

253 Winchester Road

Flood Risk Assessment

December 2025



Quality Management

Project	253 Winchester Road Flood Risk Assessment
Location	253 Winchester Road, Hampshire, SO53 2DX
Reference	LE2025975FRA

Revision History

Rev	Date	Issue / Purpose/ Comment	Prepared
R01	December 2025	Final	ZY

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Executive Summary

Site Name	253 Winchester Road Flood Risk Assessment
Location	253 Winchester Road, Hampshire, SO53 2DX
Grid Reference	444947 , 122164
EA Flood Zone Classification	Flood Zone 1
Current Site Use	Residential
Description of proposed development	Construction of 2no. semi-detached dwellings following the demolition of existing dwelling
Vulnerability Classification	Residential – ‘More Vulnerable’
Summary of Pre-development Risks	• Fluvial/Tidal Flood Risk: Low Risk • Flood Risk from Land, Surface Water and Sewers: Low Risk • Groundwater Flood Risk: Low Risk • Flood Risk from Artificial Sources: Low Risk • Residual Flood Risk: Low Risk

1. Introduction

1.1 Requirement

- 1.1.1 Liska Environmental has been commissioned to undertake a desk based Flood Risk Assessment (FRA) for a development at 253 Winchester Road, Hampshire, SO53 2DX (Figure 3-1). It is understood by Liska Environmental that this report is to support a planning application for the Construction of 2no. semi-detached dwellings following the demolition of existing dwelling.

1.2 Report Objectives

- 1.2.1 The contents of this FRA describe the assessment of the proposal and the implications of the proposed development on flood risk. The FRA has been prepared following guidance provided in the revised National Planning Policy Framework (February 2025).
- 1.2.2 The aim of this assessment is to provide the level of detail necessary to demonstrate that the potential effects of flood risk (to the proposal) have been addressed by:
- Identifying the source and probability of flooding to the application site, including the possible effects of climate change;
 - Determining the consequences of flooding to and from the proposed development proposal and advising on the how this will be managed, if necessary; and
 - Demonstrating the flood risk issues described in this assessment are compliant with the relevant guidance.

1.3 Limitations

- 1.3.1 This report relies on publicly available information which Liska Environmental assumes to be correct: Liska Environmental cannot and does not verify accuracy of this data, and it is outside the scope of this commission to do so.

1.4 Sources of Information

- 1.4.1 Sources of information used during the compilation of this report include:
- Environment Agency (EA) website – ‘*Flood Map for Planning*’ [Accessed 03/12/2025];
 - British Geological Survey (BGS) website – ‘*GeoIndex*’ and ‘*Lexicon of Named Rock Units*’ [Accessed 03/12/2025];
 - Department of Environment, Food, and Rural Affairs (DEFRA) website – ‘*MAGIC Map Application*’ [Accessed 03/12/2025];
 - Environment Agency (EA) website - ‘*Catchment Data Explorer*’ [Accessed 03/12/2025].

2. Policy and Guidance

2.1 Thames Catchment Flood Management Plan (CFMP), 2009

- 2.1.1 A Catchment Flood Management Plan (CFMP) is a high-level strategic plan prepared by the EA, which identifies long-term (50 to 100 year) policies for sustainable flood risk within a catchment.
- 2.1.2 The relevant key messages contained within the Thames Region CFMP (2009) are that:
- Climate change will be the major cause of increased flood risk in the future; in urban areas and areas of narrow floodplain, flooding from heavy rainfall will be more regular and more severe. Surface water, sewer and fluvial flooding can occur within minutes of a severe rainfall event. Flooding can therefore occur at any time of the year, and there is very little time to provide flood warnings.
 - Development and urban regeneration provide a crucial opportunity to manage flood risk; the location, layout and design of development can all reduce flood risk. For example, the use of SuDS can help to control surface water runoff.

2.2 Flood and Water Management Act, 2010

- 2.2.1 Combined with the Flood Risk Regulations 2009 ('the Regulations'), (which enact the EU Floods Directive in the England and Wales) the Flood and Water Management Act 2010 ('the Act') places significantly greater responsibility on Local Authorities to manage and lead on local flooding issues. The Act and the Regulations together raise the requirements and targets Local Authorities need to meet, including:
- Playing an active role leading Flood Risk Management;
 - Development of Local Flood Risk Management Strategies (LFRMS);
 - Implementing requirements of Flood and Water Management legislation;
 - Development and implementation of drainage and flooding management strategies; and
 - Responsibility for first approval, then adopting, management and maintenance of Sustainable Drainage Systems (SuDS) where they service more than one property.
- 2.2.2 The Act also clarifies three key areas that influence development:
1. **Sustainable Drainage Systems (SuDS)** - the Act makes provision for a national standard to be prepared on SuDS, and developers will be required to obtain local authority approval for in accordance with the standards, likely with conditions. Supporting this, the Act requires local authorities to adopt and maintain SuDS, removing any ongoing responsibility for developers to maintain SuDS if they are designed and constructed robustly.
 2. **Flood risk management structures** - the Act enables the EA and local authorities to designate structures such as flood defences or embankments owned by third parties for protection if they affect flooding or coastal erosion. A developer or landowner will not be able to alter, remove or replace a designated structure or feature without first obtaining consent from the relevant authority.
 3. **Permitted flooding of third party land** - The EA and local authorities have the power to carry out work, which may cause flooding to third party land where the works are deemed to be in the interest of nature conservation, the preservation of cultural heritage or people's enjoyment of the environment or of cultural heritage.

2.3 National Planning Policy Framework (NPPF), February 2025

- 2.3.1 In determining an approach for the assessment of flood risk for the proposal there is a need to review the policy context. The National Planning Policy Framework requires that consideration be given to flood risk in the planning process. The National Planning Policy Framework was revised and issued in July 2018 and outlines the national policy position on development and flood risk assessment.
- 2.3.2 The Framework states that the appropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in flood risk areas, it can be permitted provided it is made safe without increasing flood risk elsewhere.
- 2.3.3 The essence of NPPF is that:
- Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards;
 - Policies in development plans should outline the consideration, which will be given to flooding issues, recognising the uncertainties that are inherent in the prediction of flooding and that flood risk is expected to increase as a result of climate change;
 - Planning authorities should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid such risk where possible and managing it elsewhere;
 - The vulnerability of a proposed land use should be considered when assessing flood risk;
 - Opportunities offered by new developments should be used to reduce the causes and impacts of flooding;
 - Planning authorities should recognise the importance of functional floodplains, where water flows or is held at times of flood, and avoid inappropriate development on undeveloped and undefended floodplains; and
 - Development is based on the concept of Flood Risk Reduction, particularly in circumstances where development has been sanctioned on the basis of the “Exception Test”.

3. Development Site Planning Considerations

3.1 Location

- 3.1.1 The site is located at 253 Winchester Road, Hampshire, SO53 2DX at Ordinance Survey (OS) coordinates 444947 , 122164



Figure 3-1 Site Boundary. Source: Google Map

3.2 Proposed Development

- 3.2.1 The proposal consists of the Construction of 2no. semi-detached dwellings following the demolition of existing dwelling. Further details about the proposals have been provided in Appendix A.

3.3 Local Geology

- 3.3.1 A review of the published geological information was carried out, including information from the BGS GeoIndex and Lexicon of Named Rock Units websites¹. The geological sequence underlying the Site is summarised in Table 3-1.

¹ <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

Table 3-1 Underlying Geological Sequence

Stratum	Name	Location	Description
Bedrock Geology	Whitecliff Sand Member - Sand and gravel	Onsite	Sedimentary bedrock formed between 66 and 23.03 million years ago during the Palaeogene period.
Superficial Deposits	N/A	Onsite	N/A

3.4 Flood Zone

- 3.4.1 Flood Zones describe the extent of flooding that would occur on the assumption that no flood defences are in place. The definition of Flood Zones is provided in Table 1 of the PPG and in table 3.1 below:

Table 3-1: Flood zone terminology

Flood Zone	Definition
Zone 1 Low Probability	Land having a less than 1 in 1,000 annual probability of river or sea flooding. (Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)
Zone 2 Medium Probability	Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding. (Land shown in light blue on the Flood Map)
Zone 3a High Probability	Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding. (Land shown in dark blue on the Flood Map)
Zone 3b The Functional Floodplain	This zone comprises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map)

- 3.4.2 The site lies within the Environment Agency's Flood Zone 1 which is described within PPG Table 1 as having a 'Low Probability' of flooding. The Environment Agency's flood zone map is shown in Appendix B.

3.5 Vulnerability Classification

- 3.5.1 The proposed development is considered to fall under the classification of 'More Vulnerable' land uses based on Table 2 of PPG Technical Guidance. Table 3: Flood Risk Vulnerability and Flood Zone Compatibility in PPG, states that these land uses are compatible in Flood Zone 1 (with the requirement to apply the Exception Test) (as in Table 3.2 below).

Table 3.2: Flood Zone Risk and Vulnerability

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

Key: ✓Development is appropriate ✗Development should not be permitted

3.6 Sequential Test and Exception Test

- 3.6.1 Paragraph 172 of the NPPF sets out guidance on the application of the Sequential Test, the aim of which is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. Where areas of lower risk are not available, the Exception Test, as set out in paragraph 178 of the NPPF can be applied, to ensure that flood risk to people and property will be managed satisfactorily.
- 3.6.2 As the proposed development is in Flood Zone 1, and there would be no additional vulnerability to flood risk nor any worsening of flood risk elsewhere over that as a result of the proposal on this site. Therefore, a Sequential and Exception Test are considered as passed.

4. Sources of Flooding – Actual Flood Risk

4.1.1 The NPPF describes potential sources of flooding. It is necessary to consider the risk of flooding from all sources within a FRA. This section provides a review of flooding from land, sewers, groundwater and artificial sources, in addition to that from rivers and the sea.

4.2 Fluvial/Tidal Flood Risk

4.2.1 The Environment Agency's Flood map for Planning, was used to identify risk of flooding at site (refer Appendix A). These confirm that the site is in Flood Zone 1 .

4.3 Flood Risk from Land, Surface Water and Sewers

4.3.1 Flooding from land can be caused by rainfall being unable to infiltrate into the natural ground or entering the drainage systems due to blockage, or flows being above design capacity. This can then result in (temporary) localised ponding and flooding. The natural topography and location of buildings/structures can influence the direction and depth of water flowing off impermeable and permeable surfaces.

4.3.2 Surface water flooding can be difficult to predict, much more so than river or sea flooding as it is hard to forecast exactly where or how much rain will fall in any storm. The Environment Agency classifies the site, as being within a low risk area of flooding.

