENERAL ABBREVIATIONS

SURVEY STATION	5	AIR CONDITIONING UNIT	ADU
		AIR VALVE	AV
		AVENUE	Av.
BANKING	TOP / BOTTOM	BACK DROP	BD
		BASE LEVEL	BL
		BELISHA BEACON	BB
		BOLLARD	BO
HEDGE SPREADS		BOLLARD LIGHT	BOL
		BRICK	BK
		BUS STOP	BS
WOODLAND CANOPY		CABLE RISER	CR
		CABLE TV COVER	CATV
		CABLES TO GROUND	CTG
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS		CATCH PIT	CP
		CONTROL BOX	CB
		COVER LEVEL	CL
		CROSSING CONTROL BUTTON	CCB
TREES	SPREAD & GIRTH SHOWN TO SCALE	DAMP PROOF COURSE	DPC
		DRAINAGE CHANNEL	DCH
		DROP KERB	DK
		ELECTRICITY POLE	EP
		FENCE	F
GATE		FIRE HYDRANT	FH
		FLOOR LEVEL	FL
KERB CHANNEL		FOOTPATH	FP
ROAD UNKERBED		FOUL WATER	FW
		GAS RISER	GR
FOOTPATH		GAS VALVE	GV
		GATE	G
CHANGE IN SURFACE		GULLY	GY
		HARD BED	HB
FENCE		INSPECTION COVER	IC
		INVERT LEVEL	IL
WALL		KERB OUTLET	KO
		LAMP POST	LP
OVERHEAD ELECTRIC		MANHOLE	MH
		METAL POST	MP
OVERHEAD TELECOM		METER	MT
		NO PIPES VISIBLE	NPV
FOUL SEWER		ORDNANCE SURVEY BENCH MARK	OSBM
		P-TRAP	PT
SURFACE SEWER		POST	P
		POST BOX	P BOX
P-TRAP		RODDING EYE	RE
		ROAD SIGN	RS
BACK DROP (EXTERNAL)		RAIN WATER PIPE	RWP
		RETAINING WALL	RW
BACK DROP (INTERNAL)		SOFT BED	SB
		SOIL PIPE	SP
BUILDING		STREET NAME PLATE	SNP
		STOP VALVE	SV
OPEN SIDED BUILDING		SOIL PIPE	SP
		SOIL VENT PIPE	SVP
OVERHANG / CANOPY		SURFACE WATER	SW
		TACTILE PAVING	TAC
GLASSHOUSE		TELECOM	TEL
		TELECOM INSPECTION COVER	TIC
CONTOUR	20.00	TELEPHONE CALL BOX	TCB
		TICKET MACHINE	TM
SPOT LEVEL	+ 127.13	TOP OF WALL	TOW
SONAR LEVEL	⊙ 127.13	TRAFFIC LIGHT	TL
		TRAFFIC LIGHT COVER	TLC
BORE HOLE	BH	THRESHOLD LEVEL	THL
		UNABLE TO LOCATE	UTL
TRIAL HOLE	TH	UNABLE TO RAISE	UTR
		UNABLE TO SURVEY	UTS
		VENT PIPE	VP
		WATER LEVEL	WL
		WATER METER	WM
		WASH OUT	WO
		WATER RISER	WR
		WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	I/R
CLOSE BOARDED FENCE	C/B	LARCH LAP FENCE	L/L
CONCRETE PANEL FENCE	CPL	POST AND RAIL FENCE	P/R
CORRUGATED IRON FENCE	C/I	POST AND WIRE FENCE	P/W
CHAIN LINK FENCE	CL	WIRE MESH FENCE	W/M
CHESTNUT PALING	CNP		

Revision	Description	Surv. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.	A	KJ	EP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client: Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	1	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

mksurveys
www.mksurveys.com www.surveys4bim.co.uk
Head Office: Milton Keynes t: 01908 565561 e: mail@mksurveys.co.uk

Notes:

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JH6	PEG	515646.852	127810.914	58.843
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R2	PEG	515625.583	127921.873	58.712
R3	PEG	515673.722	128047.706	58.375
R4	PEG	515690.232	128175.594	57.553
R5	PEG	515668.626	128310.047	58.644
R6	PEG	515798.416	128268.231	55.626
R7	PEG	515914.345	128235.732	57.126
R8	PEG	515870.784	128359.459	55.931
R9	PEG	515805.953	128462.300	55.164
R10	PEG	515755.301	128571.988	53.859
R11	PEG	515677.545	128651.588	52.408
R12	PEG	515571.585	128689.367	46.069
R13	PEG	515519.391	128580.672	50.872
R14	PEG	515474.700	128506.521	51.408
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R16	PEG	515330.091	128324.648	52.542
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S5	PEG	515062.952	127577.959	53.833
S6	PEG	514945.583	127372.101	49.240
S20	PEG	515281.042	127852.201	56.598
S21	PEG	515402.519	127829.679	56.616
S22	PEG	515425.017	127732.489	57.616
S23	PEG	515350.482	127706.732	57.577
S24	PEG	515436.784	127659.275	57.891
S25	PEG	515461.161	127589.953	58.200
S26	PEG	515395.734	127460.775	56.932
S27	PEG	515213.497	127362.873	55.386
S28	PEG	515040.593	127403.982	54.309
SW1	ROAD NAIL	514734.034	127127.839	50.150
SW2	ROAD NAIL	514892.096	127067.072	49.971
SW3	PEG	514860.321	127069.953	46.825
SW4	PEG	514842.798	127200.269	49.842
SW5	PEG	514926.589	127326.585	49.794
SW6	PEG	515451.292	127311.551	57.104
SW7	PEG	515362.811	127175.751	54.847
SW8	PEG	515182.662	127133.993	52.488
SW9	PEG	514989.372	127031.281	50.785
SW20	ROAD NAIL	514852.876	127012.106	49.788
SW21	ROAD NAIL	514903.477	126969.283	49.645
SW22	ROAD NAIL	514958.572	126918.169	49.860
SW23	ROAD NAIL	514998.633	126883.808	50.058
SW24	ROAD NAIL	515054.515	126837.542	49.957

TOPOGRAPHICAL KEY

SURVEY STATION 5 (TOP / BOTTOM)
BANKING
HEDGE SPREADS
WOODLAND CANOPY
ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/AWAY
TREES (SPREAD & GIRTH SHOWN TO SCALE)
GATE
KERB CHANNEL
ROAD UNKERBED
FOOTPATH
CHANGE IN SURFACE
FENCE
WALL
OVERHEAD ELECTRIC
OVERHEAD TELECOM
FOUL SEWER
SURFACE SEWER
P-TRAP
BACK DROP (EXTERNAL)
BACK DROP (INTERNAL)
BUILDING
OPEN SIDED BUILDING
OVERHANG / CANOPY
GLASSHOUSE
CONTOUR (0.05)
SPOT LEVEL + 127.13
SONAR LEVEL 127.13
BORE HOLE BH
TRIAL HOLE TH

GENERAL ABBREVIATIONS

AIR CONDITIONING UNIT	ACU
AIR VALVE	AV
AVERAGE	AV
BACK DROP	BD
BENCH LEVEL	BL
BELISHA BEACON	BB
BOLLARD	BO
BOLLARD LIGHT	BOL
BRICK	BK
BUS STOP	BS
CABLE RISER	CR
CABLE TV COVER	CATV
CABLES TO GROUND	CTG
CATCH PIT	CP
CONTROL BOX	CB
CONVEX LEVEL	CL
CROSSING CONTROL BUTTON	CCB
DAMP PROOF COURSE	DPC
DRAINAGE CHANNEL	DCH
DROP KERB	DK
ELECTRICITY POLE	EP
FENCE POST	FP
FIRE HYDRANT	FH
FLOOR LEVEL	FL
FOOTPATH	FP
FOUL WATER	FW
GAS GOVERNOR	GT
GAS VALVE	GV
GULLY	G
HARD BED	HB
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
MANHOLE	MH
MARKHOLE	MH
MARKER POST	MK
METER	MT
NO PIPES VISIBLE	NPV
ORDNANCE SURVEY BENCH MARK	OSBM
P-TRAP	PT
PIPE	P
POST BOX	P.BOX
RODDING EYE	RE
ROAD SIGN	RS
RAIN WATER PIPE	RWP
RETAINING WALL	RW
SOFT BED	SB
STONE PITCH	SP
STREET NAME PLATE	SNP
STOP VALVE	SV
SOIL PIPE	SP
SOIL VENT PIPE	SVP
STREET LAMP	SL
TACTILE PAVING	TAC
TELECOM POLE	TP
TELECOM INSPECTION COVER	TEL
TELEPHONE CALL BOX	TCB
TICKET MACHINE	TM
TOP OF WALL	TOW
TRAFFIC LIGHT	TL
TRAFFIC LIGHT COVER	TLC
THRESHOLD LEVEL	THL
UNABLE TO LOCATE	UTL
UNABLE TO RAISE	UTR
UNABLE TO SURVEY	UTS
VALVE	VA
WATER LEVEL	WL
WATER METER	WM
WASH OUT	WO
WATER RISER	WR
WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	I/R
CLOSE BOARDED FENCE	C/B	LARCH LAP FENCE	L/L
CONCRETE PANEL FENCE	C/PL	POST AND RAIL FENCE	P/R
CHAIN LINK MESH FENCE	CL	POST AND WIRE FENCE	P/W
CHAIN LINK FENCE	CL	WIRE MESH FENCE	W/M
CHESTNUT PALING	CNP		

Revision	Description	Surv. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.		AJ	CP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client: Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	2	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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Sheet Layout: (Not to Scale)

Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR APPLIED (0.99976).
2. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.
3. BACKGROUND INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY PRODUCED BY MEON SURVEY PARTNERSHIP. JOB NO: M1353 REV A. DATE: OCTOBER 2013.
4. ORDNANCE SURVEY DIGITAL DATA SHOWN IN BLUE.

Coordinate Table

Station	Description	Easting	Northing	Level
J1	PEG	514691.545	126904.857	48.375
J2	PEG	514738.299	127028.478	49.788
J3	PEG	514873.506	126936.579	44.561
J4	PEG	514860.781	126846.095	44.249
J5	PEG	514650.581	126783.345	46.687
J6	PEG	514611.425	126696.924	45.151
J7	PEG	514702.832	126583.647	41.775
J71	PEG	514667.859	126537.860	40.945
J72	PEG	514577.668	126568.667	42.358
J8	PEG	514782.725	126688.002	43.024
JH1	PEG	515165.382	126980.212	51.020
JH2	PEG	515036.197	126954.748	50.261
JH3	PEG	515528.172	127482.063	58.105
JH4	PEG	515625.221	127592.340	59.167
JH5	PEG	515802.296	127727.424	59.933
JH6	PEG	515646.852	127810.914	58.843
R1	PEG	515527.671	127941.282	57.534
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TOPOGRAPHICAL KEY

SURVEY STATION — BANKING — HEDGE SPREADS — WOODLAND CANOPY — ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/AWAY — TREES — GATE — KERB CHANNEL — ROAD UNKERBED — FOOTPATH — CHANGE IN SURFACE — FENCE — WALL — OVERHEAD ELECTRIC — OVERHEAD TELECOM — FOUL SEWER — SURFACE SEWER — P-TRAP — BACK DROP (EXTERNAL) — BACK DROP (INTERNAL) — BUILDING — OPEN SIDED BUILDING — OVERHANG / CANOPY — GLASSHOUSE — CONTOUR — SPOT LEVEL — SONAR LEVEL — BORE HOLE — TRIAL HOLE

GENERAL ABBREVIATIONS

AIR CONDITIONING UNIT	ACU
AIR VALVE	AV
AVERAGE	Av.
BACK DROP	BD
BENCH LEVEL	BL
BELISHA BEACON	BB
BOLLARD	BO
BOLLARD LIGHT	BOL
BRICK	BK
CABLE RISER	CR
CABLE TV COVER	CATV
CABLES TO GROUND	CTG
CATCH PIT	CP
CONTROL BOX	CB
COVER LEVELS	CL
CROSSING CONTROL BUTTON	CCB
DAMP PROOF COURSE	DPC
DRAINAGE CHANNEL	DCH
DROP KERB	DK
ELECTRICITY POLE	EP
FENCE POST	FP
FIRE HYDRANT	FH
FLOOR LEVEL	FL
FOOTPATH	FP
FOUL WATER	FW
GAS RISER	GR
GAS VALVE	GV
GULLY	GY
HARD BED	HB
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
LAMP POST	LP
MANHOLE	MH
MARKER POST	MP
METER	MT
NO PIPES VISIBLE	NPV
ORDNANCE SURVEY BENCH MARK	OSBM
P-TRAP	PT
POST	PO
POST BOX	P.BOX
RODDING EYE	RE
ROAD SIGN	RS
RAIN WATER PIPE	RWP
RETAINING WALL	RW
SOFT BED	SB
STEPS/RAMP	SR
STORM MANHOLE PLATE	SMP
STOP VALVE	SV
SOIL PIPE	SP
SOIL VENT PIPE	SVP
SURFACE WATER	SW
TACTILE PAVING	TAC
TELEGRAPH POLE	TP
TELECOM INSPECTION COVER	TEL
TELEPHONE CALL BOX	TCB
TICKET MACHINE	TM
TOP OF WALL	TOW
TRAFFIC LIGHT	TL
TRAFFIC LIGHT COVER	TLC
TRAFFIC SIGNAL	TS
UNABLE TO LOCATE	UTL
UNABLE TO RAISE	UTR
UNABLE TO SURVEY	UTS
VENT PIPE	VP
WATER LEVEL	WL
WATER METER	WM
WASH OUT	WO
WATER RISER	WR
WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	BWF	IRON RAILINGS
CLOSE BOARDED FENCE	CBF	LARCH LAP FENCE
CONCRETE PANEL FENCE	CPF	POST AND RAIL FENCE
CORRUGATED IRON FENCE	CIF	POST AND WIRE FENCE
CHAIN LINK FENCE	CLF	WIRE MESH FENCE
CHESTNUT PALING	CNP	

Revision	Description	Surv. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.	A.	AJ	DP	February 2022

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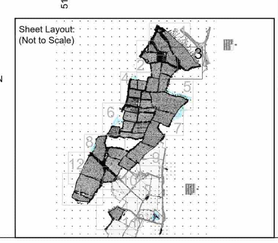
Topographical Survey

Client:

Berkeley

Southwater
Horsham
West Sussex

Sheet Layout:
(Not to Scale)



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1:500	A0	3	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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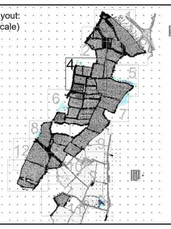

N

515200 E
515300 E
515400 E
515500 E
515600 E

128100 N
128000 N
127900 N
127800 N

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SW24	ROAD NAIL	515054.515	126837.542	49.957

TOPOGRAPHICAL KEY

GENERAL ABBREVIATIONS

SURVEY STATION	5	AIR CONDITIONING UNIT	ACU
	TOP	AIR VALVE	AV
BANKING	BOTTOM	AVERAGE	AV.
		BACK DROP	BD
HEDGE SPREADS		BACK OF LEVEL	BL
		BELISHA BEACON	BB
WOODLAND CANOPY		BOLLARD	BO
		BOLLARD LIGHT	BOL
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS		BRICK	BK
		BUS STOP	BS
		CABLE RISER	CR
		CABLE TV COVER	CATV
		CABLES TO GROUND	CTG
		CATCH PIT	CP
		CONTROL BOX	CB
		COVER LEVEL	CL
		CROSSING CONTROL BUTTON	CCB
TREES	SPREAD & GIRTH SHOWN TO SCALE	DAMP PROOF COURSE	DPC
		DRAINAGE CHANNEL	DCH
		DROP KERB	DK
		DRY RISING POLE	DR
		EARTH ROD	ER
GATE		FIRE HYDRANT	FH
		FLOOR LEVEL	FL
KERB CHANNEL		FOOTPATH	FP
ROAD UNKERBED		FOUL WATER	FW
		GAS RISER	GR
FOOTPATH		GAS VALVE	GV
		GULLY	GY
CHANGE IN SURFACE		HARD BED	HB
		INSPECTION COVER	IC
FENCE		INVERT LEVEL	IL
		KERB OUTLET	KO
WALL		LAMP POST	LP
		MANHOLE	MH
OVERHEAD ELECTRIC		MARKER POST	MK
		METER	MT
OVERHEAD TELECOM		NO PIPES VISIBLE	NPV
		ORDNANCE SURVEY BENCH MARK	OSBM
FOUL SEWER		PEDESTAL	PD
		POST	PO
SURFACE SEWER		POST BOX	P.BOX
		RODDING EYE	RE
P-TRAP		ROAD SIGN	RS
		RAIN WATER PIPE	RWP
BACK DROP (EXTERNAL)		RETAINING WALL	RW
		SOIL VENT	SV
BACK DROP (INTERNAL)		STOP COCK	SC
		STREET NAME PLATE	SNP
BUILDING		STOP VALVE	SV
		SOIL PIPE	SP
		SURFACE WATER PIPE	SWP
OPEN SIDED BUILDING		SURFACE WATER	SW
		TACTILE PAVING	TAC
OVERHANG / CANOPY		TELECOM POLE	TP
		TELECOM INSPECTION COVER	TEL
GLASSHOUSE		TELEPHONE CALL BOX	TCB
		TICKET MACHINE	TM
		TOWER	TOW
CONTOUR	25.00	TRAFFIC LIGHT	TL
		TRAFFIC LIGHT COVER	TLC
SPOT LEVEL	+ 127.13	THRESHOLD LEVEL	THL
SONAR LEVEL	⊙ 127.13	UNABLE TO LOCATE	UTL
		UNABLE TO RAISE	UTR
BORE HOLE	BH	UNABLE TO SURVEY	UTS
TRIAL HOLE	TH	VENT PIPE	VP
		WATER LEVEL	WL
		WATER METER	WM
		WASH OUT	WO
		WATER RISER	WR
		WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE		B/W	IRON RAILINGS	I/R
CLOSE BOARDED FENCE		C/B	LARCH LAP FENCE	L/L
CONCRETE PANEL FENCE		CPL	POST AND RAIL FENCE	P/R
CORRUGATED IRON FENCE		C/I	POST AND WIRE FENCE	P/W
CHESTNUT PALING		CNP	WIRE MESH FENCE	W/M

