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Mr and Mrs Fawsitt

BIRD PLACE, HENLEY-ON-THAMES

Flood Risk Assessment and Surface Water
Drainage Strategy

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1.0 INTRODUCTION

- 1.1 Create Consulting Engineers Ltd was instructed by Mr and Mrs Fawsitt to prepare a Flood Risk Assessment (FRA) and Sustainable Drainage Strategy (SuDS) in support of a proposal to extend the residential property called Bird Place.
- 1.2 The Site is 0.86 ha in size and is located in Henley-on-Thames, immediately to the east of the River Thames and south of Henley Bridge. The Site boundary is shown in Figure 1.1.
- 1.3 The Site lies within the jurisdiction of Wokingham Borough Council (WBC), which acts as both the Local Planning Authority (LPA) and the Lead Local Flood Authority (LLFA).
- 1.4 According to the Environment Agency's Flood Map for Planning, the Site is located within Flood Zone 3. Therefore a submission of a Flood Risk Assessment (FRA) is required in support of the planning application. This report fulfils that requirement by assessing the Site's flood risk and setting out the proposed development's SuDS strategy too.

Objectives

- 1.5 The following objectives for this report are to:
 - Provide an FRA of the site, compliant with the guidelines set out in the National Planning Policy Framework (NPPF)¹ and associated Planning Practice Guidance (PPG)²;
 - Assess the risk and implications of flooding on the site including flooding from tidal, fluvial, groundwater, surface water runoff, and artificial sources.
 - Provide advice on the site layout and design that will ensure the safe operation of the site in any flood event.
 - To undertake surface water calculations for the Site in its current and post-development state with the most current hydrology available,
 - Provide advice and guidance on the management of surface water runoff at the site to ensure the risk of surface water flooding on the site and on nearby sites does not increase post development,
 - To develop a suitable outline SuDS scheme for the proposed development, and
 - Consider the potential future impacts of climate change over the lifetime of the proposed development.

¹ Ministry of Housing, Communities and Local Government, National Planning Practice Framework, February 2025

² Ministry of Housing, Communities and Local Government, Flood Risk and Coastal Change Planning Practise Guide: <https://www.gov.uk/guidance/flood-risk-and-coastal-change> [Accessed September 2025]

Planning Policy Requirements

National Policy

1.6 The National Planning Policy Framework (NPPF) is the overarching planning policy for England and sets out the government's planning policies for England and how these are expected to be applied by developers and how it should be assessed by Local Planning Authorities (LPA).

1.7 The NPPF requires that developments must consider flood risk and 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 is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

1.8 The supporting documents to the NPPF are the Planning Practice Guidance (PPG) and recent case law³ states that the PPG has the same legal status as the NPPF. As such, at the planning stage, the developer must follow the NPPF and the PPG. The PPG on flood risk and coastal change sets out when an appropriate FRA must be undertaken to demonstrate how flood risk from all sources of flooding to the development itself and flood risk to others will be managed now and in the future.

1.9 The NPPF includes Government policy on development and surface water management (SuDS) stating that:

Applications which could affect drainage on or around the site should incorporate sustainable drainage systems to control flow rates and reduce volumes of runoff, and which are proportionate to the nature and scale of the proposal. These should provide multifunctional benefits wherever possible, through facilitating improvements in water quality and biodiversity, as well as benefits for amenity. Sustainable drainage systems provided as part of proposals for major development should:

- a) Take account of advice from the Lead Local Flood Authority;*
- b) Have appropriate proposed minimum operational standards; and*
- c) Have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development.*

1.10 The NPPF and PPG states that an FRA and SuDS Assessment should be appropriate to the scale, nature and location of the development and should identify and assess the risk from all sources of flooding to and from the development and demonstrate how any flood risks will be managed over the lifetime of the development.

1.11 The NPPF and PPG requires that SuDS should be considered and included where practicable for new developments and follow the DEFRA Non-Statutory Technical Standards⁴.

1.12 The Non-Statutory Technical Standards are therefore a key reference document and should be used in the formulation of the surface water drainage strategy for a scheme of this nature.

³ Judgement Ruling R (Mead and Redrow) v SoS LUHC [2024] EWHC 279 (Admin)

⁴ Department for Environment and Rural Affairs (DEFRA), 2025. National Standard for Sustainable drainage systems: non-statutory standards for the design, maintenance and operation of surface water drainage systems in England technical

Local and County Council Policy

- 1.13 WBC act as LLFA for the area and are a statutory consultee for all major developments, as set out in the NPPF.

Development Plan

- 1.14 WBC's current Development Plan comprises the following key documents:

- Wokingham Core Strategy (2010)⁵
- Wokingham Managing Development Delivery Local Plan (February 2014)⁶

- 1.15 These documents are supported by more detailed guidance provided within Supplementary Planning Documents (SPDs). In relation to flood risk, the most relevant SPD for the submitted application is the Sustainable Design and Construction SPD⁷.

- 1.16 The policies within these documents that are relevant to the proposed development are outlined below.

Core Strategy

- 1.17 The WBC Core Strategy⁵ was adopted in January 2010. It sets out the policies that guide and control future development across the Borough, reflecting national, regional, and local planning guidance. Of particular relevance to this application is Policy CPI: Sustainable Development, which states that:

Planning permission will be granted for development proposals that:

- 3. Limit any adverse effects on water quality (including ground water).*
- 9. Avoid increasing (and where possible reduce) risks of or from all forms of flooding (including from groundwater).*

Wokingham Managing Development Delivery Local Plan

- 1.18 Relevant parts of Policy CC09⁶ are detailed below:

- 1. All sources of flood risk, including historic flooding, must be taken into account at all stages and to the appropriate degree at all levels in the planning application process to avoid inappropriate development in areas at risk of flooding. Proposals must be consistent with the guidance in paragraphs 99-104 of the National Planning Policy Framework (NPPF); the Technical Guidance to the NPPF and demonstrate how they have used the Strategic Flood Risk Assessment (SFRA) to determine the suitability of the proposal.*
- 2. Development proposals in Flood Zones 2 or 3 must take into account the vulnerability of proposed development.*
- 3. Development must be guided to areas of lowest flood risk by applying the sequential approach taking into account flooding from all sources and shall ensure flood risk is not*

⁵Wokingham Core Strategy (2010): <https://www.wokingham.gov.uk/planning-policy/adopted-development-plan/local-plans> [accessed September 2025]

⁶Wokingham Managing Development Delivery Local Plan (2014): <https://www.wokingham.gov.uk/planning-policy/adopted-development-plan/local-plans> [accessed September 2025]

⁷Sustainable Design and Construction SPD: <https://www.wokingham.gov.uk/planning-policy/adopted-planning-guidance> [accessed September 2025]

worsened for the application site and elsewhere, and ideally that betterment of existing conditions is achieved.

4. *In exceptional circumstances, new development in areas of flood risk will be supported where it can be demonstrated that:*
 - a) *The development provides wider sustainability benefits to the community that outweigh flood risk*
5. *Where required, suitable and appropriately detailed flood risk information will need to accompany a planning application. A Flood Risk Assessment (FRA) is required for:*
 - a) *All proposals in areas of known historic flooding from all sources*
 - b) *Where there is evidence of a risk from all sources of flooding identified in the Strategic Flood Risk Assessment*
 - c) *Those proposals set out in footnote 20 to paragraph 103 of the NPPF¹ (Core Document 55).*

1.19 Relevant parts of CC10 Drainage⁶ are detailed below:

1. *All development proposals must ensure surface water arising from the proposed development including taking into account climate change is managed in a sustainable manner. This must be demonstrated through:*
 - a) *A Flood Risk Assessment, or*
 - b) *Through a Surface Water Drainage Strategy.*
2. *All development proposals must:*
 - a) *Reproduce greenfield runoff characteristics and return run-off rates and volumes back to the original greenfield levels, for greenfield sites and for brownfield sites both run-off rates and volumes be reduced to as near greenfield as practicably possible.*
 - b) *Incorporate Sustainable Drainage Systems (SuDS), where practicable, which must be of an appropriate design to meet the long term needs of the development and which achieve wider social and environmental benefits*
 - c) *Provide clear details of proposed SuDS including the adoption arrangements and how they will be maintained to the satisfaction of the Council [as the Lead Local Flood Authority (LLFA)]*
 - d) *Not cause adverse impacts to the public sewerage networks*

1.20 The LLFA has produced a range of technical guidance documents, including a SuDS Strategy⁸, Preliminary Flood Risk Assessment⁹, and Level 1¹⁰ and 2¹¹ Strategic Flood Risk Assessment. Together, these documents set out guidance on development and flood risk, alongside the LLFA's consenting policy and associated protocols. WBC also provides further guidance within its Local Flood Risk Management Strategy (LFRMS)¹².

⁸ Wokingham Borough Council., 2017. *Sustainable Drainage Systems (SuDS)*. [Online]. Available at:

<https://www.wokingham.gov.uk/sites/wokingham/files/2023-06/Sustainable%20drainage%20systems%20%28SuDS%29%20strategy.pdf> [Accessed September 2025].

⁹ Halrow Group Limited., June 2011 <https://www.wokingham.gov.uk/sites/wokingham/files/2023-07/Wokingham%20Borough%20Council%20Preliminary%20Flood%20Risk%20Assessment%202011.pdf> [Accessed September 2025].

¹⁰ JBA Consulting., 2023. *Strategic Flood Risk Assessment Level 1*. [Online]. Available at

<https://www.wokingham.gov.uk/sites/wokingham/files/2024-05/WBC%20Level%201%20SFRA%202023%20-%20Main%20report.pdf> [Accessed September 2025]

¹¹ JBA Consulting., 2023. *Strategic Flood Risk Assessment Level 2*. [Online]. Available at: <https://www.walthamforest.gov.uk/planning-and-building-control/planning-policy/local-plan/evidence-base> [Accessed September 2025]

¹² Wokingham Borough Council., 2015. *Local Flood Risk Management Strategy*. [Online]. Available at:

<https://www.wokingham.gov.uk/sites/wokingham/files/2023-06/Local%20Flood%20Risk%20Management%20Strategy%20April%202015%20%28PDF%20document%29.pdf>

[Accessed September 2025].

- 1.21 This Flood Risk Assessment has been prepared to ensure that the proposed development is fully compliant with all relevant national, regional, and local flood risk and drainage policies.

Constraints and Limitations

- 1.22 The copyright of this report is vested in Create Consulting Engineers Ltd and the Clients, Mr and Mrs Fawsitt. The Client, or their appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or the Client.
- 1.23 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.
- 1.24 The Flood Risk Assessment and SuDS strategy addresses the flood risk posed to and from the proposed development, the extent of which is shown by the Site boundary, as indicated on the attached drawings and SuDS drawing.
- 1.25 This report has been undertaken with the assumption that the Site will be developed by the above proposals without significant change. The conclusions resulting from this study are not necessarily indicative of future conditions or operating practices at or adjacent to the Site.
- 1.26 Create Consulting Engineers Ltd has endeavoured to assess all information provided to them during this appraisal. The report summarises information from several external sources and cannot offer any guarantees or warranties for the completeness or accuracy of the information relied upon. Information from third parties has not been verified by Create Consulting Engineers Ltd unless otherwise stated in this report.
- 1.27 The revised Construction (Design and Management) Regulations 2015¹³ (CDM Regulations) came into force in April 2015 to update certain duties on all parties involved in a construction project, including those promoting the development. One of the designer's responsibilities is to ensure that the clients, in this instance Mr and Mrs Fawsitt are made aware of their duties under the CDM Regulations. Further information on the CDM Regulations is provided in the client guide and is available online. It has been assumed for this assessment that the lead designer will be responsible for advising the Client.
- 1.28 The approach to this FRA and SuDS report follows the ethos of the CDM Regulation, in as much as during the assessment process the development is considered and any foreseeable associated health and safety flood risks are identified. It is then considered how these flood risks can be eliminated, or mitigations identified to reduce or control them. The outcome of this assessment process is presented in this report. While preparing this FRA no other noteworthy or unquiet health and safety risk have been identified.

¹³Health and Safety Executive., 2015. *Construction (Design and Management) Regulations*. [Online]. Available at: <http://www.hse.gov.uk/pubns/indg411.pdf> [Accessed September 2025].

2.0 SOURCES OF INFORMATION

2.1 The information contained in this report is based on a review of existing information and consultation with interested parties.

2.2 Key reports and websites reviewed as part of this study are listed in Table 2.1 below.

Document/Website	Author/Publisher	Date
Flood Map for Planning – https://flood-map-for-planning.service.gov.uk/	GOV.UK	Accessed September 2025
Long Term Flood Risk Maps – https://flood-warning-information.service.gov.uk/long-term-flood-risk/map	GOV.UK	Accessed September 2025
BGS GeoIndex – Geology and borehole records https://mapapps.bgs.ac.uk/geologyofbritain/home.html	British Geological Survey	Accessed September 2025
Core Strategy	Wokingham Borough Council	2010
Local Flood Risk Management Strategy	Wokingham Borough Council	April 2015
Strategic Flood Risk Assessment Level 1	JBA Consulting	August 2023
Strategic Flood Risk Assessment Level 2	JBA Consulting	August 2023
Preliminary Flood Risk Assessment	Halrow Group Limited	June 2011
Thames Water Asset Plans	Thames Water	March 2025
Thames Water Sewer Flooding History	Thames Water	March 2025
Topographic Survey – 87900_Bird Place Henley Bridge Henley-on-thames RG9 2LN-PRELIM	FourWall Surveys	April 2025
Drainage Layout (2537_CSD_ZZ_DR_S_00-91_T8)	Centre Space	April 2024
Plans – All Revision PR2 - Location Plan (SC013-PA-01) - Existing Site and Roof Plan (SC013-PA-02) - Existing Floor Plans (SC013-PA-03) - Demolition Floor Plans (SC013-PA-04) - Existing Elevations (SC013-PA-05) - Proposed Site and Roof Plan (SC013-PA-06) - Proposed Floor Plans (SC013-PA-07) - Proposed Floor Plans (SC013-PA-08) - Proposed Elevations (SC013-PA-09) - Proposed Sections (SC013-PA-10)	Shack Group Ltd	August 2025

Table 2.1: Key Information Sources

3.0 SITE SETTING AND PROPOSED SCHEME

Site Location and Description

- 3.1 The Site is located in Henley-on-Thames, to the east of the River Thames and immediately south of Henley Bridge and 'The Boathouse'. It forms part of a large estate containing a Grade II listed building (Listing Reference: 1319073, designated 23 December 1983), together with associated grounds that include a swimming pool, conservatory, and landscaped areas.
- 3.2 Bird Place is a Grade II listed Georgian riverside villa situated adjacent to Henley Bridge within the Remenham (Henley Bridge) Conservation Area. The property has been vacant for several years and is now in need of sensitive repair and adaptation to secure its long-term viable residential use.
- 3.3 The Site lies at Ordnance Survey grid reference 476446E, 182580N, as shown in Figure 1.1.
- 3.4 The surrounding area is predominantly residential, interspersed with open fields and a number of boathouse-type establishments reflecting the riverside setting.
- 3.5 The Site extends to 0.86 ha and is currently occupied by the listed house and its associated grounds, including the glass conservatory, pool area, and extensive lawn.
- 3.6 The nearest watercourse is the River Thames, located on the western Site boundary (Figure 3.1). In addition, an inlet runs west to east across the southern part of the Site and connects directly to the River Thames.

The Proposed Scheme

- 3.7 The proposals for the Site comprise a household extension application involving the removal of the existing rear lean-to structure and its replacement with a new extension. The extension will accommodate a kitchen at ground floor level with ancillary basement accommodation below.
- 3.8 The proposed extension falls within the Environment Agency (EA) householder standing advice, as the extension of the property is less than 250 m².
- 3.9 Access to the Site will continue to be taken from White Hill (A4130) both during and after development.
- 3.10 The proposed scheme is illustrated on the layout drawing appended to this report.

Site Levels

- 3.11 According to the topographical survey carried out by FourWall Surveys in April 2025, the Site is generally flat, with average ground levels of approximately 31.9 mAOD. At the location of the proposed kitchen extension, the ground level is approximately 32.02 mAOD.
- 3.12 Levels fall slightly towards the south, where a stream runs along the southern Site boundary, before levelling off again near the southern tip of the Site. Overall, ground levels are highest at the northern extent adjacent to the existing dwelling and lowest at the southern extent.
- 3.13 The full topographical survey is provided in the appendix to this report.

4.0 FLOOD RISK ASSESSMENT

- 4.1 This FRA has reviewed data from the EA¹⁴, and other LPA and LLFA published documents related to flood risk.

Flood History

- 4.2 According to Environment Agency (EA) records, the Site has experienced several flood events within the last two decades, notably in 2000, 2002/2003, and 2013/2014, all of which were attributed to channel capacity exceedance.
- 4.3 Historic flood events across the wider Wokingham Borough, as summarised in Table 5.1 of the WBC Strategic Flood Risk Assessment (SFRA), include occurrences in March 1947, February 1990, December 2000, December 2003/2004, July 2007, 2008, 2009, January 2010, and 2015. Most of these incidents were caused by surface water flooding or local drainage issues rather than main river flooding. Importantly, none of these borough-wide historic events have been directly associated with the Site or its immediate surroundings.
- 4.4 Table 5.2 of the SFRA¹⁰ records flood incidents reported by the EA, which correspond with the events noted above, further confirming the EA's historic flood records.
- 4.5 No additional published information on flood risk at the Site has been identified.

Assessment of Flood Risk

- 4.6 The design flood event for the Site is the 1% Annual Exceedance Probability (AEP) event, with an allowance for climate change, in accordance with the National Planning Policy Framework (NPPF). Climate change allowances take into account the type of development, its expected lifespan, and the catchment in which it is located, as outlined in the GOV.UK document, 'Flood Risk Assessments: Climate Change Allowances'¹⁵.
- 4.7 The PPG requires that developments be assessed against the 1% AEP event plus the relevant climate change allowance, which is referred to as the design event. For fluvial and surface water flooding, the allowance is based on development type, longevity, and catchment; tidal flood risk uses a separate methodology.
- 4.8 For this Site, which comprises residential development with an expected lifespan of approximately 100 years, the relevant epoch for climate change allowance is the 2080s. The Site lies within the Thames and South Chilterns Management Catchment which has the following climate change allowances for the 2080's period:
- River Flow Allowance: 31% (central) and 43% (Higher)
 - Peak Rainfall Allowance: 40% (Upper End)

¹⁴ Environment Agency Product 4, Reference EIR2025/05568

¹⁵ GOV.UK., 2021. Climate change allowances. [Online]. Available at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> [Accessed February 2025].

Flood Risk from Tidal and Fluvial Sources

- 4.9 Flooding from tidal or fluvial (rivers) sources is shown within the Flood Map for Planning. The latest Flood Map for Planning¹⁶ is presented in Figure 4.1 and shows the Site is in Flood Zone 3.
- 4.10 For context within the Flood Map for Planning, Flood Zone 1 is land which has been assessed as susceptible to less than 0.1% AEP (Annual Exceedance Potential) risk of flooding from rivers or the sea in any given year. Flood Zone 2 comprises land assessed as having between a 1% (1 in 100 year) and 0.1% (1 in 1000 year) chance of flooding from rivers or between a 0.5% (1 in 200 year) and 0.1% chance of flooding from the sea in any one year. Flood Zone 3 is land which has a 1% or greater chance of river or a 0.5% or greater risk of flooding from the sea in any given year. These classes are often contextually referred to as 'High', 'Medium' and 'Low' flood risk respectively.
- 4.11 The Interactive mapping from the WBC Strategic Flood Risk Assessment (SFRA) further confirms that the Site is located within indicative Flood Zone 3b.
- 4.12 The Site is not located in a tidal stretch of the River Thames, as it is upstream of the tidal lock at Teddington Local. The Site is not at risk of flooding from tidal sources.
- 4.13 Given the Site's location in the fluvial Flood Zone 3, the Environment Agency was contacted, and detailed hydraulic modelling for the area was requested and reviewed. The full analysis is presented below.

Fluvial Flood Risk – Thames (Sonning to Hurley) 2019 model.

- 4.14 The EA provided flood level data from the Thames (Sonning to Hurley) 2019 model as shown in Table 4.1 below. The design event assessed is the 1% Annual Exceedance Probability (AEP) event, incorporating an allowance of 31% climate change.

Flood Return Period (AEP)	Flood Level mAOD	Ground Level (mAOD)
3.3%	32.47	31.90
1%	32.79	
1% plus 35% climate change	33.30	
1% plus 70% climate change	33.79	
0.1%	33.42	

Table 4.1 Flood return period and associated flood levels as obtained from the Thames (Sonning to Hurley) 2019 model

- 4.15 Flood levels for the Site boundary for various return periods are presented in Table 4.1, with corresponding flood depths illustrated in Figures 4.2–4.4.
- 4.16 Based on ground levels from the appended topographical survey, the Site is generally flat, with an average level of approximately 31.90 mAOD. The highest ground levels are located at the northern

¹⁶ Environment Agency., 2021. *Flood Map for Planning (Rivers and Sea) – Flood Zone 2 and Flood Zone 3*. [Online]. Available at: <https://data.gov.uk/dataset/cf494c44-05cd-4060-a029-35937970c9c6/flood-map-for-planning-rivers-and-sea-flood-zone-2> [Accessed September 2025]

extent of the Site, where the existing building and the proposed extension are situated. These ground levels correspond to the average flood depths across the Site as detailed below:

- 3.33% AEP event 0.57 m
- 1% AEP event 0.89 m
- 1% AEP + 35% CC event 1.40 m
- 0.1% AEP event 1.52 m

- 4.17 We have used the 1% AEP + 35% climate change event as a surrogate for the 1% AEP + 31% climate change. This is larger than the fluvial design event for the Site and ensures an accurate assessment is undertaken. **The design fluvial flood level for the Site is 33.30 m AOD with a flood depth of 1.40 m.**
- 4.18 This flood water level results in the majority of the site being affected by fluvial flooding in the design event.
- 4.19 The EA guidance recommends using the higher central climate change allowance when consulting peak river flow maps. For the relevant catchment, the central allowance is 31%, while the higher allowance is 43%. Given that this is a more vulnerable development located within Flood Zone 3, the available EA flood data has been assessed, an assessment will also be made for the higher allowance climate change.
- 4.20 By linear interpolation, the 1% AEP + 43% climate change (CC) event represents an increase of approximately 69.9%, corresponding to a flood depth of approximately 1.51 m. The difference between the 1% AEP + 35% CC and 1% AEP + 43% CC events is approximately 0.11 m.
- 4.21 The Site is at risk of fluvial flooding during the design flood event. However, with the incorporation of appropriate mitigation measures, the proposed development can be made resilient during such an event. The detailed mitigation strategy is provided in the concluding section of this chapter.

Flood Risk from Surface Water (Rainfall)

- 4.22 Flooding from surface water can occur during intense local rainfall events when floodwaters cannot infiltrate into the ground or discharge into natural or artificial drainage systems. As a result, the floodwater follows the topography of the local area. In an urban environment, the risk of flooding from surface water and overloaded sewers is closely related, and both are included in the relevant surface water flooding datasets. Flooding events are typically of short duration (unless there is a blockage in the drainage system) but can be severe.
- 4.23 The EA has recently updated (January 2025) the Risk of Flooding from Surface Water (RoFSW) mapping dataset¹⁷. This data assesses where surface water flooding may occur when the volume of rainwater exceeds the capacity of the existing drainage network (with a default loss rate of 18 mm/hr to model and replicate on-site drainage systems) or exceeds the infiltration capacity of the receiving soils, causing water to flow overland instead. The data includes information about flood extents and depths, produced using national-scale modelling, enhanced with locally produced modelling from some LLFAs.
- 4.24 The recently updated RoFSW now includes a climate change representation based on the latest UK Climate Projections (UKCP18) from the MET Office, using the Representative Concentration Pathway (RCP) 8.5. The RoFSW shows a near-term epoch (2040–2060, the “2050s” epoch), with central

¹⁷ Environment Agency., 2025. *Risk of Flooding from Surface Water Extent, Depths and Plus climate change* [Online]. Available at: <https://www.data.gov.uk/dataset/0d6falf4-0c82-4c91-8667-a549e8e3ca2d/risk-of-flooding-from-surface-water3> [Accessed September 2025]

allowances used to support short- and medium-term decisions informed by the highest flood likelihood projections.

- 4.25 The current scenario RoFSW Extent Map (Figure 4.5) shows the site is generally at a 'very low' risk of flooding from surface water. However, there are two areas of risk identified within the mapping. To the northwest of the existing house, there is a pool of low to medium surface water flood risk and within the southern extent of the site boundary, there is an isolated pool of low risk. The southern pool of surface water flood risk corresponds to the stream running through the southern extent of the site boundary.
- 4.26 The future-plus-climate-change scenario RoFSW mapping (Figure 4.6) closely follows the present-day scenario but with an additional pool of low risk corresponding with the presence of the stream running across the site. However, the extent of surface water pooling is increased due to the impact of climate change.
- 4.27 The new RoFSW dataset includes the predicted risk of flooding for a series of depths in incremental steps of 0.2 m, 0.3 m, 0.6 m, 0.9 m, and 1.2 m. This data uses the same 'high,' 'medium,' and 'low' risk categories as set out in the above extent mapping for each return period. The depth mapping shows the risk of a specific depth of flooding in either the current or future event. We have reviewed these maps, and the worst-case depths have been included in the appendix of this report, as described below.
- 4.28 Figure 4.7 presents the risk of surface water flooding up to a depth of 0.6 m on the site in the present-day event. The data shows that a depth of 0.6 m would potentially be classified as "Low risk in a very small area in the southern extent of the site boundary. This correlates to the inlet running through that part of the site, as confirmed by the topographic survey.
- 4.29 Figure 4.8 presents the risk of surface water flooding up to a depth of 0.6 m on the Site in the climate change event. The data closely follows the present-day scenario and remains within the "Low" risk category. While greater depths of flooding might be expected due to climate change, this does not alter the expected extent of flooding on-site.
- 4.30 Given the nature of the site, the risk of surface water flooding to the proposed development is considered low. This is due to the nature of the proposals and the isolated nature of the surface water flood areas, which are located at a distance from any planned built development.
- 4.31 Flooding from surface water remains a residual risk due to the potential for rainfall to exceed the design standard of the proposed drainage system and the effects of climate change on the frequency and severity of rainfall events.

Flood Risk from Groundwater

- 4.32 Groundwater flooding occurs when groundwater rises through permeable strata to reach the surface.
- 4.33 The Site is shown to be underlain by a Principal bedrock aquifer according to online mapping provided by the Department of Farming, Agriculture and Rural Affairs (DEFRA) Magic Maps¹⁸. This is defined below:

¹⁸ Department for Environment and Rural Affairs (DEFRA) Magic Website., 2025. [Online]. *Environment Agency Bedrock Aquifer Designation Data*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> [Accessed September 2025].

'Principal and secondary aquifers provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands'.

- 4.34 The Site is shown to be underlain by a Secondary A superficial deposit, this is defined below:

'Secondary A aquifers comprise permeable layers that can support local water supplies, and may form an important source of base flow to rivers'

- 4.35 The Site is located within a designated Total Catchment Groundwater Source Protection Zone¹⁹, as identified by the DEFRA Magic Maps.
- 4.36 British Geological Survey (BGS) mapping (1:50,000 scale)²⁰ identifies the bedrock geology at the Site as Holywell Nodular Chalk Formation and New Pit Chalk Formation (Undifferentiated) – Chalk (Figure 4.9). The Superficial deposits at the Site are Alluvium – Clay, Silt, Sand and Gravel and Kempton Park Gravel Member – Sand and Gravel (4.10).
- 4.37 A BGS borehole record (SU78SE138), located approximately 150 m northwest of the Site and within the same mapped geological units, recorded gravels to 6.80 m, underlain by chalk bedrock to the full depth of the borehole (10.50 m). Groundwater was recorded at approximately 3.50 m below ground level.
- 4.38 A second BGS borehole (SU78SE20), located 250 m east of the Site and mapped within the Kempton Park Gravel Member, recorded gravel to 6.20 m, underlain by chalk to the borehole depth of 6.70 m. Groundwater was recorded at approximately 2.90 m below ground level.
- 4.39 Interactive mapping from the WBC Strategic Flood Risk Assessment (SFRA) indicates that the Site is located within a zone of ≥75% EA Areas Susceptible to Groundwater Flooding.
- 4.40 It is assumed that groundwater levels at the Site are intrinsically linked to general water levels in the River Thames and the inlet. This is because groundwater contributes to the baseflow of rivers and streams in the area and it is typical for groundwater levels to be similar to the water level in an adjacent watercourse.
- 4.41 As the Site is located adjacent to the watercourse, there is a potential risk that groundwater could emerge at the surface during periods of high water levels in the river, or that areas outside the fluvial floodplain could become highly saturated due to elevated groundwater levels.
- 4.42 Should groundwater emerge at the surface, it is expected to follow existing surface water flow routes (as described in the surface water flooding section) or be intercepted by private or adopted surface water drainage systems.
- 4.43 The current house is located away from the River Thames and the inlet. The proposed extension to the house is elevated above ground levels, which provides suitable protection from groundwater emergence.
- 4.44 Dewatering may be required during construction, and the foundations of the extension should be adequately waterproofed for groundwater.