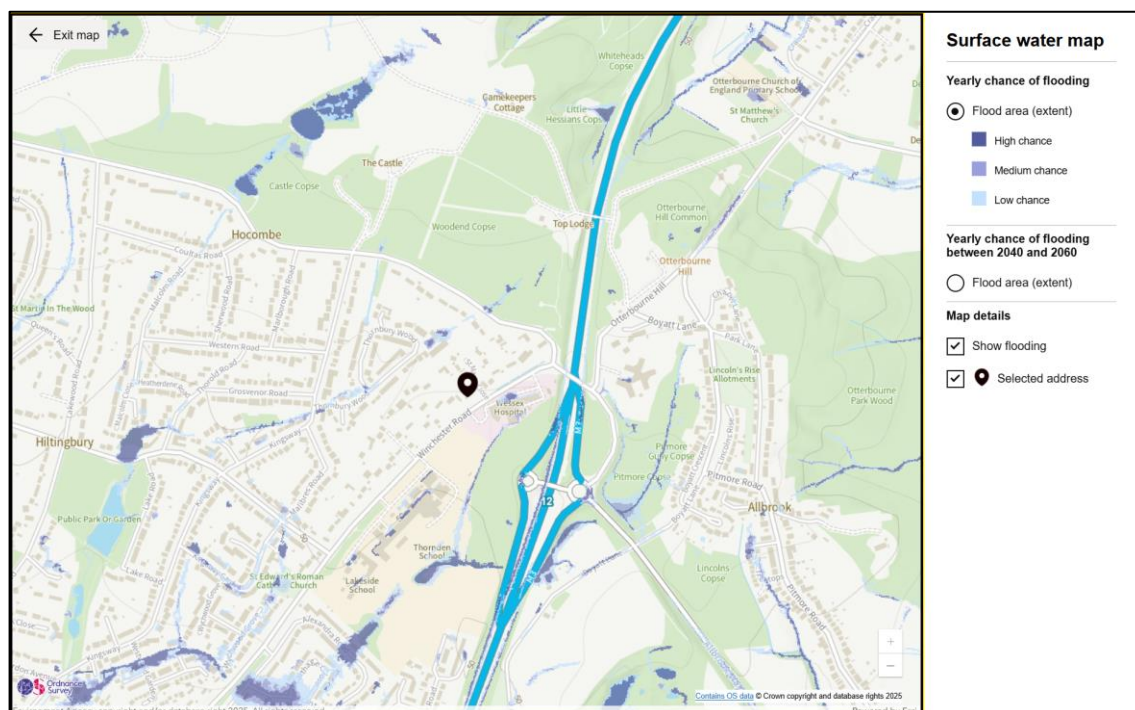


Figure 4-1: Surface Water Flood Map (Source Environment Agency²)

² <http://watermaps.environment-agency.gov.uk/wiyby/wiyby.aspx?&topic=ufmfs#x=357683&y=355134&scale=2>

4.4 Groundwater Flood Risk

- 4.4.1 As the proposed development is on ground level or above, the risk of flooding from this source could be considered low.

4.5 Flood Risk from Artificial Sources

- 4.5.1 Artificial sources of flooding include reservoirs, canals, ponds and mining abstraction.
- 4.5.2 A review of the Environment Agency Reservoir Maps indicates that the site is not within an area at risk from reservoir flooding.

4.6 Residual Flood Risk

- 4.6.1 Residual Risk is defined as 'the risk which remains after risk avoidance, reduction and mitigation measures have been implemented'. For the purpose of assessing flood risk, it is assumed that events greater than those assessed as Actual Risk are considered a 'Residual Risk'.
- 4.6.2 As proposed development is located in a low flood risk zone and does not benefit from the presence of significant defences. As such, the residual risk to the site could be considered to be relatively low.

4.7 Summary of flood risk

- 4.7.1 Table 4.1 below summarises the types of flood risk at the Site:

Table 4-1: Summary of flood risk

Source of risk	Ongoing risk
Fluvial/Tidal Flood Risk	Low Risk
Flood Risk from Land, Surface Water and Sewers	Low Risk
Groundwater Flood Risk	Low Risk
Flood Risk from Artificial Sources	Low Risk
Residual Flood Risk	Low Risk

5. Flood Risk Management

5.1 Principles of Flood Risk Management

- 5.1.1 NPPF requires a precautionary approach to be undertaken when making land use planning decisions regarding flood risk. This is partly due to the considerable uncertainty surrounding flooding mechanisms and how flooding may respond to climate change. It is also due to the potentially devastating consequences of flooding to the people and property affected.
- 5.1.2 Flood risk is a combination of the probability of flooding and the consequences of flooding. Hence 'managing flood risk' involves managing either, the probability of flooding or the consequences of flooding, or both.
- 5.1.3 NPPF requires flooding from tidal, fluvial, land, surface water & sewerage and from groundwater to be considered. The flood risk management measures discussed in this section are based on the sources of flooding identified in Section 4 that are considered to pose a risk to the development proposals.

5.2 Flood Resilient Measures

- 5.2.1 The Environment Agency classifies the development area of the site is located in an area with a low risk of surface water flooding.

Floor construction

- 5.2.2 Concrete ground-supported floors will be installed and concrete slabs of at least 100mm thickness will be specified.
- 5.2.3 Damp Proof Membranes (d.p.m.) will be included in the design to minimise the passage of water through ground floors.

Service entries (Cables and pipes)

- 5.2.4 Wiring for telephone, TV, Internet and other services will be protected by suitable insulation to minimise damage.
- 5.2.5 Wall sockets will be raised to as high as is feasible and practicable to avoid damage if flood waters inundate the property.

5.3 Finished Floor Level (FFL)

- 5.3.1 The finished ground floor level is to be set to a minimum 150mm above the external ground level.

5.4 Safe Access/Egress Arrangements

- 5.4.1 Demonstrating safe access and egress is available for the site for the development lifetime is a key factor in demonstrating compliance with the NPPF. This requires site occupants to be able to safely access and exit their dwellings in design flood conditions. Vehicular access to allow the emergency services to safely reach the development during design flood conditions is also normally required.

- 5.4.2 In order for the development to be classified as safe users should be able evacuate the site building before an extreme flood. Key points to note are:
- Occupiers would have more than 24 hours' notice of severe weather warning service.
 - The Environment Agency and Emergency Services would evacuate the area should a breach be detected or expected. This is likely to occur if a breach were spotted well in advance of inundation.
 - Following the receipt of flood warning it is recommended that the site is evacuated and closed and is only re-opened when it is safe to do so taking advice from the Environment Agency and the Local Authority. In the event that users cannot reach an evacuation area, it is suggested that safe refuge is sought in locations such as the upper storeys of the main building.
- 5.4.3 As a further precaution, the Environment Agency provides a warning system, which is free to all users, including their flood warning feeds, flood warning widget, live flood warning map and three day flood risk forecast.

6. Surface Water Drainage Strategy

6.1 SuDS Principles

6.1.1 The Local Authority expects all developments to take advantage of any suitable opportunities to reduce surface water runoff. Developers should utilise SuDS on all developments, unless there are practical reasons for not doing so. Therefore, it is expected to see suitable consideration given to using sustainable measures in line with the following drainage hierarchy:

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

6.2 Surface Water Drainage Design

6.2.1 The proposal consists of the Construction of 2no. semi-detached dwellings following the demolition of existing dwelling. The existing and proposed areas are summarised below.

Table 5-1 Site areas

Parameter	Existing (m ²)	Existing (%)	Proposed (m ²)	Proposed (%)
Impermeable area	388	45%	540	63%
Permeable area	472	55%	320	37%
Total area	860		860	

6.2.2 The surface water runoff from the site is currently picked up in the site drainage system and discharges into the surface water sewer in Winchester Road.

Existing Site Characteristics

6.2.3 The existing hydrological characteristics for the site are as follows:

- IH 124 Soil Type: 4
- Total Site Area = 860 m²
- Total Existing Impermeable Area = 388 m²
- Percentage Impermeable (PIMP) = 45%

6.2.4 The discharge rates for the greenfield and existing site are summarised below (calculations in Appendix C). The greenfield discharge rates are calculated based on IH 124 and 'Rainfall runoff management for developments'. The existing discharge rates were determined using an analytical model based on the assumption that the existing site discharges via a 150mm outfall pipe.

Table 5-2: Greenfield and Existing Discharge Rates

	Discharge Rates (l/s)				
	1 year	Qbar	30 year	100 year	100 year +40% CC
Greenfield Rates	0.4	0.4	1.1	1.5	-
Existing discharge rates	3.6	-	8.5	11.2	-

SuDS Considerations

6.2.5 The aim of SuDS is to identify “at source” water management measures to reduce surface water runoff. The most appropriate means of surface water control and discharge has been determined based on the hierarchy as set out in the NSTS: CIRIA SuDS Manual (C753). The following SuDS featured have been considered as part of the development.

- **Rainwater harvesting/green roof** – Water Butt is recommended
- **Infiltration** – Soakaway is proposed in the front/rear garden (subject to infiltration test results)
- **Swales, detention basins, ponds** – There is insufficient space to appropriately incorporate these elements within the small private garden and as such these have not been considered.
- **Watercourse** – No nearby watercourse
- **Permeable paving** – Permeable paving has been proposed in the driveway area, in order to deal with the surface water run off at source

Proposed SuDS Solution

- 6.2.6 Surface water runoff from the roof of the main building and the patio area is to discharge directly to the cellular crate soakaways located in the front and rear garden.
- 6.2.7 Surface water runoff from the driveway is to discharge directly to the voided stone subbase of the permeable paving in the driveway area.
- 6.2.8 Conservative Infiltration rate of 5×10^{-5} m/s is used to size the soakaway and permeable paving. Percolation testing is to be undertaken in accordance with BRE 365 to confirm infiltration rates for site. The permeable paving and soakaway attenuation system provide sufficient attenuation for all storm events up to and including the 100-year storm +40% climate change.
- 6.2.9 Details of the drainage system and attenuation structures are presented in the design drawings and calculations in Appendix D.

Drainage Exceedance

- 6.2.10 The area is not subject to overland flow routes or surface water flooding.
- 6.2.11 All overland flow will pond in the paved area and slowly infiltrate into the ground or drainage system.

Foul water

- 6.2.12 Foul water produced by the new dwelling will be connected to the existing foul run onsite.

6.3 SuDS Maintenance and Ownership

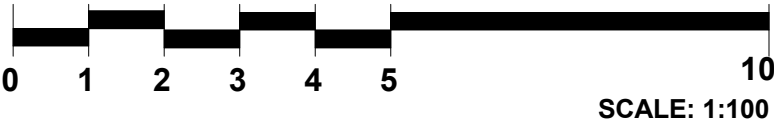
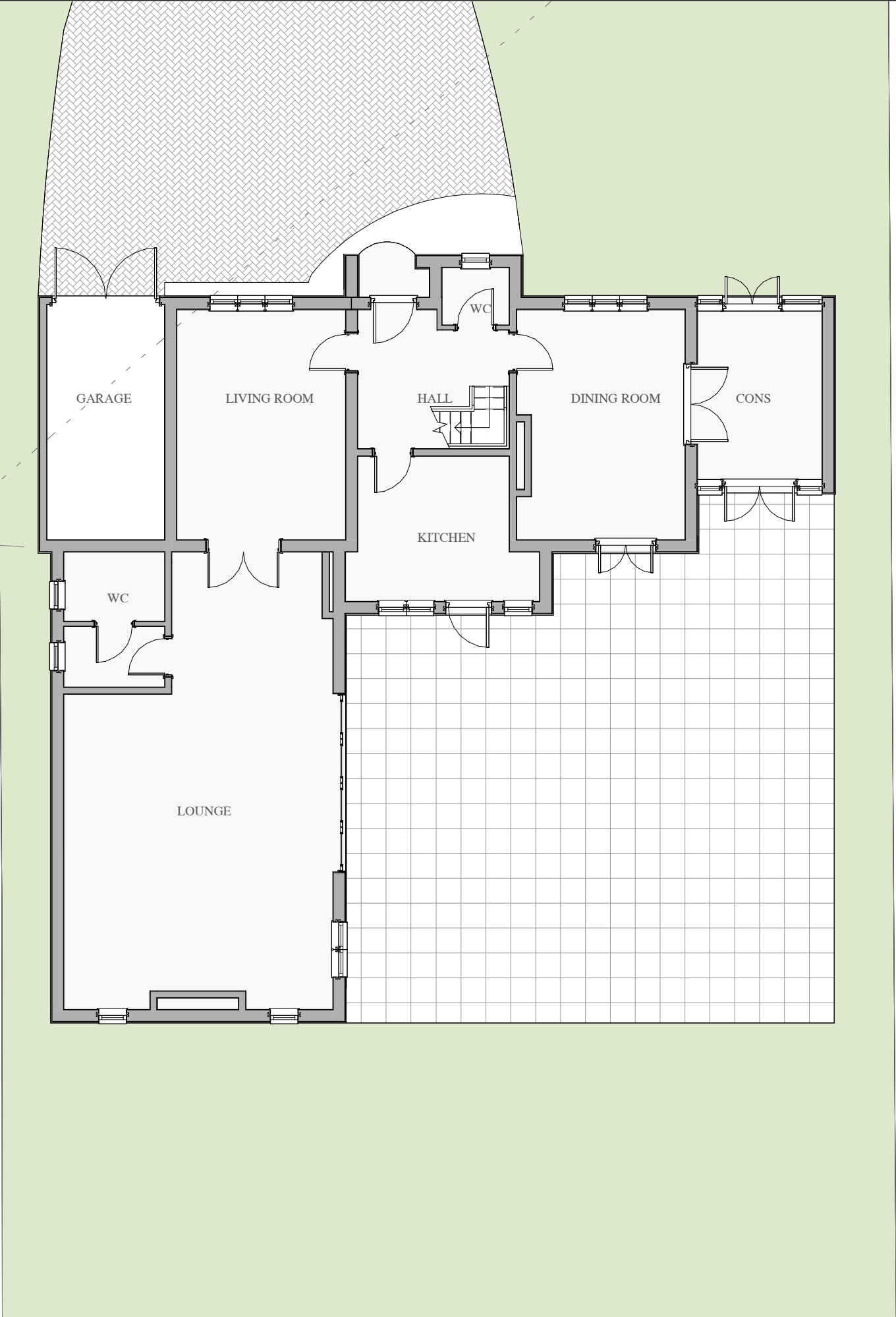
- 6.3.1 All drainage on-site will remain private. There are no elements that could be adopted by the Public Sewer authority or by the Council. A long-term maintenance regime schedule can be found in Appendix E.