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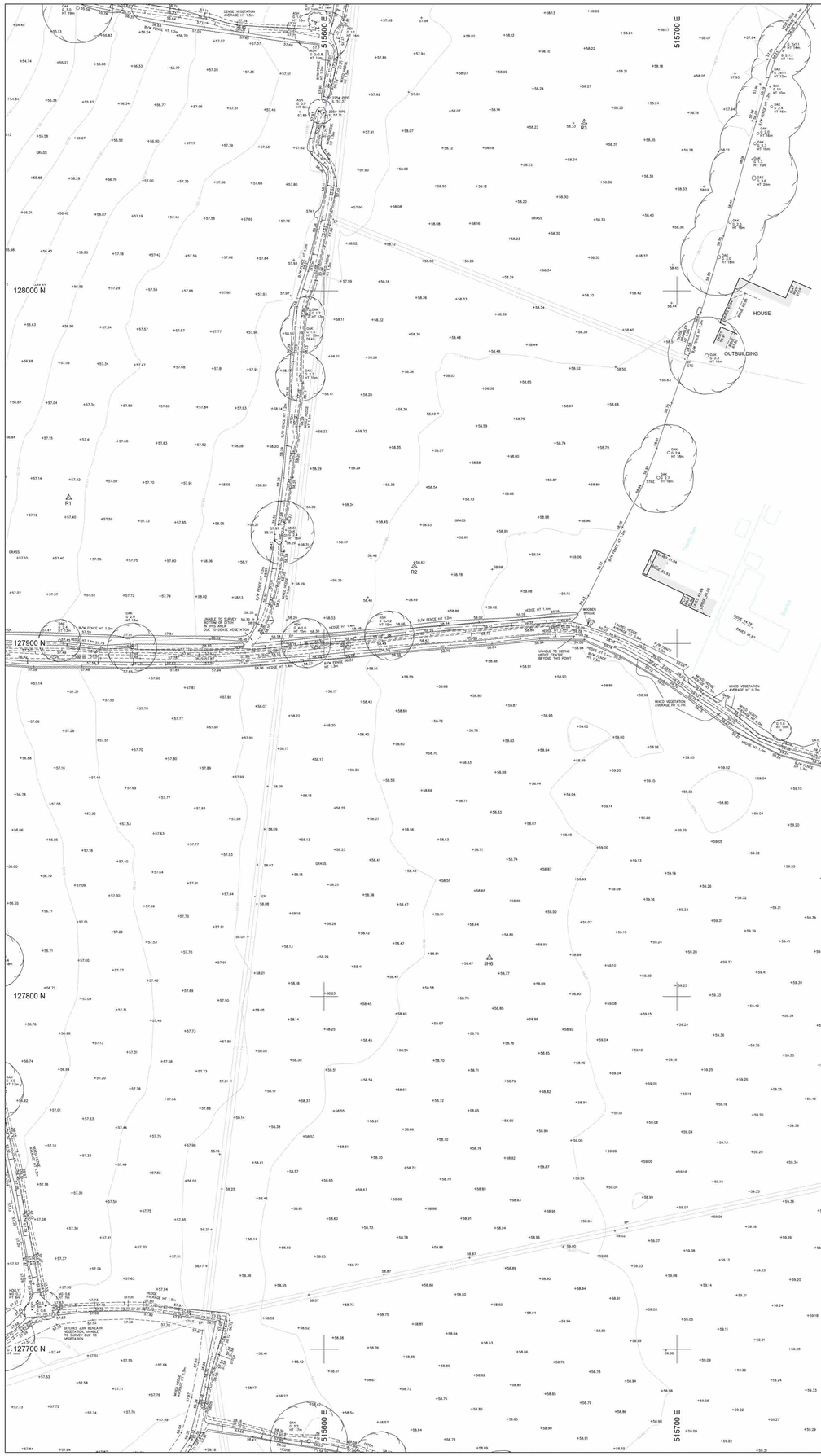
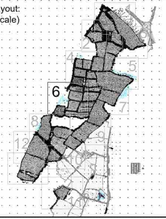

515600 E
515700 E
515800 E
515900 E
516000 E
128000 N
127900 N
127800 N
127700 N
HOUSE
OUTBUILDING
R1
R2
R3
JH5
JH6
GRASS
MIXED VEGETATION AVERAGE HT 0.7m
MIXED VEGETATION AVERAGE HT 0.7m
WOODEN HEDGE
WOODEN HEDGE
B/W FENCE HT 1.3m
B/W FENCE HT 1.5m
HEDGE HT 1.4m
HEDGE HT 1.5m
HEDGE HT 1.6m
HEDGE HT 1.8m
UNABLE TO SURVEY BOTTOM OF DITCH IN THIS AREA DUE TO DENSE VEGETATION
UNABLE TO DEFINE HEDGE VIEWING BEYOND THIS POINT
STONES JOIN BENEATH VEGETATION, UNABLE TO SURVEY DUE TO VEGETATION
DITCH
EP
EDGE OF TARMAC
EDGE OF TARMAC
EDGE OF TARMAC

Sheet Layout:
(Not to Scale)



N

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515100 E
515200 E
515300 E
515400 E
514900 E
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515000 E
515100 E
515200 E
515300 E
515400 E

127700 N
127600 N
127500 N
127400 N

NEWLANDS

TWO MILE ASH ROAD

SHELTER

OAK G 4.4 HT 18m

OAK G 4.8 HT 18m

OAK G 5.2 HT 20m

OAK G 5.5 HT 20m

OAK G 4.0 HT 18m

OAK G 4.2 HT 18m

OAK G 3.1 HT 20m

OAK G 3.4 HT 18m

OAK G 3.6 HT 18m

OAK G 3.8 HT 18m

OAK G 4.1 HT 18m

OAK G 4.3 HT 18m

OAK G 4.5 HT 18m

OAK G 4.7 HT 18m

OAK G 4.9 HT 18m

OAK G 5.1 HT 18m

OAK G 5.3 HT 18m

OAK G 5.4 HT 20m

OAK G 5.6 HT 20m

OAK G 5.7 HT 20m

OAK G 5.8 HT 20m

OAK G 5.9 HT 20m

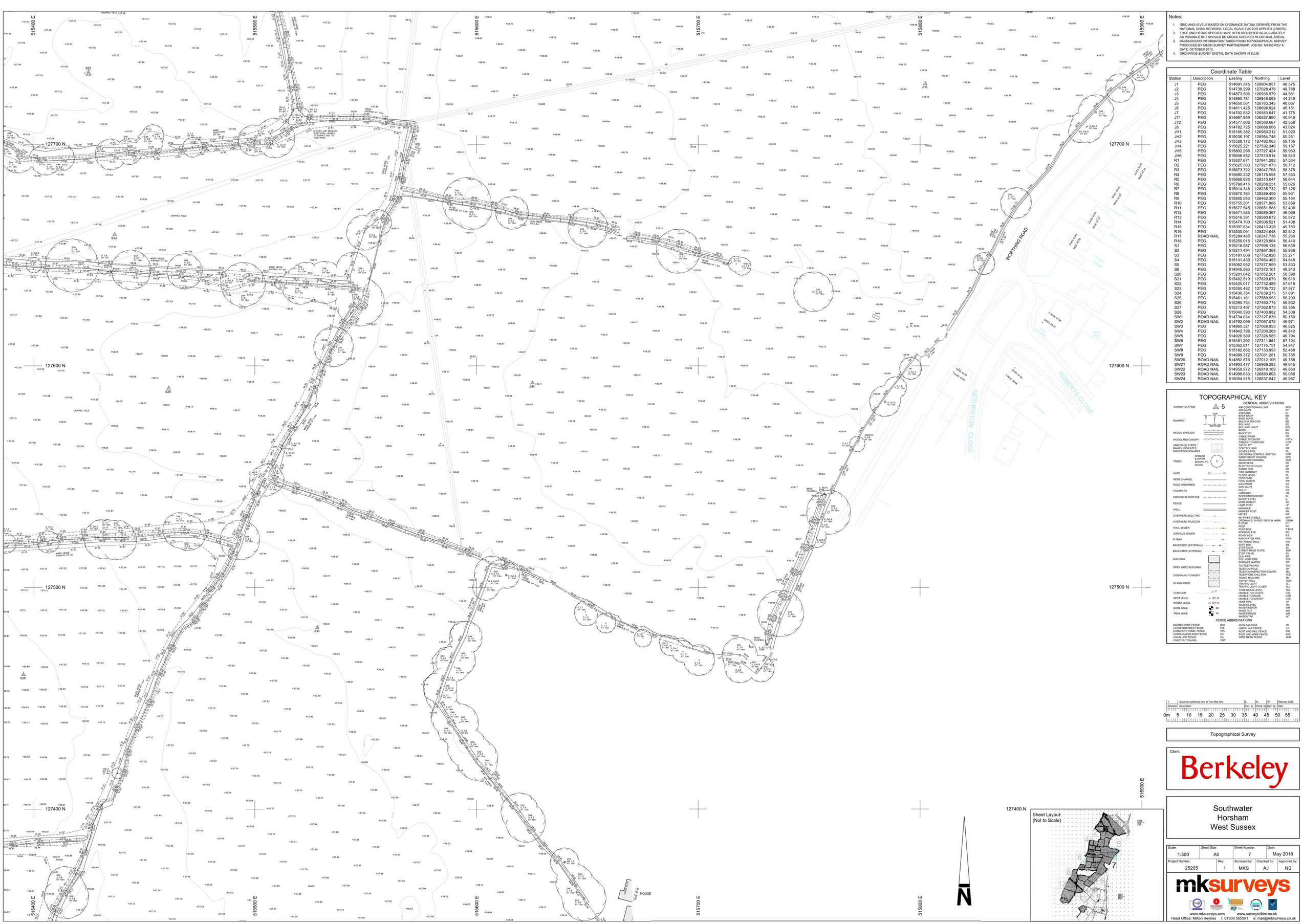
OAK G 6.0 HT 20m

OAK G 6.1 HT 20m

OAK G 6.2 HT 20m

OAK G 6.3 HT 20m

OAK G



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SW6	PEG	515451.292	127311.551	57.104
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SW8	PEG	515182.862	127133.993	52.498
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SW23	ROAD NAIL	514998.633	126883.808	50.058
SW24	ROAD NAIL	515054.515	126837.542	49.957

TOPOGRAPHICAL KEY

SURVEY STATION — 5
BANKING — TOP / BOTTOM
HEDGE SPREADS
WOODLAND CANOPY
ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/AHEAD
TREES — SPREAD & GIRTH SHOWN TO SCALE
GATE
KERB CHANNEL
ROAD UNKERBED
FOOTPATH
CHANGE IN SURFACE
FENCE
WALL
OVERHEAD ELECTRIC
OVERHEAD TELECOM
FOUL SEWER
SURFACE SEWER
P-TRAP
BACK DROP (EXTERNAL)
BACK DROP (INTERNAL)
BUILDING
OPEN SIDED BUILDING
OVERHANG / CANOPY
GLASSHOUSE
CONTOUR — 25.00
SPOT LEVEL — + 127.13
SONAR LEVEL — ○ 127.13
BORE HOLE — BH
TRIAL HOLE — TH

GENERAL ABBREVIATIONS

AIR CONDITIONING UNIT	ACU
AIR VALVE	AV
AVENAGE	Av.
BACK DROP	BD
BACK LEVEL	BL
BELISHA BEACON	BB
BOLLARD	BO
BOLLARD LIGHT	BOL
BRICK	BK
BUS STOP	BS
CABLE RISER	CR
CABLE TV COVER	CATV
CABLES TO GROUND	CTG
CATCH PIT	CP
CONTROL BOX	CB
COVER LEVELS	CL
CROSSING CONTROL BUTTON	CCB
DAMP PROOF COURSE	DPC
DRAINAGE CHANNEL	DCH
DROP KERB	DK
ELECTRICITY POLE	EP
EARTH ROD	ER
FIRE HYDRANT	FH
FLOOR LEVEL	FL
FOOTPATH	FP
FOUL WATER	FW
GAS RISER	GR
GAS VALVE	GV
GRILLY	GY
GRASS BED	GB
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
LAMP POST	LP
MANHOLE	MH
MARKER POST	MK
METER	M
NO PIPES VISIBLE	NPV
ORDNANCE SURVEY BENCH MARK	OSBM
PI-TANP	PIT
POST	PO
POST BOX	PBOX
RODDING EYE	RE
ROAD SIGN	RS
RAIN WATER PIPE	RWP
RETAINING WALL	RW
SOFT BED	SB
STOP COCK	SC
STOP COCK COVER PLATE	SCP
STOP VALVE	SV
SOIL PIPE	SP
SOIL VENT PIPE	SVP
SURFACE WATER	SW
TACTILE PAVING	TAC
TELECOM POLE	TP
TELECOM JUNCTION COVER	TPL
TELEPHONE CALL BOX	TCB
TICKET MACHINE	TM
TOP OF WALL	TOW
TRAFFIC LIGHT	TL
TRAFFIC LIGHT COVER	TLC
THRESHOLD LEVEL	THL
UNABLE TO ACCURATE	UTA
UNABLE TO RAISE	UTR
UNABLE TO SURVEY	UTS
VENT PIPE	VP
WATER LEVEL	WL
WATER METER	WM
WASH OUT	WO
WATER RISER	WR
WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	BW	IRON RAILINGS	IR
CLOSE BOARDED FENCE	CB	LARCH LAP FENCE	LL
CONCRETE PANEL FENCE	CPL	POST AND RAIL FENCE	PR
CORRUGATED IRON FENCE	CI	POST AND WIRE FENCE	PW
CHAIN LINK FENCE	CL	WIRE MESH FENCE	WM
CHESTNUT PALING	CMP		

Sheet Layout: (Not to Scale)

Revision	Description	Surv. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.	JL	AJ	CP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client: Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	7	May 2018
Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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Sheet Layout:
(Not to Scale)

N

514800 E
514900 E
515000 E
515100 E
514700 E
127300 N
127200 N
127100 N
127000 N

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FENCE POST	FP
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FLOOR LEVEL	FL
FOOTPATH	FP
FOUL WATER	FW
GATE VALVE	GV
GULLY	GY
HARD BED	HB
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
MANHOLE	MH
MARKHOLE	MH
MARKER POST	MK
METER	MT
NO PIPES VISIBLE	NPV
ORDNANCE SURVEY BENCH MARK	OSBM
P-TRAP	PT
PIPE	P
POST BOX	P.BOX
RODDING EYE	RE
ROAD SIGN	RS
RAIN WATER PIPE	RWP
RETAINING WALL	RW
SOFT BED	SB
SOIL PIPE	SP
STREET NAME PLATE	SNP
STOP VALVE	SV
SOIL PIPE	SP
SOIL VENT PIPE	SVP
STOP TAP WATER	ST
TACTILE PAVING	TAC
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UNABLE TO RAISE	UTR
UNABLE TO SURVEY	UTS
VENT PIPE	VP
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Topographical Survey

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Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	8	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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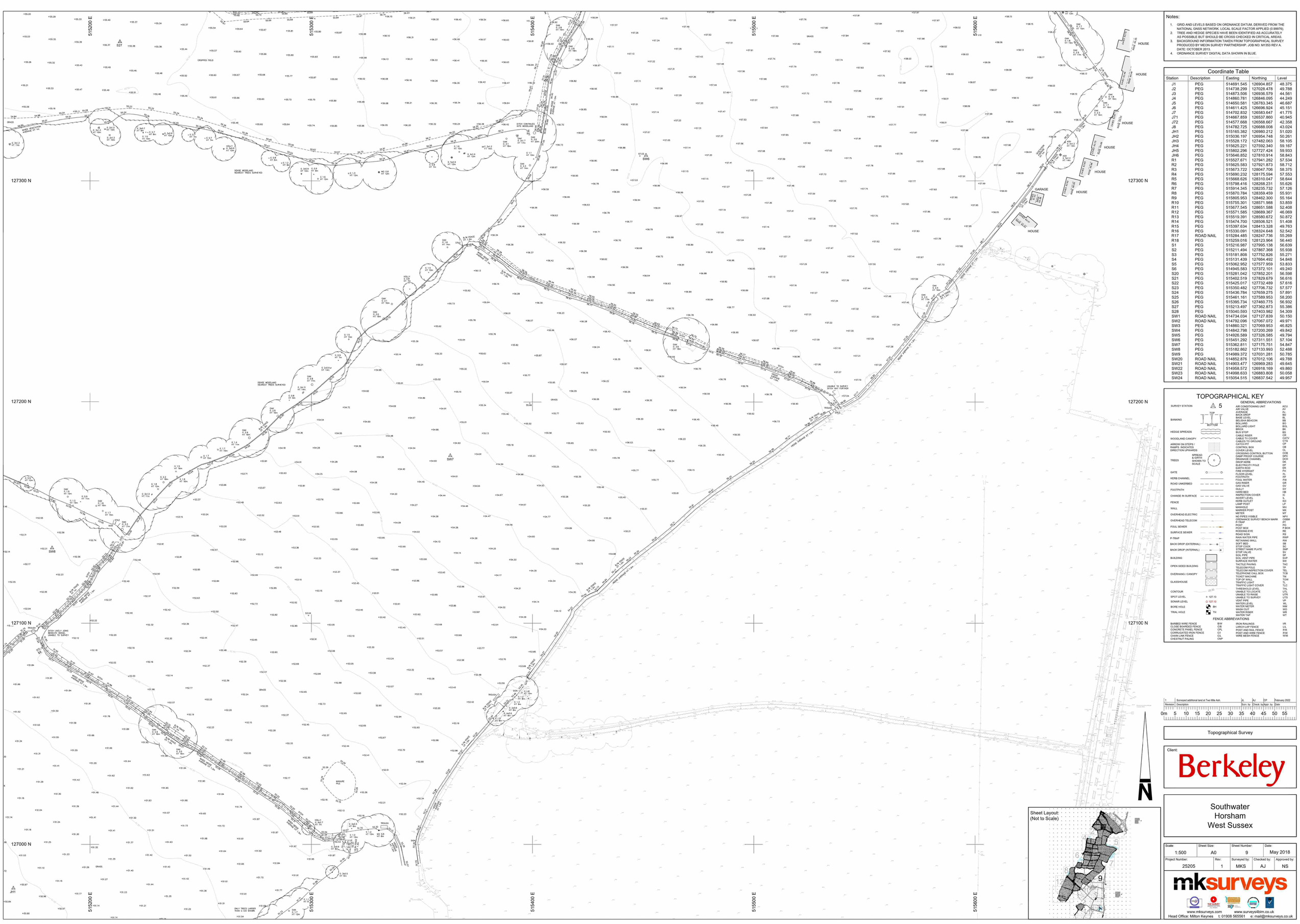