¹⁹ Department for Environment and Rural Affairs (DEFRA) Magic Website., 2025. [Online]. *Environment Agency Superficial Deposit Aquifer Designation Data*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> [Accessed September 2025].

²⁰ British Geological Survey (BGS) Onshore GeolIndex., 2025. *DiGMapGB-50 Bedrock Geology and Superficial Deposits*. [Online]. Available at: <https://mapapps.bgs.ac.uk/geologyofbritain/home.html> [Accessed September 2025].

- 4.45 Overall, the risk of groundwater flooding at the Site is considered to be low for both the Site and the proposed development, owing to the depth of recorded groundwater below existing ground levels.

Flood Risk from Public Sewers and Water Mains

- 4.46 Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of sewers. Flooding from sewers and highways is linked to the risk of flooding from surface water in urban areas, with the exact source of flooding often indistinguishable.
- 4.47 Thames Water (TW) is the statutory (adoption) sewerage undertaker for the area and is responsible for the operation and maintenance of public sewers serving the Site. Sewer plans (Appendix A) indicate the presence of a surface water rising main in White Hill Road.
- 4.48 The Site is not served by TW for surface water or foul drainage. The Site has its own private network which the owner is responsible for maintaining.
- 4.49 A drainage layout of the Site (appended to this report) illustrates the existing private drainage network. It is assumed the foul network terminates in a septic tank or cess pool. Surface water is assumed to discharge to an existing outfall, which subsequently discharges into ditch which connects to the inlet via a culvert. The surface water ultimately discharges into the River Thames via the inlet.
- 4.50 Thames Water have also supplied an extract of their flood history records which shows no historical sewer flooding at or near the site.
- 4.51 Sewer flooding resulting from blockage of the private site or building drainage remains a residual risk, which is mitigated by the on-site drainage design and through regular inspection and maintenance of both public and private sewer networks.
- 4.52 Flooding from a water main is also a residual risk, as this should not cause flooding under standard operation. The main threat therefore will be from damage to existing main lines and newly constructed internal pipe work during the construction phase.
- 4.53 The Site and proposed development are therefore considered to be at low risk of sewer or water main flooding.

Flood Risk from Artificial Waterbodies

- 4.54 The Site is shown to be located within the GOV.UK long term flood risk map (Figure 4.11) to be at risk from flooding during a reservoir breach event²¹. This includes the dry weather breach (no rainfall) and wet weather event (when rainfall and fluvial flooding occur).
- 4.55 According to the GOV.UK dataset, the Site is potentially at risk from Farmoor Reservoir, located approximately 38.79 km northwest of the Site (Figure 4.11). While the distance suggests that risk is low, Farmoor Reservoir has a raised concrete embankment, which, in the unlikely event of a breach, could result in floodwaters reaching the Site.
- 4.56 The Environment Agency is the enforcement authority for the Reservoirs Act 1975 in England, they ensure that reservoirs are inspected regularly, and that all essential safety work is carried out. All

²¹ Environment Agency., 2022. *Risk of Flooding from Reservoirs – Maximum Flood Extent (Web Mapping Service)*. [Online]. Available at: <https://environment.data.gov.uk/dataset/d81646cf-37e5-4e71-bbcf-b7d5b9ca3a1c> [Accessed September 2025].

reservoirs must be inspected and supervised by reservoir panel engineers. There has been no loss of life in the UK from reservoir flooding since 1925.

- 4.57 The Site is therefore considered at direct risk of reservoir flooding and there are no further artificial waterbodies in the area that would constitute a significant risk of flooding to the Site.

Design Response to Flood Risk

- 4.58 The FRA has confirmed that the Site is at risk of fluvial flooding during the design flood event and smaller events. As such, mitigation measures are required to be implemented to minimise the risk of flood water ingress into the proposed development.
- 4.59 Design fluvial flood levels provided by the Environment Agency are 33.30 m AOD for the 1% AEP + 35% Climate Change (design) event.
- 4.60 As the proposed extension is approximately 89 m² (less than 250 m²) it is considered a minor development and is therefore subject to EA Standing Advice. This guidance recommends raising finished floor levels (FFLs) at least 600 mm above the estimated flood level, or installing flood-resistant materials incorporated up to the same height. Where there is a high degree of certainty regarding flood levels, such as in this case, with the EA-supplied data, the FFLs may be set to 300 mm above peak flood level.
- 4.61 The proposed extension has been designed on a 600 mm raised platform above the surrounding ground level, achieving a FFL of 32.62 m AOD. This allows a 0.15 m freeboard above the 1 in 30 year flood level (32.47 m AOD) however this is below the expected design flood level (33.30 m AOD).
- 4.62 Raising the floor level further is not possible due to the building's Grade II listed status (Reference: 1319073, designated 23-Dec-1983). Conservation constraints prevent additional elevation without adversely affecting the proportions of first-floor windows, obscuring historic brickwork, or diminishing the architectural and heritage value of the dwelling. The Design and Access Statement confirms that the extension scale has been carefully reduced and adjusted in consultation with the Conservation Officer and heritage consultant to preserve the building's character and its contribution to the wider estate setting. Flood resistance and resilience measures will therefore be proposed in accordance with the CIRIA Code of Practice outlined below.
- 4.63 In accordance with the CIRIA Code of Practice for Property Flood Resilience, a "Water Entry" strategy is recommended for floodwater depths greater than 0.6 m, allowing floodwater to enter the building to prevent structural damage caused by hydrostatic pressure. For depths less than 0.6 m, a "Water Exit" strategy is applied. Consequently, any flood defences are designed to a height of 0.6 m above external ground levels.
- 4.64 Based on the expected fluvial flood depths, for shallow flood events below 0.6 m, the "Water Exit" approach can be used, and once the water levels become 0.6 m deep, the "Water Entry" approach. Therefore, flood protection measures might include:
- A pump will be installed in the basement (dual pump system) to enable the flood water to be removed and pumped out and dried to allow for future occupation.
 - Flood Doors such as Floodguard Heritage Doors. These will use materials to ensure that the character of the property is maintained.
 - State-of-the-art stainless steel engineering
 - Heritage flood door design with bespoke wood finish which can replicate existing door aesthetics

- Inward or outward opening
- Approved by Historic England for use of Grade 2 Listed Buildings (UK)
- Demountable flood barriers,
 - These can be placed on entrances and windows which may come into contact with flood water.
 - These will need to be installed prior to a flood event occurring. This requires the owner/occupier being observant and reactive to any flood warnings or weather warnings.
- Flood resilient construction techniques used wherever possible, such as a solid floor and external masonry walls rendered with cement/lime-based products to above the flood level for new construction;
- A damp-proof membrane chased into the walls on the existing ground floor and basement level;
- All gas and electrics taken up to first floor level, if possible, with connections dropped down into the ground floor and basement as required, or at very least raised up to above expected flood levels;
- Avoiding the use of MDF carpentry at ground floor and basement level, with kitchen units of water-resistant materials where possible to minimise damage (if water get into the property);
- Non-return valves or positive pump fitted to all drainage and sewer outlets, and manhole covers secured; and
- Any external ventilation outlets and/or airbricks fitted with waterproof covers.

4.65 The above flood protection measures have been discussed with the design team.

4.66 The homeowners should implement a household flood emergency plan to ensure the safety of all residents and visitors in the event of a flood. This plan should include clear instructions on actions to take during a flood. All family members and regular household occupants should be familiar with the plan and able to respond efficiently during a flood event.

4.67 It is recommended that the household registers for flood warnings from the Environment Agency and monitors weather alerts from the MET Office to provide sufficient time to enact the emergency plan. Alerts from the Environment Agency should provide sufficient warning to allow residents to implement any flood defence devices that need to be installed prior to water reaching the property.

4.68 The implementation of these measures will ensure that the household can manage the risks associated with the design flood event. These precautions will also help to minimise internal flooding within the property, protecting the family and their home in accordance with guidance from the National Planning Policy Framework (NPPF).

5.0 SURFACE WATER DRAINAGE AND FLOOD RISK FROM THE DEVELOPMENT

Existing Surface Water Drainage

- 5.1 Detailed runoff calculations have been undertaken for the site (Appendix C) and are shown in Table 5.1. Greenfield runoff rates have been calculated using the FEH statistical method within the Causeway Flow software package, while Brownfield runoff rates have been determined using the Modified Rational Method.
- 5.2 As the Site already contains an existing surface water drainage network, the proposed Sustainable Drainage System (SuDS) strategy focuses solely on the newly developed areas, specifically the proposed extension.
- 5.3 The Site redline boundary measures 0.86 ha, with the proposed new development area comprising of approximately 0.009 ha. The runoff rates presented below are therefore based on the proposed kitchen extension area.

Rainfall Event	Brownfield Run-off Rates Kitchen Extension (l/s)	Greenfield runoff rate Kitchen Extension (l/s)
Q bar	-	0.1
Q 1 year	1.04	0.1
Q 30 year	2.54	0.1
Q 100 year	3.28	0.2

Table 5.1: Greenfield and Brownfield Runoff Rates from the Site for Various Rainfall Events

- 5.4 The WBC LLFA guidance recommends that surface water discharge from a brownfield site should, where possible, be restricted to the 1 in 1-year greenfield runoff rate. For the Site, this equates to 0.7 l/s for the 1-year event and 0.2 l/s for the 100-year event.
- 5.5 It is acknowledged industry wide that any proposed flow rate of 2.0 l/s or lower does not result in self-cleansing velocities being achieved and therefore an increased risk of blockages due to the small diameter of piping required to achieve rates lower than 2.0 l/s.
- 5.6 As described in Chapter 4, the Site is served by a private drainage network. Current surface water flows are assumed to discharge via an outfall into a ditch and, ultimately connecting to the inlet along the southern boundary of the Site. The topographical survey indicates the presence of gullies and manholes; however, details of all below-ground sections and their connection points are not fully known.
- 5.7 Surface water from the existing Site is assumed to be collected by rainwater downpipes (RWDPs), which feed to localised soakaways. This is considered the most likely route for outfall. A full drainage survey, including CCTV inspection, will be required at the detailed design stage to confirm the existing connection points.

Climate Change Allowances

- 5.8 An allowance for climate change must be included within all SuDS strategies within the rainfall parameters. Climate change allowances for rainfall are based on the catchment the site is based within and the proposed lifespan for the development. The Site is within the Thames and South Chilterns Management Catchment: and residential development is deemed to have a 100-year lifetime.
- 5.9 The influence of climate change on rainfall intensity has been taken into account by the surface water drainage strategy with the inclusion of the following allowances:
- Rainfall uplift for 1 in 30 year event: 35 %
 - Rainfall uplift for 1 in 100 year event: 40%

Drainage Discharge Hierarchy

- 5.10 The discharge hierarchy should be considered which is stated in PPG as:

"Generally the aim should be to discharge surface runoff as high up the following hierarchy of drainage options as reasonably practicable:

1. Into the ground (infiltration);
2. To a surface water body;
3. To a surface water sewer, highway drain or another drainage system;
4. To a combined sewer."

- 5.11 The proposed drainage strategy is to connect to the existing private drainage on site, as detailed within the appended drainage plan..

SuDS Drainage Principles

- 5.12 The SuDS hierarchy shown in Table 5.2 provides guidance on the how to manage surface water with the most sustainable being chosen first for implementation. The table also notes which SuDS devices are practicable and proposed to be included within the development. There should be a preference for green over grey features, in line with the SuDS hierarchy.

	SuDS Techniques	Practicable	Proposed	Site and Development Specific Notes
Most Sustainable	Rainwater Harvesting	✓	Proposed to include water butts where possible.	Rainwater Harvesting will be provided where possible in the form of water butts to be used for watering and washdown of the hardstanding areas.
	Green Roof	N	N	The proposed kitchen extension will be constructed primarily of glass, making it unsuitable for supporting a green roof. In addition, a green roof would not be considered appropriate in terms of the established

	SuDS Techniques	Practicable	Proposed	Site and Development Specific Notes
				character and aesthetics of the estate.
	Basins and Ponds. -Constructed wetlands -Balancing ponds -Detention basins -Retention ponds	N	N	Not suitable on the site due to other proposed plans within the Site boundary.
	Filter Strips and Swales	Y	N	There is an existing ditch located along the eastern boundary of the Site, which will be incorporated into the proposed drainage strategy by connecting to the existing outfall situated to the north of the ditch.
	Infiltration Devices -Soakaways -Infiltration trenches and basins - Rain Gardens	Y	Y	Infiltration methods not suitable due to geology at the Site. Informal rain gardens are proposed to provide water quality treatment. Shallow rain gardens have been proposed (not included within calculations) to provide amenity and biodiversity value.
	Permeable Surfaces -Gravelled areas -Permeable pavers	Y	N	Not proposed for the scheme.
Least Sustainable	Tanks Systems -Oversized pipes -Crated storage	Y	Y	Cellular crated storage to be provided with discharge to the private sewer limited to the lowest possible rate.

Table 5.2: SuDS Techniques and Application to the Development

Proposed SuDS Strategy

- 5.13 Analysis has been undertaken to propose an outline SuDS strategy, in accordance with sustainable drainage principles, which limits the surface water runoff from the proposed development, including an appropriate allowance for climate change and sufficient water quality treatment prior to discharge.
- 5.14 The proposed SuDS solution has been designed sequentially to avoid several constraints on site which had to be respected during the design process including the existing drainage on site and the trees located within proximity to the proposed extension and outfall.

- 5.15 As per the requirements of local policy, new developments are required to reduce surface water runoff post-development.
- 5.16 The proposed SuDS strategy is as follows:
- A geo-cellular attenuation crate system is proposed to be installed beneath the grassed area to the east of the proposed patio. This system is designed to provide sufficient storage capacity to accommodate the 1% AEP flood event plus 40% climate change allowance.
- 5.17 Excess surface water flows are proposed to be attenuated below ground for all events up to the 1% AEP plus 40% climate change. The proposed kitchen roof area will drain via conventional downpipes into a piped connection leading to the geo-cellular attenuation crates, which then discharge to the existing private sewer located east of Bird Place.
- 5.18 FLOW calculations for both the permeable paving and the attenuation crates are provided in Appendix D, with the proposed strategy illustrated on Drawing 3458_CCE_XX_XX_DR-D-0001 (appended).
- 5.19 The geo-cellular crate storage feature provides an effective storage volume of 2.4 m³ for the 1% AEP plus 40% climate change event. Water levels within the crates are expected to reach 0.29 m for the 3.33% AEP event and 0.44 m for the 1% AEP event, based on 0.5 m deep geo-cellular blocks.

Design Parameters

- 5.20 The resulting storage and network design calculations, conducted using FLOW design software, have used some conservative design decisions. These include:
- Volumetric runoff coefficient (Cv) values were changed to 1 from the default (Cv=0.74 and 0.84) to ensure that all of the design storm events were captured in the drainage model. The default Cv values assume loss of water through natural infiltration etc. A Cv value of 1.0 ensures all of the storm water is assessed i.e. 100% of the water is modelled.
 - Reducing the additional storage (m³/ha) value of 20 within Flow to 0 within the simulation settings. This has been undertaken as the default settings assume that 20m³ is lost or stored in peripheral storage in the drainage system between hitting the ground and reaching the drainage network. Reducing this to 0 allows all water hitting the development to be attenuated to reflect a worst-case scenario.
 - FEH 22 (Flood Estimation Handbook 2022) point data was used for the storm event rather than FSR (Flood Studies Report). FEH is more up to date than FSR data and provides a better representation of an actual event.
 - The collection of rainwater into water butts, rain gardens or water reuse was excluded from the outline calculations as these could be full at the time of a storm event. The additional storage available within these features can provide additional storage for exceedance events.
 - The drainage design calculations have been based on the ACO StormBrixx SD (0.5m) system; however, alternative industry-standard products with comparable orifice specifications may also be suitable. This will be confirmed and reviewed further during the detailed design stage.
- 5.21 The geo-cellular attenuation crates outlined above have been designed based on ACO Stormbrixx dimensions for ease of installation however, there are other forms of geo-cellular unit on the market which may be used as long as the void ratio of 97% and the effective storage volume is maintained.

- 5.22 To make the SuDS design as sustainable as possible, the Site's surface water drainage network works fully on a gravity system up to and including the point of connection with the private sewer.
- 5.23 The detailed design of the permeable paved areas, attenuation crates, and associated connections will be completed during the detailed design stage of the development. This level of detail can be conditioned as part of the planning permission, if required.

Surface Water Quality

- 5.24 Pollution control requirements are determined by the using the Simple Index Approach as detailed in the CIRIA SuDS Manual. The pollution indices for this Site as per table 26.2 of the CIRIA SuDS Manual can be seen below:

Land Use	Total Suspended Solids	Metals	Hydrocarbons
Other Roofs	0.20	0.20	0.05

Table 5.3: Calculated SuDS pollution mitigation indexes for the Site

- 5.25 Surface water from the site will be treated via the rain gardens and attention crates feature prior to attenuation. Based on table 26.3 and 26.4 of the CIRIA SuDS Manual, this will provide treatment indices of:

SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Rain Garden underlain by an attenuation crate of at least 300 mm in depth.	0.6	0.5	0.6

Table 5.4: Indicative SuDS mitigation indices

- 5.26 It can be seen from the tables above that the proposed treatment provides the required level of treatment for this Site prior to discharge.
- 5.27 It should be noted that SuDS components only deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the CIRIA SuDS Manual.

Four Pillars of SUDS

- 5.28 For the purposes of this assessment, it must be demonstrated how the drainage strategy design provided above adheres to the four pillars of SuDS. It is defined that the approaches to manage surface water should take into account water quantity (flooding), water quality (pollution), amenity and biodiversity issues.
- 5.29 The proposed drainage strategy provides mitigation of water quantity, water quality, amenity and biodiversity all in the forms of the attenuation crates and rain gardens for the proposed kitchen extension.
- 5.30 The above SuDS features will control the rate of stormwater overflow and provide sufficient water treatment prior to discharge as per the SUDS indices outlined above.

Exceedance Flow Routes

- 5.31 The precautionary assumptions and decisions used (i.e., no water butts or rainwater harvesting although proposed to mimic that they could be full) within the SuDS calculations ensure there is adequate space in the network for the design storm event. This means there should be additional storage available within the proposed SuDS network for exceedance events.
- 5.32 For larger events, the surface water flows would follow the local topography as per the current scenario onsite. This would be towards the proposed rain gardens adjacent to the proposed kitchen extension.
- 5.33 Exceedance flow routes are shown on Drawing 3458_CCE_XX_XX_DR-D-0001. These may be adapted to suit any proposed changes to the Site layout as the design progresses in line with the following principles:
- External ground levels will be profiled such that no ponding occurs against buildings,
 - All flows in excess of the drainage network design standard will be channelled towards the rain garden to the east of the proposed extension or southeast, towards the existing soakaway and stream.
 - The FLOW calculations show that a 1% AEP + 40 % climate change event will be stored wholly below ground.

Management and Maintenance of Drainage Assets

- 5.34 The SuDS Manual provides general guidance on maintenance requirements; however, these are generic recommendations. The management and maintenance of all drainage elements should be carried out in accordance with the guidance and specifications provided by the relevant manufacturers or suppliers.
- 5.35 Flow control devices, non-return valves, and manholes should be maintained strictly according to manufacturer specifications to ensure ongoing functionality.
- 5.36 The freeholder will be responsible for the upkeep and management of the SuDS network. Management responsibilities may be subcontracted to a specialist company if required.
- 5.37 Further detail regarding the specific management and maintenance procedures will be developed during the detailed design stage. These procedures will follow the principles set out in Table 5.5, ensuring that all aspects of the SuDS system continue to operate effectively over its lifetime.

Maintenance Schedule	Required Actions	Typical Frequency
Attenuation Storage Tanks (Geo-cellular storage)		
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other	Annually

Maintenance Schedule	Required Actions	Typical Frequency
Remedial Actions	matter; remove and replace surface infiltration medium as necessary.	
	Remove sediment from pre-treatment structures and/or internal fore-bays	Annually or as required
	Repair / rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
Bioretention Systems (Rain Gardens)		
Regular Inspections	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary	Quarterly
	Check operation of underdrains by inspection of flows after rain	Annually
	Assess plants for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Inspect inlets and outlets for blockage	
Regular maintenance	Remove litter and surface debris and weeds	Quarterly (or more frequently for tidiness or aesthetic reasons)
	Replace any plants, to maintain planting density	As Required
	Remove sediment, litter and debris build-up from around inlets or from forebays	Quarterly to biannually
Occasional maintenance	Infill any holes or scour in the filter medium, improve erosion protection if required	As Required
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch	
Remedial actions	Remove and replace filter medium and vegetation above	As required but likely to be > 20 years
Other General: Site Owners/Management Company.		
Regular Maintenance	Inspect rainwater gutter channels, inlets and outlets for blockages and clear as required.	Monthly for first year then annually thereafter
	Inspect gully drains, channel drains and inspection chambers (including silt traps) for siltation/blockage.	Monthly for first year then annually thereafter
	Inspect for sediment and debris in manhole bases and any blockage of soakaway chamber and geocellular storage.	Bimonthly for first six months then every six months thereafter

Maintenance Schedule	Required Actions	Typical Frequency
Occasional Maintenance Remedial Actions	Remove litter and debris. Carry out periodic mowing of grassed surface and inspect for silt accumulation to determine appropriate removal frequency.	Monthly or as required (and through growing season for swales)
	Remove any sediment and debris from base of chambers and cellular storage.	As required, based on inspections
	Remove sediment from any affected articles including silt traps (most likely via jetting).	As required
	Clear any pipe blockages with appropriate equipment	As required
	Repair any damage arising from various inspections (by approved engineer where required)	As required
	Replacement of permeable surfacing, manhole components.	As required

Table 5.5: Outline SUDS Management and Maintenance Requirements

Flood Risk from the Development

- 5.38 As the Site has an existing drainage network, it is assumed that under current conditions, any surface water will currently enter the existing piped drainage system and outfall to the private sewer to the east of the site.
- 5.39 The development proposes to reduce runoff rates from the new development to 2.0 l/s. This is the lowest possible flow rate within a drainage network to ensure self-cleansing velocities and the minimum flow rate Thames Water will accept for new developments connecting to their sewers.
- 5.40 This has resulted in increasing the greenfield runoff rate, as it was calculated as 0.2 l/s which is not feasible to be designed to. The brownfield rate for the drained area is in a calculated 3.28 l/s during the 1% AEP event, meaning that the proposed runoff rate is a 39% reduction in peak run-off rate during a 1% AEP event. The Site post-development and the proposals therefore limit runoff, in so far as technically practicable, towards greenfield rates. This is compliant with the NPPF, London Plan, and local policy.
- 5.41 The proposed drainage strategy will therefore reduce the peak load to the private sewer network, reducing the risk of sewer flooding to neighbouring properties.
- 5.42 For all events beyond the 1% AEP event plus climate change rainfall event, the situation will be no worse than existing, as long as a consideration of exceedance flows is made as part of the detailed drainage design, to ensure that any excess surface water runoff would continue to overflow away from the existing and proposed properties.
- 5.43 Additional SuDS measures such as rainwater harvesting for watering landscaped areas have been excluded from the network calculations. These are recommended for inclusion within the site where possible as they can provide water re-use benefits and provide small scale additional attenuation during both regular and exceedance rainfall events.

6.0 CONCLUSIONS AND RECOMMENDATIONS

- 6.1 The proposals comprise the removal of the existing rear lean-to structure and conservatory and its replacement with a new extension, incorporating a ground floor kitchen and ancillary basement accommodation. The extension footprint is approximately 89 m² and therefore classed as minor householder development (<250 m²) by the EA.
- 6.2 The Site lies within Flood Zone 3 and is at risk of fluvial flooding. EA data shows that for the fluvial design event (1% AEP + 35% Climate Change event) flood levels are 33.30 m AOD.
- 6.3 The proposed finished floor level (FFL) for the extension is to be set at 32.62 m AOD, which is 0.6 m above existing ground level in line and 150 mm above the 3.3% AEP flood event. Due to the proposals comprising an extension to a listed building, it is not feasible to raise FFL's any further therefore, flood resistance and resilience measures are proposed in line with CIRIA guidance as set out below.
- 6.4 For the current building, in line with CIRIA guidance for flood depths less than 0.6 m above FFL's, the "water Exit" strategy will be implemented, where water will be prevented from entering the building via flood doors or demountable barriers.
- 6.5 For water depths greater than 0.6 m above FFL's, a "Water Entry" strategy will be adopted to ensure the structural integrity of the building. Measures include installation of a dual-pump system in the basement for water removal; flood doors or demountable barriers at extension entrances; flood-resilient construction including solid floors, external masonry rendered above flood level, and damp-proof membranes chased into ground floor and basement walls; raising of services such as gas and electrics above predicted flood levels, with connections dropped as required; resilient internal finishes such as avoidance of MDF and use of water-resistant kitchen materials; non-return valves on drains and sewers with secured manhole covers; and sealed ventilation outlets or airbricks with removable flood covers.
- 6.6 Other flood risks have also been assessed. The Site lies within the residual risk zone of Farmoor Reservoir, though risk is reduced through robust embankments and statutory safety measures. Risks from surface water, groundwater, and sewers are considered low to manageable through design measures. No other significant sources of flooding are identified.
- 6.7 It is recommended that site owners sign up to Environment Agency flood warnings and Met Office weather alerts to support the household emergency planning for a flood event.
- 6.8 Surface water will be managed through a SuDS strategy, comprising roof drainage to below-ground geo-cellular attenuation crates, prior to controlled discharge at 2 l/s into the existing private surface water sewer. The design respects site constraints, avoids conflict with existing sewers, and allows for gravity drainage throughout. While additional features such as rainwater harvesting or bioretention areas are excluded from calculations, they could provide supplementary resilience. Responsibility for long-term SuDS maintenance will rest with the freeholder.
- 6.9 The proposed SuDS design reduces flood risk to others by controlling and attenuating runoff, compared with the existing uncontrolled discharge. The development is compliant with the NPPF, PPG, and local planning policy regarding flood risk and surface water management. Residual risks remain, including extreme fluvial events, sewer exceedance, and climate change impacts, and these should be periodically reviewed as new information becomes available.

- 6.10 With the proposed floor level mitigation, incorporation of flood-resilient construction measures, and implementation of a robust SuDS strategy limiting runoff to 2 l/s, the development can be considered safe for occupants, resilient to flooding, and compliant with national and local planning policy, without increasing flood risk to third parties.