7. Conclusions & Recommendations

- 7.1.1 An assessment of areas potentially at risk from flooding has been undertaken and the development proposals have been examined in relation to their potential to increase flood risk both on and off site. This desk based FRA accompanies the planning application for the Construction of 2no. semi-detached dwellings following the demolition of existing dwelling at 253 Winchester Road, to demonstrate that flood risk has been given material consideration throughout the development planning process and development should not be restricted at this Site due to flood risk.
- 7.1.2 The site is located within Flood Zone 1 according to the Environment Agency Flood Zones Maps. The current and proposed development Site use is classified as a 'More Vulnerable' land use according to NPPF. Therefore, the site is compatible with the Environment Agency's vulnerability tests.
- 7.1.3 In line with the NPPF, all sources of flooding have been considered and assessed, using readily available sources of information. The site is located in the area with low risk from all sources including fluvial/tidal risk, groundwater, surface water and reservoir.
- 7.1.4 The development proposal has considered flood risk at all stages throughout the development of the final layout and reflects the flood risk constraints and the need to manage, and where possible reduce, flood risk in compliance with the guidance in NPPF. The proposal will not increase the risk of flooding to others and as a result, proposed development at this site should not be restricted as a result of flood risk.

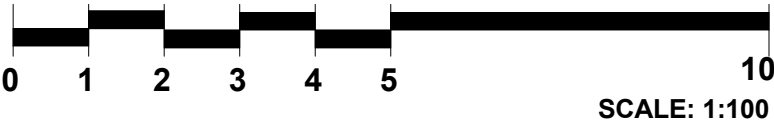
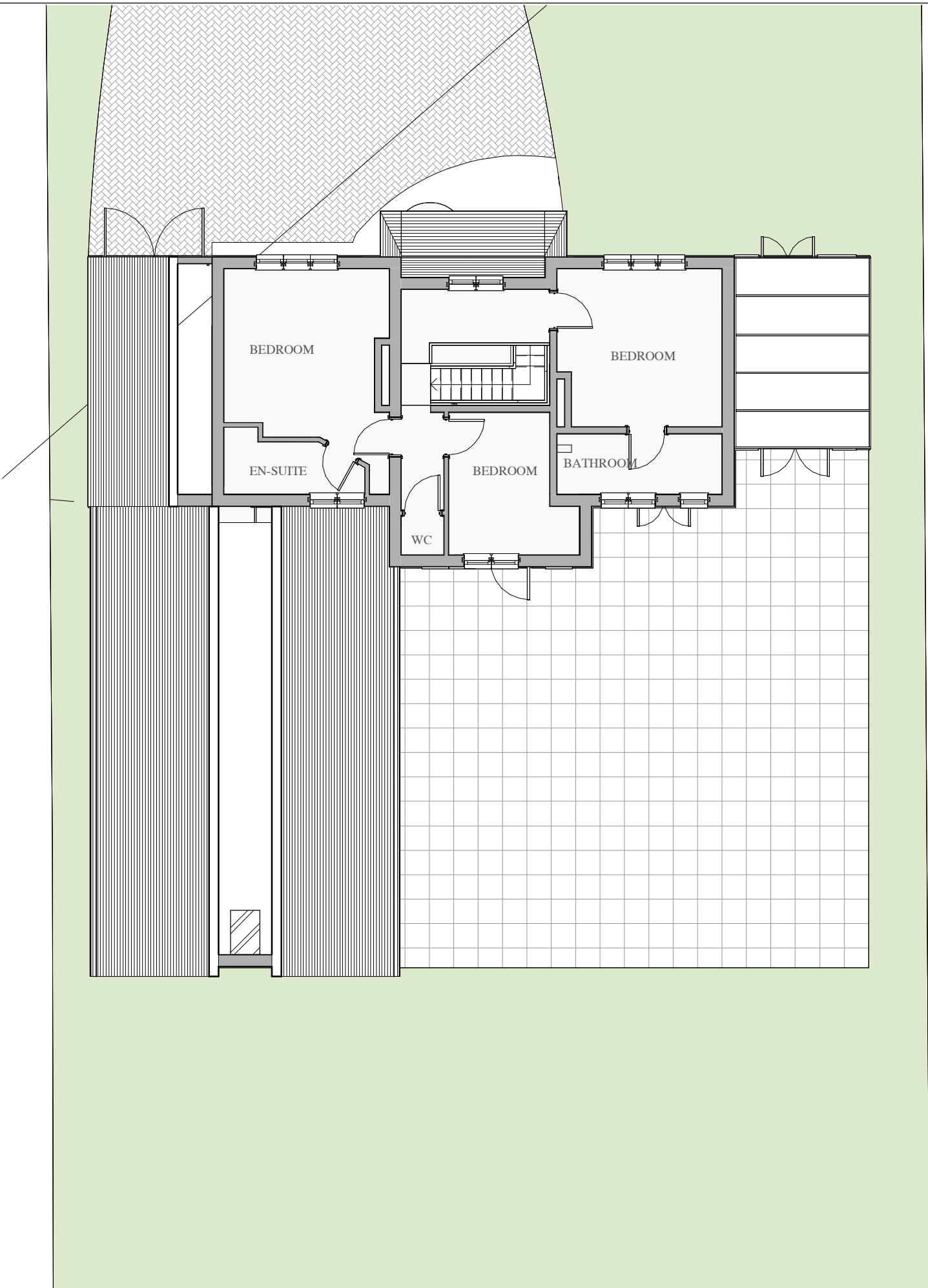
Appendix A Existing Site and Proposed Plans

01 Existing Ground Floor
1 : 100



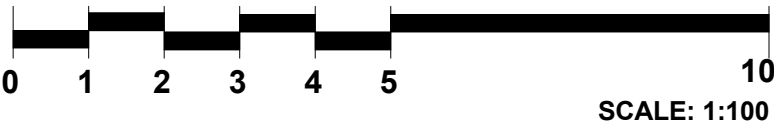
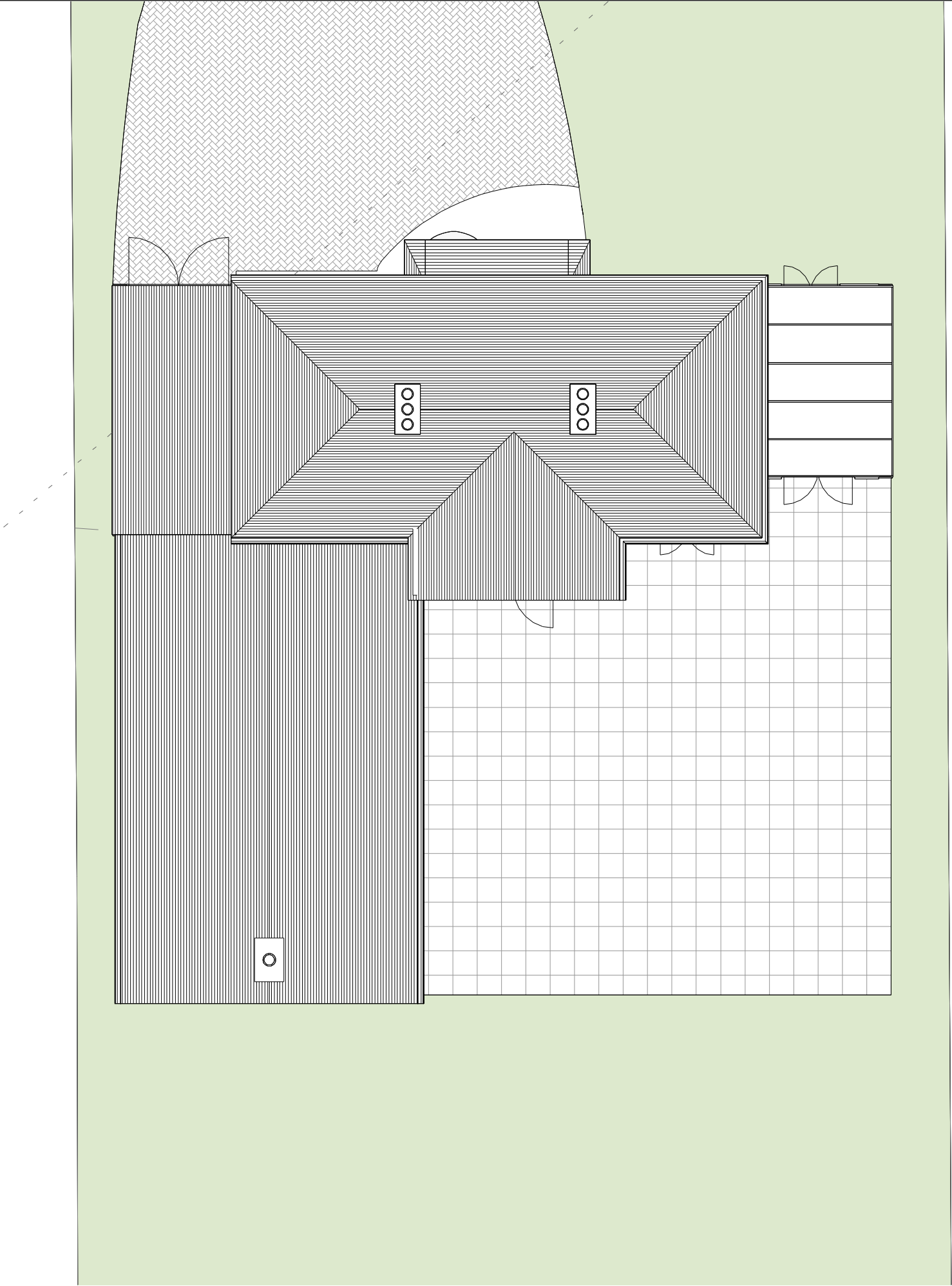
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 - 2. All materials to match existing unless specified in drawing.
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02 Existing First Floor
1 : 100