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S28	PEG	515040.593	127403.982	54.309
SW1	ROAD NAIL	514734.034	127127.839	50.150
SW2	ROAD NAIL	514792.696	127067.072	49.971
SW3	PEG	514860.321	127069.953	46.825
SW4	PEG	514842.798	127200.269	49.842
SW5	PEG	514926.589	127326.585	49.794
SW6	PEG	515451.292	127311.551	57.104
SW7	PEG	515362.811	127175.751	54.847
SW8	PEG	515182.862	127133.993	52.498
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SW20	ROAD NAIL	514852.876	127012.106	49.788
SW21	ROAD NAIL	514903.477	126969.283	49.645
SW22	ROAD NAIL	514958.572	126918.169	49.860
SW23	ROAD NAIL	514998.633	126883.808	50.058
SW24	ROAD NAIL	515054.515	126837.542	49.957

TOPOGRAPHICAL KEY

GENERAL ABBREVIATIONS

SURVEY STATION	5	AIR CONDITIONING UNIT	ACU
		AIR VALVE	AV
BANKING	TOP / BOTTOM	AVENUE	Av
		BACK DROP	BD
		BASE LEVEL	BL
		BELISHA BEACON	BB
		BOLLARD	BO
		BOLLARD LIGHT	BOL
HEDGE SPREADS		BRIDGE	BR
		BUS STOP	BS
WOODLAND CANOPY		CABLE RISER	CR
		CABLE TV COVER	CATV
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS		CABLES TO GROUND	CTG
		CATCHPIT	CP
		CHAMBER, BOX	CB
		COVER LEVEL	CL
TREES	SPREAD AS SHOWN TO SCALE	CROSSING CONTROL BUTTON	CCB
		DAMP PROOF COURSE	DPC
		DRAINAGE CHANNEL	DCH
		DROP KERB	DK
		ELECTRICITY POLE	EP
		EARTH ROD	ER
GATE		FIRE HYDRANT	FH
		FLOOR LEVEL	FL
KERB CHANNEL		FOOTPATH	FP
		FOUL WATER	FW
ROAD UNKERBED		GAS RISER	GR
		GAS VALVE	GV
FOOTPATH		GULLY	GY
		HARD BED	HB
CHANGE IN SURFACE		INSPECTION COVER	IC
		INVERT LEVEL	IL
FENCE		KERB LOWERED	KD
		LAMP POST	LP
WALL		MANHOLE	MH
		MARKER POST	MK
OVERHEAD ELECTRIC		METER	MT
		NO PIPES VISIBLE	NPV
OVERHEAD TELECOM		ORDNANCE SURVEY BENCH MARK	OSBM
		PEDESTAL	PED
FOUL SEWER		POST	PO
		POST BOX	P.BOX
SURFACE SEWER		RODDING EYE	RE
		ROAD SIGN	RS
P-TRAP		RAIN WATER PIPE	RWP
		RETAINING WALL	RW
BACK DROP (EXTERNAL)		SOIL PIPE	SP
		STOP COCK	SC
BACK DROP (INTERNAL)		STREET NAME PLATE	SNP
		STOP VALVE	SV
BUILDING		SOIL PIPE	SP
		SURFACE PIPE	SWP
OPEN SIDED BUILDING		SURFACE WATER	SW
		TACTILE PAVING	TAC
OVERHANG / CANOPY		TELECOM POLE	TP
		TELECOM INSPECTION COVER	TEL
GLASSHOUSE		TELEPHONE CALL BOX	TCB
		TICKET MACHINE	TM
CONTOUR	25	TREE STUMP	TSW
		TRAFFIC LIGHT	TL
		TRAFFIC LIGHT COVER	TLC
		THRESHOLD LEVEL	THL
SPOT LEVEL	+ 127.13	UNABLE TO LOCATE	UTL
SONAR LEVEL	⊙ 127.13	UNABLE TO RAISE	UTR
		UNABLE TO SURVEY	UTS
BORE HOLE	BH	VENT PIPE	VP
		WATER LEVEL	WL
TRIAL HOLE	TH	WATER METER	WM
		WASH OUT	WO
		WATER RISER	WR
		WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	I/R
CLOSE BOARDED FENCE	C/B	LARCH LAP FENCE	L/L
CORRUGATED IRON FENCE	C/I	POST AND RAIL FENCE	P/R
CORRUGATED IRON FENCE	CR	POST AND WIRE FENCE	P/W
CHAIN LINK FENCE	C/L	WIRE MESH FENCE	W/M
CHESTNUT PALING	CNP		

Sheet Layout: (Not to Scale)

Revision	Description	Surv. by	Check by	App. by	Date
1	Surveyed additional land at Two Mile Ash.	JL	AJ	CP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client: Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	9	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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Sheet Layout:
(Not to Scale)

Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR APPLIED (0.99976).
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3. BACKGROUND INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY PRODUCED BY MEON SURVEY PARTNERSHIP. JOB NO: M1353 REV A. DATE: OCTOBER 2013.
4. ORDNANCE SURVEY DIGITAL DATA SHOWN IN BLUE.

Coordinate Table

Station	Description	Easting	Northing	Level
J1	PEG	514691.545	126904.857	48.375
J2	PEG	514738.299	127028.478	49.788
J3	PEG	514873.506	126936.579	44.561
J4	PEG	514860.781	126846.095	44.249
J5	PEG	514650.581	126783.345	46.687
J6	PEG	514611.425	126696.924	45.151
J7	PEG	514702.832	126583.647	41.775
J71	PEG	514667.859	126537.860	40.945
J72	PEG	514577.668	126568.667	42.358
J8	PEG	514782.725	126688.083	43.024
JH1	PEG	515165.382	126980.212	51.020
JH2	PEG	515036.197	126954.748	50.261
JH3	PEG	515528.172	127482.063	58.105
JH4	PEG	515625.221	127592.340	59.167
JH5	PEG	515802.296	127727.424	59.933
JH6	PEG	515646.852	127810.914	58.843
R1	PEG	515527.671	127941.282	57.534
R2	PEG	515625.583	127921.873	58.712
R3	PEG	515673.722	128047.706	58.375
R4	PEG	515690.232	128175.594	57.553
R5	PEG	515668.626	128310.047	58.644
R6	PEG	515798.416	128268.231	55.626
R7	PEG	515914.345	128235.732	57.126
R8	PEG	515870.784	128359.459	55.931
R9	PEG	515805.953	128462.300	55.164
R10	PEG	515755.301	128571.988	53.859
R11	PEG	515677.545	128651.588	52.408
R12	PEG	515571.585	128689.367	46.069
R13	PEG	515519.391	128580.672	50.872
R14	PEG	515474.700	128506.521	51.408
R15	PEG	515397.634	128413.328	49.763
R16	PEG	515330.091	128324.648	52.542
R17	ROAD NAIL	515284.485	128247.736	55.269
R18	PEG	515259.016	128123.964	56.440
S1	PEG	515216.987	127995.138	56.639
S2	PEG	515211.494	127867.368	55.938
S3	PEG	515181.808	127752.826	55.271
S4	PEG	515131.439	127664.492	54.848
S5	PEG	515062.852	127577.959	53.833
S6	PEG	514945.583	127372.101	49.240
S20	PEG	515281.042	127852.201	56.598
S21	PEG	515402.519	127829.679	56.616
S22	PEG	515425.017	127732.489	57.616
S23	PEG	515350.482	127706.732	57.577
S24	PEG	515436.784	127659.275	57.891
S25	PEG	515461.161	127589.953	58.200
S26	PEG	515395.734	127460.775	56.932
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	TOP	AIR VALVE	AV
BANKING	BOTTOM	AVERAGE	Av.
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		BELISHA BEACON	BB
WOODLAND CANOPY		BOLLARD	BO
		BOLLARD LIGHT	BOL
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS		BRICK	BK
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		DRAINAGE CHANNEL	DCH
		DROP KERB	DK
GATE		ELECTRICITY POLE	EP
		FENCE	F
KERB CHANNEL		FIRE HYDRANT	FH
		FLOOR LEVEL	FL
ROAD UNKERBED		FOOTPATH	FP
		FOUL WATER	FW
FOOTPATH		GAS GOVERNOR	GV
		GAS VALVE	GV
CHANGE IN SURFACE		GULLY	GY
		HARD BED	HB
FENCE		INSPECTION COVER	IC
		INVERT LEVEL	IL
WALL		KERB OUTLET	KO
		LAMP POST	LP
OVERHEAD ELECTRIC		MANHOLE	MH
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FOUL SEWER		ORDNANCE SURVEY BENCH MARK	OSBM
		PEDESTRIAN CROSSING	PC
SURFACE SEWER		POST	PO
		POST BOX	P.BOX
P-TRAP		RODDING EYE	RE
		ROAD SIGN	RS
BACK DROP (EXTERNAL)		RAIN WATER PIPE	RWP
		RETAINING WALL	RW
BACK DROP (INTERNAL)		SEWER	SC
		STOP COCK	SC
BUILDING		STREET NAME PLATE	SNP
		STOP VALVE	SV
OPEN SIDED BUILDING		SOIL PIPE	SP
		SURFACE PIPE	SWP
OVERHANG / CANOPY		SURFACE WATER	SW
		TACTILE PAVING	TAC
GLASSHOUSE		TELECOM POLE	TP
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TRIAL HOLE	TH	UNABLE TO SURVEY	UTS
		VALVE	V
		WATER LEVEL	WL
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CHESTNUT PALING	CNP		

Revision	Description	Rev. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.	JL	AJ	DP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client:

Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	10	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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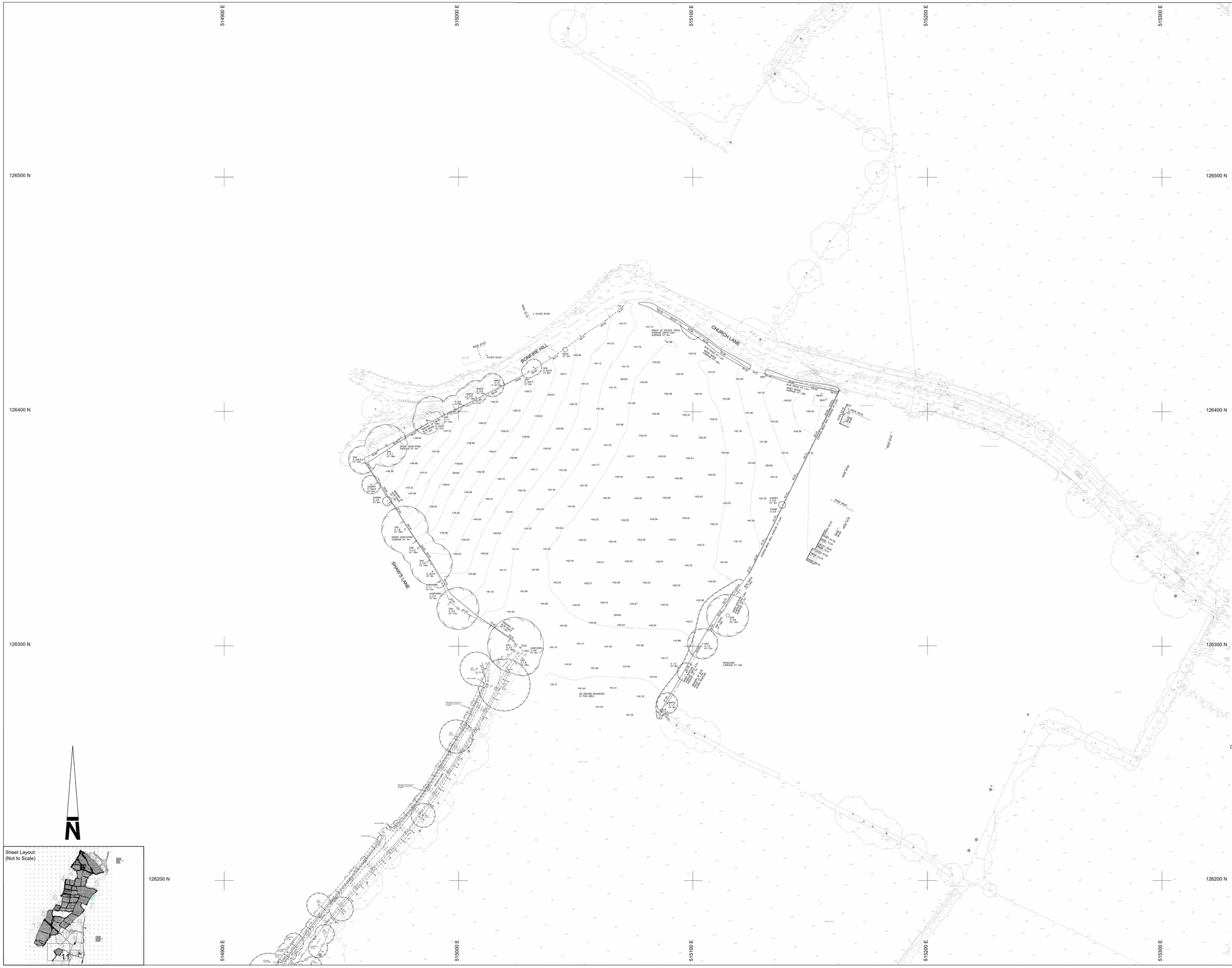
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ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/WARDS		CABLE RISER	CR
		CABLE TV COVER	CATV
		CABLES TO GROUND	CTG
		CATCH PIT	CP
		CONTROL BOX	CB
		CONTROL VEG.	CV
		CROSSING CONTROL BUTTON	CCB
TREES	SPREAD & GIRTH SHOWN TO SCALE	DAMP PROOF COURSE	DPC
		DRAINAGE CHANNEL	DCH
		DROP KERB	DK
		ELECTRICITY POLE	EP
		EARTH ROD	ER
GATE		FIRE HYDRANT	FH
		FLOOR LEVEL	FL
KERB CHANNEL		FOOTPATH	FP
		FOUL WATER	FW
ROAD UNKERBED		GAS RISER	GR
		GAS VALVE	GV
FOOTPATH		GULLY	GY
		HARD BED	HB
CHANGE IN SURFACE		INSPECTION COVER	IC
		INVERT LEVEL	IL
FENCE		KERB OUTLET	KO
		LAMP POST	LP
WALL		MANHOLE	MH
		MARKER POST	MR
OVERHEAD ELECTRIC		METER	M
		NO PIPES VISIBLE	NPV
OVERHEAD TELECOM		ORDNANCE SURVEY BENCH MARK	OSBM
		P-TRAP	PT
FOUL SEWER		POST	PS
		POST BOX	PBOX
SURFACE SEWER		RODDING EYE	RE
		ROAD SIGN	RS
P-TRAP		RAIN WATER PIPE	RWP
		RETAINING WALL	RW
BACK DROP (EXTERNAL)		SOFT BED	SB
		STOP COCK	SC
BACK DROP (INTERNAL)		STOP COCK MARKER PLATE	SCMP
		STOP VALVE	SV
BUILDING		SOIL PIPE	SP
		SOIL VENT PIPE	SVP
OPEN SIDED BUILDING		SURFACE WATER	SW
		TACTILE PAVING	TAC
OVERHANG / CANOPY		TELECOM POLE	TP
		TELECOM INSPECTION COVER	TPL
GLASSHOUSE		TELEPHONE CALL BOX	TCB
		TICKET MACHINE	TM
CONTOUR	25.00	TOP OF WALL	TOW
		TRAFFIC LIGHT	TL
SPOT LEVEL	+ 127.13	TURNING CIRCLE COVER	TLC
SONAR LEVEL	○ 127.13	TURNING LEVEL	TNL
BORE HOLE	BH	UNABLE TO LOCATE	UTL
TRIAL HOLE	TH	UNABLE TO RAISE	UTR
		UNABLE TO SURVEY	UTS
		VENT PIPE	VP
		WATER LEVEL	WL
		WATER METER	WM
		WASH OUT	WO
		WATER RISER	WR
		WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	I/R
CLOSE BOARDED FENCE	C/B	LARCH LAP FENCE	L/L
CONCRETE PANEL FENCE	C/PL	POST AND RAIL FENCE	P/R
CORRUGATED IRON FENCE	C/I	POST AND WIRE FENCE	P/W
CHAIN LINK FENCE	C/L	WIRE MESH FENCE	W/M
CHESTNUT PALING	CNP		

Revision	Description	Surv. by	Check. by	Appr. by	Date
1	Surveyed additional land at Two Mile Ash.	JL	AJ	CP	February 2022

0m 5 10 15 20 25 30 35 40 45 50 55

Topographical Survey

Client: Berkeley

Southwater
Horsham
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:500	A0	13	May 2018

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
25205	1	MKS	AJ	NS

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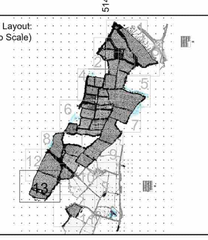
Sheet Layout: (Not to Scale)



SWAINS
MARLPOST MEADOWS
RYELANDS FARM
FERN HOLLOW
STREAM CONTINUES INTO ADJOINING PRIVATE LAND

514800 E | 514850 E | 514900 E | 514950 E

129250 N

129200 N

129150 N

WOODLAND

BRAMBLES Av. HT 2m

BRAMBLES Av. HT 3m

W/M FENCE HT 1.2m

W/M FENCE HT 1.3m

W/M FENCE 1.5m

P/R FENCE HT 1.2m

P/R FENCE HT 1.3m

CAR PARK ENTRANCE

TARMAC

STATION ROAD

TARMAC

GRASS

STILE

KISSING GATE

DISUSED GATE

GATE

STAYS

EP

SIGN

BO

BOs

PO

TEL

CB

MH SERVICES CL 42.51

IC SERVICES CL 42.82

ROAD MARKINGS FADE

DOG WASTE BIN

MANHOLE

PROVIDE 1 x SV

OAK G 2.6 HT 25m

OAK G 2.5 HT 20m

OAK G 0.9 HT 20m

OAK G 2.0 HT 20m

OAK G 1.5 HT 20m

OAK G 5.4 HT 18m

OAK G 3.1 HT 15m

OAK G 4.0 HT 18m

OAK G 5.5 HT 18m

OAK G 3.4 HT 18m

OAK G 4.8 HT 17m

ASH G 3x1.4 HT 17m

ASH MG 1.4 HT 20m

ASH G 2x2.1 HT 20m

ASH G 1.0 HT 8m

HAWTHORN G 2.6 HT 10m

HAWTHORN G 1.0 HT 13m

HAWTHORN G 0.9 HT 9m

HAWTHORN G 1.7 HT 9m

HAWTHORN G 0.8 HT 6m

HAWTHORN G 0.5 HT 4m

HAWTHORN G 0.4 HT 3m

HAWTHORN MG 0.2 HT 4m

HAWTHORN MG 0.2 HT 5m

HAWTHORN G 2x0.2 HT 4m

HAWTHORN MG 0.2 HT 7m

MAPLE G 0.4 HT 7m

MAPLE G 0.8 HT 11m

MAPLE G 0.9 HT 11m

MAPLE G 3x0.9 HT 11m

MAPLE G 0.9 HT 11m

MG 0.3 HT 4m

S1

S2

S3

WIRE LEVEL 51.36

WIRE LEVEL 51.21

WIRE LEVEL 43.10

Notes:

1. GRID AND LEVELS BASED ON ORDNANCE DATUM, DERIVED FROM THE NATIONAL GNSS NETWORK. LOCAL SCALE FACTOR OF 0.999976 APPLIED.
2. DRAINAGE INFORMATION HAS BEEN DETERMINED WITHOUT MAN ENTRY INTO CHAMBERS AND WHILST EVERY EFFORT HAS BEEN MADE TO CORRECTLY IDENTIFY THIS INFORMATION, IT SHOULD ALWAYS BE CHECKED IN AREAS THAT ARE CRITICAL TO THE FUTURE PROPOSAL.
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4. TREE AND HEDGE SPECIES HAVE BEEN IDENTIFIED AS ACCURATELY AS POSSIBLE BUT SHOULD BE CROSS CHECKED IN CRITICAL AREAS.