FIGURES

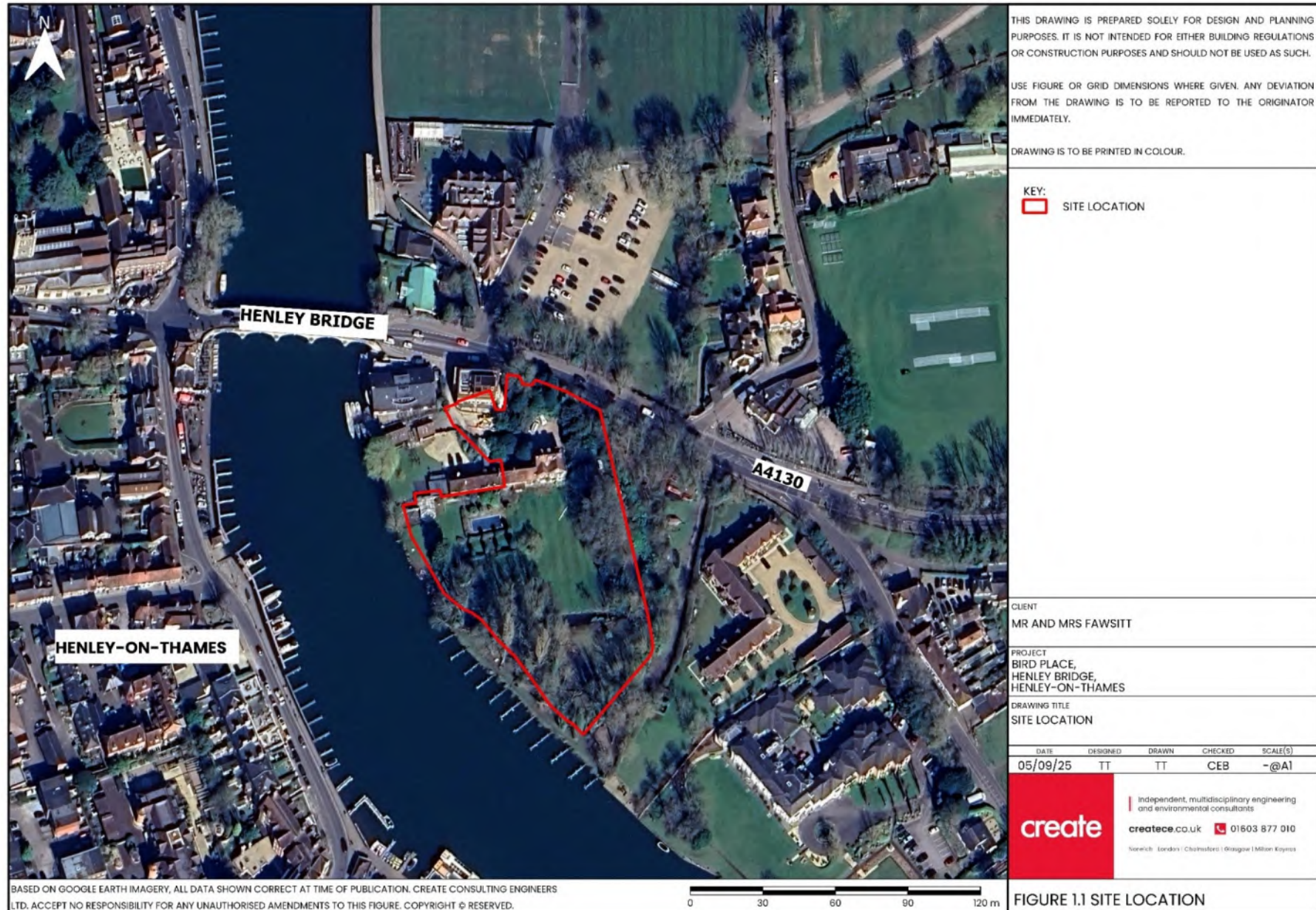


Figure 1.1: Site Location

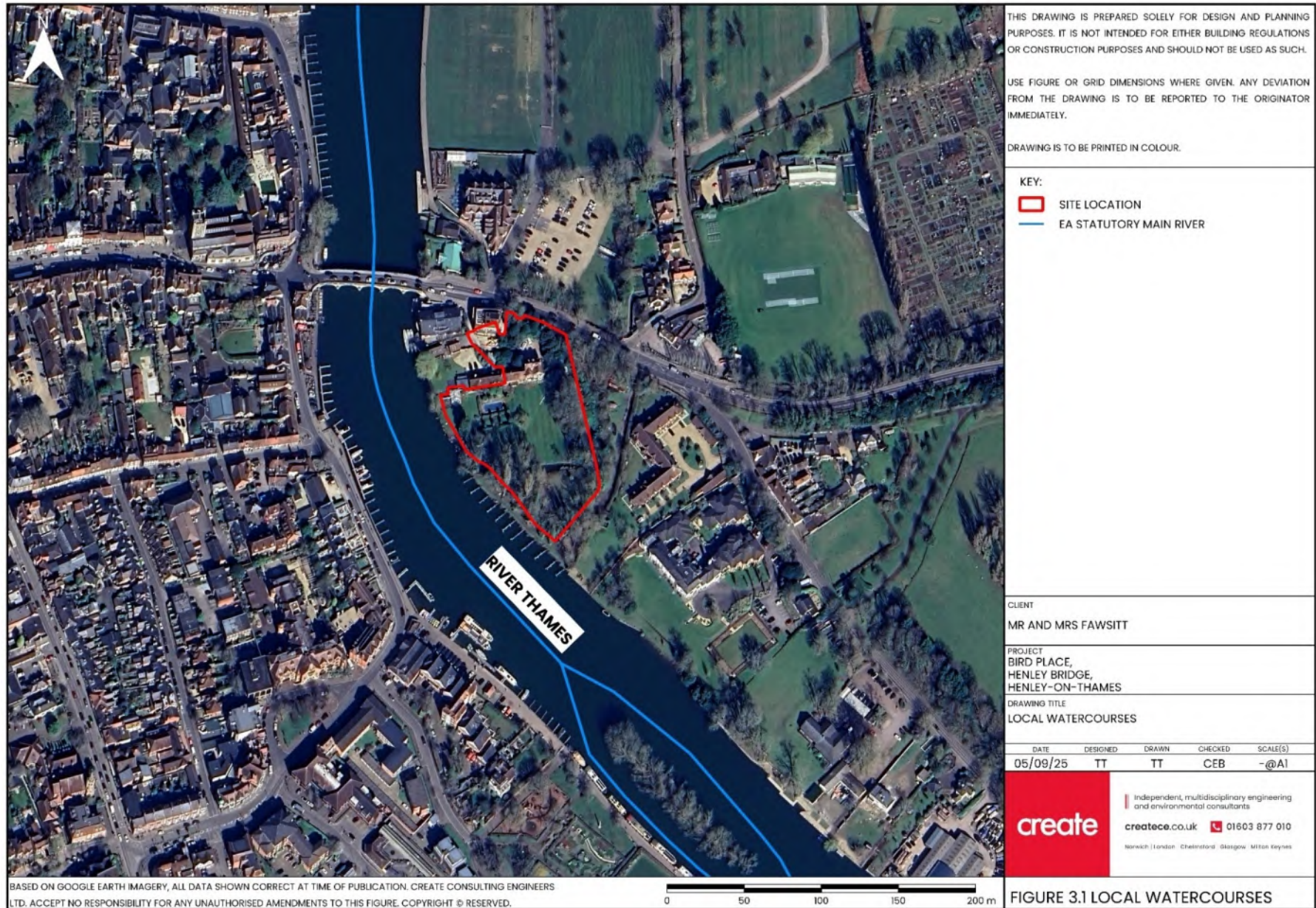


Figure 3.1: Local Watercourses.



Figure 4.1: Flood Map for Planning and associated watercourses



Figure 4.2: 3.33% AEP Flood Levels – Thames (Sonning to Hurley) 2019 model.

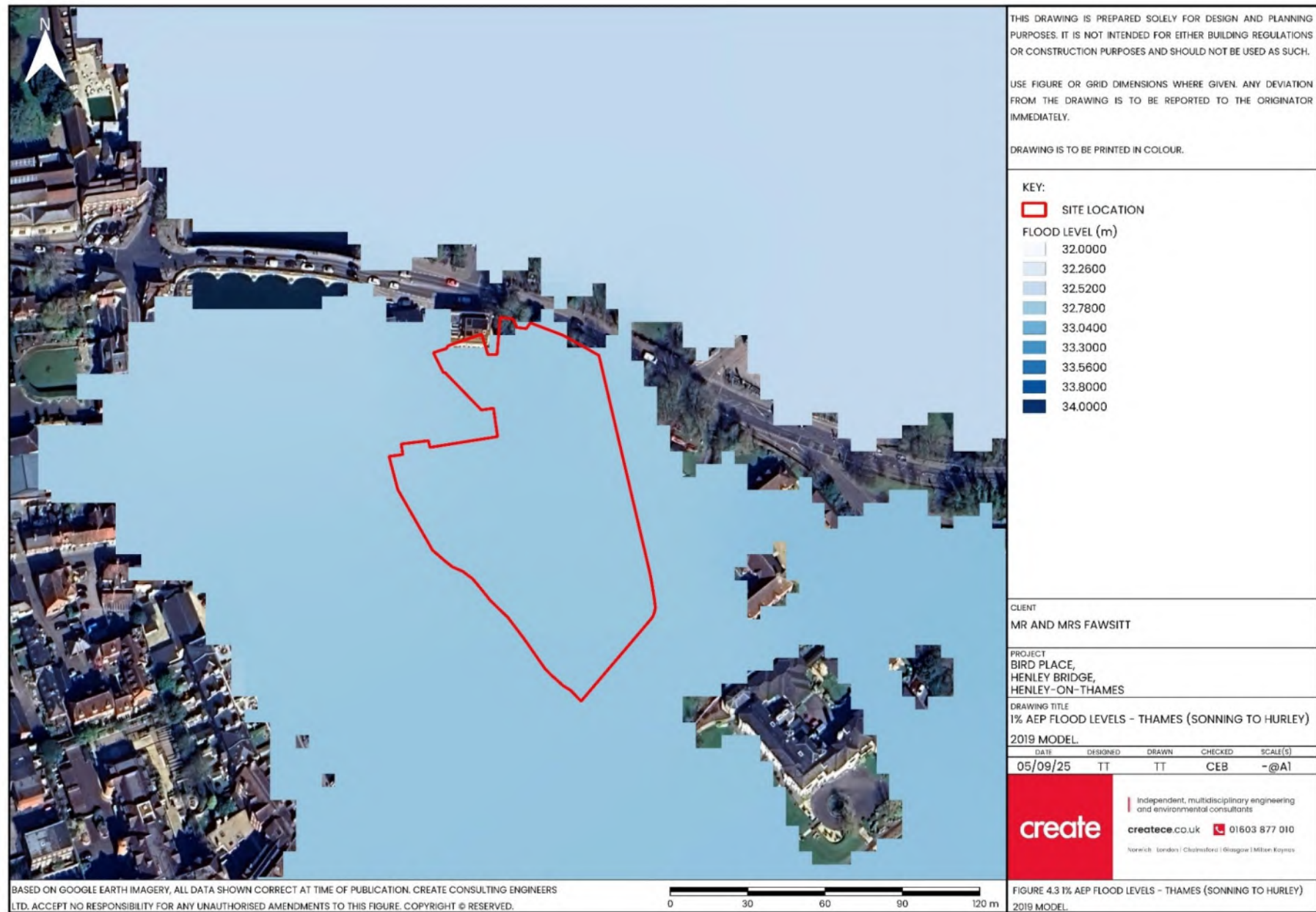


Figure 4.3: 1% AEP Flood Levels – Thames (Sonning to Hurley) 2019 model.

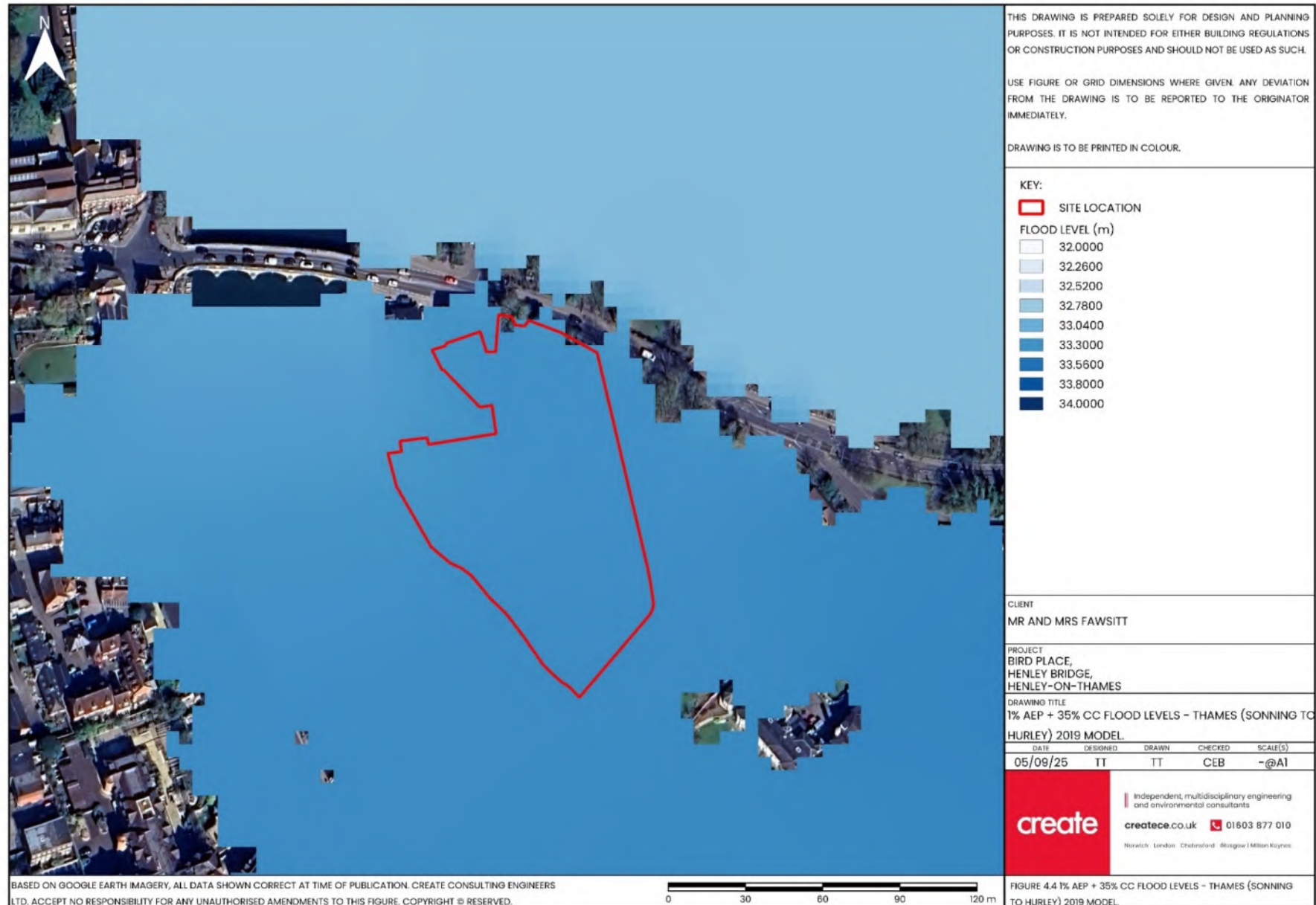


Figure 4.4: 1% AEP +35 CC Flood Levels – Thames (Sonning to Hurley) 2019 model

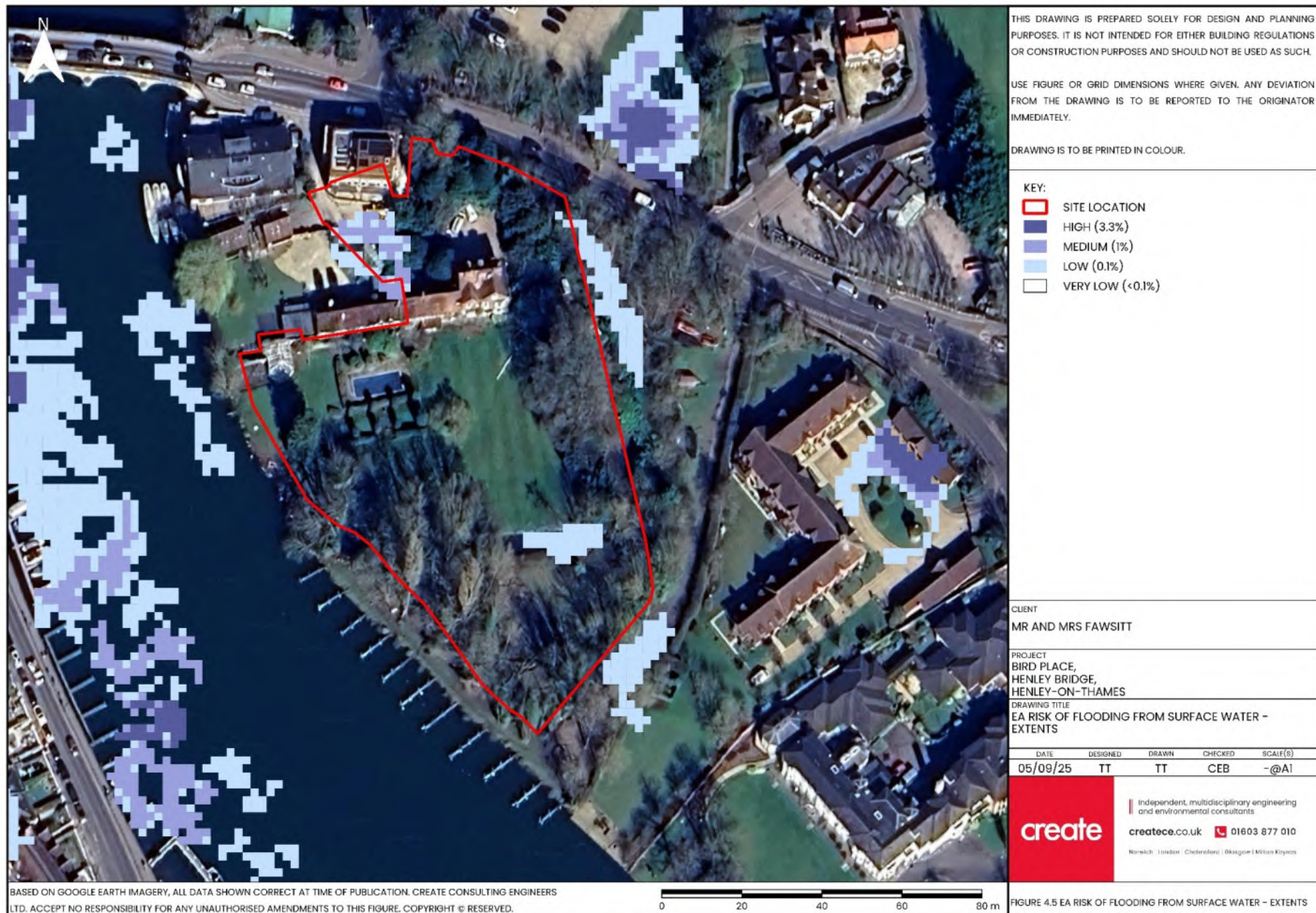


Figure 4.5: EA Risk of Flooding from Surface Water – Extents

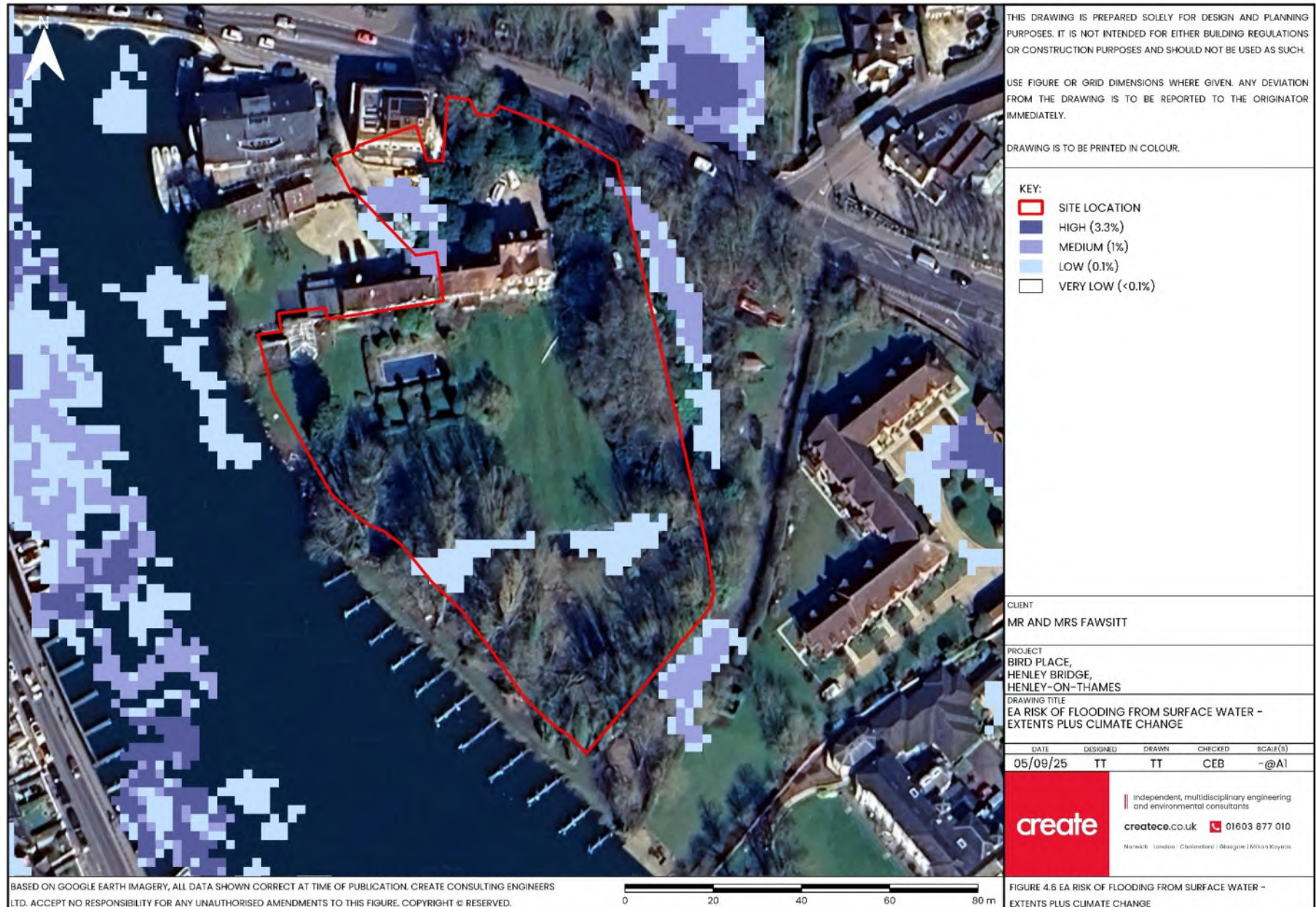


Figure 4.6: EA Risk of Flooding from Surface Water – Extents plus Climate Change

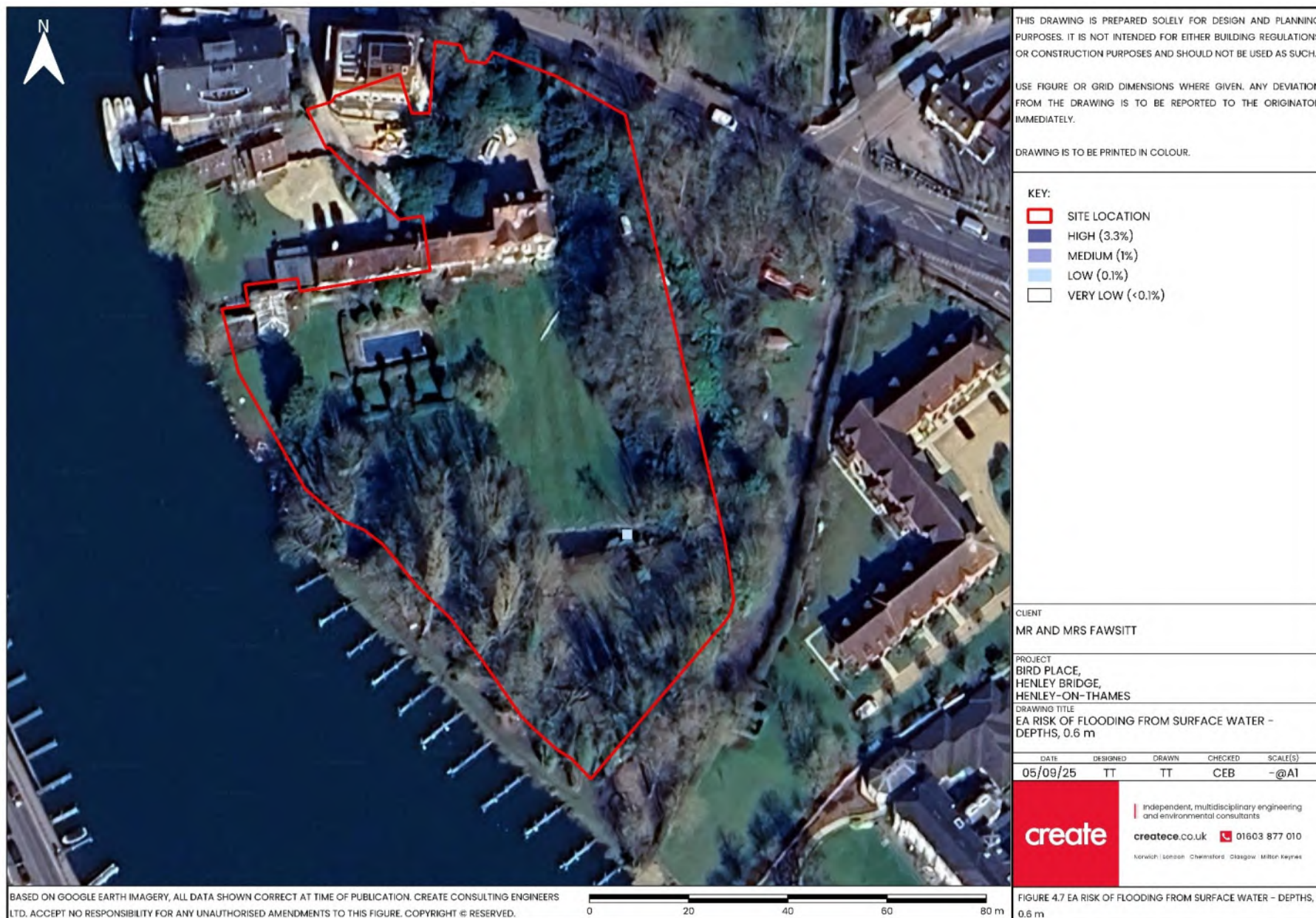


Figure 4.7: EA Risk of Flooding from Surface Water – Depths 0.6 m

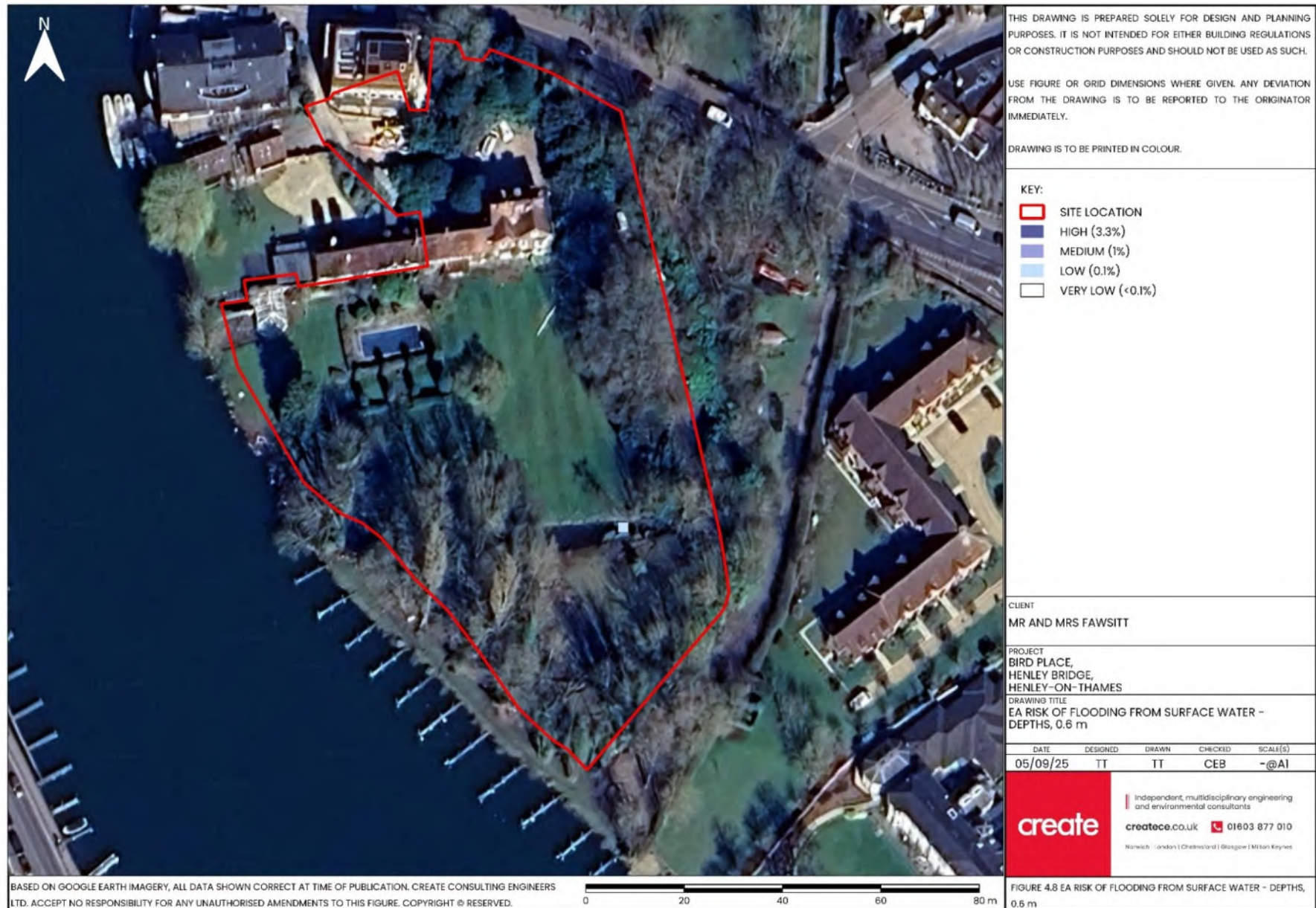


Figure 4.8: EA Risk of Flooding from Surface Water plus Climate Change – Depths 0.6 m