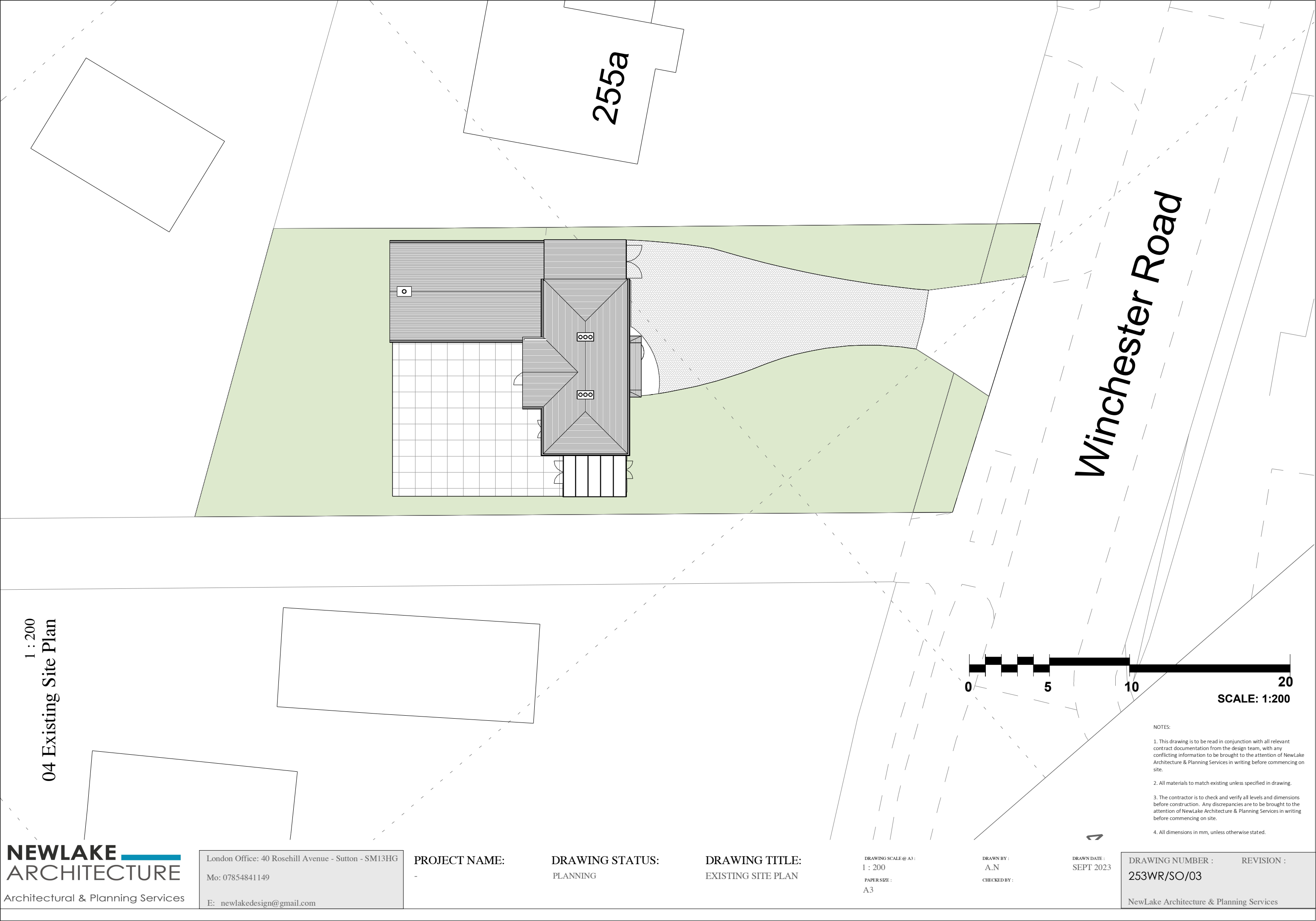


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03 Existing Roof Plan
1 : 100



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1 : 200
04 Existing Site Plan

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PROJECT NAME:
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DRAWING STATUS:
PLANNING

DRAWING TITLE:
EXISTING SITE PLAN

DRAWING SCALE @ A3:
1 : 200
PAPER SIZE :
A3

DRAWN BY :
A.N
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DRAWN DATE :
SEPT 2023

DRAWING NUMBER :
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Existing Section A-A
1 : 50



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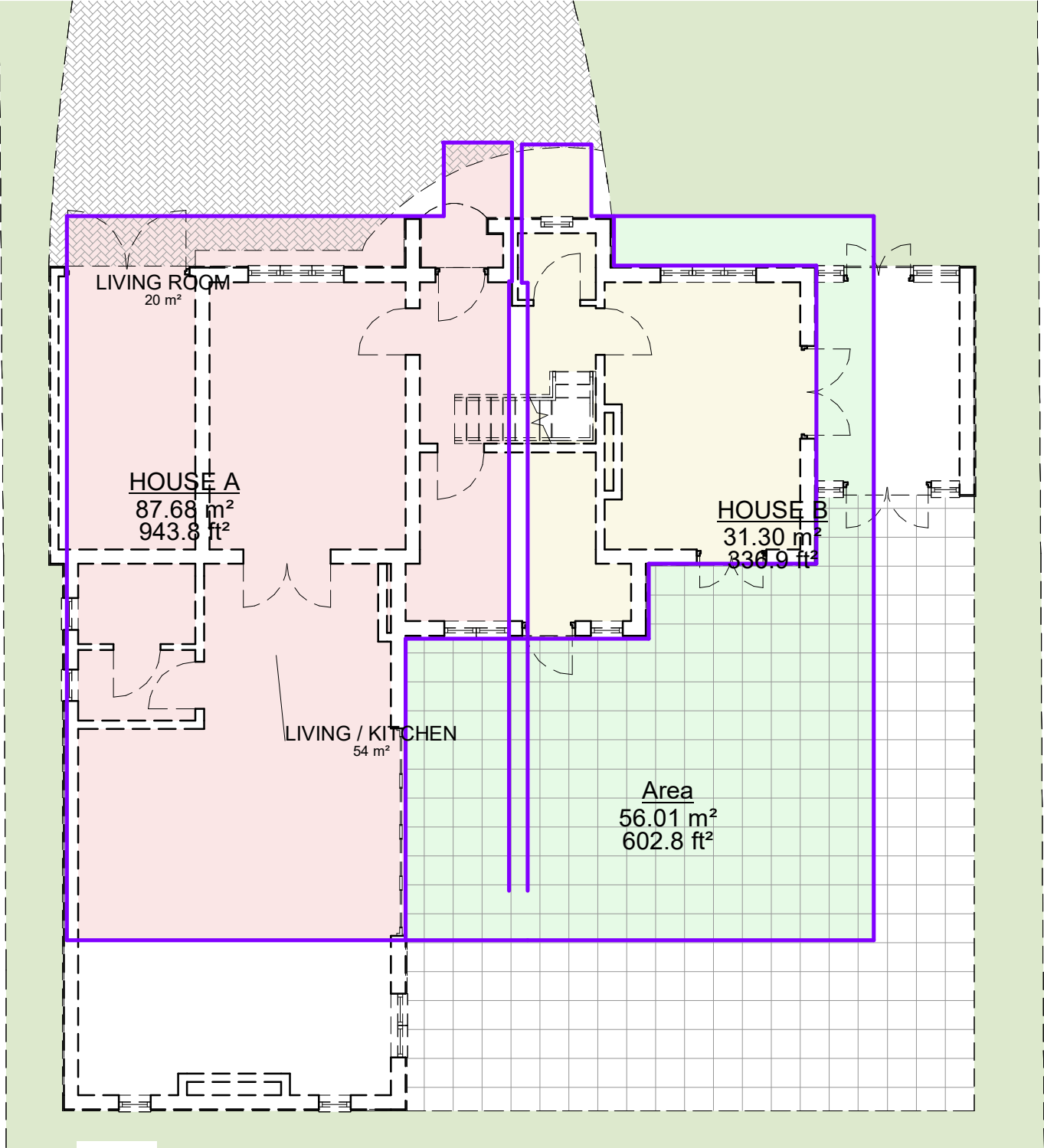


Existing Section B-B
1 : 50



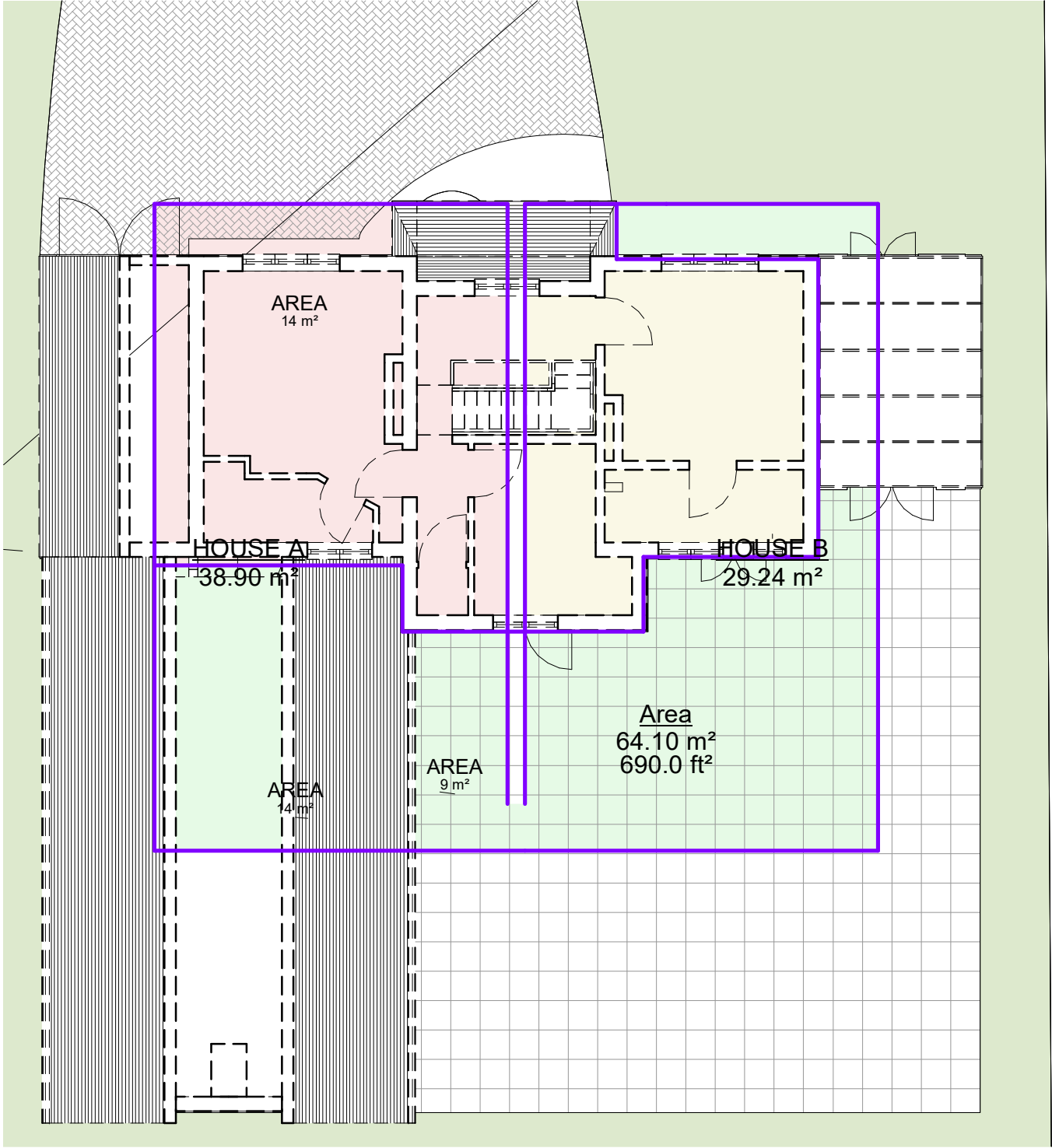
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4. All dimensions in mm, unless otherwise stated.