Coordinate Table

Station	Description	Easting	Northing	Level
S1	ROAD NAIL	514794.100	129138.747	42.740
S2	PEG	514900.330	129145.857	44.281
S3	PEG	514925.400	129210.607	43.563

TOPOGRAPHICAL KEY

SURVEY STATION 5

BANKING (TOP / BOTTOM)

HEDGE SPREADS

WOODLAND CANOPY

ARROW ON STEPS / RAMPS INDICATES DIRECTION UP/HARDS

TREES (SPREAD & GIRTH SHOWN TO SCALE)

GATE

KERB CHANNEL

ROAD UNKERBED

FOOTPATH

CHANGE IN SURFACE

FENCE

WALL

OVERHEAD ELECTRIC

OVERHEAD TELECOM

FOUL SEWER

SURFACE SEWER

P-TRAP

BACK DROP (EXTERNAL)

BACK DROP (INTERNAL)

BUILDING

OPEN SIDED BUILDING

OVERHANG / CANOPY

GLASSHOUSE

CONTOUR (25.50)

SPOT LEVEL + 127.13

SONAR LEVEL ⊙ 127.13

BORE HOLE BH

TRIAL HOLE TH

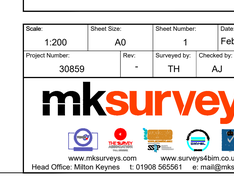
GENERAL ABBREVIATIONS

AIR CONDITIONING UNIT	ACU
AIR VALVE	AV
BACK DROP	BD
BASE LEVEL	BL
BELISHA BEACON	BB
BOLLARD	BO
BOUNDARY LIGHT	BOL
BRICK	BK
BUS STOP	BS
CABLE RISER	CR
CABLE TV COVER	CATV
CABLES TO GROUND	CTG
CATCH PIT	CP
CONTROL BOX	CB
COVER LEVEL	CL
CROSSING CONTROL BUTTON	CCB
DAMP PROOF COURSE	DPC
DRAINAGE CHANNEL	DCH
ELECTRIC	E
ELECTRICITY POLE	EP
EARTH ROD	ER
FIRE HYDRANT	FH
FLOOR LEVEL	FL
FOOTPATH	FP
FOUL WATER	FW
GAS GOVERNOR	GG
GAS VALVE	GV
GULLY	GY
HARD BED	HB
INSPECTION COVER	IC
INVERT LEVEL	IL
KERB OUTLET	KO
LAMP POST	LP
MANHOLE	MH
MARKER POST	MK
METER	MT
NO PIPES VISIBLE	NPV
PERMANENT SURVEY BENCH MARK	PBM
P-TRAP	PT
POST	PO
POST BOX	P.BOX
RODDING EYE	RE
ROAD SIGN	RS
RAIN WATER PIPE	RWP
RETAINING WALL	RW
SOFT BED	SB
STOP COCK	SC
STREET NAME PLATE	SNP
STOP VALVE	SV
SIGN	SYP
SOIL VENT PIPE	SVP
SURFACE WATER	SW
TACTILE PAVING	TAC
TELECOM POLE	TP
TELECOM INSPECTION COVER	TEL
TELEPHONE CALL BOX	TCB
TELEPHONE MACHINE	TM
TOP OF WALL	TW
TRAFFIC LIGHT	TL
TRAFFIC LIGHT COVER	TLC
THRESHOLD LEVEL	THL
UNABLE TO LOCATE	UTL
UNABLE TO RAISE	UTR
UNDER SURVEY	US
VENT PIPE	VP
WATER LEVEL	WL
WATER METER	WM
WASH OUT	WO
WATER TANK	WR
WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	IR
CLOSE BOARD FENCE	CBF	LARCH LAP FENCE	LLF
CONCRETE PANEL FENCE	CPF	POST AND RAIL FENCE	P/R
CORRUGATED IRON FENCE	CIF	PALISADE METAL FENCE	PMF
CHAIN LINK FENCE	CL	WIRE MESH FENCE	WM
CHESTNUT PALING	CNP		

Sheet Layout: (Not to Scale)



Revision	Description	Surv. by	Check. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

Topographical Survey

Client: Berkeley

Christ's Hospital Car Park
Southwater
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:200	A0	1	February 2022

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
30859	-	TH	AJ	CP

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514800 E | 514850 E | 514900 E | 514950 E

129150 N | 129100 N | 129050 N

CAR PARK ENTRANCE
TARMAC

STATION ROAD
TARMAC

THE OLD GOODS YARD NU. 1-7
RIDGE 49.42
EAVES 48.42

No. 24
EAVES 52.71
RIDGE 57.91
EAVES 52.71
RIDGE 57.99

No. 8
EAVES 55.61
EAVES 55.86
EAVES 53.71
RIDGE 59.21
EAVES 54.22
RIDGE 58.72
EAVES 58.58
RIDGE 60.67

S1
S2

P/R FENCE HT 1.2m
P/R FENCE HT 1.7m
C/A FENCE HT 1.8m
B/W FENCE 1.2m
BRAMBLES Av. HT 2m
BEECH HEDGE Av. HT 1.5m
BUSH HT 2m
IC SERVICES CL 42.82
MH SERVICES CL 42.51
MH SW CP CL 42.48 BL 40.94 IL 40.96 (x) 150# VC IL 40.99 (o) 150# VC
KISSING GATE
DISUSED GATE
DOG WASTE BIN
ROAD MARKINGS FADE
CONCRETE BASE
STAYS
EP CTG

HAWTHORN G 0.8 HT 6m
HAWTHORN G 0.5 HT 4m
HAWTHORN G 0.4 HT 3m
HAWTHORN MG 0.2 HT 4m
HAWTHORN MG 0.2 HT 5m
HAWTHORN G 2x0.2 HT 4m
HAWTHORN G 1.0 HT 13m
HAWTHORN G 0.9 HT 9m
HAWTHORN G 1.7 HT 9m
HAWTHORN G 3x0.6 HT 8m
MAPLE G 0.8 HT 11m
MG 0.3 HT 4m
ASH G 1.0 HT 8m
MAPLE G 1.4 HT 15m
MAPLE G 3.0 HT 17m
MAPLE G 2x0.8 HT 9m
MAPLE G 2x0.7 HT 8m
MAPLE G 0.8 HT 9m
PINE G 2.5 HT 20m
LORAL G 0.8 HT 7m
STUMP G 2x1.0
G 0.5 HT 6m
G 0.7 HT 6m
OAK G 3.4 HT 16m
OAK G 4.8 HT 17m

Notes:

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TOPOGRAPHICAL KEY

GENERAL ABBREVIATIONS

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BANKING (TOP / BOTTOM)
HEDGE SPREADS
WOODLAND CANOPY
ARROW ON STEPS / RAMPS INDICATES DIRECTION UPWARDS
TREES (SPREAD & GIRTH SHOWN TO SCALE)
GATE
KERB CHANNEL
ROAD UNKERBED
FOOTPATH
CHANGE IN SURFACE
FENCE
WALL
OVERHEAD ELECTRIC
OVERHEAD TELECOM
FOUL SEWER
SURFACE SEWER
P-TRAP
BACK DROP (EXTERNAL)
BACK DROP (INTERNAL)
BUILDING
OPEN SIDED BUILDING
OVERHANG / CANOPY
GLASSHOUSE
CONTOUR
SPOT LEVEL
SONAR LEVEL
BORE HOLE
TRIAL HOLE

AIR CONDITIONING UNIT	ACU	MANHOLE	MH
AIR VALVE	AV	MARKER POST	MK
BACK DROP	BD	METER	MT
BASE LEVEL	BL	NO PIPES VISIBLE	NPI
BELISHA BEACON	BB	OBSTRUCTANCE SURVEY BENCH MARK	OBSM
BOLLARD	BO	P-TRAP	PT
BOUNDARY LIGHT	BOL	POST	PO
BRICK	BK	POST BOX	P BOX
BUS STOP	BS	RODDING EYE	RE
CABLE RISER	CR	ROAD SIGN	RS
CABLE TV COVER	CATV	RAIN WATER PIPE	RWP
CABLES TO GROUND	CTG	RETAINING WALL	RW
CATCHPIT	CP	SOFT SEED	SS
CONTROL BOX	CB	STOP COCK	SC
COVER LEVEL	CL	STREET NAME PLATE	SNP
CROSSING CONTROL BUTTON	CCB	STOP VALVE	SV
DAMP PROOF COURSE	DPC	SIGN	SY
DRAINAGE CHANNEL	DCH	SOIL VENT PIPE	SVP
DRAINAGE	D	SURFACE WATER	SW
ELECTRICITY POLE	EP	TACTILE PAVING	TAC
EARTH ROD	ER	TELECOM POLE	TP
FIRE HYDRANT	FH	TELECOM INSPECTION COVER	TEL
FLOOR LEVEL	FL	TELEPHONE CALL BOX	TCB
FOOTPATH	FP	TELEPHONE	TM
FOUL WATER	FW	TOP OF WALL	TW
GAS GOVERNOR	GV	TRAFFIC LIGHT	TL
GAS VALVE	GV	TRAFFIC LIGHT COVER	TLC
GULLY	GY	THRESHOLD LEVEL	THL
HARD BED	HB	UNABLE TO LOCATE	UTL
INSPECTION COVER	IC	UNABLE TO RAISE	UTR
INVERT LEVEL	IL	UNDER GROUND SURVEY	UTS
KERB OUTLET	KO	VENT PIPE	VP
LAMP POST	LP	WATER LEVEL	WL
		WATER METER	WM
		WASH OUT	WO
		WATER TAP	WR
		WATER TAP	WT

FENCE ABBREVIATIONS

BARBED WIRE FENCE	B/W	IRON RAILINGS	IR
CLOSE BOARD FENCE	CBF	LARCH LAP FENCE	LLF
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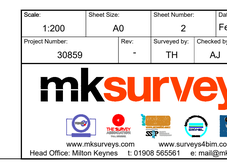
CORRUGATED IRON FENCE	CIF	PALISADE FENCE	PAL
CHAIN LINK FENCE	CL	WIRE MESH FENCE	WM
CHESTNUT PALING	CNP		

Sheet Layout: (Not to Scale)



Revision	Description	Surv. by	Check. by	Appr. by	Date

0m 2 4 6 8 10 12 14 16 18 20 22

Topographical Survey

Client: Berkeley

Christ's Hospital Car Park
Southwater
West Sussex

Scale:	Sheet Size:	Sheet Number:	Date:
1:200	A0	2	February 2022

Project Number:	Rev:	Surveyed by:	Checked by:	Approved by:
30859	-	TH	AJ	CP

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CHRIST'S HOSPITAL ROAD
INFIRMARY DRIVE
TOWER HILL
TWO MILE ASH ROAD
WORTHING ROAD
NEW ROAD
WELCOME PLACE
COMPTON PLACE
COURTLANDS
WILLOWMEAD
ROBERTS CLOSE
NETHERTON CLOSE
WARNHAM GATE
Bay Dry
Pumping Station
The Old Lodge
GP
East Lodge
Little Pilfolds
Pilfolds
West Pilfolds
South Pilfolds
Hollowcroft
Porters Cottage
Tara
Foxes
Badgers
Prep House
Field End Cottage
Dairy
Path (um)
Praters Farm
Kirbys
Praters
Prater's Cottage
Lanaways Farm
Lanaways Barn
Bodimans
Track
Backsett
Dandegate Cottage
High Croft
Fairlands
Llandair
Whiteoaks
Rossetwood
Rowan
Outview
Stanyside
Woodcote
Westlands
Greenacre
Westwood
Breakspeare
Swallowfield
Ainslie
Merryfield
Twenty Two
Bracken
Gowalla
L'Abri
Sentosa
Old Cottage
The Nook
Ferrell
Holly Lodge
The Pippins
Juniper
Dragons
Elmore
Bay Tree Lodge
Bryherry
Asseleys
Mansfield
Fornells
Orchard House
Highfields
Padbury House
Willow Croft
Pine Lodge
Woodlands
Hazelhurst
Ellington House
Tiree
Little Twynham
Tedmore House
Walnut Tree Cottage
Beech House
Trollslund
The Rest
Rossbank
Cherry Trees
Sunny Side
The Copse
Field Cottage
Westmead
Barford
West View
Cherry Cottage
Thornhill
Silver Birch
Ash Meadow
Hen and Chicken (PH)
Alma Cottage
Wendover
Charwood House
Garage
Blakes Farm
Oakhurst Business Park
El Sub Sta
5903
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9540

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0001	F	0.00	0.00	
0101	F	0.00	0.00	
0501	F	61.35	59.03	
0502	F	61.30	59.17	
0601	F	62.90	60.07	
0602	F	61.80	59.46	
0603	F	0.00	0.00	
0604	F	0.00	0.00	
0701	F	0.00	0.00	
0702	F	0.00	0.00	
0703	F	0.00	0.00	
0704	F	0.00	0.00	
0801	F	61.04	0.00	
0901	F	0.00	0.00	
0902	F	60.75	59.58	
1001	F	64.22	62.64	
1101	F	0.00	0.00	
1501	F	51.01	47.94	
1502	F	51.00	47.86	
1601	F	63.40	61.50	
2101	F	56.73	55.06	
2102	F	56.64	55.23	
3100	F	56.33	54.64	
3201	F	0.00	0.00	
3202	F	0.00	0.00	
3204	F	53.56	0.00	
3205	F	53.72	52.57	
3206	F	53.90	52.87	
3301	F	49.98	48.63	
3302	F	51.07	49.80	
3303	F	0.00	0.00	
3304	F	0.00	0.00	
4401	F	0.00	0.00	
4501	F	48.69	47.54	
4502	F	48.11	47.05	
4601	F	48.74	46.67	
4801	F	46.81	45.30	
5601	F	49.42	46.11	
5602	F	46.02	45.56	
5701	F	46.90	45.08	
5702	F	46.57	44.79	
5703	F	47.44	46.08	
5801	F	0.00	0.00	
6701	F	0.00	0.00	
6702	F	0.00	0.00	
6703	F	0.00	0.00	
6903	F	54.59	53.05	
7501	F	59.79	57.57	
7701	F	0.00	0.00	
7901	F	58.66	57.09	
7902	F	58.56	56.77	
8601	F	60.26	58.13	
8602	F	59.82	57.98	
8801	F	58.47	56.75	
8901	F	58.31	56.46	
8902	F	0.00	0.00	
8903	F	57.37	55.58	
8904	F	57.28	55.17	
8905	F	0.00	0.00	
9701	F	60.64	58.64	
9702	F	60.50	58.47	
9801	F	59.78	58.00	
9802	F	59.90	0.00	
9803	F	60.88	58.71	
0550	S	61.40	57.65	
0551	S	61.30	57.57	
0650	S	63.00	58.41	
0651	S	61.70	57.84	
0654	S	0.00	0.00	
1650	S	63.50	0.00	
1652	S	68.00	58.79	

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

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Data updated: 20/05/22

Scale: 1:1000 | Date: 16/06/22 | Wastewater Plan A0

Map Centre: 515661,126574 | Our Ref: 880050 - 1 | Powered by digdat

Foul Gravity Sewer | Combined Gravity Sewer | Culverted Water Course or Tracked Effluent | Surface Water Gravity Sewer | Rising Main, Vacuum or Syphon

Combined Outfall | Foul Outfall | Surface Water Outfall | Surface Water Inlet

Combined Pumping Station | Surface Water Pumping Station | Foul Pumping Station | Water Treatment Works | Section 104 Area | Building Over Agreement Area

Foul Manhole | Combined Manhole | Surface Water Manhole | Blue Baby Manhole, Combined Manhole, Queen's Manhole or Surface Water Soakaway

sulaiman.umar-farook@wsp.com

North SouthWater

WATER for LIFE — from Southern Water.

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2022 Ordnance Survey 100031673 .This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.