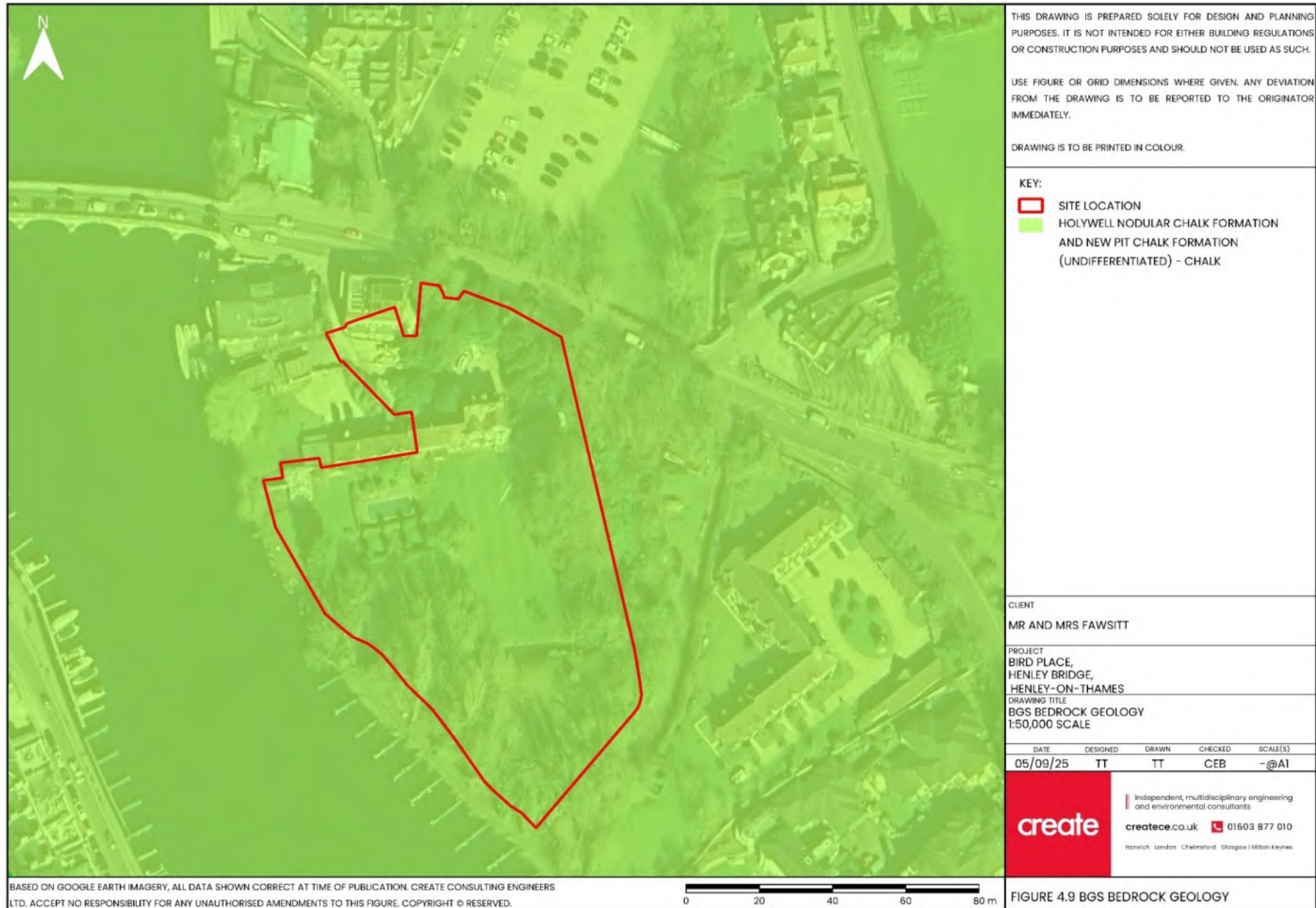


Figure 4.9: BGS Bedrock Geology



Figure 4.10: BGS Superficial Geology

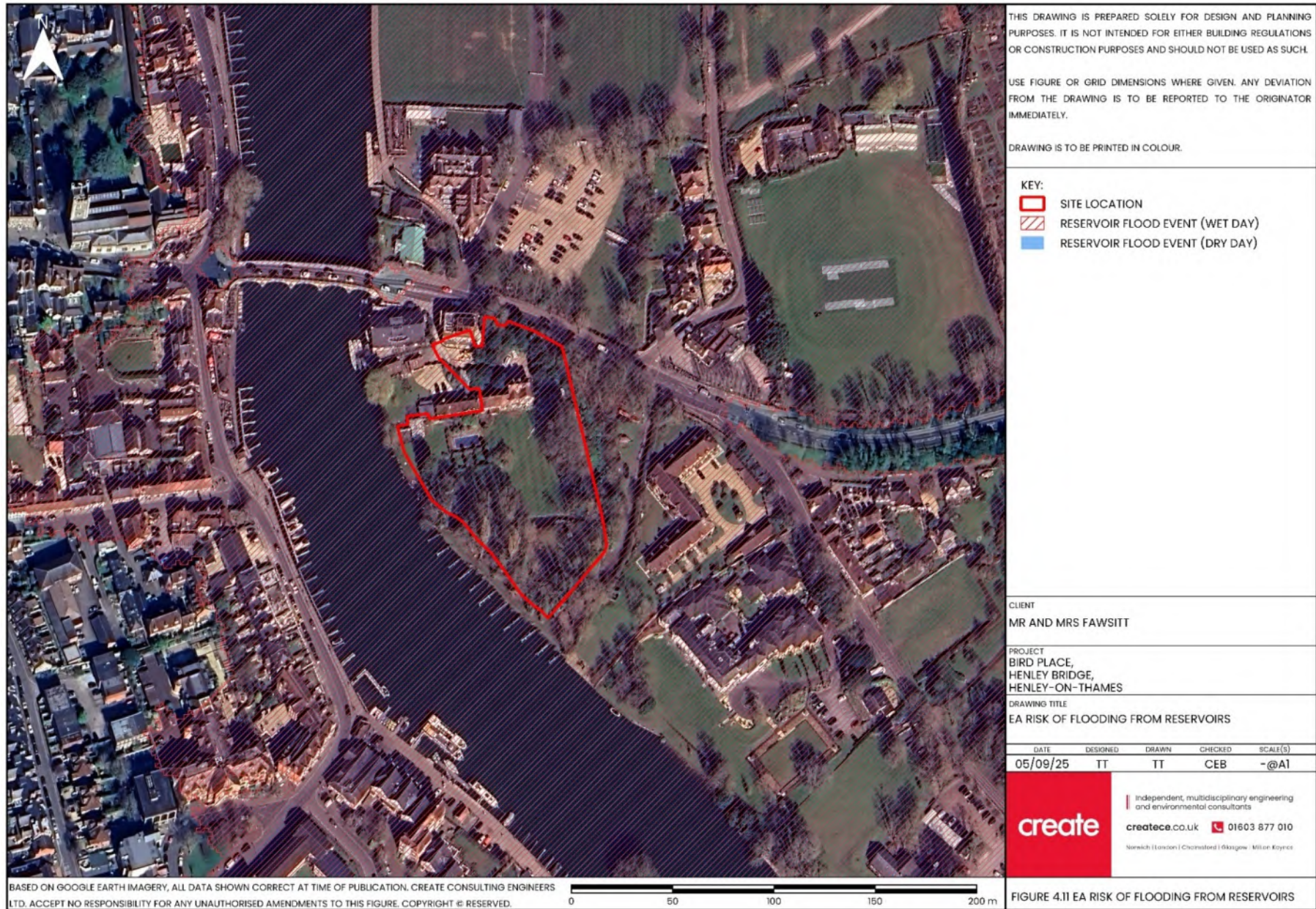


Figure 4.11: EA Risk of Flooding from Reservoirs

APPENDIX A

Thames Water – Clean & Wastewater Plans

Create Consulting Engineers Ltd
15 PRINCES STREET,
NORWICH
NR3 1AF

Search address supplied Bird Place
Henley Bridge
Henley-on-thames
RG9 2LN

Your reference P25-3458

Our reference ALS/ALS Standard/2025_5132110

Search date 10 March 2025

Keeping you up-to-date

We have a new website and email address

Website URL: thameswater.co.uk/propertysearches

Email address: property.searches@thameswater.co.uk

Please do get in contact with us if you have any questions.



Thames Water Utilities Ltd
Property Searches,
Clearwater Court, Vastern Road, Reading RG1 8DB



property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches



0800 009 4540

Search address supplied: Bird Place, Henley Bridge, Henley-on-thames, RG9 2LN

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position and size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the contact details below:

Thames Water Utilities Ltd
Property Searches
Clearwater Court
Vastern Road
Reading
RG1 8DB

Email: property.searches@thameswater.co.uk

Web: thameswater.co.uk/propertysearches

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority. Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners. The public sewer map relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus. The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer



Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. You can do this by emailing customer.feedback@thameswater.co.uk with the email subject header 'Enquiry – TWOSA', along with details of the request.

If you have any questions regarding sewer connections, budget estimates, diversions or building over issues please direct them to our service desk which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

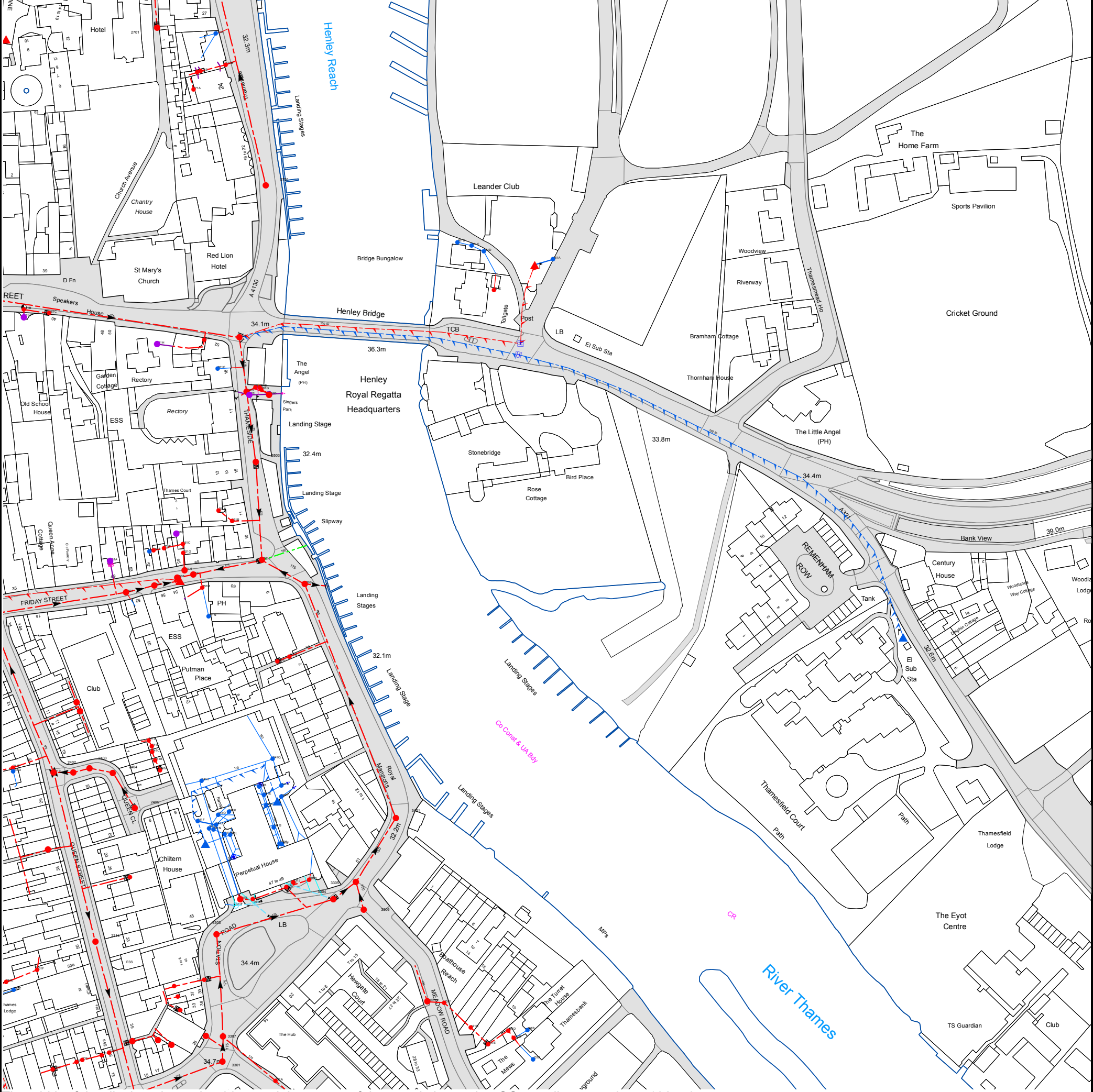
Clean Water queries

Should you require any advice concerning clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS Standard/2025 5132110



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 476455,182546
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2024) with the Sanction of the controller of H.M. Stationery Office, License no. AC0000849556 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
261A	n/a	n/a
261C	n/a	n/a
261B	n/a	n/a
3503	32.43	31.06
361I	n/a	n/a
361D	31.97	29.4
361H	32.71	31.46
361G	n/a	n/a
361E	32.31	31.72
361F	32.42	31.8
361C	n/a	n/a
3601	34.1	31.72
3701	32.05	31.03
271A	n/a	n/a
271C	n/a	n/a
271B	n/a	n/a
371B	n/a	n/a
371A	n/a	n/a
2701	n/a	n/a
341A	n/a	n/a
2501	33.96	31.82
2502	32.6	29.16
3506	n/a	n/a
251I	n/a	n/a
251H	n/a	n/a
251A	n/a	n/a
3501	32.55	30.41
251G	n/a	n/a
251F	n/a	n/a
251B	n/a	n/a
251E	n/a	n/a
251C	n/a	n/a
251D	n/a	n/a
351B	n/a	n/a
351A	n/a	n/a
2411	n/a	n/a
2412	n/a	n/a
241P	n/a	n/a
241O	n/a	n/a
2408	n/a	n/a
2410	36.54	34.06
2402	36.48	34.58
2403	36.43	34.69
2404	36.41	34.76
2318	n/a	n/a
2405	36.45	34.97
241E	n/a	n/a
241D	n/a	n/a
241C	n/a	n/a
241B	n/a	n/a
241A	n/a	n/a
241F	34.14	33.2
241H	32.69	31.38
241G	n/a	31.53
341N	34.08	31.53
341J	34.07	33.09
341O	n/a	31.53
341M	32.17	31.56
341K	34.1	33.17
341L	32.17	31.31
341B	32.17	31.67
341E	32.17	31.03
341C	32.17	31.33
341Q	n/a	n/a
341G	32.17	31.47
3401	32.2	31.2
331K	n/a	n/a
431F	n/a	n/a
461B	n/a	n/a
421Q	n/a	n/a
461C	n/a	n/a
461D	n/a	n/a
431E	n/a	n/a
461E	n/a	n/a
431D	n/a	n/a
431C	n/a	n/a
431B	n/a	n/a
431A	n/a	n/a
461A	n/a	n/a
231E	n/a	n/a
231C	n/a	n/a
231F	n/a	n/a
231G	n/a	n/a
231J	n/a	n/a
231I	n/a	n/a
2314	35.92	33.6
231A	n/a	n/a
231H	n/a	n/a
2315	n/a	n/a
2304	n/a	n/a
2305	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
2310	n/a	n/a
2309	n/a	n/a
2308	n/a	n/a
2316	n/a	n/a
2317	n/a	n/a
3303	34.86	32.59
3301	34.61	32.96
3307	34.39	32.87
331F	n/a	n/a
331B	n/a	n/a
331C	n/a	n/a
331H	n/a	n/a
331A	n/a	n/a
3306	32.64	31.6
3304	32.91	31.4
331E	n/a	n/a
331I	n/a	n/a
331J	n/a	n/a
3305	32.73	31.33
331D	n/a	n/a
341F	32.17	31.35
341H	n/a	31.47
341P	n/a	31.53
341D	34.1	30.6
341R	n/a	n/a
3502	32.33	30.46
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

	Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.
	Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.
	Storm Sewer
	Sludge Sewer
	Foul Trunk Sewer
	Surface Trunk Sewer
	Combined Trunk Sewer
	Foul Rising Main
	Surface Water Rising Main
	Combined Rising Main
	Vacuum
	Thames Water Proposed
	Vent Pipe
	Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

	Sewer		Culverted Watercourse
	Proposed		Decommissioned Sewer
	Content of this drainage network is currently unknown		Ownership of this drainage network is currently unknown

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plan are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve		Meter
	Dam Chase		Vent
	Fitting		

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Ancillary		Drop Pipe
	Control Valve		Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Inlet		Outfall
	Undefined End		

Other Symbols

Symbols used on maps which do not fall under other general categories.

	Change of Characteristic Indicator		Public / Private Pumping Station
	Invert Level		Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Chamber
	Operational Site

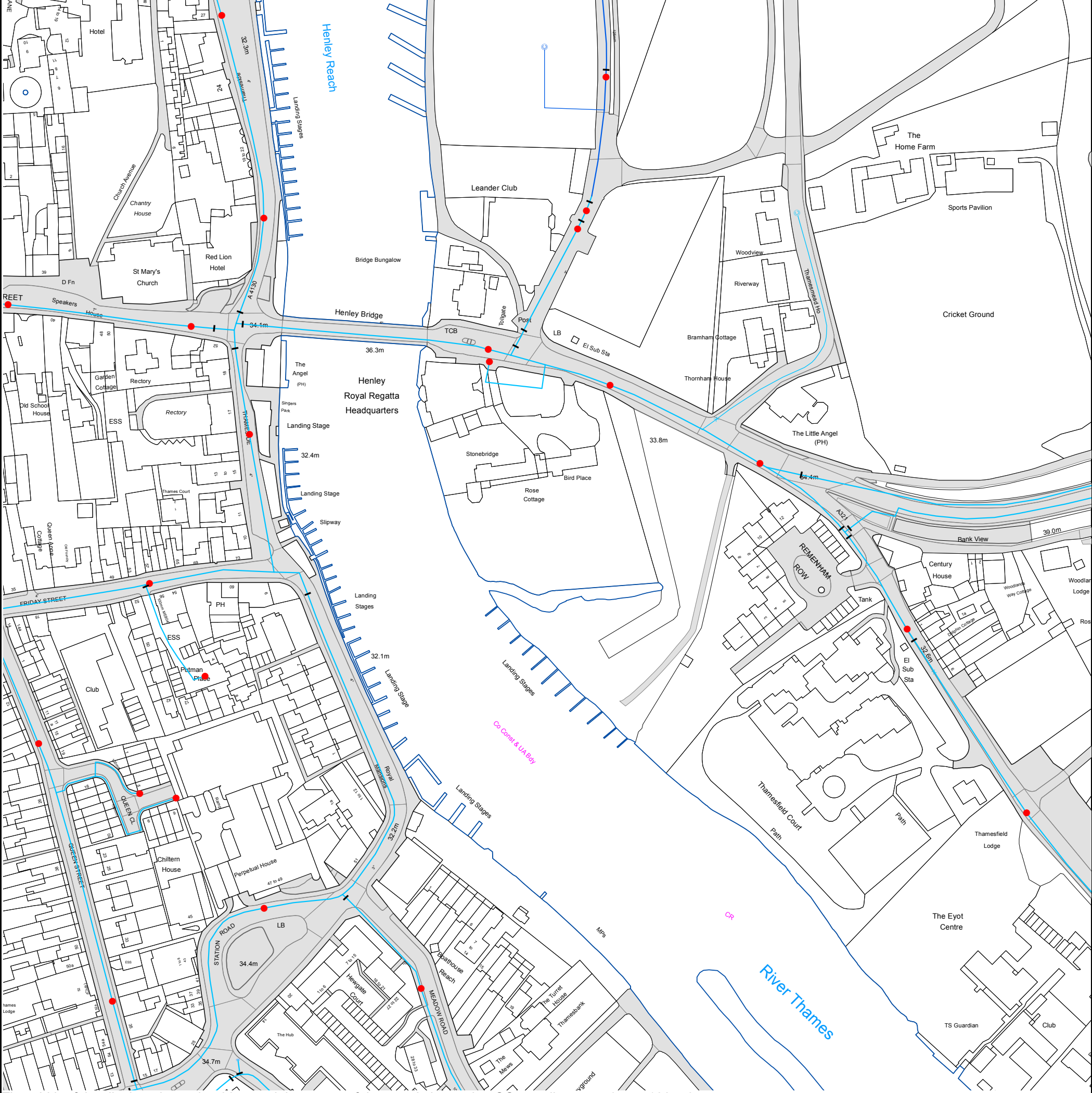
Ducts or Crossings

	Casement	Ducts may contain high voltage cables. Please check with Thames Water.
	Conduit Bridge	
	Subway	
	Tunnel	

5) 'na' or '0' on a manhole indicates that data is unavailable.

6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS Standard/2025_5132110



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 476455, 182546.
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map (2024) with the Sanction of the controller of H.M. Stationery Office, License no. AC0000849556 Crown Copyright Reserved.



Asset Location Search - Water Key

Water Pipes (Operated & Maintained by Thames Water)

- 4"** **Distribution Main:** The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
- 16"** **Trunk Main:** A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
- 3" SUPPLY** **Supply Main:** A supply main indicates that the water main is used as a supply for a single property or group of properties.
- 3" FIRE** **Fire Main:** Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
- 3" METERED** **Metered Pipe:** A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
- Transmission Tunnel:** A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
- Proposed Main:** A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

- General Purpose Valve
- Air Valve
- Pressure Control Valve
- Customer Valve

Hydrants

- Single Hydrant

Meters

- Meter

End Items

Symbol indicating what happens at the end of a water main.

- Blank Flange
- Capped End
- Emptying Pit
- Undefined End
- Manifold
- Customer Supply
- Fire Supply

Operational Sites

- Booster Station
- Other
- Other (Proposed)
- Pumping Station
- Service Reservoir
- Shaft Inspection
- Treatment Works
- Unknown
- Water Tower

Other Symbols

- Data Logger
- Casement:** Ducts may contain high voltage cables. Please check with Thames Water.

Other Water Pipes (Not Operated or Maintained by Thames Water)

- Other Water Company Main:** Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
- Private Main:** Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

APPENDIX B

Thames Water Sewer Flooding History

Sewer Flooding

History Enquiry



Property
Searches

Create Consulting Engineers Ltd

15 PRINCES STREET,

Search address supplied

Bird Place
Henley Bridge
Henley-on-thames
RG9 2LN

Your reference

P25-3458

Our reference

SFH/SFH Standard/2025_5132116

Received date

10 March 2025

Search date

10 March 2025



Thames Water Utilities Ltd
Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB



property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches



0800 009 4540

Sewer Flooding

History Enquiry



Property
Searches

Search address supplied: Bird Place, Henley Bridge, Henley-on-thames, RG9 2LN

This search is recommended to check for any sewer flooding at a specific address or area

TWUL are responsible in respect of the following:-

- (i) any negligent or incorrect entry in the records searched;
- (ii) any negligent or incorrect interpretation of the records searched;
- (iii) and any negligent or incorrect recording of that interpretation in the search report
- (iv) compensation payments



Thames Water Utilities Ltd
Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB



property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches



0800 009 4540

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is “overloaded” when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- “Internal flooding” from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- “At Risk” properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company’s reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk



Thames Water Utilities Ltd
Property Searches, Clearwater Court, Vastern Road, Reading RG1 8DB



property.searches@thameswater.co.uk
thameswater.co.uk/propertysearches



0800 009 4540

APPENDIX C

Brownfield and Greenfield Runoff Rates



M5-60 : 20 mm
r : 0.45
Wallingford Method - maps

For different durations, From Table 1

Duration, D	Z1		
15 min	0.65	M5-15:	Z1 x M5-60
30 min	0.82	M5-30:	Z1 x M5-60
60 min	1	M5-60:	Z1 x M5-60
6hr	1.51	M5-360:	Z1 x M5-60

For different return intervals,

From Table 2*

Duration, D	M1	Z2	
		M30	M100
15 min	0.62	1.52	1.96
30 min	0.62	1.53	2.00
60 min	0.64	1.54	2.03
6 hr	0.68	1.51	1.97

Average point intensity, API = I/(D/60)

	D (min)	Calculation	I (mm)	API (mm/hr)
M 1-15	15	M5-15*Z2(M1)	8.06	32.24
M 1-30	30	M5-30*Z2(M1)	10.17	20.34
M 1-60	30	M5-360*Z2(M1)	12.80	25.60
M1-360	360	M5-360*Z2(M1)	20.54	3.42
M 30-15	15	M5-15*Z2(M30)	19.76	79.04
M 30-30	30	M5-30*Z2(M30)	25.09	50.18
M 30-60	60	M5-60*Z2(M30)	30.80	30.80
M30-360	360	M5-360*Z2(M30)	45.60	7.60
M 100-15	15	M5-15*Z2(M100)	25.48	101.92
M 100-30	30	M5-30*Z2(M100)	32.80	65.60
M100-60	60	M5-60*Z2(M100)	40.60	40.60
M100-360	360	M5-360*Z2(M100)	59.49	9.92

Peak Runoff

Q=2.78CiA Rational Method, SUDS Manual Section 4.3.3

where: (1) C = Cv Cr
(2) i = API, defined above Cv = 1
(3) A = areas measured for subcatchments Cr = 1.3
therefore, C = 1.3
Q=2.78CiA 2.78*C= 3.614

	i	Contributing Impermeable Area (ha)	
	mm/hr	Site	Per hectare
		0.0089	1
M 1-15	32.24	1.04	116.52
M 1-30	20.34	0.65	73.49
M 1-60	25.60	0.82	73.49

Table 1

Rainfall Duration D										
Minutes	5	10	15	30	Hours	1	2	4	6	10
r										
0.12	0.22	0.34	0.45	0.67	1.00	1.48	2.17	2.75	3.70	6.00
0.15	0.25	0.38	0.48	0.69	1.00	1.42	2.02	2.46	3.32	4.90
0.18	0.27	0.41	0.51	0.71	1.00	1.36	1.86	2.25	2.86	4.30
0.21	0.29	0.43	0.54	0.73	1.00	1.33	1.77	2.12	2.62	3.60
0.24	0.31	0.46	0.56	0.75	1.00	1.30	1.71	2.00	2.40	3.35
0.27	0.33	0.48	0.58	0.76	1.00	1.27	1.64	1.88	2.24	3.10
0.30	0.34	0.49	0.59	0.77	1.00	1.25	1.57	1.78	2.12	2.84
0.33	0.35	0.50	0.61	0.78	1.00	1.23	1.53	1.73	2.04	2.60
0.36	0.36	0.51	0.62	0.79	1.00	1.22	1.48	1.67	1.90	2.42
0.39	0.37	0.52	0.63	0.80	1.00	1.21	1.46	1.62	1.82	2.28
0.42	0.38	0.53	0.64	0.81	1.00	1.20	1.42	1.57	1.74	2.16
0.45	0.39	0.54	0.65	0.82	1.00	1.19	1.38	1.51	1.68	2.03

Table 2 - England and Wales

Growth Factor Z2										
M5 rainfall	M1	M2	M3	M4	M5	M10	M20	M50	M100	M30 interpolated
5.00	0.62	0.79	0.89	0.97	1.02	1.19	1.36	1.56	1.79	1.25
10.00	0.61	0.79	0.90	0.97	1.03	1.22	1.41	1.65	1.91	1.49
15.00	0.62	0.80	0.90	0.97	1.03	1.24	1.44	1.70	1.99	1.53
20.00	0.64	0.81	0.90	0.97	1.03	1.24	1.45	1.73	2.03	1.54
25.00	0.66	0.82	0.91	0.97	1.03	1.24	1.44	1.72	2.01	1.53
30.00	0.68	0.83	0.91	0.97	1.03	1.22	1.42	1.70	1.97	1.51
40.00	0.70	0.84	0.92	0.97	1.02	1.19	1.38	1.64	1.89	1.47
50.00	0.72	0.85	0.93	0.98	1.02	1.17	1.34	1.58	1.81	1.42
75.00	0.76	0.87	0.93	0.98	1.02	1.14	1.28	1.47	1.64	1.34
100.00	0.78	0.88	0.94	0.98	1.02	1.13	1.25	1.40	1.54	1.30
150.00	0.78	0.88	0.94	0.98	1.01	1.12	1.21	1.33	1.45	1.25
200.00	0.78	0.88	0.94	0.98	1.01	1.11	1.19	1.30	1.40	1.23

* The rainfall depths from cells E8-E11 are compared with the depths given in cells J29-J40 and Z2 interpolated accordingly for each return period

** Cv varies between 0.6 (rapidly draining soils) and 0.9 (heavy clay) with an average of 0.75 taken if ground

	i	Contributing Impermeable Area (ha)	
	mm/hr	Site	Per hectare
		0.0089	1
M 30-60	30.80	0.99	181.36
M30-360	7.60	0.24	27.47
M 100-15	101.92	3.28	368.34

P25-3458, Bird Place, Henley Bridge, Henley-On-Thames
Brownfield Run-off Calculations - Impermeable Area Only

M1-360	3.42	0.11	12.37
M 30-15	79.04	2.54	285.65
M 30-30	50.18	1.61	181.36

M 100-30	65.60	2.11	237.08
M 100-60	40.60	1.31	237.08
M100-360	9.92	0.32	35.84

conditions not known.