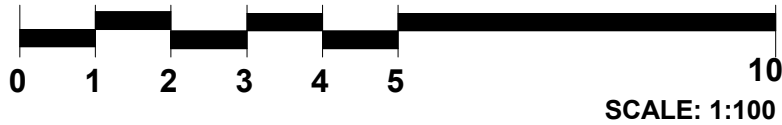
KEY

- Area
- HOUSE A
- HOUSE B



KEY

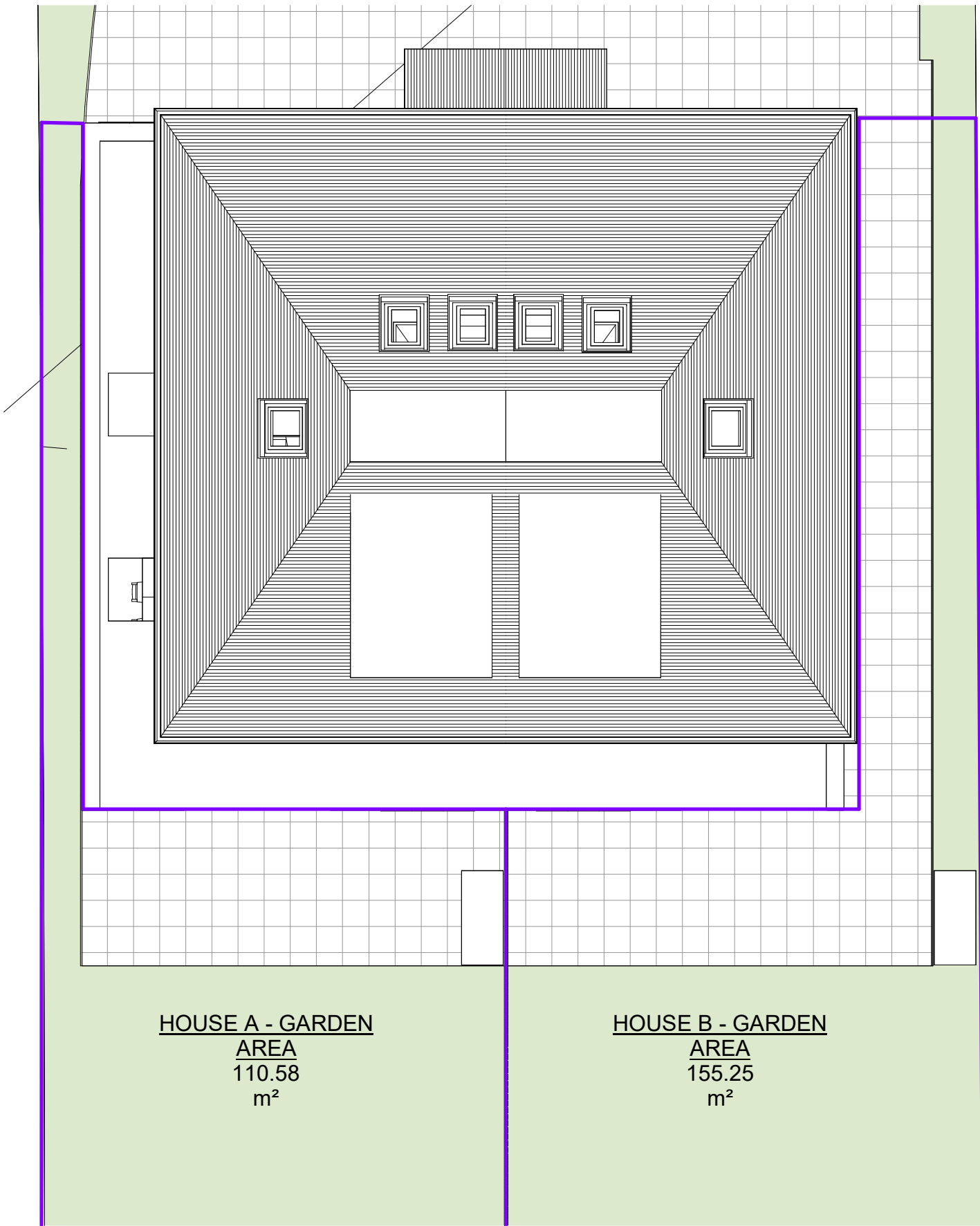
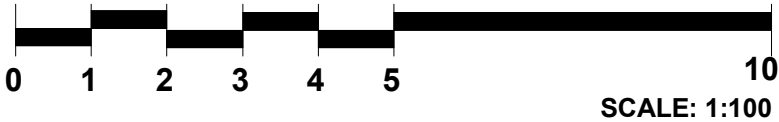
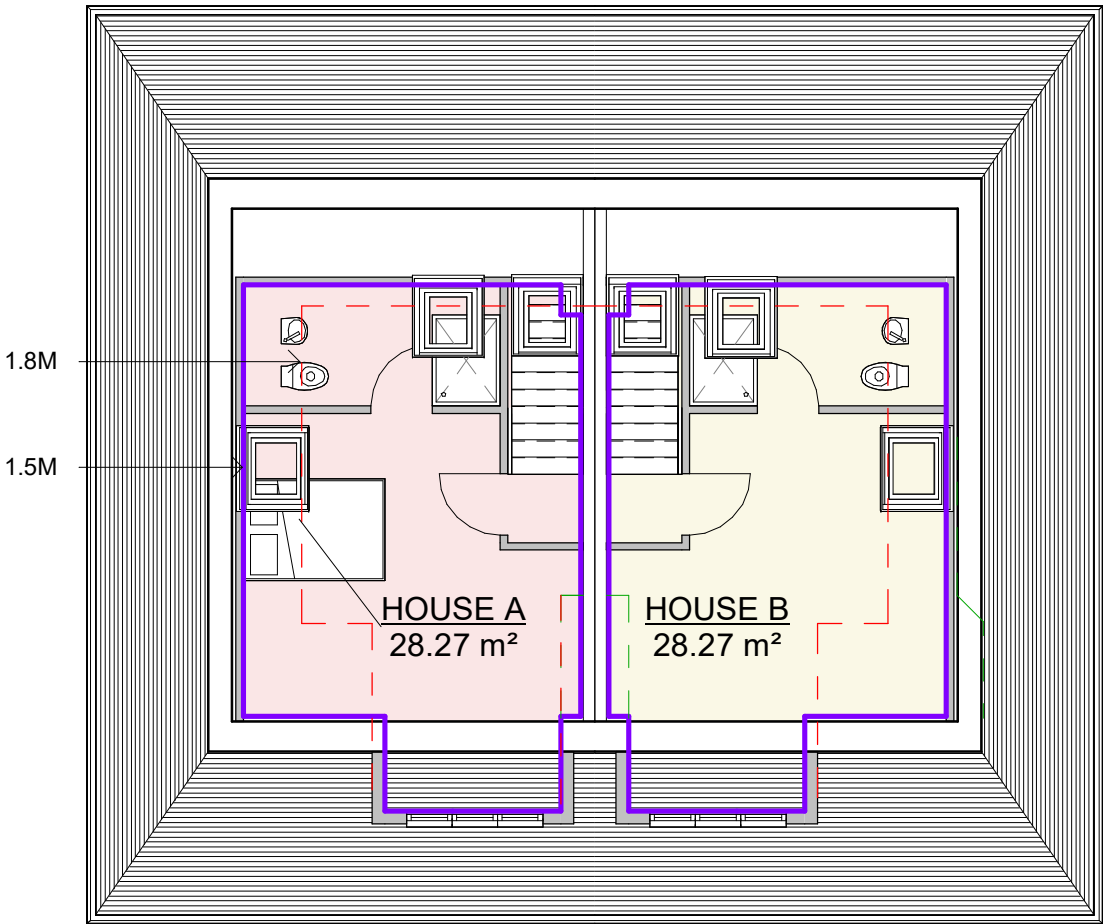
- Area
- HOUSE A
- HOUSE B



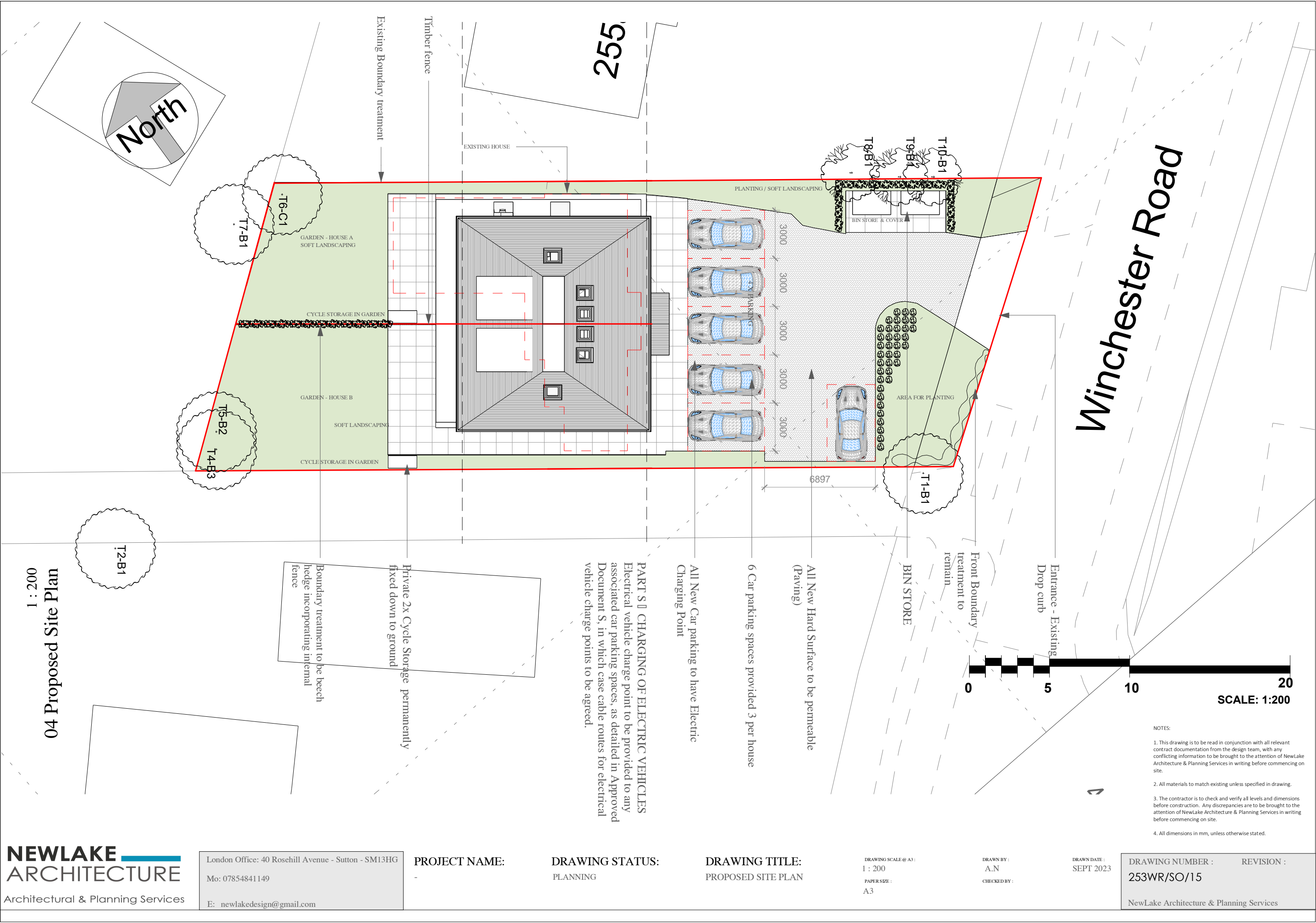
- NOTES:
- This drawing is to be read in conjunction with all relevant contract documentation from the design team, with any conflicting information to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 - All materials to match existing unless specified in drawing.
 - The contractor is to check and verify all levels and dimensions before construction. Any discrepancies are to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 - All dimensions in mm, unless otherwise stated.