British Geological Survey

Version 2.0.6.6

BGS ID: 578346 : BGS Reference: TQ12NE26
British National Grid (27700) : 515980,128340

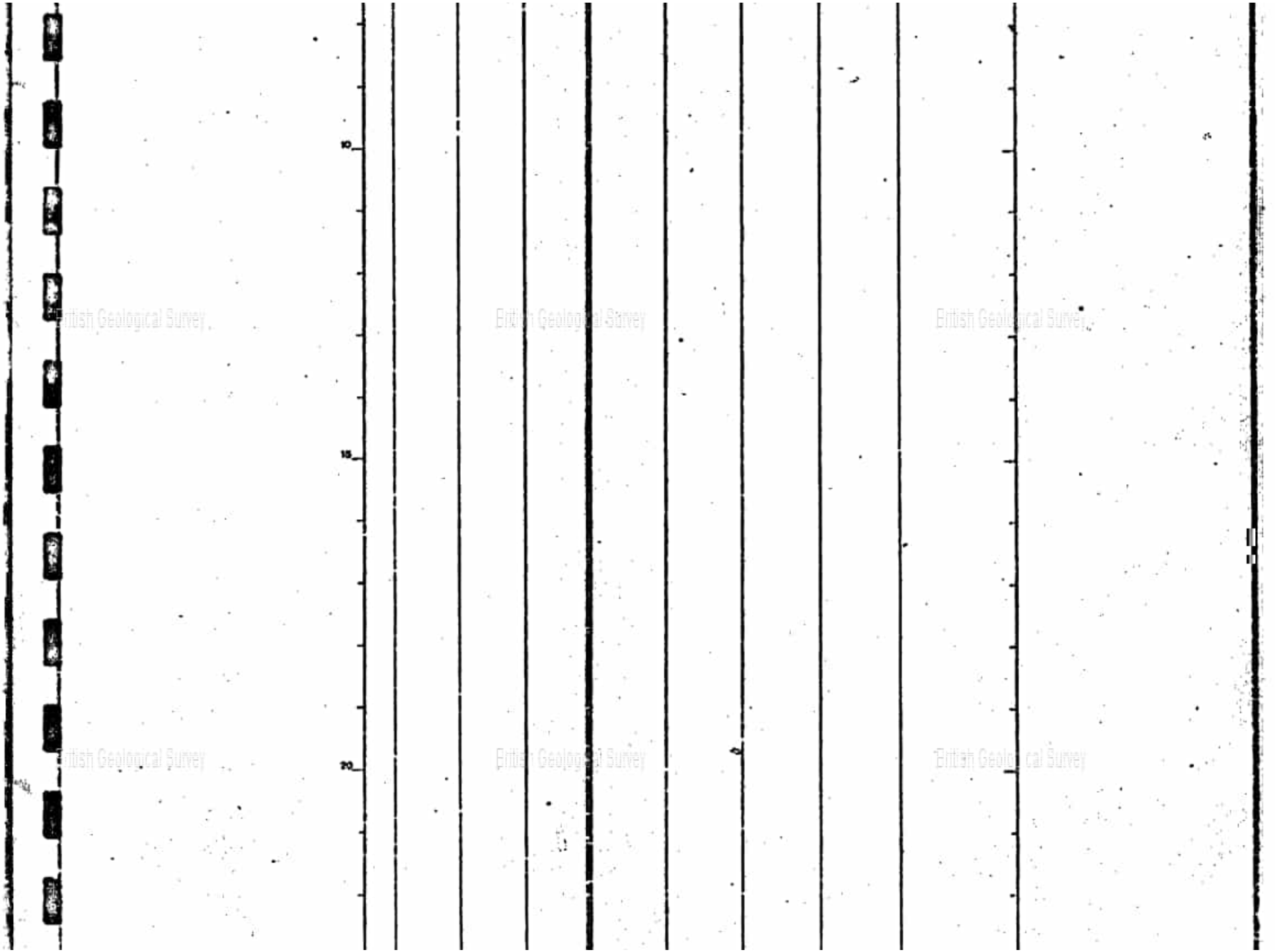
Report an issue with this borehole

GROUND EXPLORATIONS Ltd.
68/76 Alpha Street, Slough, Bucks., SL1 1QX

Contract Southwater Bypass TQ12NE/26
Location A24 Horsham Bypass Roundabout area
Report No 5949/BW 1598.2834

Borehole No	13
Started	24.5.73.
Completed	25.5.73.
Diameter	150 mm
Ground Level	O.D. 60·97 m

Description	Legend	Thickness m	Depth m	Level m	Sample Type	Sample No	Depth m	C/O (N)	M/C (G Sa Si)	Water
Topsoil		0·6	0·6	60·4	D	362	0·5			
Mottled orange-brown and grey sandy clay		2·1			D	363	0·8			
					U	364	1·1			
					B	365	1·8			
					W	371	2·1			
					D	366	2·3			
			2·7	58·3	U	367	2·6			SK 2·7/24.5.
Hard grey and brown calcareous sandstone		0·3	3·0	57·0	D	368	3·0			
Blue-grey clay-shale		2·8			D	369	4·3			
										WE 4·0/3·0/24.5.
					U	370	5·3			WS 2·1/3·0/25.5.
			5·8	55·2						WE 2·1/4·6/25.5.



British Geological Survey

SOUTHERN WATER

SOUTHWATER

Southwater Sports Club

Two Mile Ash

Kirdys Wood

Courtland Wood

Bluecoat Sports (Leisure Or Sports Centre)

Christ's Hospital (School)

Christ's Hospital Theatre

Lanaways Farm

Field End Cottage

Hop Oast Park & Ride

Hop Oast Farm (Horwood Arabian Stud)

Newlane Wood

Southwater Street

Roundstone Park

Ponds Farm Gill

Horwood Primary School

Southwater Junior School

Southwater Infant Academy

Southwater Leisure Centre

College Farm

Great House Farm

Smith's Copse

Chanwood House

RSPCA

Football Ground

Stammerham

Tennis Courts

Quadrangle

Chapel

Pavilion

Newlands

Bodmans

Pond

Spring

Footpath

Bridleway

Byway

Public Utility

Southern Water

Annex C

SURFACE WATER AND FOUL WATER DRAINAGE STRATEGY DRAWINGS

Public

TO THE RIVER ARUN

BASIN 1
TOTAL CATCHMENT AREA 4.705Ha
IMPERMEABLE AREA 3.285Ha
DISCHARGE RATE 70.4 l/s
STORAGE VOLUME 1850m³

BASIN 2
TOTAL CATCHMENT AREA 3.315Ha
IMPERMEABLE AREA 2.818Ha
DISCHARGE RATE 64.8 l/s
STORAGE VOLUME 1550m³

3.3 hectares employment

BASIN 10
TOTAL CATCHMENT AREA 0.304Ha
IMPERMEABLE AREA 0.258Ha
DISCHARGE RATE 20.3 l/s
STORAGE VOLUME 150m³

TANK 1
TOTAL CATCHMENT AREA 0.735Ha
IMPERMEABLE AREA 0.625Ha
DISCHARGE RATE 14.4 l/s
STORAGE VOLUME 345m³

BASIN 3
TOTAL CATCHMENT AREA 1.146Ha
IMPERMEABLE AREA 0.756Ha
DISCHARGE RATE 15.8 l/s
STORAGE VOLUME 425m³

BASIN 4
TOTAL CATCHMENT AREA 6.103Ha
IMPERMEABLE AREA 4.144Ha
DISCHARGE RATE 87.7 l/s
STORAGE VOLUME 2400m³

BASIN 5
TOTAL CATCHMENT AREA 7.304Ha
IMPERMEABLE AREA 4.938Ha
DISCHARGE RATE 104.3 l/s
STORAGE VOLUME 2855m³

BASIN 6
TOTAL CATCHMENT AREA 2.425Ha
IMPERMEABLE AREA 1.705Ha
DISCHARGE RATE 36.6 l/s
STORAGE VOLUME 960m³

BASIN 7
TOTAL CATCHMENT AREA 3.839Ha
TOTAL IMPERMEABLE AREA 2.638Ha
DIRECT CATCHMENT AREA 1.414Ha
DIRECT IMPERMEABLE AREA 0.933Ha
DISCHARGE RATE 56.1l/s
STORAGE VOLUME 535m³

BASIN 8
TOTAL CATCHMENT AREA 3.677Ha
IMPERMEABLE AREA 2.427Ha
DISCHARGE RATE 50.7 l/s
STORAGE VOLUME 1400m³

BASIN 9
TOTAL CATCHMENT AREA 4.905Ha
IMPERMEABLE AREA 3.237Ha
DISCHARGE RATE 67.7 l/s
STORAGE VOLUME 1835m³

TO THE RIVER ADUR

NOTES: DO NOT SCALE

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM.
2. DRAINAGE DESIGN IS OUTLINE AT THIS STAGE AND WILL BE SUBJECT TO CHANGE AT LATER STAGES OF DESIGN.
3. DRAINAGE DESIGNED IN ACCORDANCE WITH CIRIA REPORT C753 THE SUDS MANUAL & SEWER SECTOR GUIDANCE APPENDIX C: DESIGN AND CONSTRUCTION GUIDANCE.
4. ALL ATTENUATION FEATURES HAVE BEEN DESIGNED TO ACCOMMODATE THE 1 IN 100 YEAR RETURN PERIOD RAINFALL EVENT PLUS 45% CLIMATE CHANGE WITH 300mm FREEBOARD.
5. PARCEL IMPERMEABILITY BASED ON THE FOLLOWING:
   - RESIDENTIAL – 60% IMPERMEABLE
   - EMPLOYMENT – 85% IMPERMEABLE
   - SPINE ROAD – 85% IMPERMEABLE
5. RESIDENTIAL PARCELS INCLUDE A 10% ALLOWANCE FOR URBAN CREEP.
6. FLOW CONTROLS TO LIMIT SURFACE WATER RUNOFF TO GREENFIELD RUNOFF RATE FOR 1 IN 100 YEAR RETURN PERIOD RAINFALL EVENT OF 23.0 l/s/Ha.
7. NORTHERN CATCHMENT TOTAL SURFACE WATER DISCHARGE OF 171.3 l/s. SOUTHERN CATCHMENT TOTAL SURFACE WATER DISCHARGE OF 366.5 l/s.
8. DISCHARGE RATES PRO-RATED TO IMPERMEABLE AREA BEFORE URBAN CREEP ALLOWANCE INCLUDED.
9. ACCESS FOR MAINTENANCE TO BE PROVIDED FOR ALL SURFACE WATER STORAGE FEATURES.

KEY

- SITE BOUNDARY
- EXISTING ORDINARY WATERCOURSE
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER ATTENUATION BASIN
- PROPOSED SURFACE WATER STORAGE TANK
- INDICATIVE EXCEEDENCE OVERLAND FLOW ROUTING
- BASIN 1 CATCHMENT
- BASIN 2 CATCHMENT
- BASIN 3 CATCHMENT
- BASIN 4 CATCHMENT
- BASIN 5 CATCHMENT
- BASIN 6 CATCHMENT
- BASIN 7 CATCHMENT
- BASIN 8 CATCHMENT
- BASIN 9 CATCHMENT
- BASIN 10 CATCHMENT

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK.

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	29/01/2026	KW	FIRST ISSUE	DSB	DSB

DRAWING STATUS: S2 - FOR INFORMATION

wsp
Unit 9 The Chase
John Tate Road
Foxholes Business Park
Hertford
SG13 7NN, UK
T+ 44 (0) 1992 526 000
F+ 44 (0) 1992 526 001
wsp.com

CLIENT: BERKELEY

ARCHITECT: KPK STUDIOS

PROJECT: NORTH SOUTHWATER

TITLE: OUTLINE SURFACE WATER DRAINAGE STRATEGY

SCALE @ A0:	CHECKED:	APPROVED:
1:2500	DSB	DSB

PROJECT No:	DESIGNED:	DRAWN:	DATE:
70091497	KW	KW	January 26

DRAWING No: NSW-WSP-XX-XX-DR-DR-0001 REV: P01

© WSP UK Ltd

File name: \\UK.WSPGROUP.COM\CENTRAL DATA\Projects\70091xxx\70091497 - NORTH SOUTHWATER, PHASE 2\03 WIP\DR DRAINAGE ENGINEER\03 DRAWINGS\NSW\WSP-XX-XX-DR-DR-0001.DWG, plotted on 29 January 2026 15:44:44, by Willis, Karl

NOTES: DO NOT SCALE

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM.
2. DRAINAGE DESIGN IS OUTLINE AT THIS STAGE AND WILL BE SUBJECT TO CHANGE AT LATER STAGES OF DESIGN.
3. DRAINAGE DESIGNED IN ACCORDANCE WITH SEWER SECTOR GUIDANCE APPENDIX C: DESIGN AND CONSTRUCTION GUIDANCE.
4. INCOMING FOUL FLOW RATES BASED ON:
   - 4000 l/DWELLING/DAY FOR RESIDENTIAL
   - 1.1 l/s/HECTARE FOR EMPLOYMENT
   - 90 l/s/PUPIL FOR SCHOOLS
4. PUMPED FLOW RATES BASED ON HALF THE INCOMING PEAK FLOW RATE, SUBJECT TO SPECIALIST DESIGN AT LATER STAGES OF DESIGN.
5. EMERGENCY STORAGE CALCULATED BASED ON 160 LITRES PER DWELLING IN ACCORDANCE WITH SEWER SECTOR GUIDANCE APPENDIX C.
6. PUMPING STATIONS ARE PROPOSED TO BE TYPE 3 IN ACCORDANCE WITH SEWER SECTOR GUIDANCE APPENDIX C.
7. TYPE 3 PUMPING STATIONS REQUIRE A MINIMUM OF 15m FROM HABITABLE DWELLINGS IN ORDER TO MINIMISE THE RISK OF ODOUR, NOISE & NUISANCE.
8. RISING MAINS SHOWN INDICATIVELY TO SHOW ROUTING & CONNECTION POINTS. DISCHARGE LOCATIONS & RATES TO BE AGREED WITH SOUTHER WATER.
9. ALL PUMPING STATIONS & ASSOCIATED RISING MAINS SHOULD BE DESIGNED IN DETAIL BY A SPECIALIST DURING THE LATER DESIGN STAGES.

KEY

- SITE BOUNDARY
- EXISTING SOUTHER WATER FOUL SEWER
- EXISTING SOUTHERN WATER PUMPING STATION
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER RISING MAIN
- PROPOSED FOUL WATER PUMPING STATION

SOUTHERN WATER MH 5602
CL 46.02
IL 45.56
DISCHARGE TO BE AGREED WITH SOUTHERN WATER

NORTHERN TERMINAL PUMPING STATION
INCOMING FLOW RATE 14.3 l/s
PUMPED FLOW RATE 7.15 l/s
APPROX. EMERGENCY STORAGE 46m³

3.3 hectares employment

PARCEL PUMPING STATION 1
INCOMING FLOW RATE 16.2 l/s
PUMPED FLOW RATE 8.1 l/s
APPROX. EMERGENCY STORAGE 52m³

PARCEL PUMPING STATION 2
INCOMING FLOW RATE 5.0 l/s
PUMPED FLOW RATE 2.5 l/s
APPROX. EMERGENCY STORAGE 16m³

SOUTHERN WATER MH 6903
CL 54.59
IL 53.05
DISCHARGE TO BE AGREED WITH SOUTHERN WATER

SOUTHERN TERMINAL PUMPING STATION
INCOMING FLOW RATE 34.4 l/s
PUMPED FLOW RATE 17.2 l/s
APPROX. EMERGENCY STORAGE 110m³

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK.

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	29/01/2026	KW	FIRST ISSUE	DSB	DSB

DRAWING STATUS: S2 - FOR INFORMATION

wsp
Unit 9 The Chase
John Tate Road
Foxholes Business Park
Hertford
SG13 7NN, UK
T+ 44 (0) 1992 526 000
F+ 44 (0) 1992 526 001
wsp.com

CLIENT: BERKELEY

ARCHITECT: KPK STUDIOS

PROJECT: NORTH SOUTHWATER

TITLE: OUTLINE FOUL WATER DRAINAGE STRATEGY

SCALE @ A0:	CHECKED:		APPROVED:
1:2500	DSB		DSB
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70091497	KW	KW	January 26

DRAWING No: NSW-WSP-XX-XX-DR-DR-0002 REV: P01

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File name: \\UK.WSPGROUP.COM\CENTRAL DATA\Projects\70091XXX\70091497 - NORTH SOUTHWATER, PHASE 2\03 WIP\DR DRAINAGE ENGINEER\03 DRAWINGS\NSW\NSP-XX-XX-DR-DR-0002.DWG, plotted on 29 January 2026 15:47:28, by Willis, Karl

Annex D

CALCULATIONS

Public

Table 1 - Calculated North Catchment Pro-rata Greenfield Runoff Rates

DRAINAGE CATCHMENT	SUB-CATCHMENT	AREA (ha)	ALLOWABLE DISCHARGE RATE (l/s)
North	Employment Parcel	3.0	61.33
	Secondary School	1.47	149.85
	Travellers Land	0.60	12.27
	NR01	0.49	10.02
	NR02	0.75	15.33
	CH03	0.72	14.72
	CH04	0.59	12.06
	CH05	1.24	25.35
	CH06	1.17	23.92
	CH07	1.61	32.91
	CH08	1.47	30.05
	CH09	1.42	29.03
	NR23	0.62	12.68
	NR24	1.50	30.67
	NR25	0.16	3.27

*1in1 runoff rate used as a conservative measure from UKSUDS.com, 1in2 runoff rate is not provided from online tool, which is the lowest storm period that can be applied with MicroDrainage software.

Table 2 - Calculated South Catchment Pro-rata Greenfield Runoff Rates

DRAINAGE CATCHMENT	SUB-CATCHMENT	AREA (ha)	ALLOWABLE DISCHARGE RATE (l/s)
South	Creative District	0.5	10.22
	Primary School	2.00	40.88
	CH10	2.75	56.22
	CH11	1.66	33.94
	CH12	0.52	10.63
	CH13	2.73	55.81
	CH14	1.28	26.17
	CH15	1.44	29.44
	SF16	1.90	38.84
	SF17	2.95	60.31
	SF18	2.04	41.70
	SF19	2.26	46.20
	SF20	1.48	30.26
	SF21	2.52	51.52
	SF22	1.05	21.47

*1in1 runoff rate used as a conservative measure from UKSUDS.com, 1in2 runoff rate is not provided from online tool, which is the lowest storm period that can be applied with MicroDrainage software.