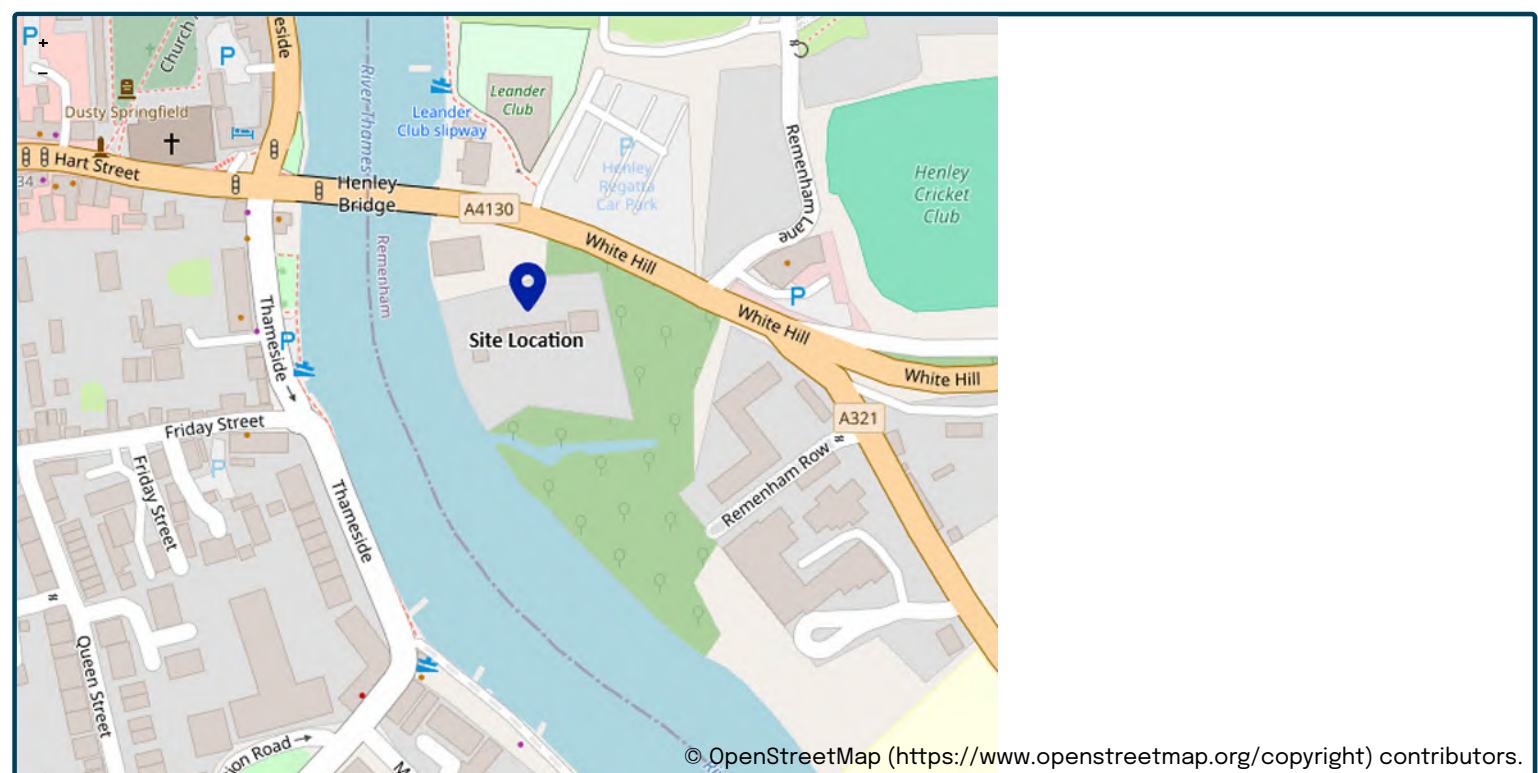
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	09/09/2025
Calculated by	Grace Beard
Reference	
Model version	2.1.2

Location

Site name	Bird Place, Henley-on-Thames
Site location	Bird Place, Henley-on-Thames



Site easting (British National Grid)	476445
Site northing (British National Grid)	182577

Site details

Total site area (ha)	0.0089	ha
----------------------	-------------------------------------	----

Greenfield runoff

Method

Method	FEH statistical
--------	-----------------

FEH statistical

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	679	mm	676
BFIHOST	0.861		
QMed-QBar conversion	1.136		1.136
QMed (l/s)	0.01	l/s	
QBar (FEH statistical) (l/s)	0.01	l/s	

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	6		6
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	
Flow rate 1 year (l/s)	0.01	l/s
Flow rate 2 year (l/s)	0.01	l/s
Flow rate 10 years (l/s)	0.01	l/s
Flow rate 30 years (l/s)	0.01	l/s
Flow rate 100 years (l/s)	0.02	l/s
Flow rate 200 years (l/s)	0.02	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 (2.1.2) 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.

APPENDIX D

FLOW Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
Tank 1	0.009	5.00	31.940	1200	1.350
Outfall			31.900	1200	1.514

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.001	Tank 1	Outfall	20.500	0.600	30.590	30.386	0.204	100.5	150	5.34	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.001	1.002	17.7	1.6	1.200	1.364	0.009	0.0	31	0.626

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.001	20.500	100.5	150	Circular	31.940	30.590	1.200	31.900	30.386	1.364

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	Tank 1	1200	Manhole	Adoptable	Outfall	1200	Manhole	Adoptable

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
Tank 1	31.940	1.350	1200					
					0	1.001	30.590	150
Outfall	31.900	1.514	1200		1	1.001	30.386	150

Simulation Settings

Rainfall Methodology	FEH-22	Skip Steady State	x	2 year (l/s)	0.0
Rainfall Events	Singular	Drain Down Time (mins)	240	30 year (l/s)	0.0
Summer CV	1.000	Additional Storage (m ³ /ha)	0.0	100 year (l/s)	0.0
Winter CV	1.000	Starting Level (m)		Check Discharge Volume	x
Analysis Speed	Normal	Check Discharge Rate(s)	✓		

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	35	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	1.95
Greenfield Method	FEH	Growth Factor 100 year	2.48
Positively Drained Area (ha)	0.009	Betterment (%)	0
SAAR (mm)	679	QMed	0.0
Host	1	QBar	0.0
BFIHost	0.861	Q 2 year (l/s)	
Region	6	Q 30 year (l/s)	
QBar/QMed conversion factor	1.136	Q 100 year (l/s)	
Growth Factor 2 year	0.88		

Node Tank 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	30.590	Product Number	CTL-SHE-0074-1900-0400-1900
Design Depth (m)	0.400	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	1.9	Min Node Diameter (mm)	1200

Node Tank 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.590
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.97	Time to half empty (mins)	17

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	4.0	4.0	0.500	4.0	7.5	0.501	0.1	7.5	1.500	0.1	7.5

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 15 minute summer	100.328	28.389	2 year 120 minute summer	31.164	8.236
2 year 15 minute winter	70.406	28.389	2 year 120 minute winter	20.705	8.236
2 year 30 minute summer	64.300	18.195	2 year 180 minute summer	25.624	6.594
2 year 30 minute winter	45.123	18.195	2 year 180 minute winter	16.656	6.594
2 year 60 minute summer	42.666	11.275	2 year 240 minute summer	20.974	5.543
2 year 60 minute winter	28.346	11.275	2 year 240 minute winter	13.935	5.543

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
2 year 360 minute summer	16.481	4.241	30 year +35% CC 720 minute summer	26.537	7.112
2 year 360 minute winter	10.713	4.241	30 year +35% CC 720 minute winter	17.835	7.112
2 year 480 minute summer	13.089	3.459	30 year +35% CC 960 minute summer	21.194	5.581
2 year 480 minute winter	8.696	3.459	30 year +35% CC 960 minute winter	14.039	5.581
2 year 600 minute summer	10.734	2.936	30 year +35% CC 1440 minute summer	14.760	3.956
2 year 600 minute winter	7.334	2.936	30 year +35% CC 1440 minute winter	9.919	3.956
2 year 720 minute summer	9.553	2.560	100 year +40% CC 15 minute summer	539.352	152.618
2 year 720 minute winter	6.420	2.560	100 year +40% CC 15 minute winter	378.492	152.618
2 year 960 minute summer	7.796	2.053	100 year +40% CC 30 minute summer	354.774	100.389
2 year 960 minute winter	5.164	2.053	100 year +40% CC 30 minute winter	248.965	100.389
2 year 1440 minute summer	5.585	1.497	100 year +40% CC 60 minute summer	237.483	62.760
2 year 1440 minute winter	3.753	1.497	100 year +40% CC 60 minute winter	157.778	62.760
30 year +35% CC 15 minute summer	403.926	114.297	100 year +40% CC 120 minute summer	142.970	37.783
30 year +35% CC 15 minute winter	283.457	114.297	100 year +40% CC 120 minute winter	94.986	37.783
30 year +35% CC 30 minute summer	262.046	74.150	100 year +40% CC 180 minute summer	108.364	27.886
30 year +35% CC 30 minute winter	183.892	74.150	100 year +40% CC 180 minute winter	70.440	27.886
30 year +35% CC 60 minute summer	174.433	46.098	100 year +40% CC 240 minute summer	84.695	22.382
30 year +35% CC 60 minute winter	115.889	46.098	100 year +40% CC 240 minute winter	56.269	22.382
30 year +35% CC 120 minute summer	107.511	28.412	100 year +40% CC 360 minute summer	63.290	16.287
30 year +35% CC 120 minute winter	71.428	28.412	100 year +40% CC 360 minute winter	41.140	16.287
30 year +35% CC 180 minute summer	82.319	21.184	100 year +40% CC 480 minute summer	48.891	12.920
30 year +35% CC 180 minute winter	53.510	21.184	100 year +40% CC 480 minute winter	32.482	12.920
30 year +35% CC 240 minute summer	64.659	17.087	100 year +40% CC 600 minute summer	39.332	10.758
30 year +35% CC 240 minute winter	42.958	17.087	100 year +40% CC 600 minute winter	26.874	10.758
30 year +35% CC 360 minute summer	48.471	12.473	100 year +40% CC 720 minute summer	34.486	9.243
30 year +35% CC 360 minute winter	31.508	12.473	100 year +40% CC 720 minute winter	23.177	9.243
30 year +35% CC 480 minute summer	37.522	9.916	100 year +40% CC 960 minute summer	27.503	7.242
30 year +35% CC 480 minute winter	24.929	9.916	100 year +40% CC 960 minute winter	18.218	7.242
30 year +35% CC 600 minute summer	30.231	8.269	100 year +40% CC 1440 minute summer	19.043	5.104
30 year +35% CC 600 minute winter	20.656	8.269	100 year +40% CC 1440 minute winter	12.798	5.104

Results for 2 year Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Tank 1	20	30.661	0.071	1.3	0.3554	0.0000	OK
30 minute summer	Outfall	20	30.409	0.023	0.9	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	Tank 1	1.001	Outfall	0.9	0.520	0.049	0.0343	0.8

Results for 30 year +35% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Tank 1	23	30.913	0.323	5.3	1.6186	0.0000	SURCHARGED
60 minute winter	Outfall	33	30.419	0.033	1.9	0.0000	0.0000	OK

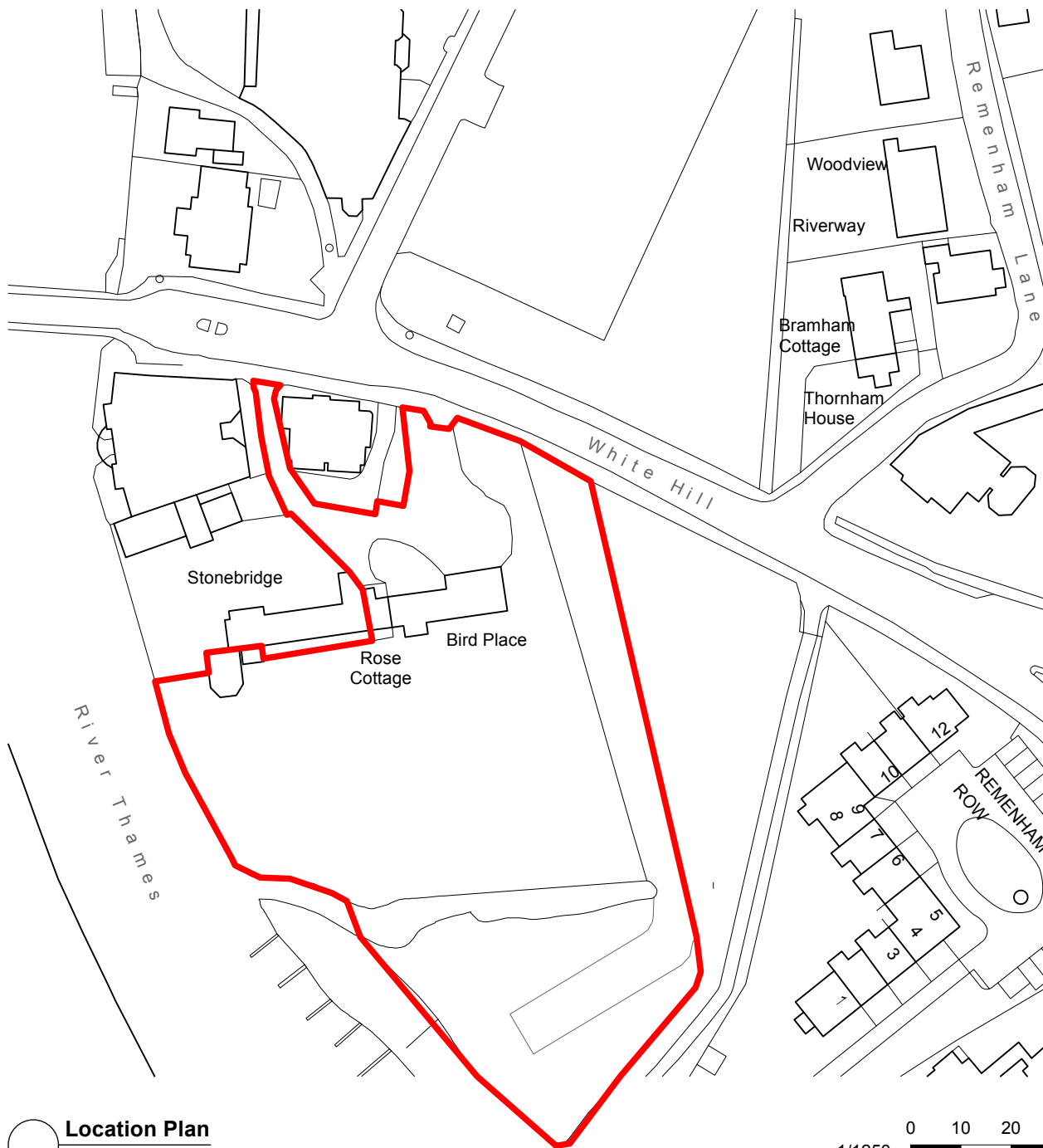
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	Tank 1	1.001	Outfall	1.9	0.652	0.107	0.0597	3.3

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	Tank 1	23	31.073	0.483	7.2	2.4204	0.0000	SURCHARGED
30 minute summer	Outfall	24	30.420	0.034	2.0	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	Tank 1	1.001	Outfall	2.0	0.662	0.113	0.0621	4.5

PLANS



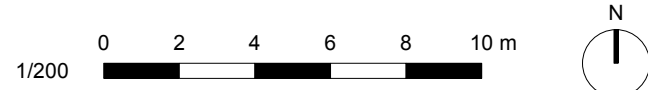
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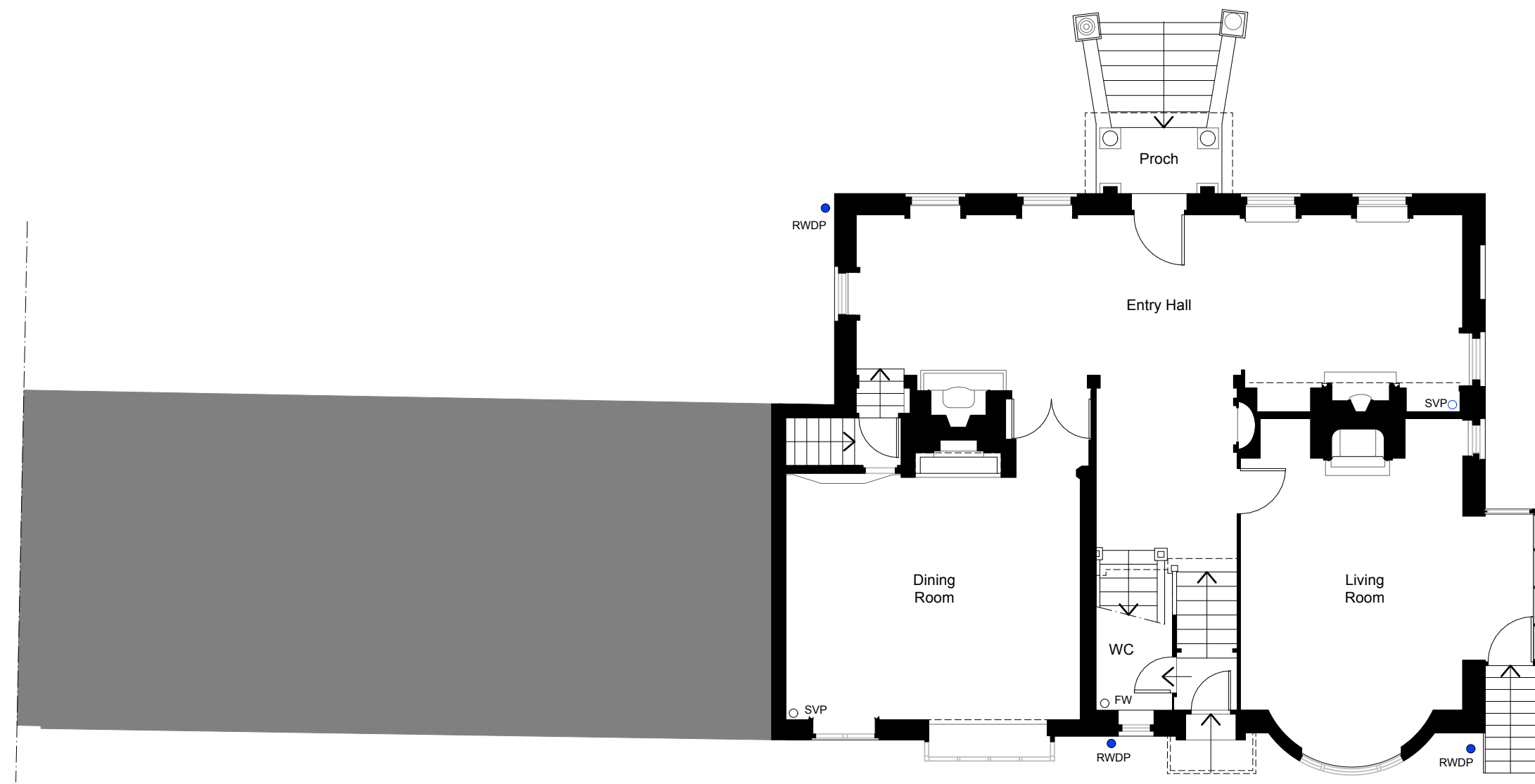
PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary PA issue

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Project Address Henley Bridge, Henley-On-Thames RG9 2LN		
Drawing No.	Rev. No.	
PA-01	PR2	
Drawing Title Location Plan		
Scale 1:1250 @ A4		
Drawn by: GG		Checked by: PS
		Project ID: SC013
Shack Group Ltd West Witheridge Fourth House, Penn Road, Knotty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		

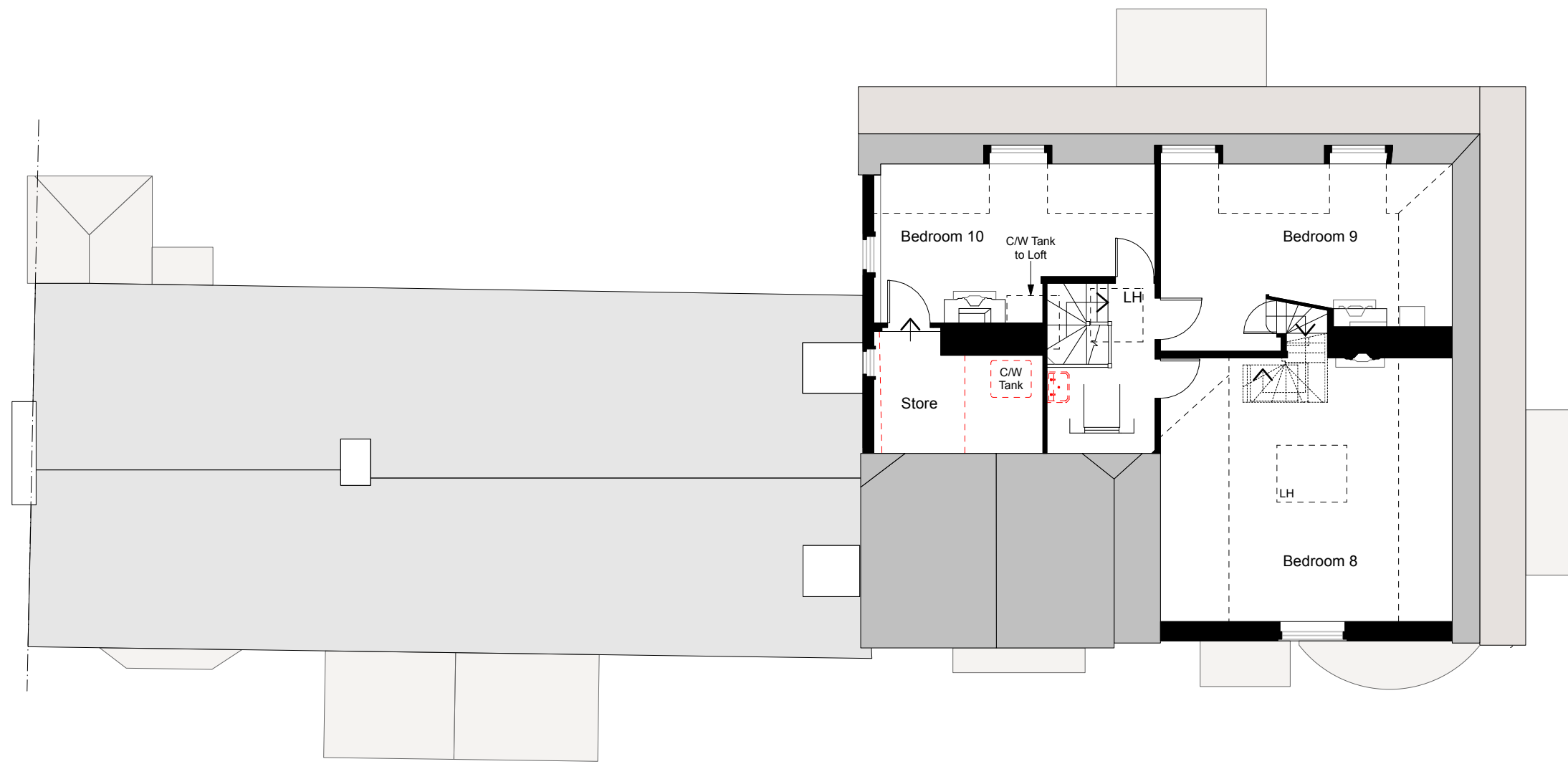


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PR1 18/08/2025 Preliminary issue

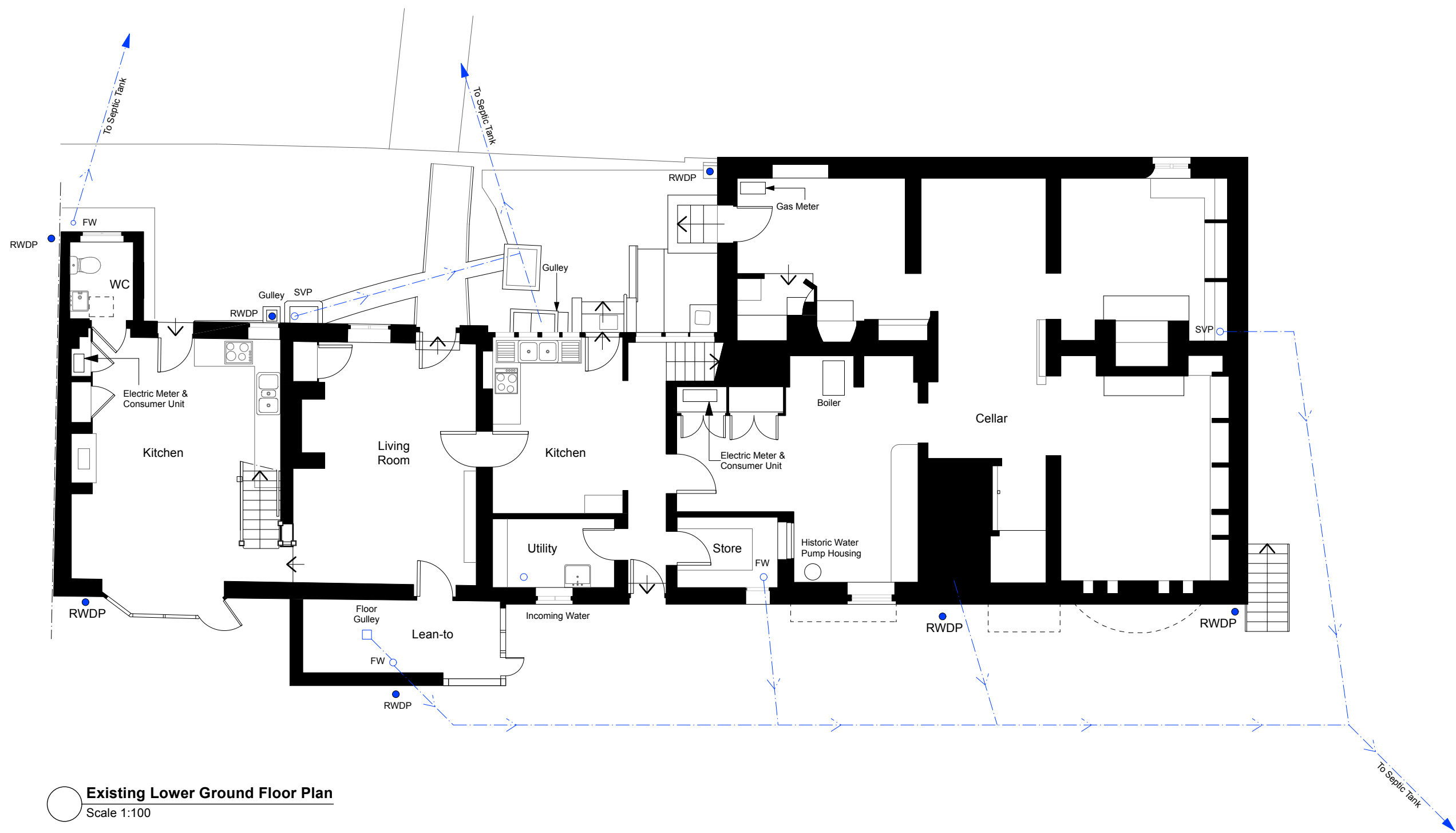
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Drawing Title Existing Site and Roof Plan		
Scale 1:200 @ A1		
Drawn by: GG Checked by: PS Project ID: SC013		
Shack Group Ltd West Wilberdridge Fourth House, Penn Road, Kingsley Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		shack.