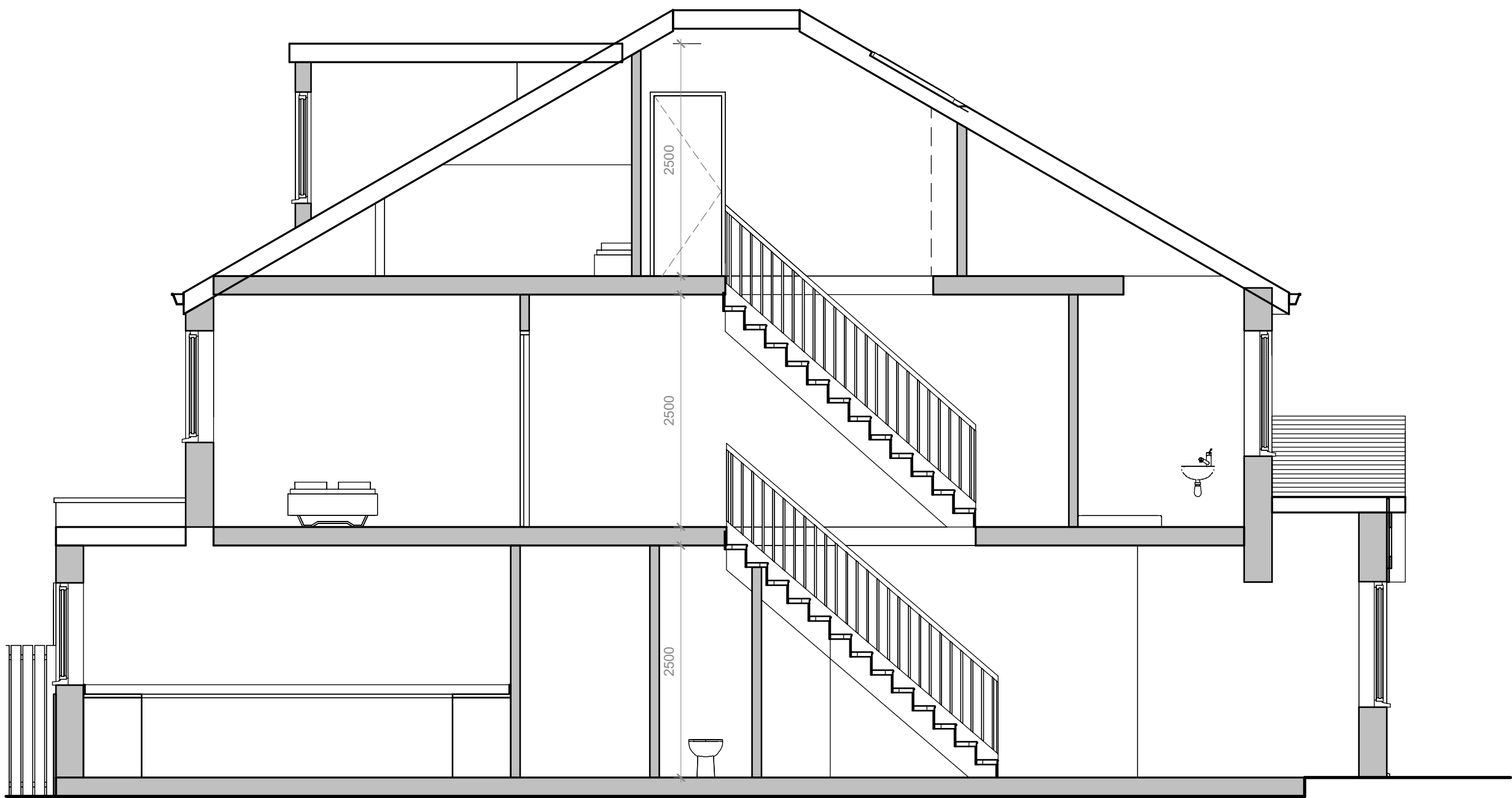
KEY

- HOUSE A
- HOUSE B



- NOTES:
1. This drawing is to be read in conjunction with all relevant contract documentation from the design team, with any conflicting information to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 2. All materials to match existing unless specified in drawing.
 3. The contractor is to check and verify all levels and dimensions before construction. Any discrepancies are to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 4. All dimensions in mm, unless otherwise stated.

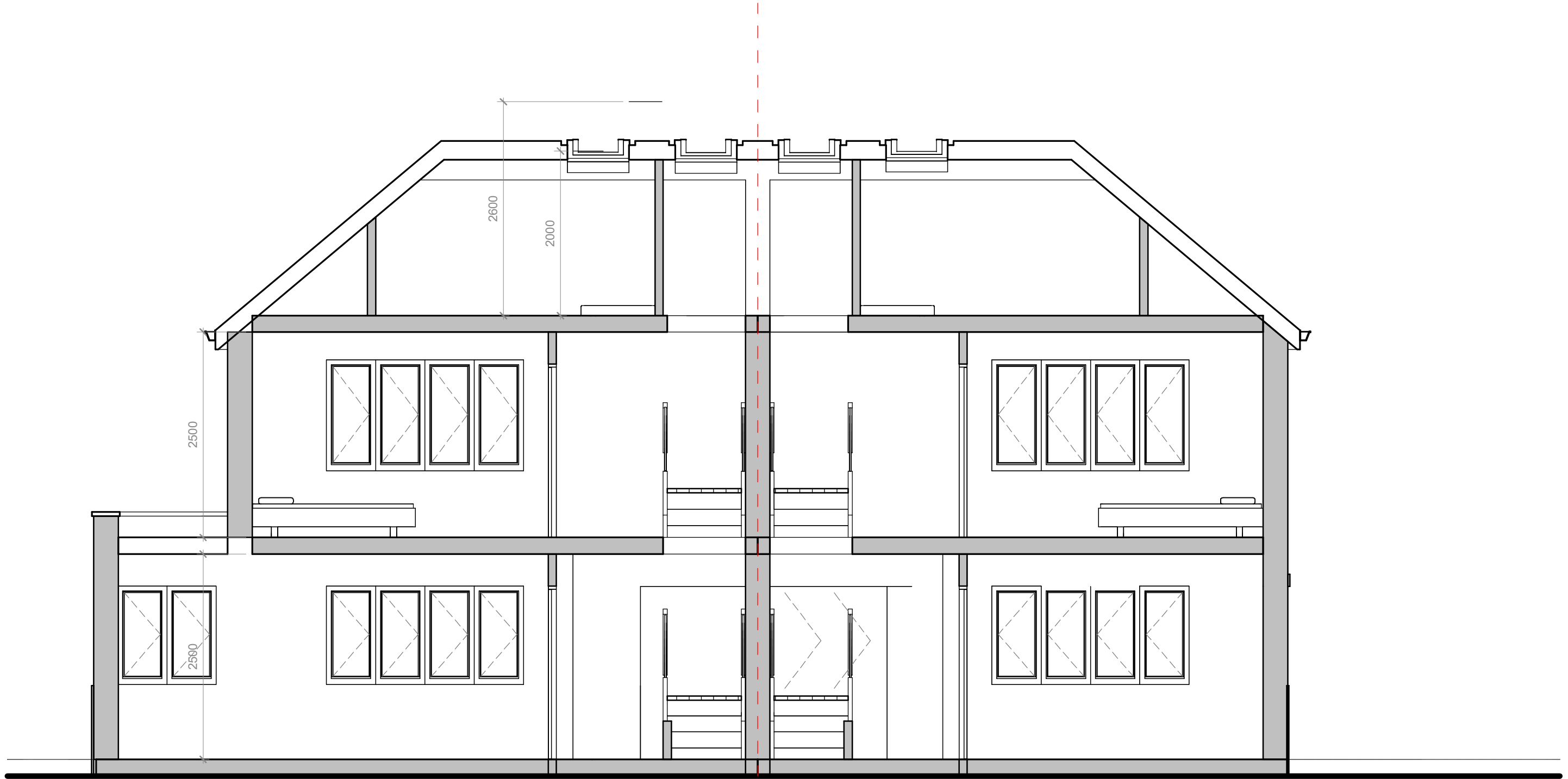




Proposed Section A-A
1 : 50



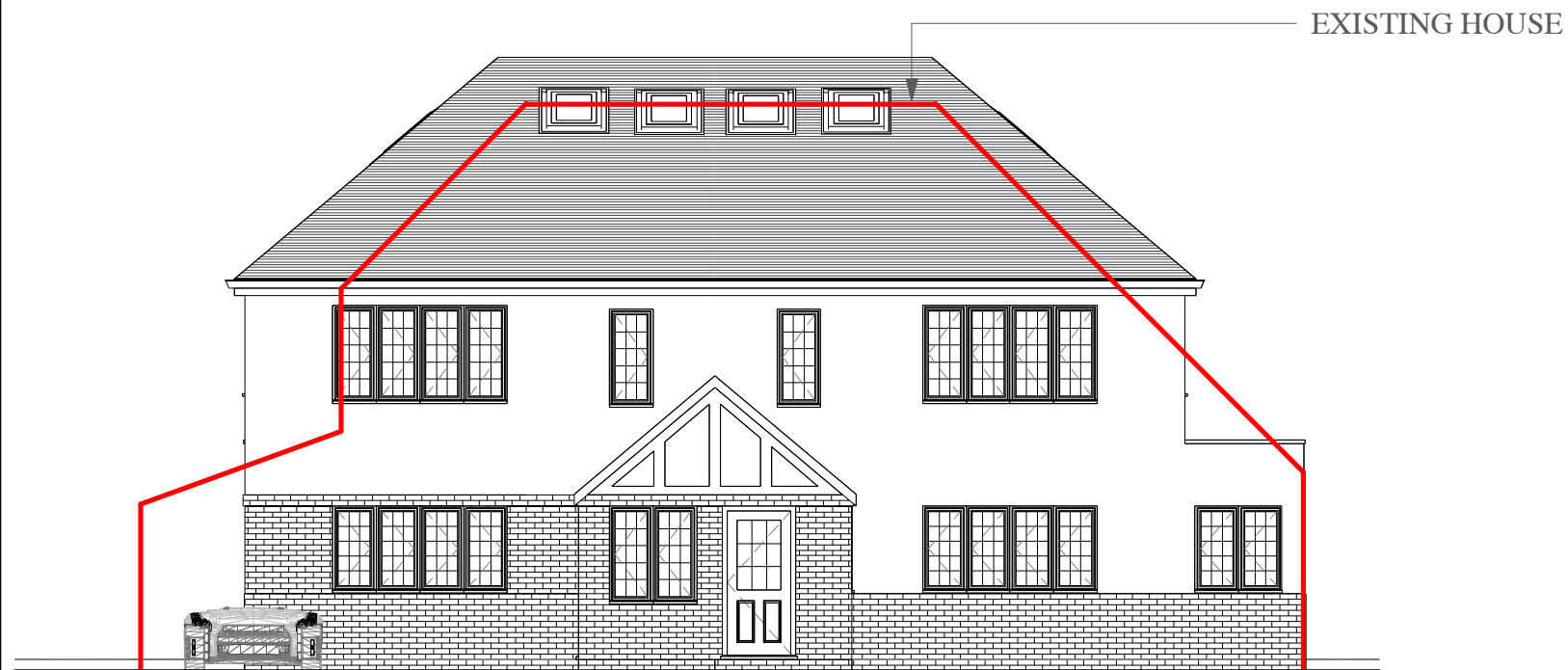
- NOTES:
1. This drawing is to be read in conjunction with all relevant contract documentation from the design team, with any conflicting information to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 2. All materials to match existing unless specified in drawing.
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 4. All dimensions in mm, unless otherwise stated.