Table 3 – North Catchment Proposed Storage Summary

DRAINAGE CATCHMENT	POND/BASIN NUMBER	SUB-CATCHMENT	CATCHMENT AREA (ha)	DISCHARGE RATE (l/s)	PROVIDED ATTENUATION VOLUME (m^3)
North	Pond 1	Secondary School	10.02	68.88	1600
		Employment Parcel West			
		NR23			
		NR24			
	Pond 2	(Half) NR02	5.71	76.9	2000
		CH03			
		CH04			
		CH05			
		CH06			
		CH07			
	Basin 10	Employment Parcel East	3.0	46.6	1240
		Travellers Land			
	Basin 11	NR25	0.21	2.8	75
	Basin 12	NR01	0.49	6.5	160
	Pond 13	CH08	2.89	39.0	1000
		CH09			

	Basin 14	(Half) NR02	0.38	5.1	130

Table 4 – South Catchment Proposed Storage Summary

DRAINAGE CATCHMENT	BASIN/POND NUMBER	SUB-CATCHMENT	CATCHMENT AREA (ha)	DISCHARGE RATE (l/s)	PROVIDED ATTENUATION VOLUME (m3)
South	Pond 4	CH10	7.14	96.1	1900
		CH11			
		CH13			
	Pond 5	SF19	2.26	113.4	750
	Basin 6	Primary School	3.76	38.1	1750
		CH12			
		CH14			
	Basin 7	CH15	3.34	50.0	1550
		SF16			
	Basin 8	SF20	4.00	160.0	950
		SF21			
	Pond 9	Creative District	2.26	142.0	2070
		SF17			
		SF18			
		SF22			

Table 5 – Summary North Sub-Catchment Foul Flow Rates

DRAINAGE CATCHMENT	SUB-CATCHMENT	DEVELOPMENT CLASSIFICATION	NUMBER OF DWELLINGS	PEAK FOUL FLOW (l/s)
North	Secondary School	Commercial	N/A	4.38
	Travellers Land	Residential	18	0.83
	Employment Parcel	Commercial	N/A	1.08
	Primary School	Commercial	N/A	1.20
	NR01	Residential	14.7	0.68
	NR02	Residential	21	0.97
	CH03	Residential	30	1.40
	CH04	Residential	27	1.25
	CH05	Residential	53	2.43
	CH06	Residential	56	2.57
	CH07	Residential	81	3.74
	CH08	Residential	73	3.38
	CH09	Residential	68	3.15
	CH10	Residential	112	5.18
	CH11	Residential	75	3.48
	CH12	Residential	31	1.44

	CH15	Residential	70	3.22
	NR23	Residential	23	1.06
	NR24	Residential	61	2.82
	NR25	Residential	6	0.29

Table 6 – Summary South Sub-Catchment Foul Flow Rates

DRAINAGE CATCHMENT	SUB-CATCHMENT	DEVELOPMENT CLASSIFICATION	NUMBER OF DWELLINGS	DESIGN FLOW (l/s)
South	Creative District	Commercial	N/A	0.30
	CH13	Residential	129	5.96
	CH14	Residential	65	3.00
	CH15	Residential	70	3.22
	SF16	Residential	104	4.81
	SF17	Residential	147	6.80
	SF18	Residential	98	4.53
	SF19	Residential	90	4.17
	SF20	Residential	89	4.13
	SF21	Residential	55	2.56
	SF22	Residential	32	1.46

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

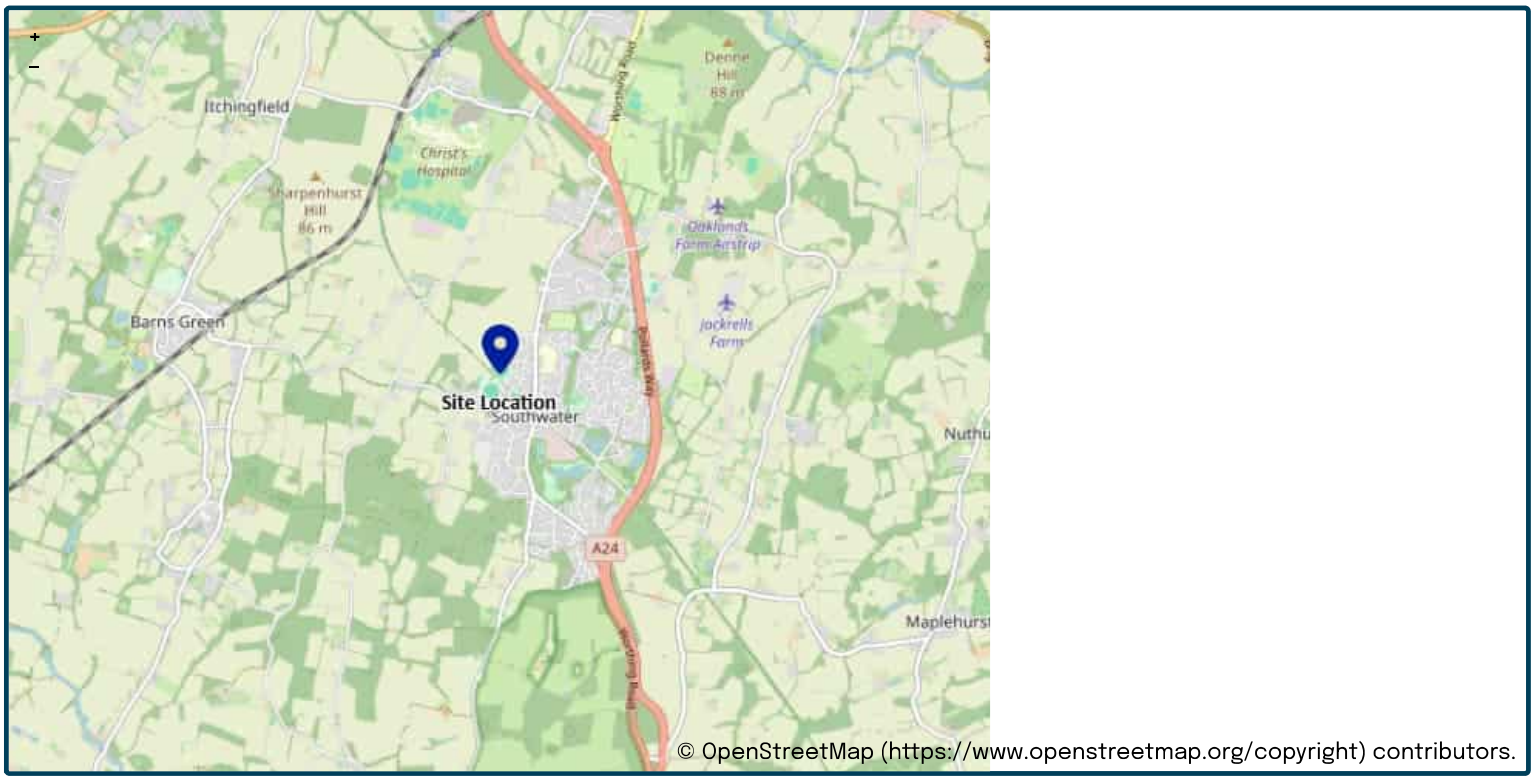
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	28/01/2026
Calculated by	Darren Brown
Reference	Southwater 2025
Model version	2.2.2

Location

Site name	Land West of Southwater
Site location	Southwater



Site easting (British National Grid)	515350
Site northing (British National Grid)	126431

Site details

Total site area (ha)	116.7 ha

Greenfield runoff

Method

Method	FEH statistical (2025)

FEH statistical (2025)

	My value		Map value	
SAAR9120 (mm)	820	mm		
BFIHOST19scaled	0.265			
QMed-QBar conversion	1.136		1.136	
QMed (l/s)	744.9	l/s		
QBar (FEH statistical 2025) (l/s)	846.2	l/s		

Growth curve factors

	My value	Map value
Hydrological region	7	7
1 year growth factor	0.85	
2 year growth factor	0.88	
10 year growth factor	1.62	
30 year growth factor	2.3	
100 year growth factor	3.19	
200 year growth factor	3.74	

Results

Method	FEH statistical (2025)	
Flow rate 1 year (l/s)	719.3	l/s
Flow rate 2 year (l/s)	744.9	l/s
Flow rate 10 years (l/s)	1370.8	l/s
Flow rate 30 years (l/s)	1946.2	l/s
Flow rate 100 years (l/s)	2699.3	l/s
Flow rate 200 years (l/s)	3164.7	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at uksuds.com (https://www.uksuds.com/). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at uksuds.com/terms-conditions (https://www.uksuds.com/terms-conditions). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: North	Company Address		

Basin 3 Type Pond

Dimensions

Exceedance Level (m)	57.400
Depth (m)	1.500
Base Level (m)	55.900
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.00
Total Volume (m³)	427.176

Depth (m)	Area (m²)	Volume (m³)
0.000	242.95	0.000
1.200	482.56	427.176
1.500	555.21	582.716

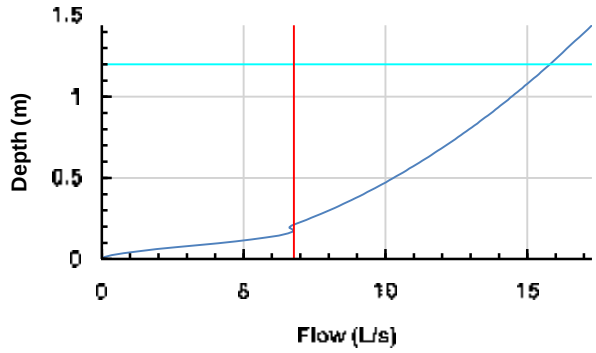
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	55.900
Design Depth (m)	1.200
Design Flow (L/s)	15.8
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0120-1580-1200-1580



Advanced

Perimeter	Circular
Length (m)	70.733
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: North	Company Address		

Basin 1

Type Pond

Dimensions

Exceedance Level (m)	49.500
Depth (m)	1.800
Base Level (m)	47.700
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.255
Total Volume (m³)	1873.425

Depth (m)	Area (m²)	Volume (m³)
0.000	955.17	0.000
1.500	1567.91	1873.425
1.800	1704.91	2364.205

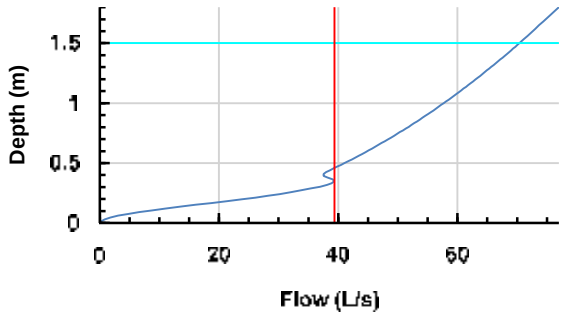
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	47.700
Design Depth (m)	1.500
Design Flow (L/s)	70.4
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0242-7040-1500-7040



Advanced

Perimeter	Circular
Length (m)	55.535
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: North	Company Address		

Basin 2 Type Pond

Dimensions

Exceedance Level (m)	52.100
Depth (m)	2.000
Base Level (m)	50.100
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	4.146
Total Volume (m³)	1569.393

Depth (m)	Area (m²)	Volume (m³)
0.000	572.14	0.000
2.000	1491.80	1991.861

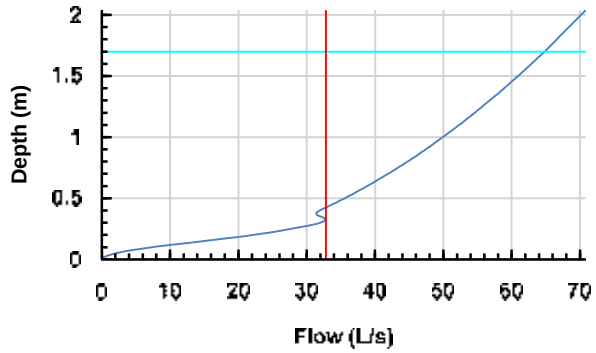
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	50.100
Design Depth (m)	1.700
Design Flow (L/s)	64.8
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0225-6480-1700-6480



Advanced

Perimeter	Circular
Length (m)	106.758
Friction Scheme	Manning's n
n	0.045

Basin 10

Type Pond

Dimensions

Exceedance Level (m)	54.500
Depth (m)	1.300
Base Level (m)	53.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.525
Total Volume (m³)	152.609

Depth (m)	Area (m²)	Volume (m³)
0.000	81.40	0.000
1.300	237.42	152.609
1.300	293.95	232.153

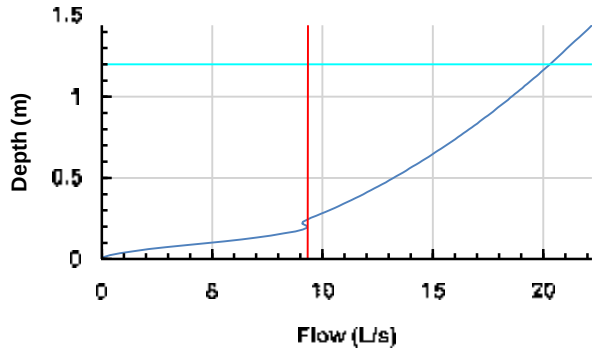
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	53.200
Design Depth (m)	1.200
Design Flow (L/s)	20.3
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0137-2030-1200-2030



Advanced

Perimeter	Circular
Length (m)	39.835
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: North	Company Address		

Tank 1

Type : Tank

Dimensions

Exceedance Level (m)	56.300
Depth (m)	2.300
Base Level (m)	54.000
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1 X)	-10.897
Total Volume (m³)	357.056

Depth (m)	Area (m²)	Volume (m³)
0.000	375.000	0.000
1.300	375.000	356.250
1.301	0.001	356.369

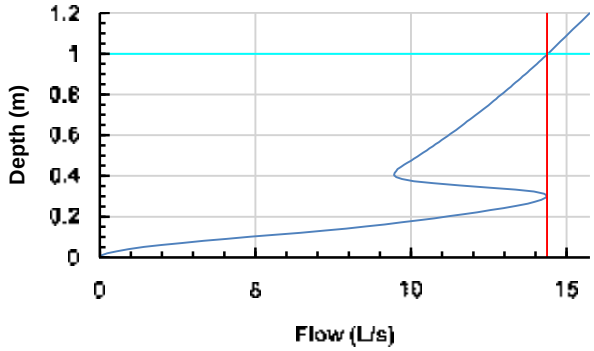
Outlets

Outlet

Outgoing Connection	No Delay
Outlet Type	Hydro-Brake®

Invert Level (m)	54.000
Design Depth (m)	1.300
Design Flow (L/s)	14.4
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☐

Unit Reference	CHE-0150-1440-1000-1440



Advanced

Perimeter	Rectangular
Length (m)	18.836

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Title Rainfall Analysis Criteria	Company Address		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH - North 2022

Type: FEH

Site Location	GB 515668 128281 TQ 15668 28281
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: North	Company Address		

FEH - North 2022: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Basin 3	FEH - North 2022: 100 years: +45 %: 180 mins: Winter	57.093	57.093	1.193	1.193	123.7	423.759	0.000	0.000	15.8	265.052	0.793	OK
Basin 1	FEH - North 2022: 100 years: +45 %: 180 mins: Winter	49.181	49.179	1.481	1.479	537.4	1842.569	0.000	0.000	69.9	1177.183	1.346	OK
Basin 2	FEH - North 2022: 100 years: +45 %: 180 mins: Winter	51.775	51.775	1.375	1.375	460.6	1535.663	0.000	0.000	64.3	1096.157	2.135	OK
Basin 10	FEH - North 2022: 100 years: +45 %: 240 mins: Winter	54.184	54.182	0.984	0.982	44.9	148.416	0.000	0.000	18.4	420.059	2.746	OK
Tank 1	FEH - North 2022: 100 years: +45 %: 180 mins: Winter	54.956	54.956	0.956	0.956	102.2	344.214	0.000	0.000	14.2	230.065	3.600	OK

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: South	Company Address		

Basin 4

Type Pond

Dimensions

Exceedance Level (m)	57.600
Depth (m)	1.500
Base Level (m)	56.100
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.664
Total Volume (m³)	2426.069

Depth (m)	Area (m²)	Volume (m³)
0.000	1680.00	0.000
1.200	2383.95	2426.069
1.500	2573.34	3769.505

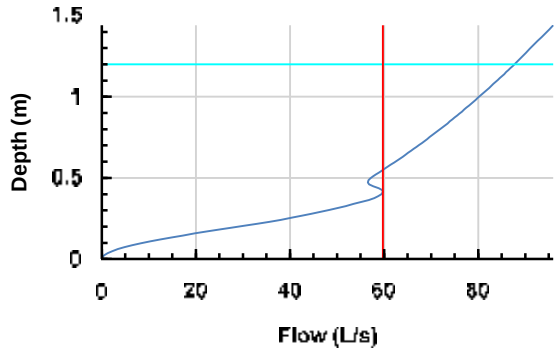
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	56.100
Design Depth (m)	1.200
Design Flow (L/s)	87.7
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0286-8770-1200-8770



Advanced

Perimeter	Circular
Length (m)	91.699
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: South	Company Address		

Basin 5 Type Pond

Dimensions

Exceedance Level (m)	55.000
Depth (m)	1.800
Base Level (m)	53.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.00
Total Volume (m³)	2872.136

Depth (m)	Area (m²)	Volume (m³)
0.000	1576.83	0.000
1.500	2273.69	2872.136
1.800	2428.57	3577.361

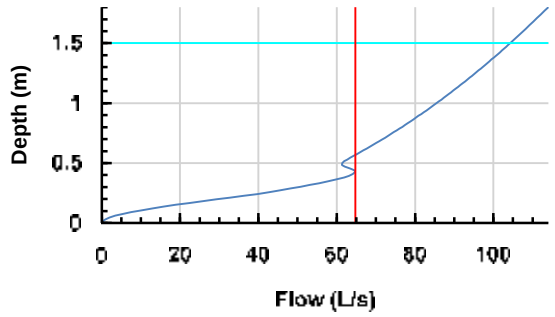
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	53.200
Design Depth (m)	1.500
Design Flow (L/s)	104.3
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0295-1043-1500-1043