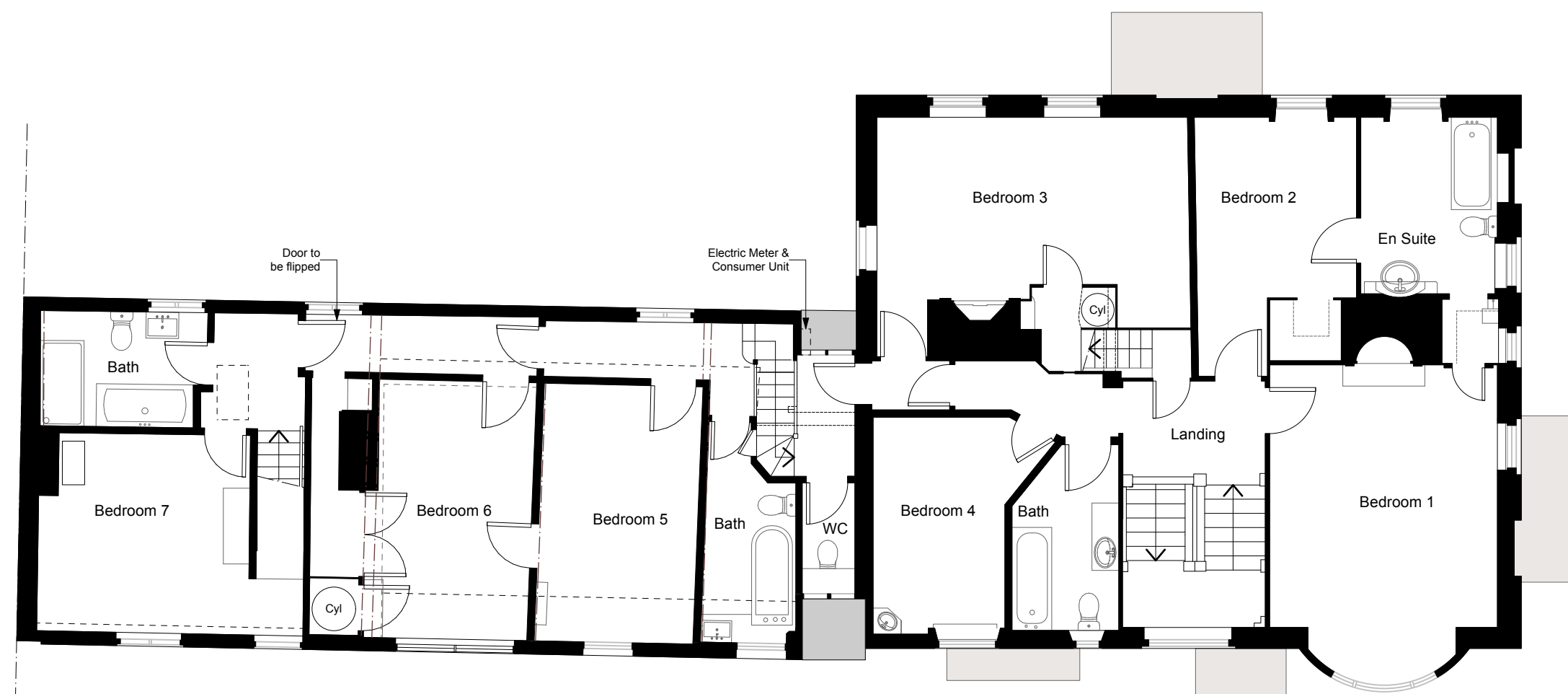
Existing Ground Floor
Scale 1:100



Existing Second Floor Plan
Scale 1:100



Existing Lower Ground Floor Plan
Scale 1:100



Existing First Floor Plan
Scale 1:100

Legend
Line of exposed timber trusses to be retained

0 1 2 3 4 5 m
1/100



PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary issue

Rev Date Note
Client
Mr & Mrs Fawcitt
Project Title
Bird Place

Project Address
Henley Bridge,
Henley-On-Thames RG9 2LN

Drawing No. Rev. No.
PA-03 PR2

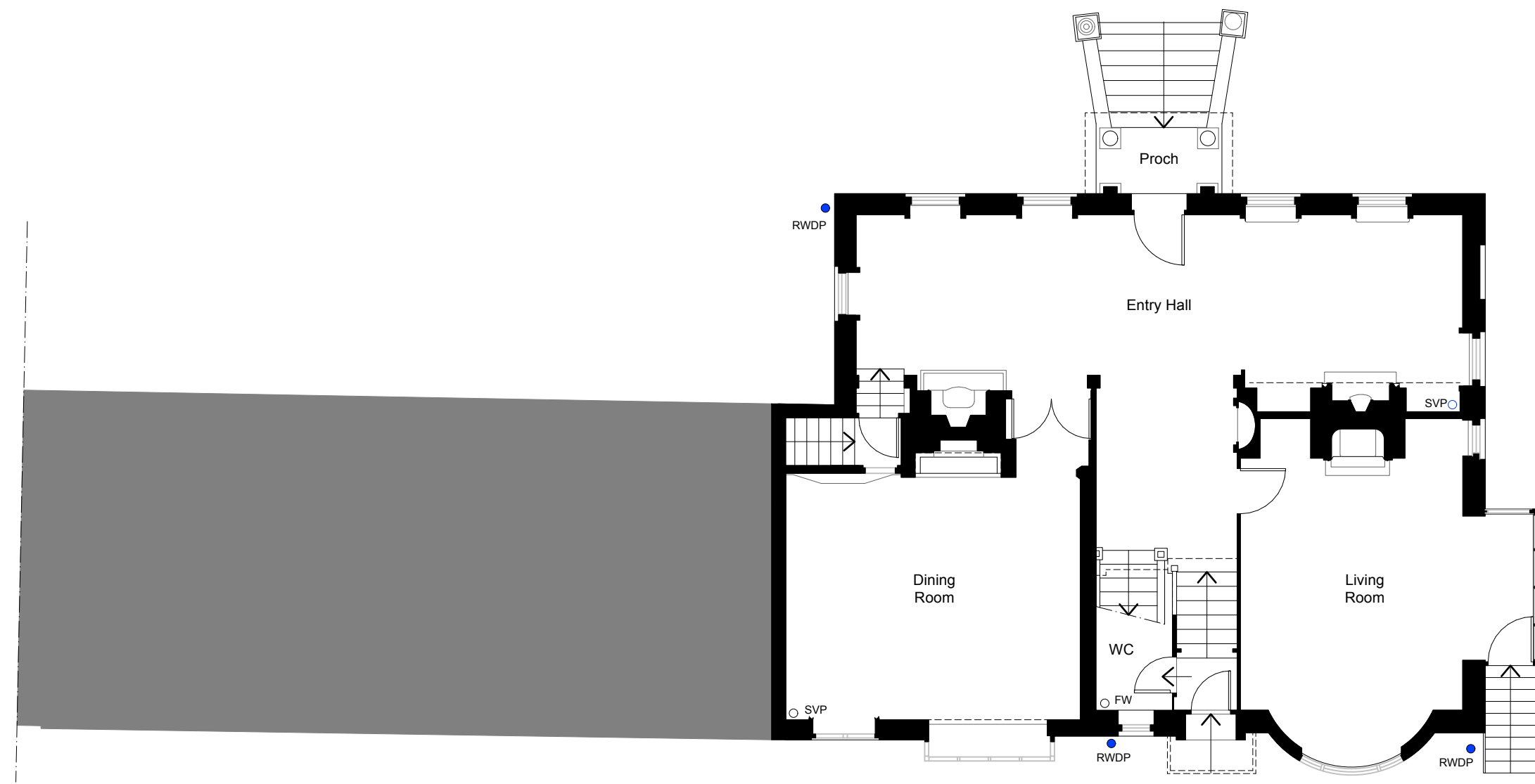
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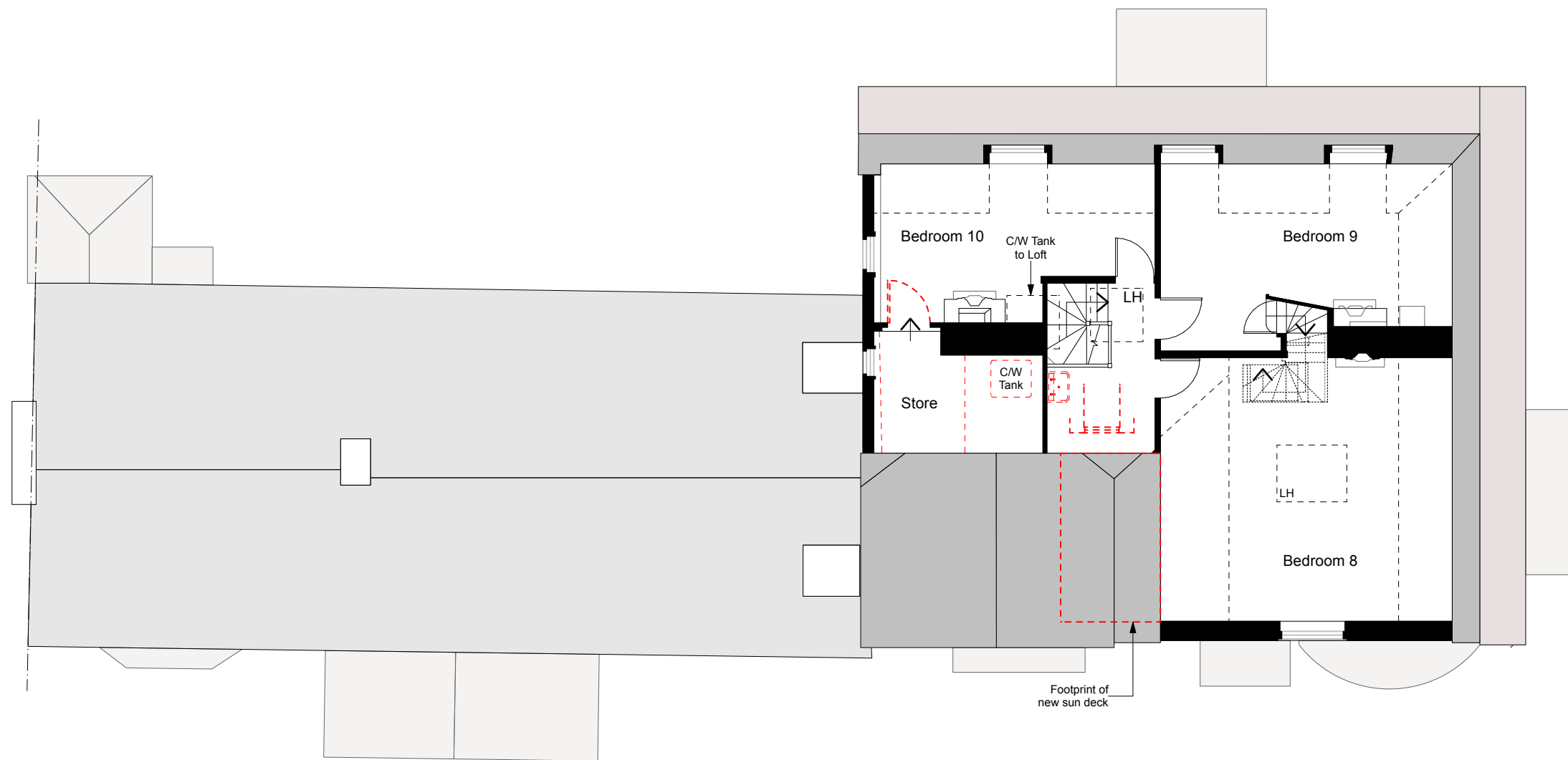
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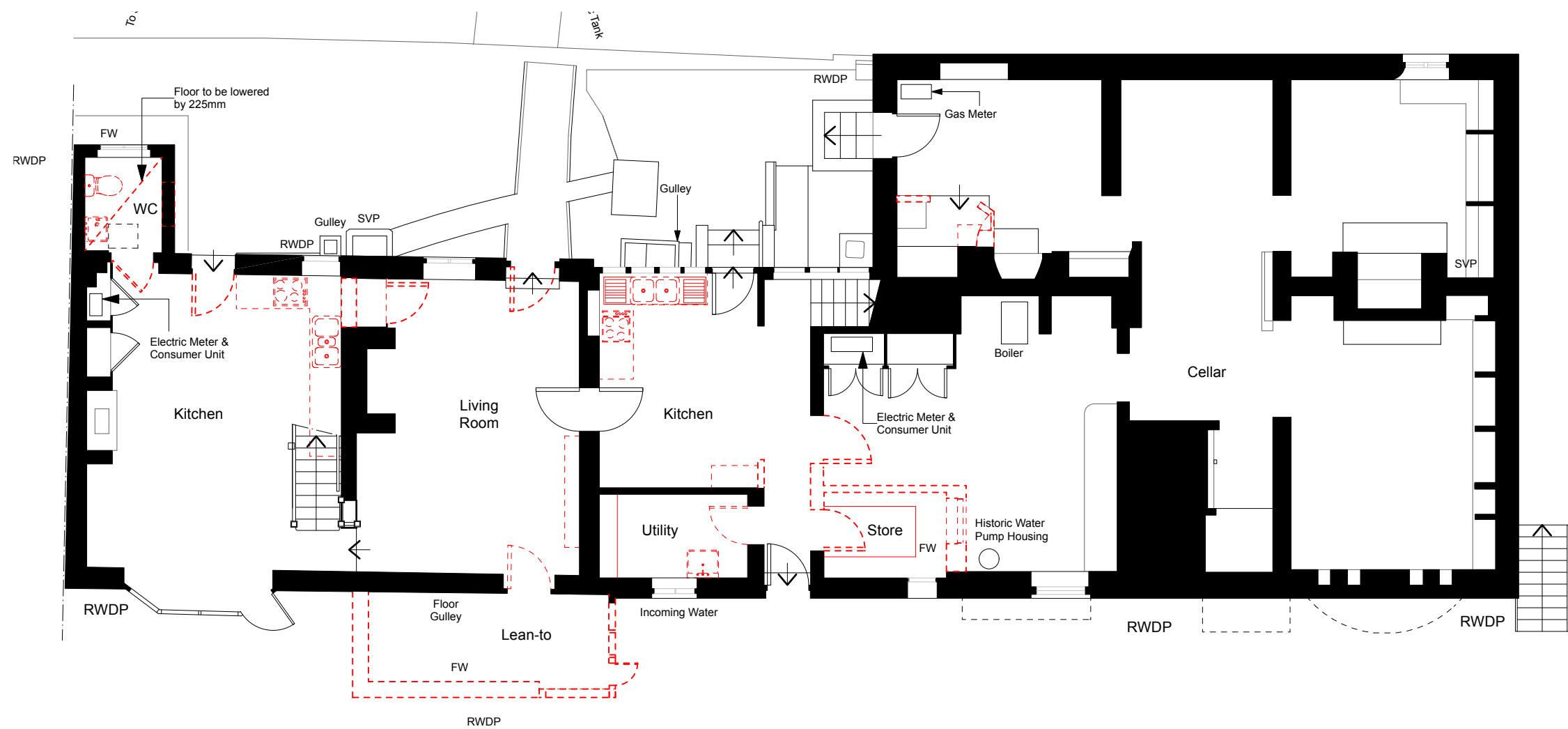
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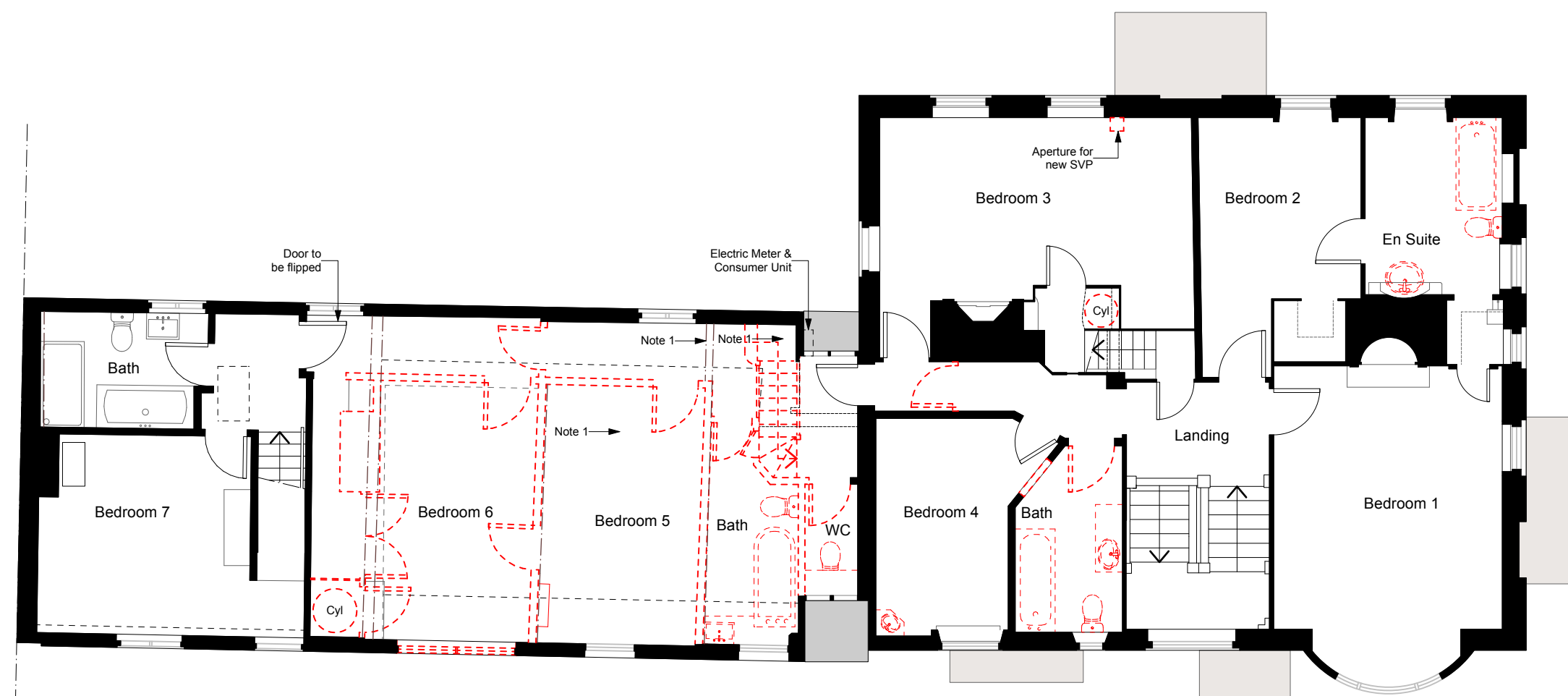
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Existing Second Floor Plan
Scale 1:100



Existing Lower Ground Floor Plan
Scale 1:100



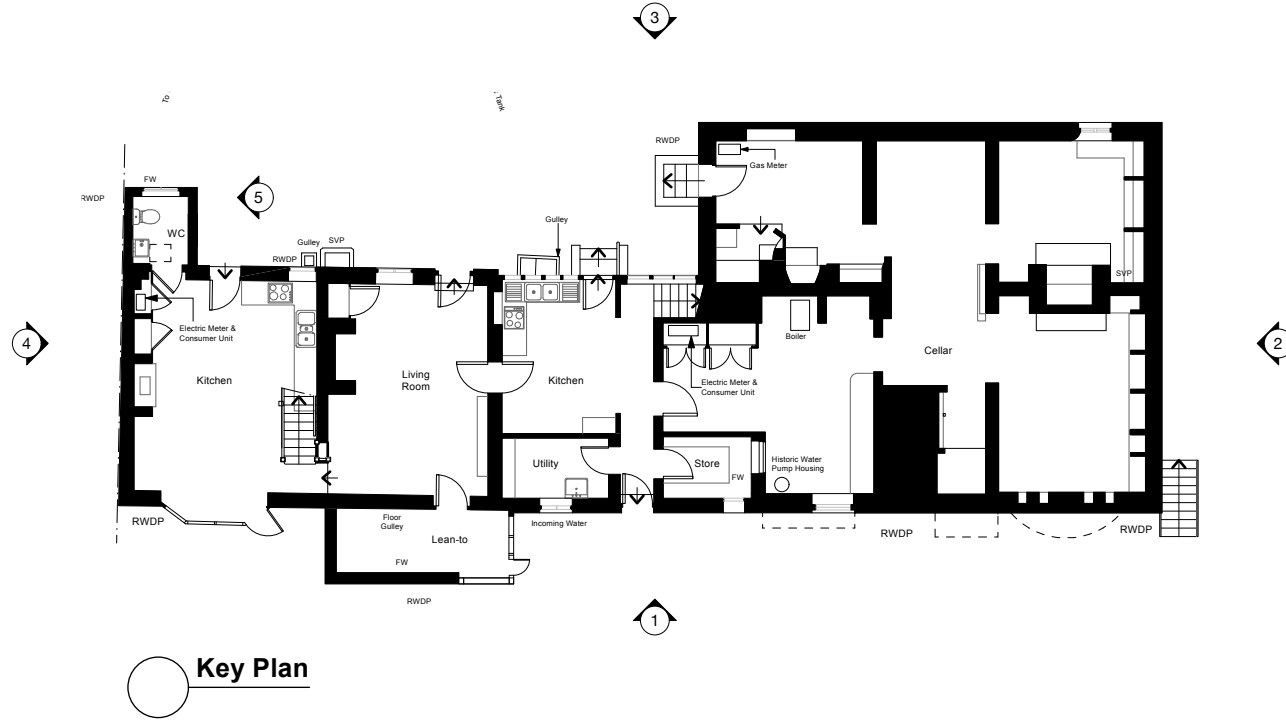
Existing First Floor Plan
Scale 1:100

- Legend**
- Note 1: Line of exposed timber trusses to be retained
 - Note 2: Element to be removed

0 1 2 3 4 5 m
1/100



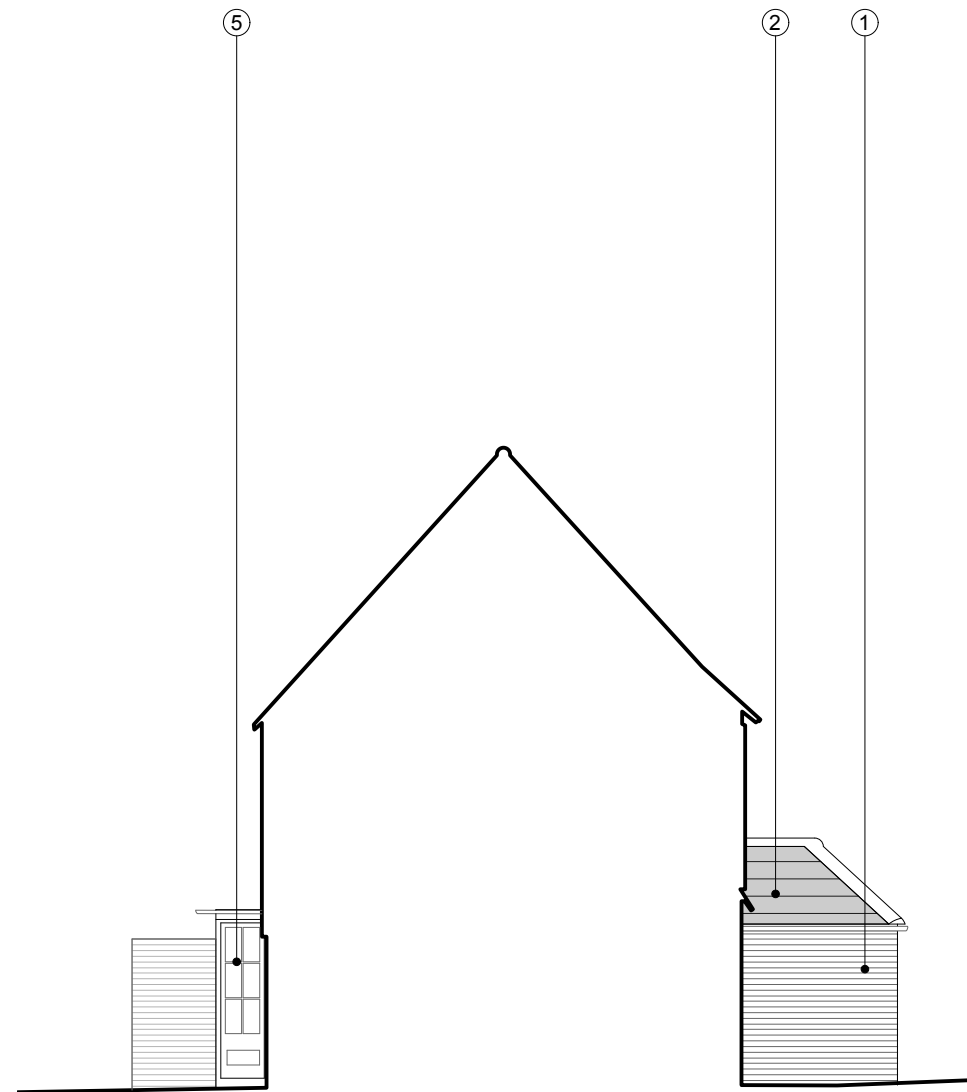
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PR1 18/08/2025 Preliminary issue			
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Project Address Henley Bridge, Henley-On-Thames RG9 2LN			
Drawing No. PA-04		Rev. No. PR2	
Drawing Title Demolition Floor Plans			
Scale 1:100 @ A1			
Drawn by GG		Checked by PS	Project ID SC013
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1 Front Elevation - North
Scale: 1:100



4 Side Elevation - West
Scale: 1:100



5 Side Elevation - East
Scale: 1:100



3 Rear Elevation - South
Scale: 1:100



2 Side Elevation - East
Scale: 1:100

LEGEND

- 1 Brickwork
- 2 Plain Roof Tiles
- 3 Slate Roof Tiles
- 4 Render
- 5 Timber Framed Window & Door
- 6 Metal Framed Window & Door

0 1 2 3 4 5 m
1/100

PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary issue

Rev	Date	Note	Rev. No.
Client	Mr & Mrs Fawcitt		
Project Title	Bird Place		
Project Address	Henley Bridge, Henley-On-Thames RG9 2LN		
Drawing No.	PA-05	Rev. No.	PR2
Drawing Title	Existing Elevations		
Scale	1:100 @ A1		
Drawn by: GG	Checked by: PS	Project ID: SC013	
Shack Group Ltd West Wilberdridge Fourth House, Penn Road, Kingsley Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com	shack.		

 **Proposed Ground Floor Plan**
Scale 1:100

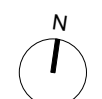
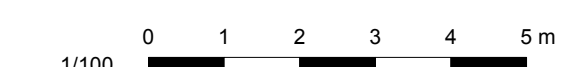


Proposed Cellar Floor Plan
Scale 1:100

 **Proposed Lower Ground Floor Plan**
Scale 1:100

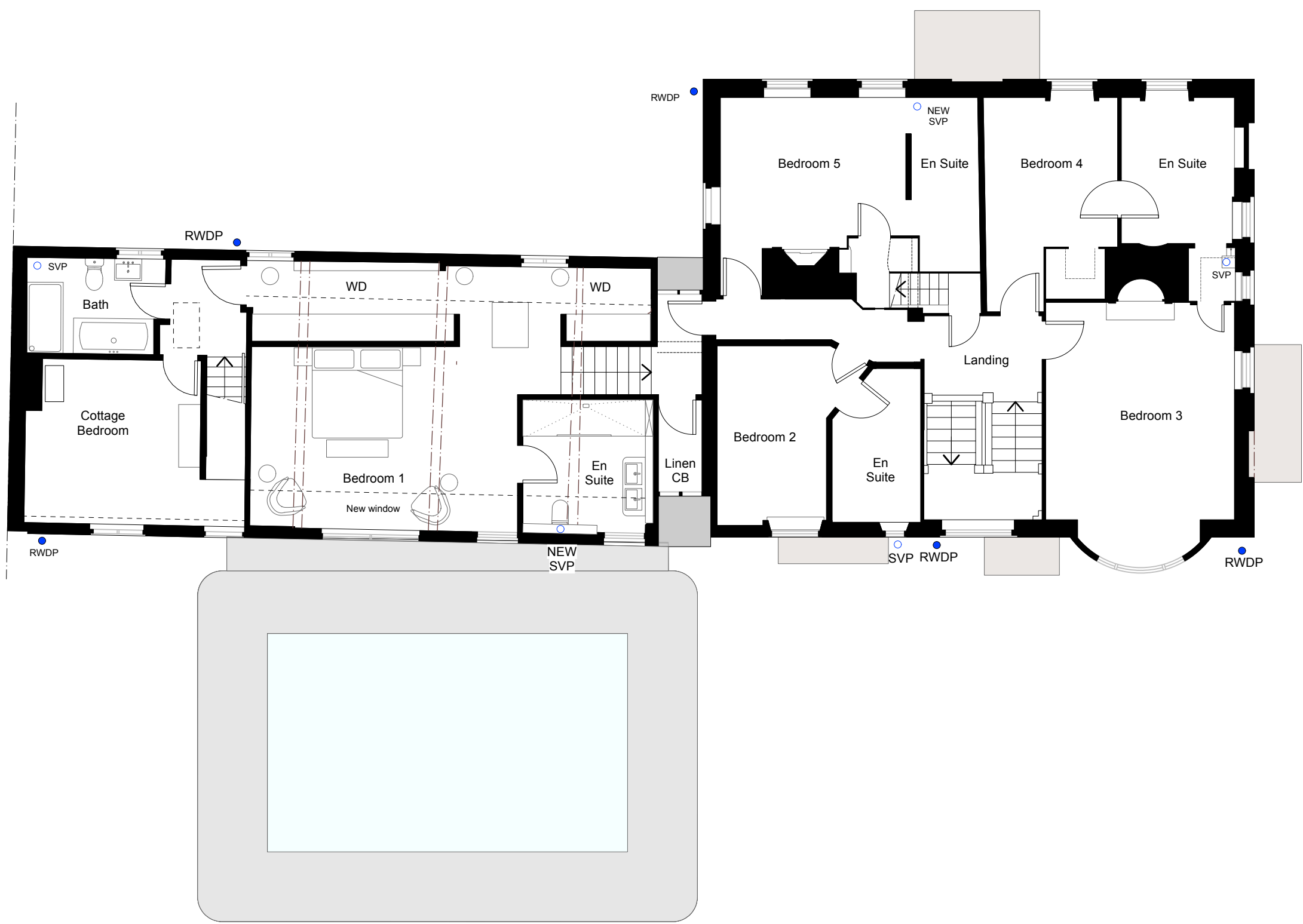
Legend

Line of exposed timber trusses

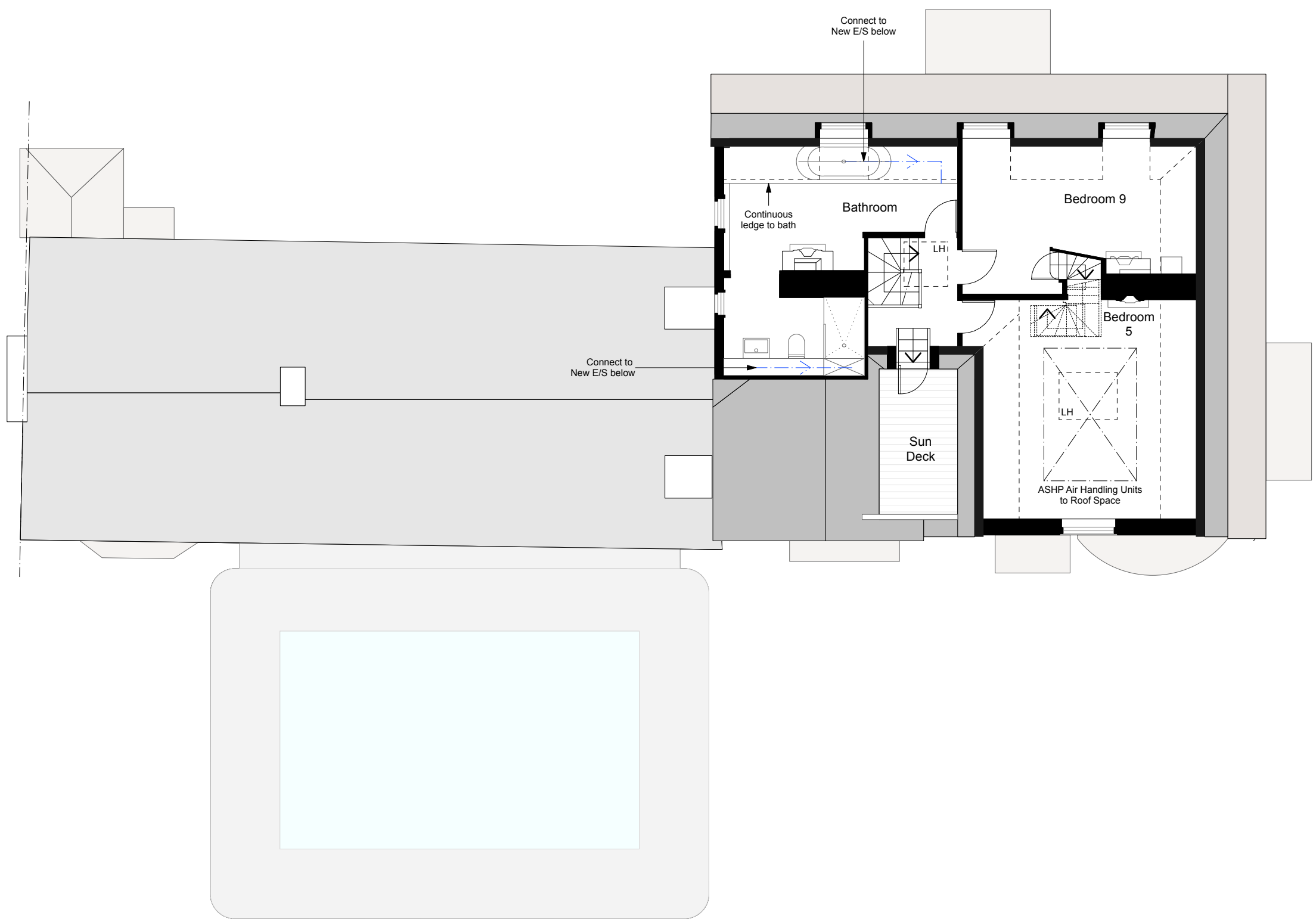


PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary Issue

Rev	Date	Note
Client Mr & Mrs Fawsitt		
Project Title Bird Place		
Project Address Henley Bridge, Henley-On-Thames, RG9 2LN		
Drawing No.	Rev. No.	
PA-07	PR2	
Drawing Title Proposed Floor Plans		
Scale 1:100 @ A1		
Drawn by: GG Checked by: PS Project ID: SC013		
Shack Group Ltd West Wittering Fourth House, Pomeroy Road, Kosley Green Hants GU24 0JW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		shack.