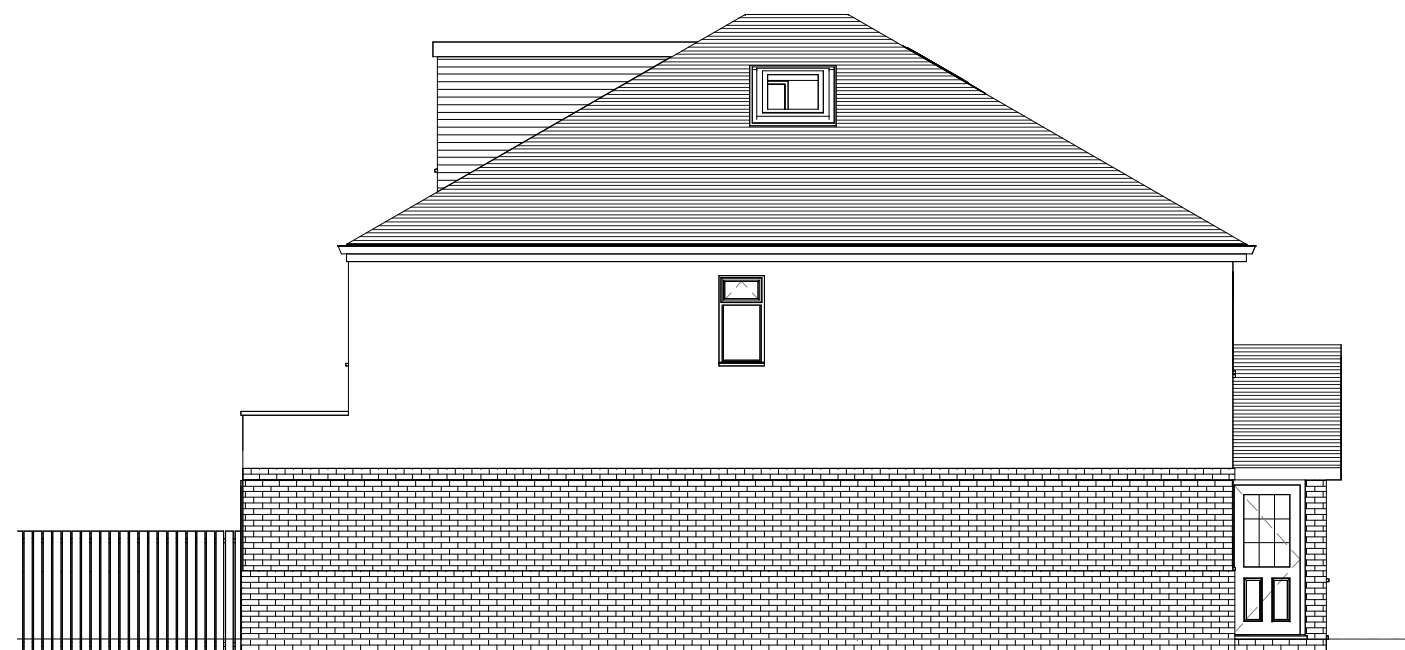
Proposed Section B-B
1 : 50



- NOTES:
1. This drawing is to be read in conjunction with all relevant contract documentation from the design team, with any conflicting information to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 2. All materials to match existing unless specified in drawing.
 3. The contractor is to check and verify all levels and dimensions before construction. Any discrepancies are to be brought to the attention of NewLake Architecture & Planning Services in writing before commencing on site.
 4. All dimensions in mm, unless otherwise stated.



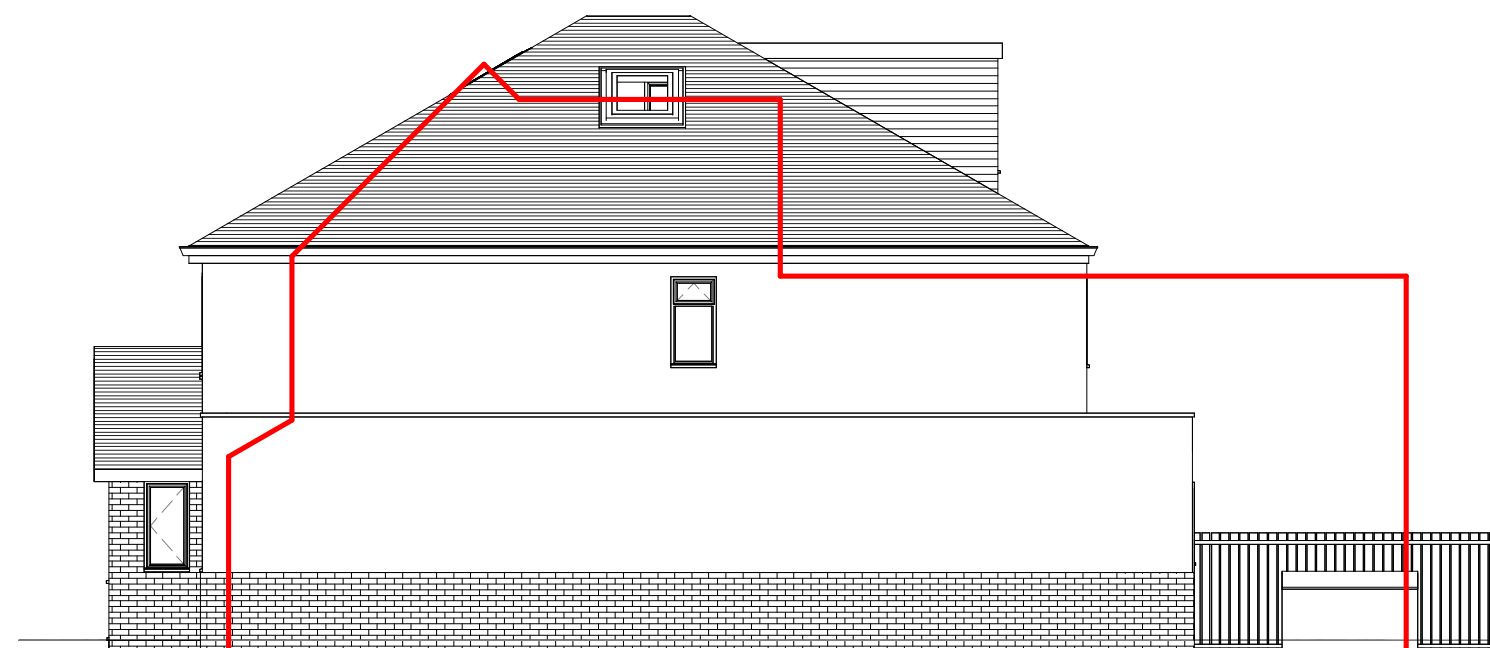
Proposed Front Elevation
1 : 100



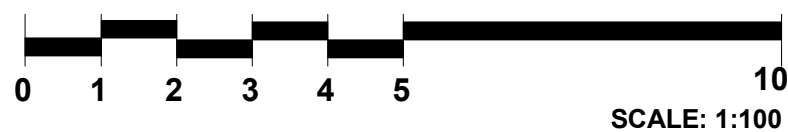
Proposed Side Elevation
1 : 100



Proposed Rear Elevation
1 : 100



Proposed Side Elevation II
1 : 100



Appendix B Environment Agency Flood Map for Planning



Flood map for planning

Your reference	Location (easting/northing)	Created
Unspecified	444945/122163	3 December 2025 23:05

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

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

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

Notes

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

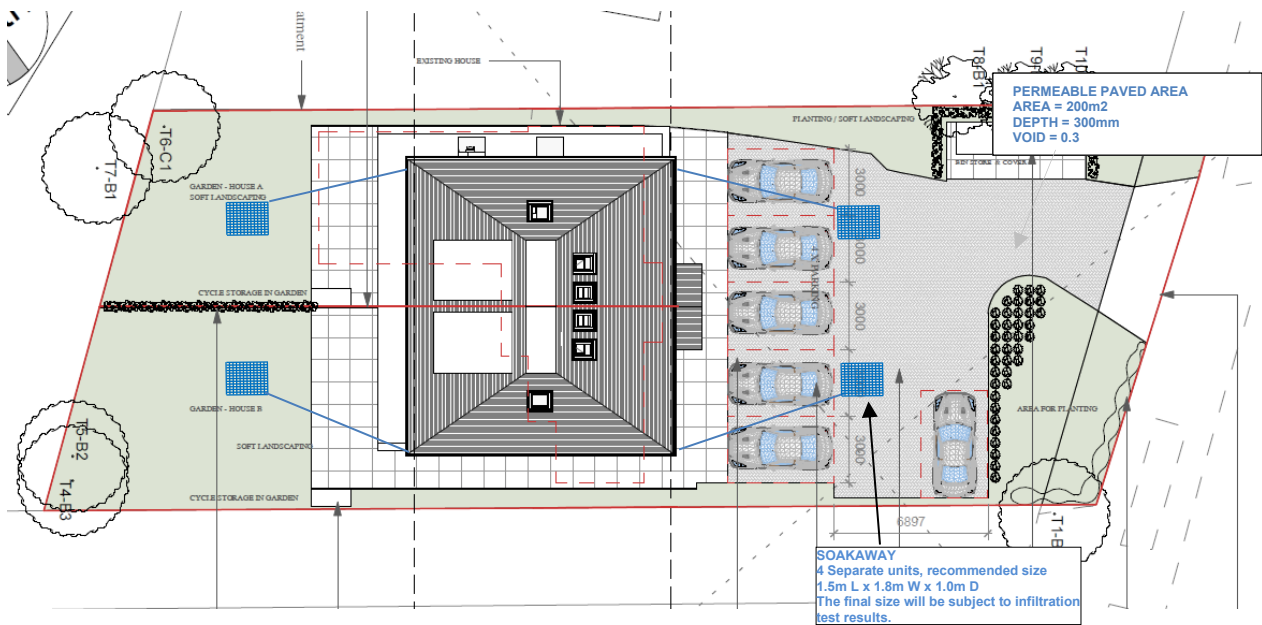
This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

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

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2025 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Appendix C Proposed Drainage Layout



Appendix D SuDS Maintenance Plan

Permeable Pavements Maintenance Schedule		
Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturer's recommendations.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds and management of any weeds in the pavement or adjacent.	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the pavement.	As required
	Rehabilitation of surface and upper structure by remedial sweeping, or by removing top asphalt layer and rolling new asphalt	Every 10 to 15 years or as required (if infiltration performance reduced due to significant clogging)
Monitoring	Initial Inspection	Monthly for three month after installation
	Inspect for evidence of poor operation and/or weed growth – take remedial action if required.	Three-monthly, 48h after large storms in first six months.
	Inspect silt accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor inspection chambers	Annually

Water Butt Maintenance Schedule			
Maintenance schedule	Requirement	Frequency	Responsibility
Regular maintenance	Clearing of tank, inlets, outlets, gutters, withdrawal devices and roof drain filters and other debris	Annual (or following poor performance)	Landowner
Occasional maintenance	Replacement of any filters	As required	Landowner
Remedial actions	Repair any erosion damage, or damage to tank	As required	Landowner
Monitoring	Inspection of tank for debris and sediment build up	Annual (or following poor performance)	Landowner
	Inspection of inlets, outlets and withdrawal devices	Annual (or following poor performance)	Landowner
	Inspection of areas receiving overflow, for evidence of erosion	After extreme storms	Landowner
	Inspection of roof drain filters	Annual (or following poor performance)	Landowner