Advanced

Perimeter	Circular
Length (m)	99.855
Friction Scheme	Manning's n
n	0.045

Basin 6

Type Pond

Dimensions

Exceedance Level (m)	52.500
Depth (m)	2.100
Base Level (m)	50.400
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.00
Total Volume (m³)	957.189

Depth (m)	Area (m²)	Volume (m³)
0.000	329.66	0.000
1.500	682.92	743.533
2.100	859.85	1205.344

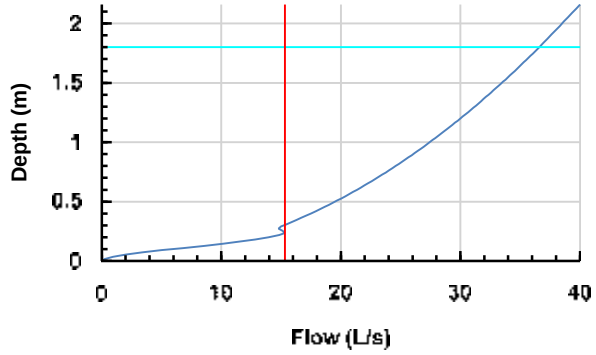
Outlets

Outlet

Outgoing Connection	No Delay
Outlet Type	Hydro-Brake®

Invert Level (m)	50.400
Design Depth (m)	1.800
Design Flow (L/s)	36.6
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0166-3660-1800-3660



Advanced

Perimeter	Circular
Length (m)	68.212
Friction Scheme	Manning's n
n	0.045

Basin 7

Type Pond

Dimensions

Exceedance Level (m)	50.800
Depth (m)	1.500
Base Level (m)	49.300
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.672
Total Volume (m³)	538.162

Depth (m)	Area (m²)	Volume (m³)
0.000	292.65	0.000
1.200	625.10	538.162
1.500	721.90	740.059

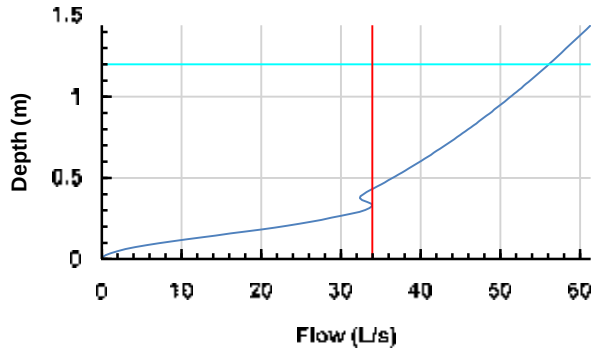
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	49.300
Design Depth (m)	1.200
Design Flow (L/s)	56.1
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0228-5610-1200-5610



Advanced

Perimeter	Circular
Length (m)	84.527
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: South	Company Address		

Basin 6 Type Pond

Dimensions

Exceedance Level (m)	45.000
Depth (m)	1.800
Base Level (m)	43.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.00
Total Volume (m³)	1408.890

Depth (m)	Area (m²)	Volume (m³)
0.000	706.11	0.000
1.500	1193.62	1408.890
1.800	1306.39	1783.764

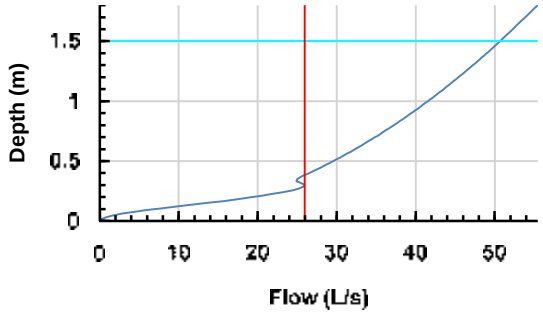
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	43.200
Design Depth (m)	1.500
Design Flow (L/s)	50.7
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0205-5070-1500-5070



Advanced

Perimeter	Circular
Length (m)	73.145
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Storm Phase: South	Company Address		

Basin 9

Type Pond

Dimensions

Exceedance Level (m)	54.000
Depth (m)	1.800
Base Level (m)	52.200
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1 X)	3.357
Total Volume (m³)	1842.814

Depth (m)	Area (m²)	Volume (m³)
0.000	927.86	0.000
1.500	1556.15	1842.814
1.800	1697.76	2330.746

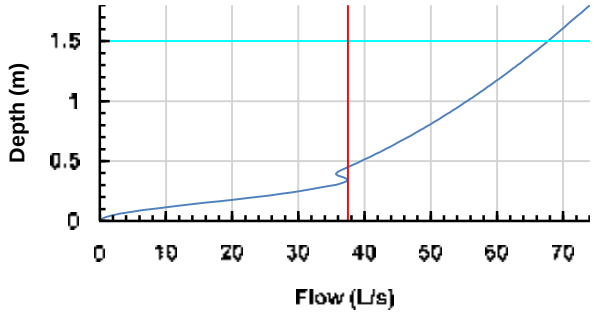
Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®

Invert Level (m)	52.200
Design Depth (m)	1.500
Design Flow (L/s)	67.7
Objective	Linear Discharge Profile
Application	Surface Water Only
Sump Available	☐

Unit Reference	CCU-0237-6770-1500-6770



Advanced

Perimeter	Circular
Length (m)	64.695
Friction Scheme	Manning's n
n	0.045

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Title Rainfall Analysis Criteria	Company Address		

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH - South 2022

Type: FEH

Site Location	GB 515223 127060 TQ 15223 27060
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880

North Southwater	Date 09/01/2026		
	Designed by KW	Checked by	Approved By
Report Details Type: Stormwater Controls Summary Storm Phase: South	Company Address		

FEH - South 2022: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Basin 4	FEH - South 2022: 100 years: +45 %: 240 mins: Winter	57.288	57.288	1.166	1.166	553.7	2368.677	0.000	0.000	87.3	1903.551	1.120	OK
Basin 5	FEH - South 2022: 100 years: +45 %: 240 mins: Winter	54.693	54.691	1.493	1.491	661.0	2952.699	0.000	0.000	104.0	2281.520	0.670	OK
Basin 6	FEH - South 2022: 100 years: +45 %: 180 mins: Winter	52.195	52.194	1.795	1.794	281.2	956.691	0.000	0.000	35.6	625.082	0.466	OK
Basin 7	FEH - South 2022: 100 years: +45 %: 180 mins: Winter	50.493	50.493	1.193	1.193	185.0	534.066	0.000	0.000	55.9	956.491	0.765	OK
Basin 8	FEH - South 2022: 100 years: +45 %: 180 mins: Winter	44.690	44.692	1.490	1.492	404.5	1398.517	0.000	0.000	50.6	855.864	0.736	OK
Basin 9	FEH - South 2022: 100 years: +45 %: 180 mins: Winter	53.693	53.693	1.493	1.493	531.4	1831.723	0.000	0.000	67.5	1139.963	0.602	OK

Annex E

LLFA CORRESPONDENCE

Public

Eleanor Read
Flood Risk Management Officer
Highways, Transport and Planning,
Place Services

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Aaron Wadhams
Berkely Strategic Land Limited
Berkely House
19 Portsmouth Road
Cobham
Surrey
KT11 1JG

BY EMAIL ONLY

28th November 2025

Dear Aaron,

LLFA/PLAN/PREAPP/25/005– Land west of Southwater

WSCC Flood Risk Management Team Level 2 Pre-Application Advice has been sought for a site in Horsham, Horsham District. The application will be for outline permission (for up to 1000 dwellings, a school and employment space amongst other features), therefore the level of advice reflects the application type. The site is allocated in Reg 19 Horsham Local Plan 2019-2031 and Southwater Neighbourhood Plan (2019-2031).

Following a meeting on 11th November 2025, we have the following initial comments to make:

It is proposed to discharge surface water at greenfield runoff rates to watercourses within the site. We've not seen any site investigations or infiltration testing to demonstrate why discharge to surface water. To ensure the application follows the SuDS Hierarchy and the National Standards for SuDS (NSfS), these will need to be provided at outline stage. We'd recommend winter groundwater monitoring is also completed, as this will be required at detailed design stage (if not already installed this winter).

As this is an outline application, we'd suggest calculating the greenfield runoff rate for the entire development that could drain into the proposed surface water drainage system. Then for each catchment, calculating a pro-rata rate to determine required attenuation from each catchment.

It is proposed to manage the surface water using swales and attenuation basins (with some permanently wet and some dry). We are supportive of the use of open SuDS features, as this follows the NSfS. Appropriate easements for the swales and basins will need to be considered, as this could have impacts on the parameter plan. Following experience with other sites, we'd suggest making it clear on all necessary drawings which basins will be permanently wet and dry – other consultees will also check this.

Given the size of the site, there may be opportunities to use SuDS for multi-functional purposes (such as edutain and recreation/amenity). The Ciria SuDS

Manual gives some ideas of examples. There may be examples in the wider area which the LPA are aware of.

The notes state that the 1 in 100 plus 45% climate change event will be sensitivity checked. This does not comply with the NSfS which state that the Upper End Allowance shall be used. The basin designs, including freeboard requirements, need to follow the SuDS Manual.

As this will be an outline application, the drainage strategy should demonstrate a high-level description on how it is suggested the NSfS are followed at reserved matters.

In the calculations, FEH22 rainfall, Cv value 1 and 10% urban creep are locally required. Depending on the modelling software being used the Additional Storage/MADD Factor will need to be 0. In line with the NSfS, 10% urban creep needs to be considered.

The FRA must consider all sources of flood risk, with consideration of future flood risk. Any surface water flow paths shall not be obstructed.

All watercourses/ditches within the red line must be retained, with a 3m maintenance easement from the top of both banks required. This can also help with BNG requirements (this is outside of our remit but we are aware BNG pushes for a buffer to watercourses). These must be clearly shown on drawings, to ensure that as the application progresses, easements are retained.

With regards to Sequential Tests, this is a Local Planning Authority matter. To assist them, it is suggested the proposed masterplan is overlayed with the Flood Zones and Surface Water Flood Risk mapping, to demonstrate how the sequential approach has been used.

The effects of climate change on surface water flood risk need to be considered. It is suggested to use the HDC SFRA, which should cover it while we await the EA's release of surface water plus climate change modelling that is appropriate for use for planning purposes (The EA have advised that Check your long term flood risk mapping is not suitable for planning purposes as it doesn't adequately reflect the lifetime of the development).

Basin 3 is currently located outside of the red line boundary. This must be appropriately dealt with (either providing an amended red line boundary, or demonstrating the land-owner is in agreement in principle with this proposal for the lifetime of the development). This is not something we'd be able to condition, as it must be demonstrated at outline stage that there is adequate space within the red line for the required attenuation volumes.

When preparing for submission to the LPA, we recommend using the SuDS Proforma (Please note this hasn't been updated since the updated NSfS – if it is updated before the application is submitted I'll let you know).

We expect to see the following at outline application stage:

- Drainage layout showing labelled attenuation features and any proposed outfall locations. This shall include any required easements, as this could have impacts on the parameter plan.
- Catchment plan to demonstrate natural catchments within the site are being followed. It was discussed that there are 2 catchments within the site.
- Evidence that the hierarchy has been followed.
- Quick storage estimates and runoff rates for the attenuation requirements. The labelling of features in calculations must match the outline drainage strategy.
- We require proposals to follow the National Standards for SuDS. For an outline application, it needs to be demonstrated that Standard 1 (Run-off destinations/hierarchy) has been followed there is a viable method of draining the site. It also needs to be demonstrated that 1% AEP plus climate change event can be managed on site, without increasing flood risk elsewhere (Standard 3 (Management of Extreme Rainfall and Flooding)). This is because this is the Standard which affects the parameter plan the most significantly, therefore it must be demonstrated at outline stage that there is enough space for the required attenuation.
- For Standards 2, 4, 5, 6 and 7, a high-level overview of the use of multi-functional SuDS and who it is thought will be responsible for the maintenance of the SuDS and ordinary watercourses (under riparian ownership) within the red line boundary is required. This is because the application is outline – we will condition the detailed information.

The application will need to be in accordance with:

- NPPF
- PPG Flood risk and coastal change
- National standards for sustainable drainage systems (SuDS) (July 2025)
- Strategic Policy 10: Flooding and Strategic Policy HA3: Land NorthWest of Southwater in Reg 19 HDC Local Plan
- Policy SNP2 and SNP3 in Southwater Neighbourhood Plan

We are happy to review any amended documents and meet again if necessary prior to formal submission to the LPA.

Yours sincerely,

Eleanor Read

Eleanor.read@westsussex.gov.uk

Flood Risk Management Team

Documents reviewed:
Southwater Outline Drainage Strategy P01 by WSP, Sept 2025

Southwater Outline Calculations, Sept 2025

Annex F

SUDS STANDARD 2 EXAMPLE

Public

DO NOT SCALE

UNTIL TECHNICAL APPROVAL HAS BEEN OBTAINED FROM THE RELEVANT LOCAL AUTHORITIES OR STATUTORY BODIES, IT SHOULD BE UNDERSTOOD THAT ALL DRAWINGS ARE ISSUED AS PRELIMINARY AND NOT FOR CONSTRUCTION. SHOULD THE CONTRACTOR AND / OR EMPLOYER COMMENCE WORK PRIOR TO APPROVAL BEING GIVEN, IT IS ENTIRELY AT THEIR OWN RISK.

KEY

- ADOPTABLE HIGHWAY IMPERMEABLE AREA DRAINING TO BIORETENTION PLANTER (4262m²)
- UNLINED PERMEABLE PAVING (1931m²)
- ROOF AREA DRAINING TO PERMEABLE PAVING WITHIN THE SAME PRIVATE OWNERSHIP (1898m²)
- ROOF AREA DRAINING TO RAIN GARDENS WITHIN THE SAME PRIVATE OWNERSHIP (1653m²)
- RESIDUAL IMPERMEABLE AREA TO BE INTERCEPTED IN BASIN (1090m²)
- BIORETENTION AREA (856m²)
- RAIN GARDEN (347m²)

REV	DATE	BY	DESCRIPTION	CHK	APP
P01	22/12/2025	KW	FIRST ISSUE	SAP	SAP

DRAWING STATUS: S2 - FOR INFORMATION

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Hertford
SG13 7NN, UK
T+ 44 (0) 1992 526 000
F+ 44 (0) 1992 526 001
wsp.com

CLIENT: BERKELEY

ARCHITECT: KPK STUDIOS

PROJECT: NORTH SOUTHWATER

TITLE: TYPICAL RESIDENTIAL PARCEL NATIONAL STANDARDS FOR SUSTAINABLE DRAINAGE SYSTEMS REQUIREMENTS

SCALE @ A1:	CHECKED:		APPROVED:
1:250	DSB		SAP
PROJECT No:	DESIGNED:	DRAWN:	DATE:
70091497	KW	KW	December 25

DRAWING No: 1497-DR-SK-001 REV: P01

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0 12.5 metres

File name: \\UK.WSPGROUP.COM\CENTRAL DATA\Projects\70091XX\70091497 - NORTH SOUTHWATER, PHASE 2&3 WIP\DR DRAINAGE ENGINEER\10 SHEETS\1497-DR-SK-001.DWG, printed on 22 December 2025 10:08:09, by Willis, Karl

Annex G

SUDS PRO FORMA

Public

Surface Water Drainage Statement

In order to provide the required information on surface water drainage from the proposed development this pro-forma must be completed in full and be submitted with any planning application which seeks permission for 'major' development. This information contained in this form will be used by West Sussex County Council in its role as Lead Local Flood Authority and 'statutory consultee' on SuDs for all 'major' planning applications. The pro-forma is supported by the Defra/EA Guidance on Rainfall Runoff Management and can be completed using freely available tools including SuDS Tools. The pro-forma should be considered alongside other supporting SuDS Guidance, but focuses on ensuring flood risk is not made worse elsewhere. The SuDS solution must operate effectively for as long as the development exists. This pro-forma is based upon current industry standard practice.

1. Site Details

Site	Land West of Southwater
Address & post code or LPA reference	Nearest postcode- RH13 0LB Easting, Northing – 515415, 127556
Grid reference	TQ15415 27556
Is the existing site developed or Greenfield?	Majority of the site is greenfield with several existing buildings (dairy farm, barn buildings)
Total Site Area served by drainage system (excluding open space) (Ha)*	55.4 ha
Topographical survey plan showing existing site layout, site levels and drainage system	Please see 'Topographical Survey' by MK Surveys (Project Number 25205, 2018) and 'Topographical Survey' by MK Surveys (Project Number 30859, 2022)

***** The Greenfield runoff off rate from the development which is to be used for assessing the requirements for limiting discharge flow rates and attenuation storage from a site should be calculated for the area that forms the drainage network for the site whatever size of site and type of drainage technique. Please refer to the Rainfall Runoff Management document or CIRIA manual for detail on this.

2. Impermeable Area

	Existing	Proposed	Difference (Proposed-Existing)	Notes for developers & Local Authorities
Impermeable area (ha) (areas to be shown on a plan)	0.5	36.033	35.533	If the proposed amount of impermeable surface is greater, then runoff rates and volumes will increase. Section 6 must be filled in. If proposed permeability is equal or less than existing, then section 6 can be skipped & section 7 filled in.
Drainage Method (infiltration/sewer/watercourse)	Infiltration and discharge into watercourse	Discharge to watercourse	N/A	If different from the existing, please fill in section 3. If existing drainage is by infiltration and the proposed is not, discharge volumes may increase. Fill in section 6.