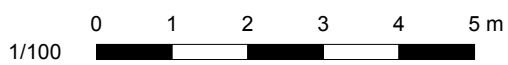


Proposed First Floor Plan
Scale 1:100



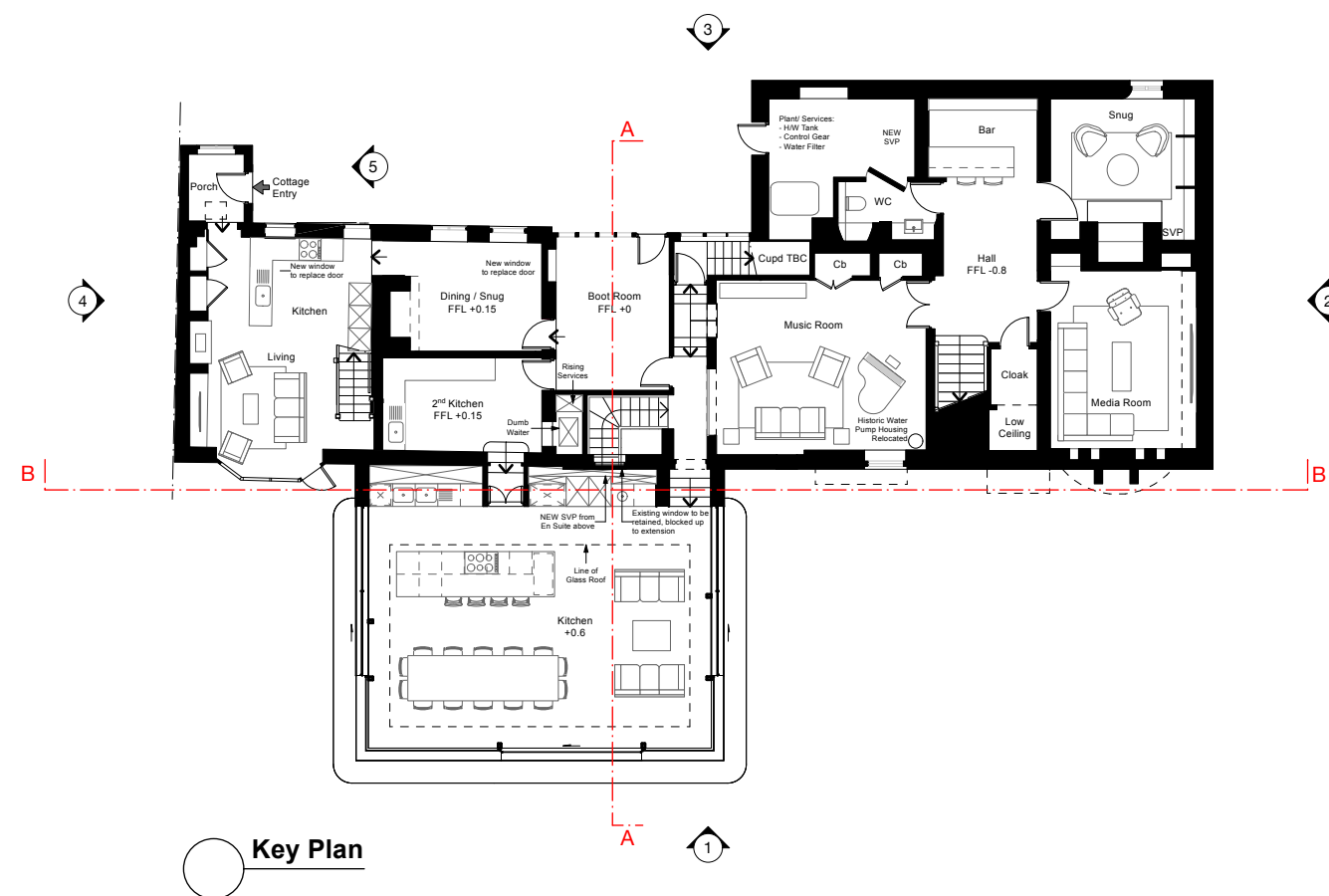
Proposed Second Floor Plan
Scale 1:100

Legend
Line of exposed timber trusses

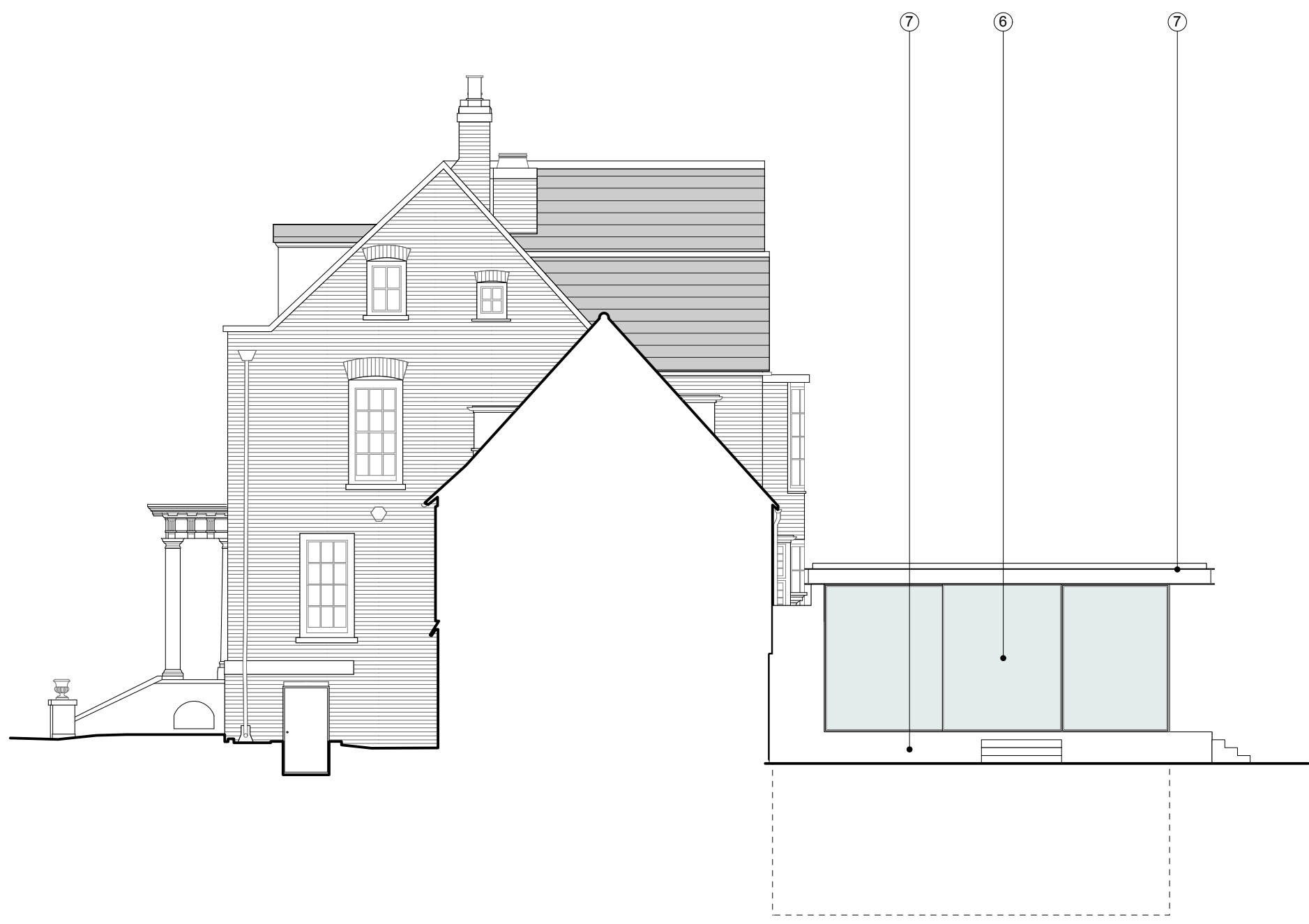


PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary issue

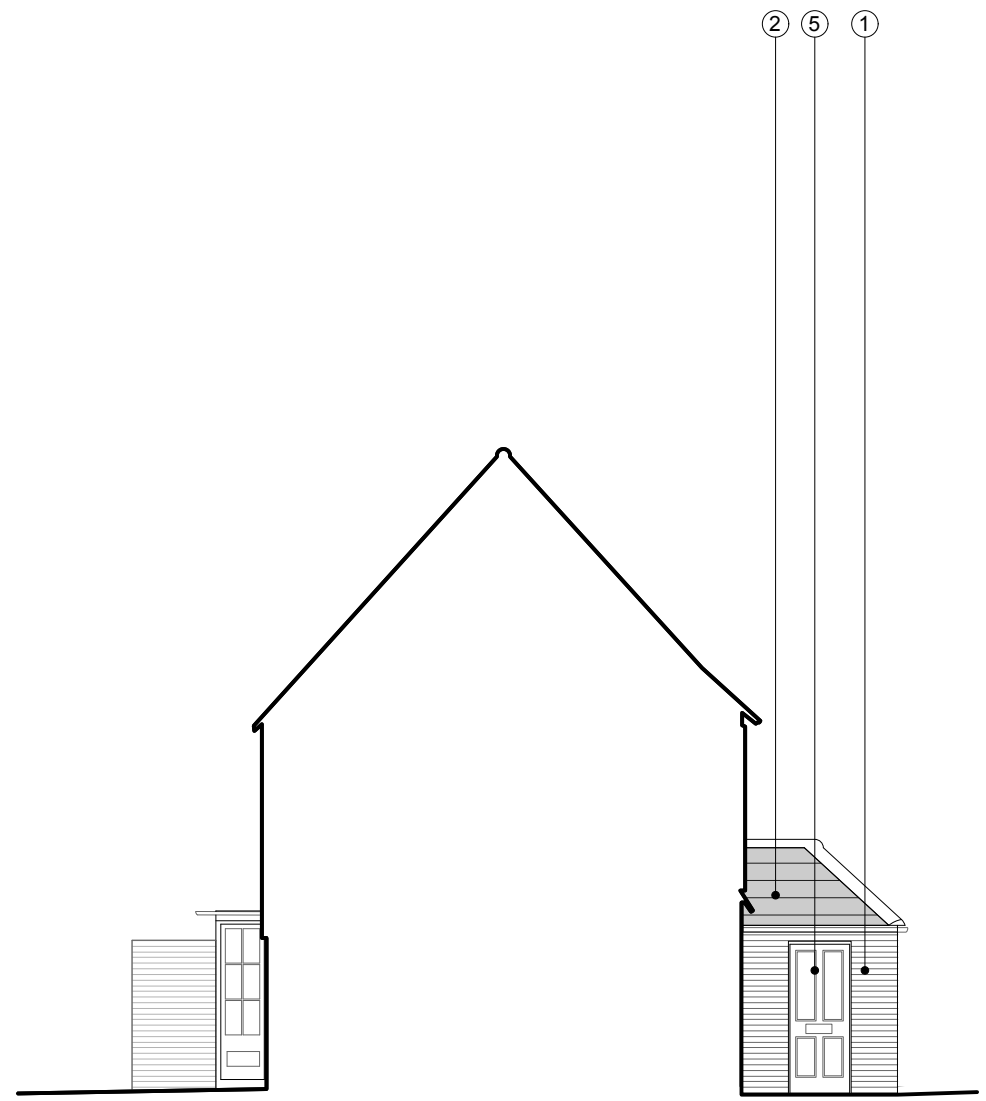
Rev	Date	Note	Rev. No.
Client Mr & Mrs Fawcitt			
Project Title Bird Place			
Project Address Henley Bridge, Henley-On-Thames RG9 2LN			
Drawing No.	PA-08		Rev. No. PR2
Drawing Title Proposed Floor Plans			
Scale 1:100 @ A1			
Drawn by: GG		Checked by: PS	Project ID: SC013
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3 Front Elevation - North
Scale: 1:100



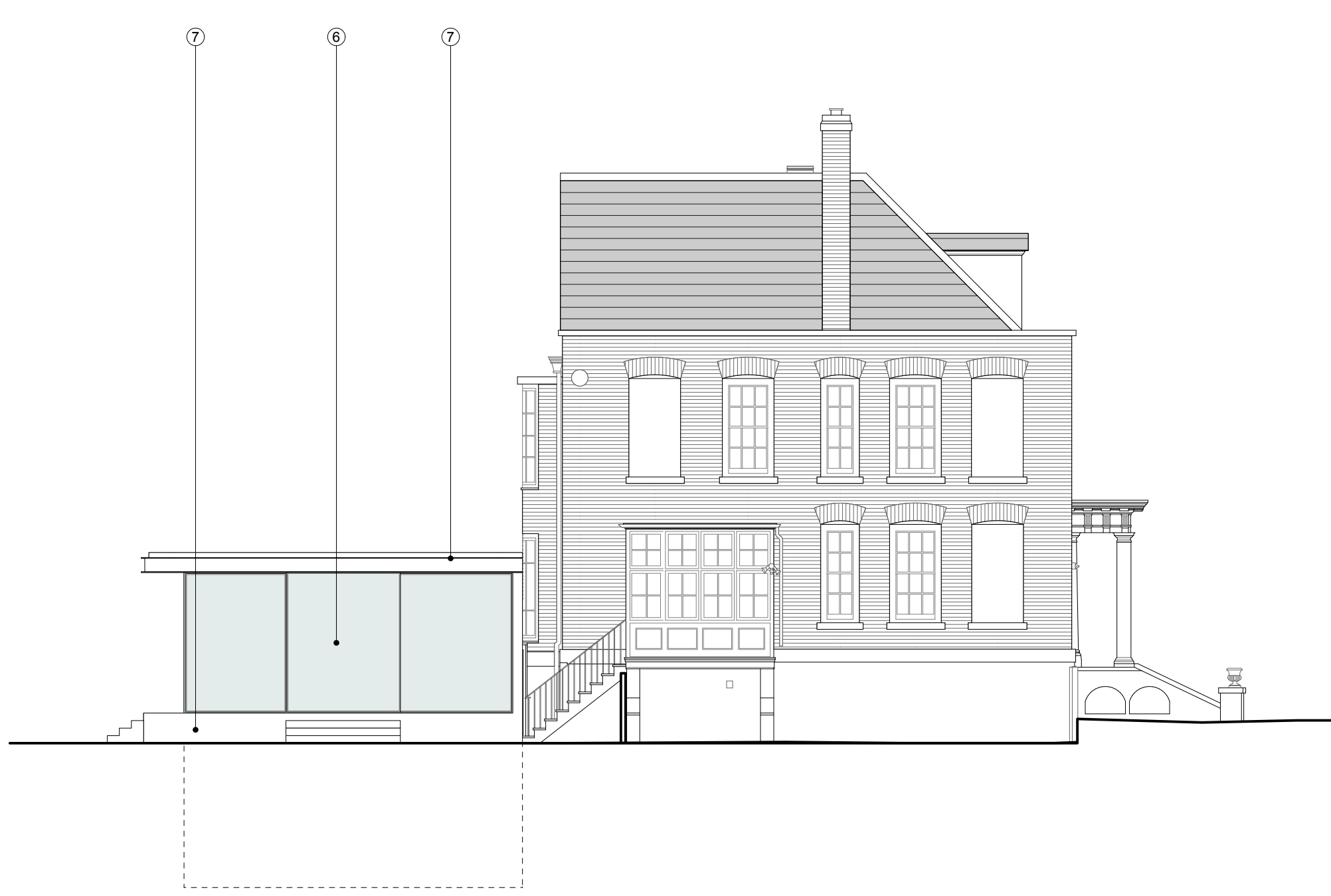
4 Side Elevation - West
Scale: 1:100



5 Side Elevation - East
Scale: 1:100



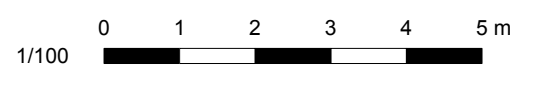
1 Rear Elevation - South
Scale: 1:100



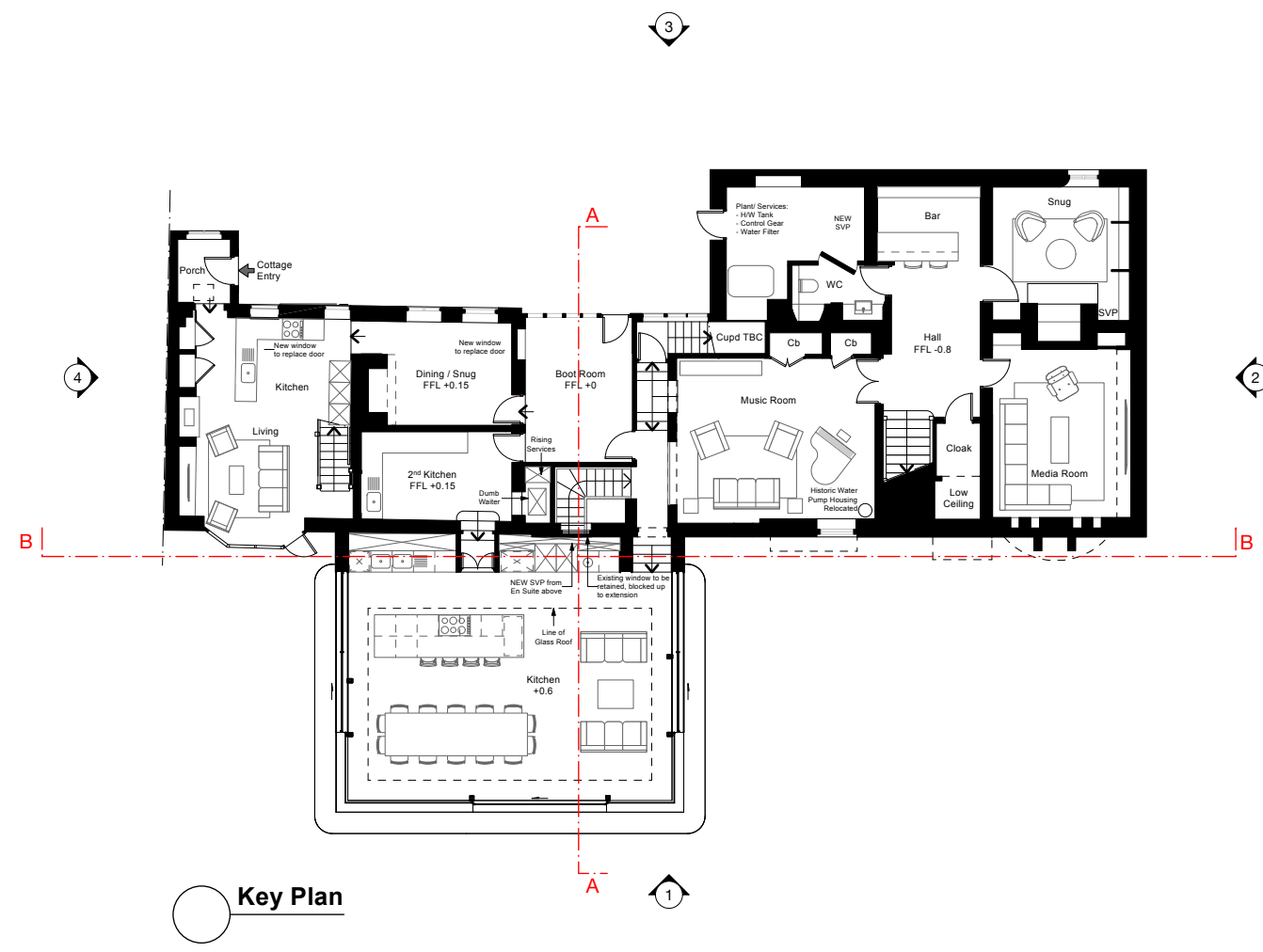
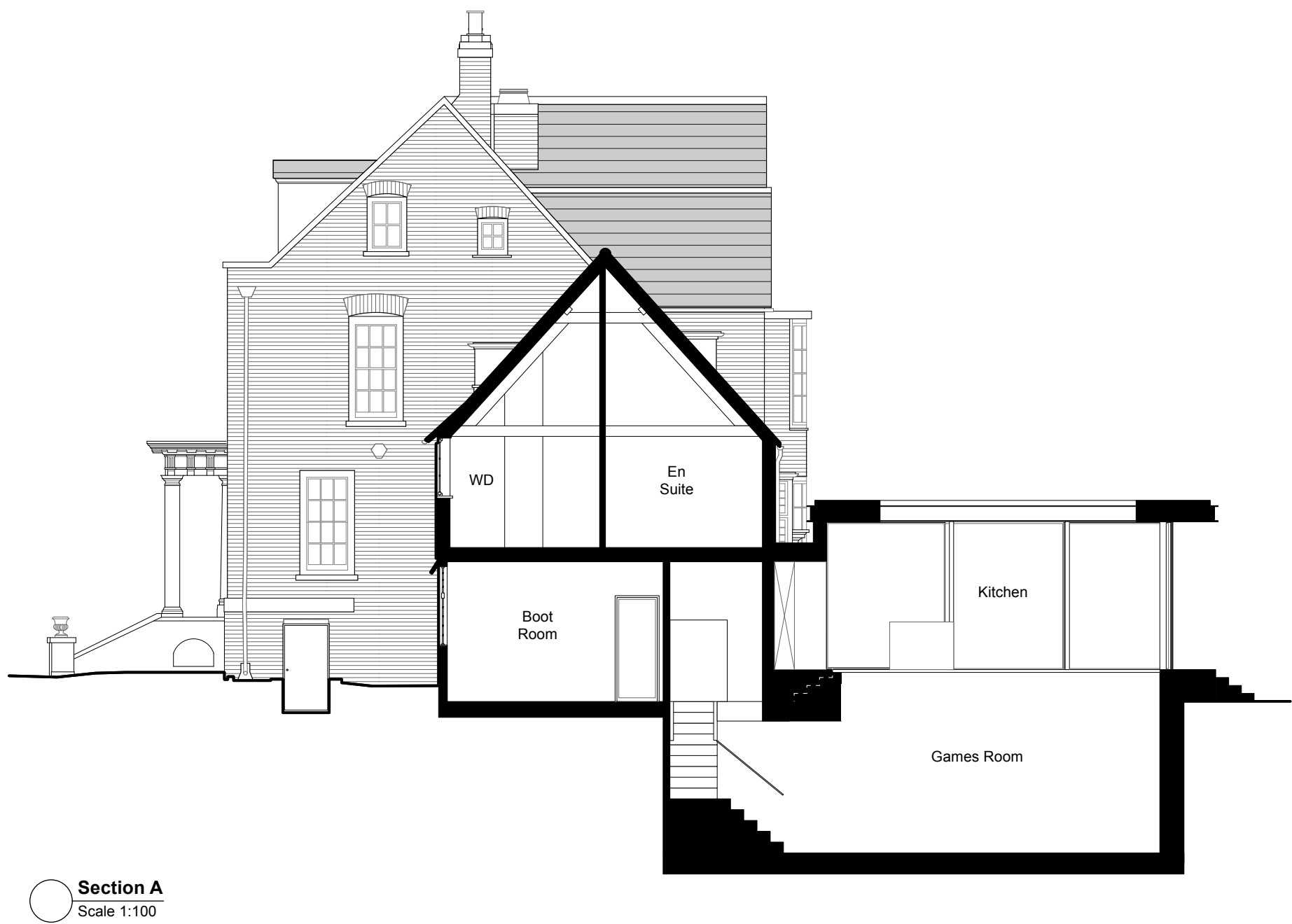
2 Side Elevation - East
Scale: 1:100

LEGEND

- 1 Brickwork
- 2 Plain Roof Tiles
- 3 Slate Roof Tiles
- 4 Render
- 5 Timber Framed Window & Door
- 6 Metal Framed Window & Door
- 7 Metal Cladding



Rev	Date	Note
PR2	20/08/2025	Updated drawings
PR1	18/08/2025	Preliminary issue
Client Mr & Mrs Fawcitt		
Project Title Bird Place		
Project Address Henley Bridge, Henley-On-Thames RG9 2LN		
Drawing No.	PA-09	Rev. No. PR2
Drawing Title Proposed Elevations		
Scale 1:100 @ A1		
Drawn by: GG Checked by: PS Project ID: SC013		
Shack Group Ltd West Villbridge Fourth House, Penn Road, Kinty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		shack.