PPG Paragraph 080

3. Proposing to Discharge Surface Water via

	Yes	No	Evidence that this is possible	Notes for developers & Local Authorities
Existing and proposed micro-drainage calculations	**X**		Taken from UK suds tool – Please refer to attached caluclations	Please provide micro-drainage calculations of existing and proposed run-off rates and volumes in accordance with a recognised methodology or the results of a full infiltration test (see line below) if infiltration is proposed.
Infiltration		X	N/A	e.g. soakage tests. Section 6 (infiltration) must be filled in if infiltration is proposed.
To watercourse	X		N/A	e.g. Is there a watercourse nearby? Please provide details of any watercourse to which the site drains including cross-sections of any adjacent water courses for appropriate distance upstream and downstream of the discharge point (as agreed with the LLFA and/or EA)
To surface water sewer		X	N/A	Confirmation from sewer provider that sufficient capacity exists for this connection.
Combination of above		X	N/A	e.g. part infiltration part discharge to sewer or watercourse. Provide evidence above.
Has the drainage proposal had regard to the SuDS hierarchy?	X		Please see Report 'UK0043490.9681-WSP-XX-XX-D-DR-0001' and drawing 'NSW-WSP-XX-XX-DR-DR-0001	Evidence must be provided to demonstrate that the proposed Sustainable Drainage proposal has had regard to the SuDS hierarchy.
Layout plan showing where the sustainable drainage infrastructure will be located on site.	X		Please refer to drawing 'NSW-WSP-XX-XX-DR-DR-0001'	Please provide plan reference numbers showing the details of the site layout showing where the sustainable drainage infrastructure will be located on the site. If the development is to be constructed in phases this should be shown on a separate plan and confirmation should be provided that the sustainable drainage proposal for each phase can be constructed and can operate independently and is not reliant on any later phase of

				development.

Technical Standards S2 and S3

4. Peak Discharge Rates – This is the maximum flow rate at which surface water runoff leaves the site during a particular storm event.

	Existing Rates (l/s)	Proposed Rates (l/s)	Difference (l/s) (Proposed-Existing)	Notes for developers & Local Authorities
Greenfield QBAR	846.2	N/A	N/A	Mean annual Greenfield peak flow - QBAR is approx. 1 in 2 storm events. Use that figure in Section 7a.
1 in 1	719.3	719.3	0	Proposed discharge rates (with mitigation) should be no greater than existing rates for all corresponding storm events. e.g. discharging all flow from site at the existing 1 in 100 event increases flood risk during smaller events.
1 in 30	1946.2	1946.2	0	
1in 100	2699.3	2699.3	0	
1 in 100 plus climate change	3799.36	2699.3	0	To mitigate for climate change the proposed 1 in 100 +CC must be no greater than the existing 1 in 100 runoff rate. If not, flood risk increases under climate change should be added to the peak rainfall intensity. EA Guidance - Flood Risk Assessments: Climate Change Allowances (Published Feb 2016) https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

Technical Standards S4 to S9

5. Calculate discharge volumes –The total volume of water leaving the development site for a particular rainfall event. Introducing new impermeable surfaces increases surface water runoff and may increase flood risk outside the development.

	Existing Volume (m^3)	Proposed Volume (m^3)	Difference (m^3) (Proposed-Existing)	Notes for developers & Local Authorities
1 in 2	6,934	8,421	1,487	Proposed discharge volumes (without mitigation) should be no greater than existing volumes for all corresponding storm events. Any increase in volume increases flood risk elsewhere. Where volumes are increased section 6 must be filled in.
1 in 30	12,855	14,673	1,818	
1in 100	16,821	18,597	1,776	
1 in 100 plus climate change	24,390	30,169	5,779	To mitigate for climate change the volume discharge from site must be no greater than the existing 1 in 100 storm event. If not, flood risk increases under climate change.

6. Calculate attenuation storage – In order to minimise the negative impact on flood risk resulting from increased volumes runoff from the proposed development, storage must be provided.

		Notes for developers & Local Authorities
Storage volume required to retain discharge rates as existing (m^3)	14,305	Volume of water to attenuate on site if discharging at existing rates. Can't be used where discharge volumes are increasing
Where will the storage be provided on site?	Yes	

7. How is Storm Water stored on site?

Storage is required for the additional volume from site but also for holding back water to slow down the rate from the site. This is known as attenuation storage and long term storage. The intention is to not discharge that volume into the watercourses so as not to increase flood risk elsewhere.

			Notes for developers & Local Authorities
Infiltration	**State the Site's Geology/drift material overlaying)**	Bedrock - Horsham Stone Member and Weald Clay formation No superficial deposits	Avoid infiltrating in made ground.
	Does the site have a high ground water table? Yes/No?	No	If yes, please provide details of the site's hydrology.
	Is the site within a known Source Protection Zones (SPZ)? Yes/No?	No	Infiltration rates are highly variable and refer to Environment Agency website to identify and source protection zones (SPZ)
	Are infiltration rates suitable?	N/A	Infiltration rates should be no lower than $1x10^{-6}$ m/s.
	Is the site contaminated? If yes, consider advice from others on whether infiltration can happen.	No	Water should not be infiltrated through land that is contaminated. The Environment Agency may provide bespoke advice in planning consultations for contaminated sites that should be considered.
	State the distance between a proposed infiltration device base and the ground water (GW) level	N/A	Need 1m (min) between the base of the infiltration device & the water table to protect Groundwater quality & ensure GW doesn't enter infiltration devices. Avoid infiltration where this isn't possible.

	Were infiltration rates obtained by desk study or infiltration test?	infiltration tests	Infiltration rates can be estimated from desk studies at most stages of the planning system if a back-up attenuation scheme is provided.
Is infiltration feasible?	**Yes/No?**	No	If infiltration is not feasible how will the additional volume be stored?. The applicant should then consider the following options in the next section.

7a. Storage requirements

Where infiltration is not possible, then the developer must confirm that either of the two options below will be implemented for dealing with the amount of water that needs to be stored on site.

Option 1 Simple – Store both the additional volume and attenuation volume in order to make a final discharge from site at **QBAR**. This is preferred if no infiltration can be made on site. This very simply satisfies the runoff rates and volume criteria.

Option 2 Complex – If some of the additional volume of water can be infiltrated back into the ground, the remainder can be discharged at a very low rate of 2 l/sec/hectare. A combined storage calculation using the partial permissible rate of 2 l/sec/hectare and the attenuation rate used to slow the runoff from site.

		Notes for developers & Local Authorities
Please confirm what option has been chosen and how much storage is required on site.	Option 1 14,305.0 m^3	The developer at this stage should understand the site characteristics and be able to explain what the storage requirements are on site and how it will be achieved.

8. Additional Consideration to comply with the Technical Standards and PPG

		Notes for developers & Local Authorities
Which Drainage Systems measures have been used?	SuDS including bioretention system, swales, Permeable paving, dry basins, and underground attenuation storage features e.g., attenuation tank.	SUDS can be adapted for most situations even where infiltration isn't feasible e.g. impermeable liners beneath some SUDS devices allows treatment but not infiltration. See CIRIA SUDS Manual C753.
How will exceedance events be catered on site without increasing flood risks (both on site and outside the development)?	Dry Basin, bioretention system on site to be utilised as additional storage in extreme flood events.	**Safely:** not causing property flooding or posing a hazard to site users i.e. no deeper than 300mm on roads/footpaths
How are rates being restricted?	Hydrobrakes are proposed to restrict the	Hydrobrakes to be used where rates are between 2l/s to 5l/s.

	surface water runoffs to greenfield runoff rates.	Orifices not be used below 5l/s as the pipes may block. Pipes with flows < 2l/s are prone to blockage.
Drainage during construction period	Please refer to 'Environmental Statement Volume I Chapter 13 - Flood Risk and Drainage'	Provide details of how drainage will be managed during the construction period including any necessary connections, impacts, diversions and erosion control.
Key Drainage components / Features	Sewers, hydrobrakes (however the size of all storage features has been designed to cater for rainfall events of 1 in 100 year + 45% climate changes. The blockages of these features will not lead to an immediate flooding to the site).	Which component if blocked (even partial) will lead to flooding?

Technical Standards S10 to S12

9. Management and Maintenance of SuDs

Details are required to be provided of the management and maintenance plan for the SUD, including for the individual plots in perpetuity.

How is the entire drainage system to be maintained in perpetuity?	Please refer to Report 'UK0043490.9681-WSP-XX-XX-D-DR-0001' Section 11.	Clear details of the maintenance proposals of all elements of the proposed drainage system must be provided to show that all parts of SuDs are effective and robust. Provide a management plan to describe the SUDS scheme and set out the management objectives for the site. It should consider how the SuDs will perform and develop over time anticipating any additional maintenance tasks to ensure the system continues to perform as designed. — Specification notes that describe how work is to be undertaken and the materials to be used. — A maintenance schedule describes what work is to be done and when it is to be done using frequency and performance requirements as appropriate. — A site plan showing maintenance areas, control points and outfalls. Responsibility for the management and maintenance of each element of the SUDS scheme will also need to be detailed within the

		Management Plan. Where open water is involved please provide a health and safety plan within the management plan.
Please confirm the owners/adopters of the entire drainage systems throughout the development. Please list all the owners.	Berkeley Homes Strategic LTD	If these are multiple owners then a drawing illustrating exactly what features will be within each owner's remit must be submitted with this Proforma. Please give details of each feature and how it will be managed in accordance with the details in the management plan.
Please provide details demonstrating that any third party agreements required using land outside the application site have been secured.	N/A	

The above form should be completed using evidence from information which should be appended to this form. The information being submitted should be proportionate to the site conditions, flood risks and magnitude of development. It should serve as a summary of the drainage proposals and should clearly show that the proposed discharge rate and volume as a result of development will not be increasing. Where there is an increase in discharge rate or volume, then the relevant section of this form must be completed with clear evidence demonstrating how the requirements will be met.

This form is completed using factual information and can be used as a summary of the surface water drainage strategy on this site.

Form Completed By…….Darren Brown…….....

Qualification of person responsible for signing off this pro-forma .....Associate Director.....

Company……WSP UK LTD ……,.....

On behalf of (Client's details) .....Berkeley Homes Strategic LTD.....

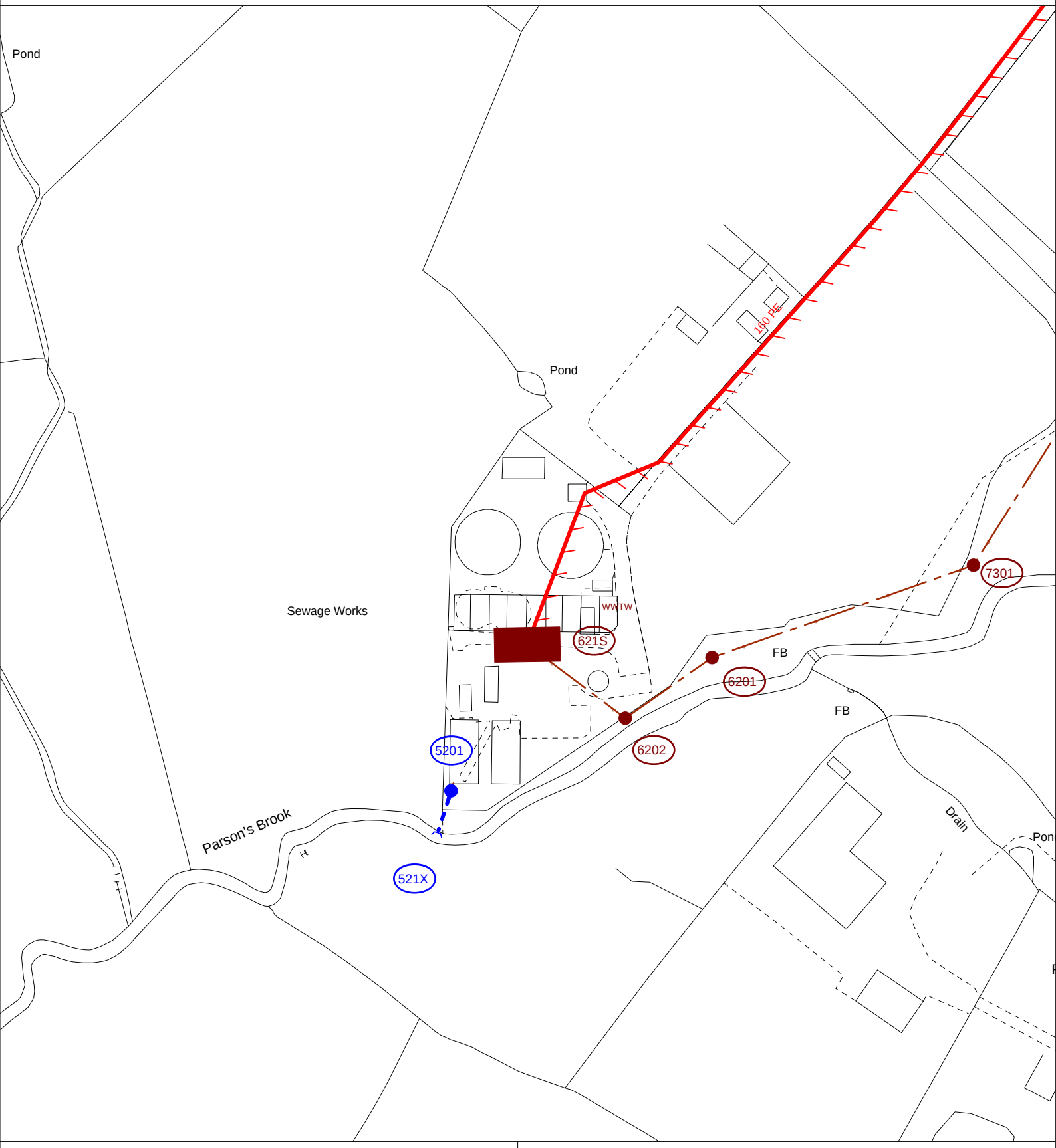
Date:……20/12/2025…….....

Annex H

SOUTHERN WATER CORRESPONDENCE

Public

SOUTHERN WATER



The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.

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Southern Water

O.S. REF: TQ1226SE	Scale: 1:1250	Printed By: Prashanth	Date: 12-7-2022
Sewer Plot		Nearest Capacity	
WARNING: BAC pipes are constructed of Bonded Asbestos Cement		Requested By:	
WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement			

SOUTHERN WATER

SOUTHWATER

Southwater Sports Club

Two Mile Ash

Kirdys Wood

Courtland Wood

Bluecoat Sports (Leisure Or Sports Centre)

Christ's Hospital (School)

Christ's Hospital Theatre

Quadrangle

Tennis Courts

Lanaways Farm

Sayers Farm

College Farm

Great House Farm

Field End Cottage

Hop Oast Park & Ride

Hop Oast Farm (Horwood Arabian Stud)

Newlane Wood

Southwater Street

Roundstone Park

Pondfarm Gill

Southwater Junior School

Southwater Infant Academy

Southwater Leisure Centre

Charwood House

RSPCA

Horwood Primary School

Southwater Sports Club

Courtland Wood

Kirdys Wood

Bonfire Hill

Marlpost Meadows

Marlpost Farm

Hyklands Farm

Great House Farm

College Farm

Lanaways Farm

Sayers Farm

Field End Cottage

Hop Oast Farm (Horwood Arabian Stud)

Southwater Junior School

Southwater Infant Academy

Southwater Leisure Centre

Southwater Sports Club

Pondfarm Gill

Roundstone Park

Newlane Wood

Southwater Street

Two Mile Ash

Kirdys Wood

Courtland Wood

Bluecoat Sports (Leisure Or Sports Centre)

Christ's Hospital (School)

Christ's Hospital Theatre

Quadrangle

Tennis Courts

Lanaways Farm

Sayers Farm

College Farm

Great House Farm

Field End Cottage

Hop Oast Park & Ride

Hop Oast Farm (Horwood Arabian Stud)

Newlane Wood

Southwater Street

Roundstone Park

Pondfarm Gill

Southwater Junior School

Southwater Infant Academy

Southwater Leisure Centre

from Southern Water

Wu Qianqian
WSP UK Ltd
WSP House
70 Chancery Lane
London
WC2A 1AF

Your ref

Our ref
DSA000012586

Date
12 July 2022

Contact
Tel 0330 303 0119

Dear Ms Qianqian,

Level 1 Capacity Check Enquiry: North SouthWater, Two Mile Ash Road, Southwater, Horsham, West Sussex, RH13 0LB.

We have completed the capacity check for the above development site and the results are as follows:

Foul Water

There is currently inadequate capacity within the foul sewerage network to accommodate a split foul flow of **6.25 l/s** and **10.69 l/s** for the above development at manhole references TQ1528**5602** and TQ1526**6903**, respectively. The proposed development would increase flows to the public sewerage system which may increase the risk of flooding to existing properties and land. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the development. Southern Water has a duty to provide Network capacity from the point of practical connection (point of equivalent or larger diameter pipe) funded by the New Infrastructure Charge.

Southern Water aim to provide this within 24 months following the date that planning has been granted for developments not identified as strategic sites in our current business plan. Strategic sites are larger developments and will often take longer than 24 months for a full solution to be provided.

The nearest point where capacity is currently available is at **Barns Green WTW** which is located approximately **2 km** Southwest of the proposed development site. Rights are not issued for a direct connection to Wastewater Treatment Works (WTW). Please note that connection to the WTW will have to be agreed by Southern Water Services before being carried out.

Southern Water Services Ltd, Registered Office: Southern House, Yeoman Road, Worthing, West Sussex, BN13 3NX Registered in England No. 2366670

New Infrastructure Charging

Please note as of 1st April 2018 we have moved to the “New Connections Services Charging Arrangements”. We understand that this may cause uncertainty for customers, particularly where they may have already committed to a development based on previous charging arrangements. We have worked with our stakeholders and Water UK to agree a set of principles by which we will base our charges. Please read through our new charging arrangement documents available at the following link: southernwater.co.uk/developing-building/connection-charging-arrangements

Alternatively, New Appointees and Variations (NAVs), also known as ‘inset’ companies, can provide new connection services or take ownership of the new water and wastewater connection infrastructure provided for a new development. NAVs are appointed by Ofwat and replace the regional water company. It is for the developer to choose whether to use a NAV or the regional water company to supply services for new sites, according to certain legal criteria.

Connecting to our network

It should be noted that this information is only a hydraulic assessment of the existing sewerage network and does not grant approval for a connection to the public sewerage system. A formal Sewer Connection (S106) application is required to be completed and approved by Southern Water Services. To make an application visit: developerservices.southernwater.co.uk

Please note the information provided above does not grant approval for any designs/drawings submitted for the capacity analysis. The results quoted above are only valid for 12 months from the date of issue of this letter.

Should it be necessary to contact us please quote our above reference number relating to this application by email at southernwaterplanning@southernwater.co.uk

Yours sincerely,

Future Growth Planning Team
Business Channels

southernwater.co.uk/developing-building/planning-your-development

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