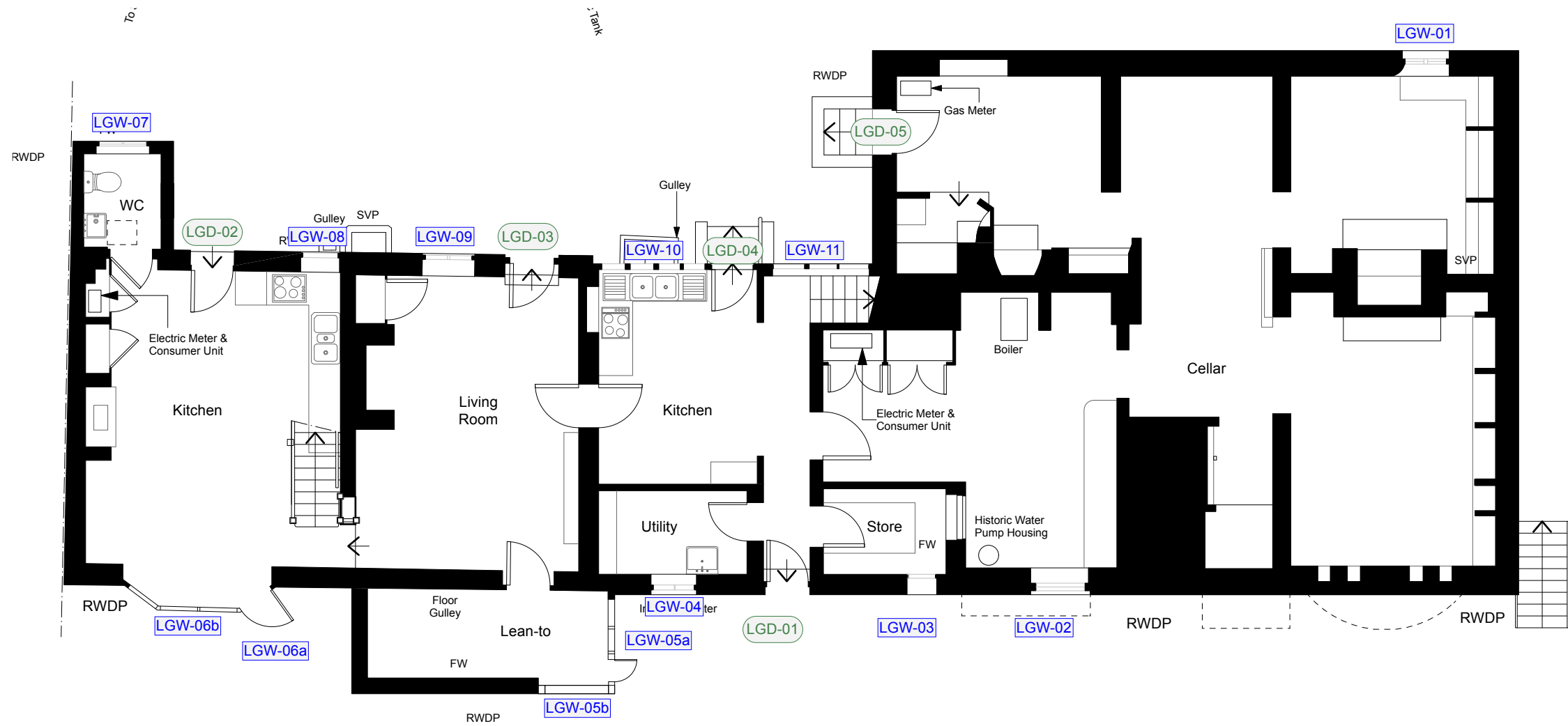
LEGEND

- 1 Brickwork
- 2 Plain Roof Tiles
- 3 Slate Roof Tiles
- 4 Render
- 5 Timber Framed Window & Door
- 6 Metal Framed Window & Door
- 7 Metal Cladding

0 1 2 3 4 5 m

PR2 20/08/2025 Updated drawings
PR1 18/08/2025 Preliminary issue

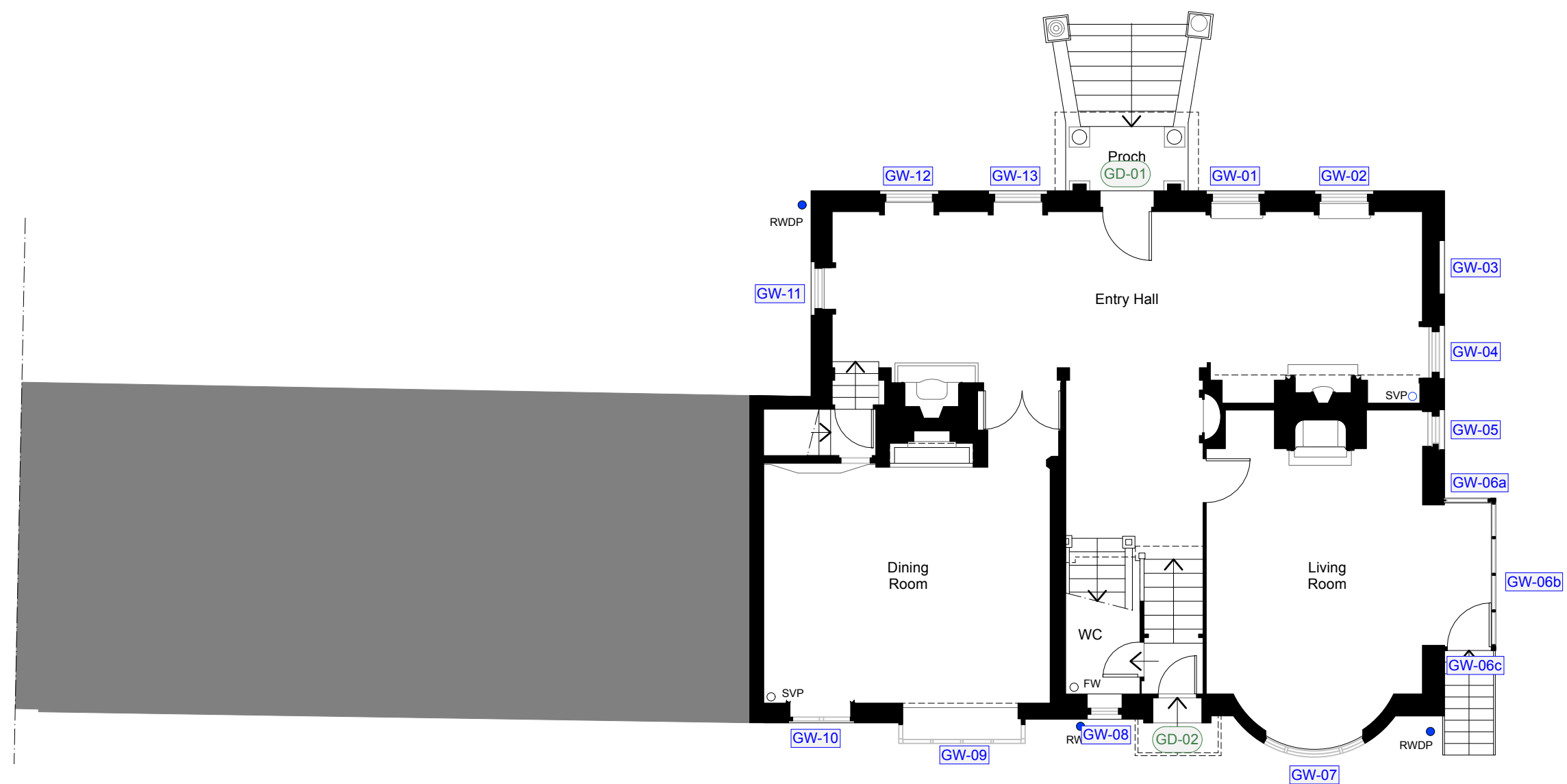
Rev	Date	Note	Rev. No.
Client Mr & Mrs Fawcitt			
Project Title Bird Place			
Project Address Henley Bridge, Henley-On-Thames RG9 2LN			
Drawing No. PA-10		Rev. No. PR2	
Drawing Title Proposed Sections			
Scale 1:100 @ A1			
Drawn by: GG		Checked by: PS	Project ID: SC013
Shack Group Ltd West Villbridge Fourth House, Penn Road, Kinty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com			shack.



Existing Lower Ground Floor Plan
Scale 1:100

XX 16/07/2025 LS INTERNAL USE ONLY

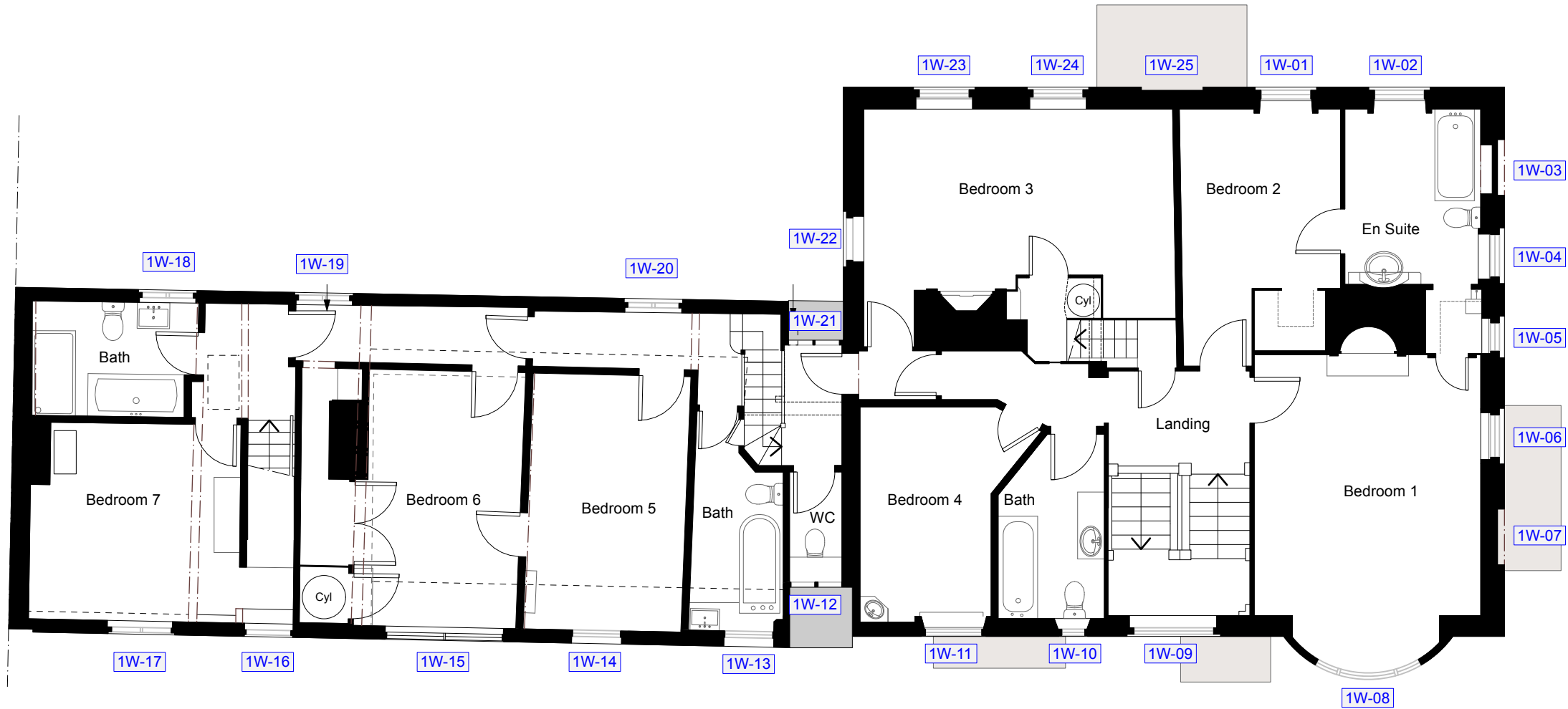
Rev	Date	Note
Client Mr & Mrs Fawsitt		
Project Title House Refurbishment, Alteration & Extension of Bird Place		
Project Address Bird Place, Henley Bridge, Henley-on-Thames RG9 2LN		
Drawing No.		Rev. No.
PA-20		XX
Drawing Title Existing Lower Ground Floor Plan		
Scale 1:100 @ A3		
Drawn by: AB		Checked by: PS
Project ID: SC013		
Shack Group Ltd West Witheridge Fourth House, Penn Road, Knotty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		



Existing Ground Floor Plan
Scale 1:100

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Rev	Date	Note
Client	Mr & Mrs Fawsitt	
Project Title	House Refurbishment, Alteration & Extension of Bird Place	
Project Address	3rd Place, Henley Bridge, Henley-on-Thames RG9 2LN	
Drawing No.	PA-21	Rev. No. XX
Drawing Title	Existing Ground Floor Plan	
Scale	1:100 @ A3	
Drawn by: AB	Checked by: PS	Project ID: SC013
Shack Group Ltd West Witheridge Fourth House, Penn Road, Knotty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		shack.



Existing First Floor Plan
Scale 1:100

XX 16/07/2025 LS INTERNAL USE ONLY

Rev	Date	Note
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Client
Mr & Mrs Fawsitt

Project Title
House Refurbishment, Alteration & Extension of Bird Place

Project Address
Bird Place, Henley Bridge,
Henley-on-Thames RG9 2LN

Drawing No.	Rev. No.
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PA-22 XX

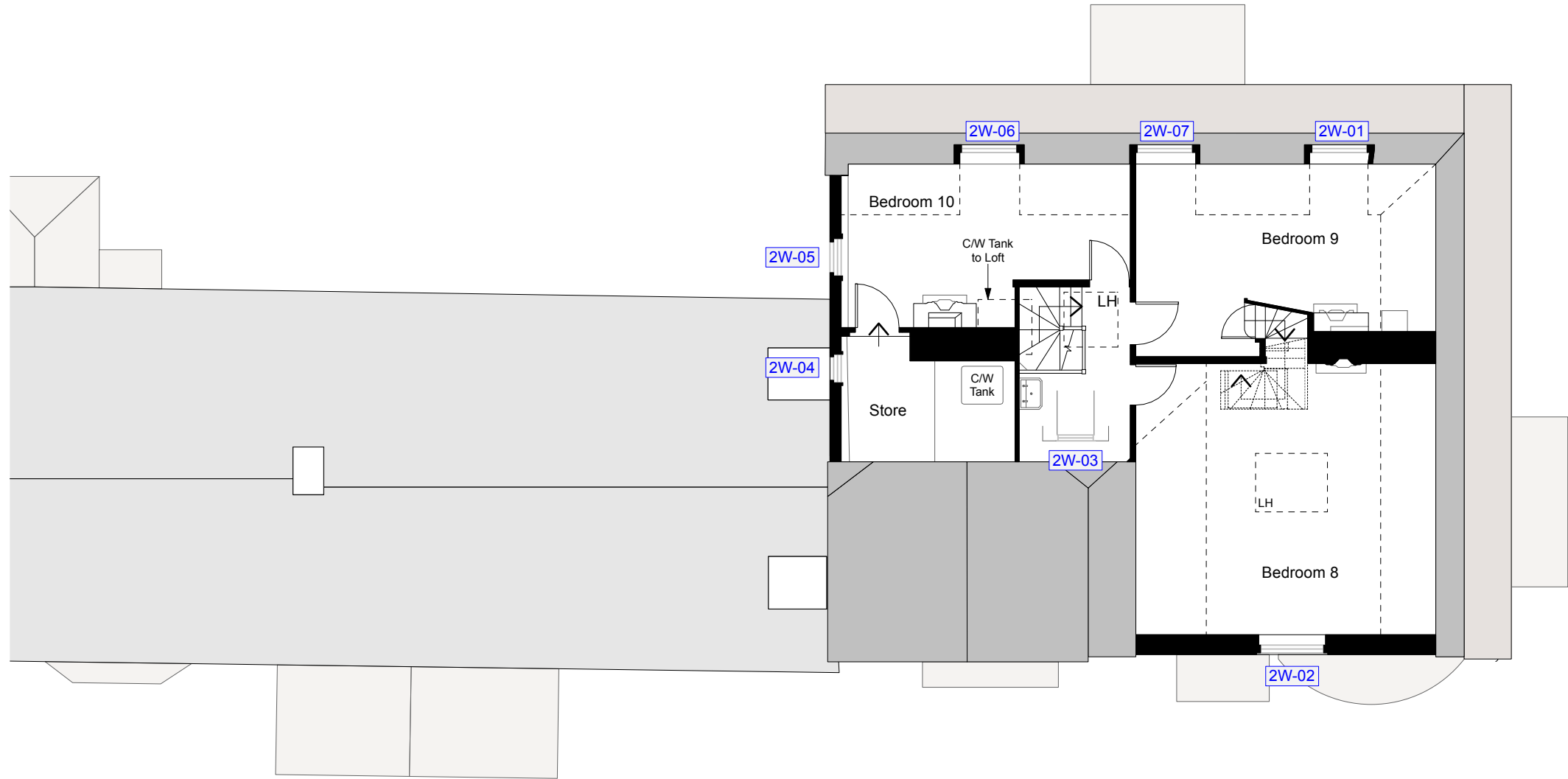
Drawing Title
Existing First Floor Plan

Scale
1:100 @ A3

Drawn by: AB Checked by: PS Project ID: SC013

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 **Existing Second Floor Plan**
Scale 1:100

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Rev	Date	Note
Client Mr & Mrs Fawsitt		
Project Title House Refurbishment, Alteration & Extension of Bird Place		
Project Address Bird Place, Henley Bridge, Henley-on-Thames RG9 2LN		
Drawing No.	Rev. No.	
PA-23	XX	
Drawing Title Existing Second Floor Plan		
Scale 1:100 @ A3		
Drawn by: AB	Checked by: PS	Project ID: SC013
Shack Group Ltd West Witheridge Fourth House, Penn Road, Knotty Green HP9 2TW +44 (0) 1494 258 181 hello@shackgroup.com www.shackgroup.com		



Front Elevation. North
Scale 1:100

PR1 16/07/2025 Preliminary Work In Progress

Rev	Date	Note
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Client
Mr & Mrs Fawsitt

Project Title
House Refurbishment, Alteration & Extension of Bird Place

Project Address
Bird Place, Henley Bridge,
Henley-on-Thames RG9 2LN

Drawing No.	Rev. No.
-------------	----------

PA-25 PR1

Drawing Title
**Existing Windows and Doors.
Front Elevation**

Scale
1:100 @ A3

Drawn by: AB	Checked by: PS	Project ID: SC013
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Side Elevation. East
Scale 1:100



Side Elevation. West
Scale 1:100

PR1 16/07/2025 Preliminary Work In Progress

Rev	Date	Note
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Client	Mr & Mrs Fawsitt
Project Title	House Refurbishment, Alteration & Extension of Bird Place
Project Address	Bird Place, Henley Bridge, Henley-on-Thames RG9 2LN

Drawing No.	Rev. No.
-------------	----------

PA-26	PR1
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Drawing Title
Existing Windows and Doors. Side Elevation

Scale
1:100 @ A3

Drawn by: AB	Checked by: PS	Project ID: SC013
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Rear Elevation. South
Scale 1:100

PR1 16/07/2025 Preliminary Work In Progress

Rev	Date	Note
-----	------	------

Client
Mr & Mrs Fawsitt

Project Title
House Refurbishment, Alteration & Extension of Bird Place

Project Address
**Bird Place, Henley Bridge,
Henley-on-Thames RG9 2LN**

Drawing No. _____ Rev. No. _____

PA-27

Drawing Title

**Existing Windows and Doors.
Rear Elevation**

Scale
1:100 @ A3

Drawn by: AB Checked by: PS Project ID: SC013

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Window LGW-01



External condition

Window description



Front Elevation. North
Scale 1:200



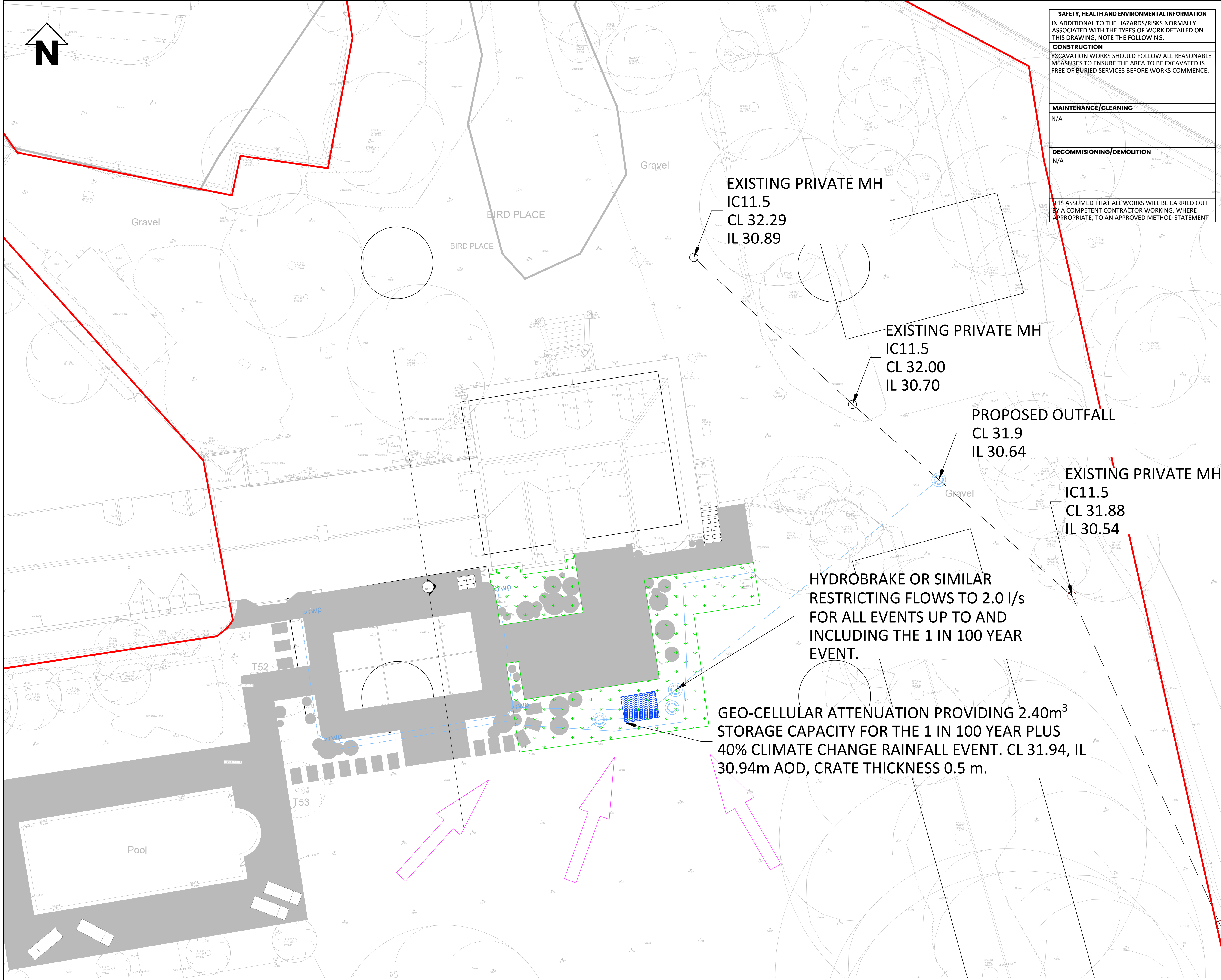
Internal condition

Proiposed Refurbishment

Technical Detail drawing

PR1 16/07/2025 Preliminary Work In Progress

Rev	Date	Note
Client Mr & Mrs Fawsitt		
Project Title House Refurbishment, Alteration & Extension of Bird Place		
Project Address Bird Place, Henley Bridge, Henley-on-Thames RG9 2LN		
Drawing No. PA-28	Rev. No. PR1	
Drawing Title Window LGW-01		
Scale 1:100 @ A3		
Drawn by: AB Checked by: PS Project ID: SC013		
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION IN ADDITIONAL TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING: CONSTRUCTION EXCAVATION WORKS SHOULD FOLLOW ALL REASONABLE MEASURES TO ENSURE THE AREA TO BE EXCAVATED IS FREE OF BURIED SERVICES BEFORE WORKS COMMENCE. MAINTENANCE/CLEANING N/A DECOMMISSIONING/DEMOLITION N/A IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT
--

- ALL DIMENSIONS TO BE CHECKED BEFORE SITE OR OFF-SITE FABRICATION BY THE CONTRACTOR, THEIR SUB-CONTRACTOR OR SUPPLIER.
- DO NOT SCALE PLANS - USE FIGURE OR GRID DIMENSIONS WHERE GIVEN. ANY DEVIATION FROM THE DRAWING IS TO BE REPORTED TO THE ORIGINATOR IMMEDIATELY.
- DRAWING IS TO BE PRINTED IN COLOUR.
- NOTES:
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELATED ENGINEERS, ARCHITECTS & SUB-CONTRACTORS DRAWINGS. IN THE CASE OF DISCREPANCIES BETWEEN DRAWINGS REFER TO CREATE CONSULTING ENGINEERS FOR CLARIFICATION.
 - THIS DRAWING IS BASED ON THE PROPOSED BLOCK PLAN PROVIDED DRAWN BY SHACK ARCHITECTS, DRAWING REF. SC013-PA-06-Proposed Site and Roof Plan-Rev.PR2 DATED AUGUST 2025 AND TOPOGRAPHIC SURVEY DRAWING topo - 87900_Bird Place Henley Bridge Henley-on-thames RG9 2LN-PRELIM BY FOURWALLS SURVEYS, DATED APRIL 2025.
 - ALL INVERT AND COVER LEVELS ARE TO BE CONFIRMED AT THE DETAILED DESIGN STAGE.
 - RAIN GARDENS TO BE LINKED TO THE GEO-CELLULAR ATTENUATION VIA PERFORATED PIPE UNDER-DRAINS.
 - PROPOSED OUTFALL ROUTE TO INCLUDE A SUITABLE NON-RETURN VALVE PRIOR TO CONNECTION WITH THE PRIVATE SEWER UPSTREAM OF IC 11.5.
 - OTHER UTILITIES SUCH AS UKPN AND THEIR EASEMENTS NOT SHOWN AND ANY CLASHES TO BE CONFIRMED AT DESIGN STAGE.
 - THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND NOT FOR CONSTRUCTION
 - ALL PROPOSED DRAINAGE TO BE SUBJECT TO A FULL DRAINAGE SURVEY AT DETAILED DESIGN.

KEY:	
INDICATIVE RWP LOCATION	
PROPOSED RAIN GARDEN UNDERDRAIN	
PROPOSED PRIVATE SURFACE WATER SEWER	
RAIN GARDENS	
PROPOSED STORAGE CRATES	
EXTREME EVENT EXCEEDANCE ROUTE	
SITE REDLINE	

EXISTING PRIVATE MH
IC11.5
CL 32.29
IL 30.89

EXISTING PRIVATE MH
IC11.5
CL 32.00
IL 30.70

PROPOSED OUTFALL
CL 31.9
IL 30.64

EXISTING PRIVATE MH
IC11.5
CL 31.88
IL 30.54

HYDROBRAKE OR SIMILAR
RESTRICTING FLOWS TO 2.0 l/s
FOR ALL EVENTS UP TO AND
INCLUDING THE 1 IN 100 YEAR
EVENT.

GEO-CELLULAR ATTENUATION PROVIDING 2.40m³
STORAGE CAPACITY FOR THE 1 IN 100 YEAR PLUS
40% CLIMATE CHANGE RAINFALL EVENT. CL 31.94, IL
30.94m AOD, CRATE THICKNESS 0.5 m.



A	10/09/25	FIRST ISSUE	GB	CEB
REV	DATE	DESCRIPTION	DRAWN	CHECKED
CLIENT				
HOLLAND GREEN				
PROJECT				
BIRD PLACE, HENLEY-ON-THAMES				
DRAWING TITLE				
SURFACE WATER DRAINAGE STRATEGY				
DATE	DESIGNED	DRAWN	CHECKED	SCALE(S)
10/09/25	GB	GB	CEB	~@A1
Independent, multidisciplinary engineering and environmental consultants create .co.uk 01603 877 010 Norwich London Chelmsford Glasgow Milton Keynes				
DRAWING STATUS			STATUS	CREATE PROJECT NUMBER
WORK IN PROGRESS			S0	P25-3458
PROJ	ORG	ZONE	LEVEL	TYPE
3458	CCE	XX	GF	DR
			ROLE	NUMBER
			D	001
				REVISION
				A



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RG9 1AT
www.centrespacedesign.co.uk
Tel : 01491 573968

Project
Thames Bridge House
Henley-on-Thames, RG9 2LN

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Rev	Comments	By	Date
T1	Tender issue	JW	15/09/23
T2	Amended issue	AG	11/10/23
T3	Amended issue	AG	19/10/23
T4	Amended issue	AG	23/10/23
T5	Amended issue	AG	26/10/23
T6	Amended issue	AG	26/10/23
T7	Amended issue	AG	11/01/24
T8	Amended issue	AG	09/02/24

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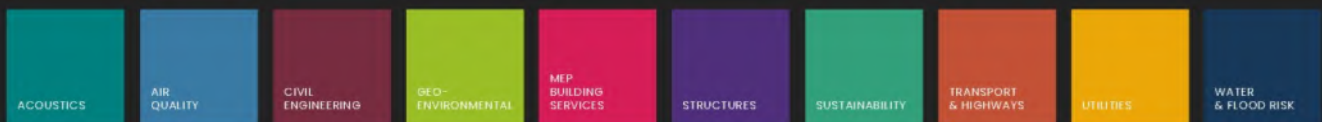
Drawing Title <					
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Mr and Mrs Fawsitt

BIRD PLACE, HENLEY-ON-THAMES

Flood Risk Assessment and Surface Water Drainage Strategy

The information contained within this report and any appendices or supporting information provided are to be treated as confidential.



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