Soakaway Maintenance Schedule
Inspections & Monitoring (Every 6 Months)
Inspection of Soakaway Structures
Inspection of Inlets & Outlets
Monitoring of Performance after Heavy Rain
Inspection for Tree Roots
Inspection of Sediment Interception Methods
Inspection of Catchment for Erosion
Inspection of Surface for Settlement
Inspection for Signs of Pollution
Regular Maintenance (Every 3 Months)
Removal of Litter & Debris (Soakaway)
Removal of Litter & Debris (Sediment Interception Methods)
Sweeping of Paved Surfaces
Cleaning of Roof Gutters
Occasional Maintenance (Every 12 Months)
Removal of Tree Roots
Tree/Shrub Management
Sediment Removal (Soakaway)
Sediment Removal (Sediment Interception Methods)
Cleaning of Inlets & Outlets
Cleaning of Pipework
Remedial Maintenance (When Required)
Full Structure Rehabilitation
Infiltration Surface Reconditioning

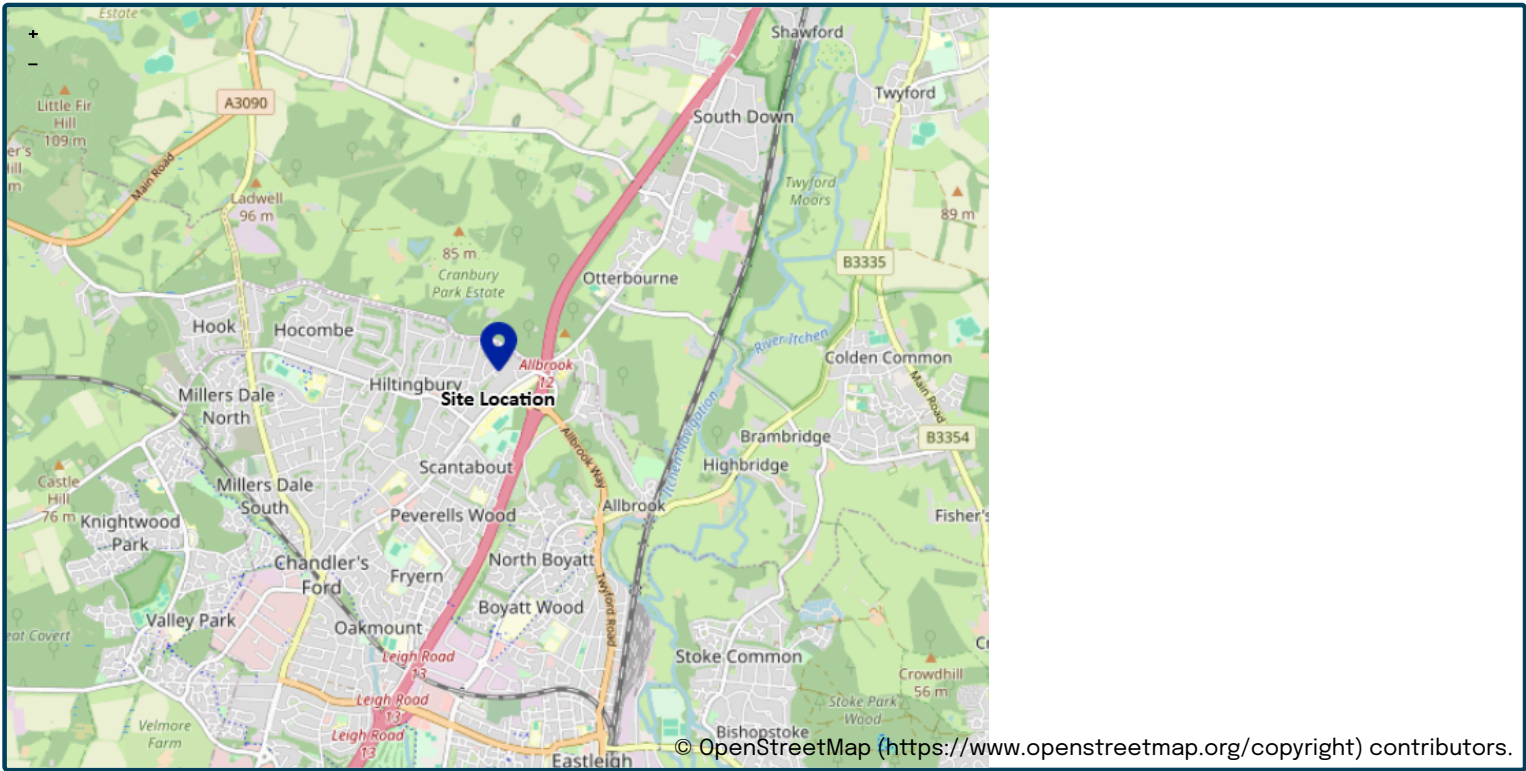
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	06/12/2025
Calculated by	liska
Reference	253 Winchester Road
Model version	2.2.2

Location

Site name	SO53 2DX
Site location	SO53 2DX



Site easting (British National Grid)	444814
Site northing (British National Grid)	122062

Site details

Total site area (ha)	0.086	ha
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Greenfield runoff

Method

Method	IH124
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IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	784	mm	784
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	0.5	l/s	

Growth curve factors

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

Results

Method	IH124	
Flow rate 1 year (l/s)	0.4	l/s
Flow rate 2 year (l/s)	0.4	l/s
Flow rate 10 years (l/s)	0.8	l/s
Flow rate 30 years (l/s)	1.1	l/s
Flow rate 100 years (l/s)	1.5	l/s
Flow rate 200 years (l/s)	1.8	l/s

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

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<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) (<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.

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By clicking the Accept button, you agree to us doing so.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
garage	0.014	5.00	5.400	1200	0.700
paving	0.025	5.00	5.400	1200	0.700
s1			5.300		0.919
out			5.200		0.870

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)
1.000	garage	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
2.002	paving	s1	7.000	0.600	4.700	4.381	0.319	21.9	100	5.07	50.0
2.003	s1	out	3.000	0.600	4.381	4.330	0.051	58.8	100	5.12	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)
1.000	1.961	15.4	2.7	0.600	0.819	0.014	0.0	28	1.457
2.002	1.655	13.0	4.7	0.600	0.819	0.025	0.0	42	1.526
2.003	1.006	7.9	7.4	0.819	0.770	0.039	0.0	77	1.142

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
2.002	7.000	21.9	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
2.003	3.000	58.8	100	Circular	5.300	4.381	0.819	5.200	4.330	0.770

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
1.000	garage	1200	Manhole	Adoptable	s1	Junction
2.002	paving	1200	Manhole	Adoptable	s1	Junction
2.003	s1		Junction		out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
garage	5.400	0.700	1200				
				0	1.000	4.700	100
paving	5.400	0.700	1200				
				0	2.002	4.700	100
s1	5.300	0.919		1	2.002	4.381	100
				2	1.000	4.381	100
				0	2.003	4.381	100
out	5.200	0.870		1	2.003	4.330	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0

Results for 1 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
60 minute summer	garage	33	4.720	0.020	1.3	0.0302	0.0000	OK
60 minute summer	paving	33	4.729	0.029	2.3	0.0527	0.0000	OK
60 minute summer	s1	33	4.428	0.047	3.6	0.0000	0.0000	OK
60 minute summer	out	33	4.377	0.047	3.6	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	garage	1.000	s1	1.3	0.568	0.084	0.0119	
60 minute summer	paving	2.002	s1	2.3	0.845	0.177	0.0192	
60 minute summer	s1	2.003	out	3.6	0.985	0.455	0.0110	3.7

Results for 30 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
60 minute summer	garage	33	4.731	0.031	3.1	0.0468	0.0000	OK
60 minute summer	paving	33	4.745	0.045	5.4	0.0831	0.0000	OK
60 minute summer	s1	33	4.472	0.091	8.5	0.0000	0.0000	OK
60 minute summer	out	33	4.421	0.091	8.5	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	garage	1.000	s1	3.1	0.653	0.201	0.0238	
60 minute summer	paving	2.002	s1	5.4	0.997	0.415	0.0382	
60 minute summer	s1	2.003	out	8.5	1.135	1.075	0.0225	9.0

Results for 100 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
60 minute summer	garage	33	4.735	0.035	4.0	0.0534	0.0000	OK
60 minute summer	paving	33	4.755	0.055	7.2	0.1006	0.0000	OK
60 minute summer	s1	33	4.533	0.152	11.2	0.0000	0.0000	SURCHARGED
60 minute summer	out	32	4.425	0.095	11.2	0.0000	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	garage	1.000	s1	4.0	0.718	0.260	0.0256	
60 minute summer	paving	2.002	s1	7.2	1.044	0.553	0.0427	
60 minute summer	s1	2.003	out	11.2	1.426	1.412	0.0232	11.9

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
drive	0.026	5.00	5.400	1200	0.700
s1			5.300		0.919
out			5.400		1.053

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)
1.000	drive	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
1.003	s1	out	2.000	0.600	4.381	4.347	0.034	58.8	100	5.08	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)
1.000	1.961	15.4	4.9	0.600	0.819	0.026	0.0	39	1.741
1.003	1.006	7.9	4.9	0.819	0.953	0.026	0.0	57	1.062

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
1.003	2.000	58.8	100	Circular	5.300	4.381	0.819	5.400	4.347	0.953

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
1.000	drive	1200	Manhole	Adoptable	s1	Junction
1.003	s1		Junction		out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
drive	5.400	0.700	1200					
				0	1.000	4.700	100	
s1	5.300	0.919			1	1.000	4.381	100
				0	1.003	4.381	100	



Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
out	5.400	1.053		1	1.003	4.347	100
				°			

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440
----	-----	-----	-----	-----	-----	-----	-----	-----	------

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node out Online Orifice Control

Flap Valve	x	Invert Level (m)	4.347	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.001		

Node s1 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.18000	Invert Level (m)	4.381	Slope (1:X)	500.0
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)	0	Depth (m)	0.300
Safety Factor	2.0	Width (m)	10.000	Inf Depth (m)	
Porosity	0.30	Length (m)	20.000		

Results for 1 year Critical Storm Duration. Lowest mass balance: 98.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	drive	32	4.729	0.029	2.4	0.0549	0.0000	OK
60 minute summer	s1	35	4.400	0.019	2.4	0.2788	0.0000	OK
60 minute summer	out	34	4.402	0.055	0.2	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	drive	1.000	s1	2.4	1.775	0.156	0.0071	
60 minute summer	s1	1.003	out	-0.2	0.152	-0.027	0.0054	
60 minute summer	s1	Infiltration		1.9				
60 minute summer	out	Orifice		0.0				0.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	drive	32	4.746	0.046	5.7	0.0854	0.0000	OK
60 minute summer	s1	36	4.420	0.039	5.7	1.1515	0.0000	OK
60 minute summer	out	37	4.421	0.074	0.4	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	drive	1.000	s1	5.7	2.038	0.371	0.0148	
60 minute summer	s1	1.003	out	0.4	0.346	0.052	0.0091	
60 minute summer	s1	Infiltration		3.9				
60 minute summer	out	Orifice		0.0				0.0

Results for 100 year Critical Storm Duration. Lowest mass balance: 98.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	drive	32	4.753	0.053	7.5	0.0999	0.0000	OK
60 minute summer	s1	37	4.430	0.049	7.9	1.7288	0.0000	OK
60 minute summer	out	37	4.431	0.084	0.5	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	drive	1.000	s1	7.5	2.130	0.488	0.0186	
60 minute summer	s1	1.003	out	0.5	0.366	0.062	0.0108	
60 minute summer	s1	Infiltration		4.9				
60 minute summer	out	Orifice		0.0				0.0

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.80%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute summer	drive	32	4.766	0.066	10.4	0.1229	0.0000	OK
60 minute summer	s1	39	4.453	0.072	10.6	3.1025	0.0000	OK
60 minute summer	out	38	4.454	0.107	0.6	0.0000	0.0000	OK
Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute summer	drive	1.000	s1	10.4	2.238	0.677	0.0253	
60 minute summer	s1	1.003	out	0.6	0.386	0.070	0.0138	
60 minute summer	s1	Infiltration		5.1				
60 minute summer	out	Orifice		0.0				0.0

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Depth (m)
roof/pave 2 front	0.006	5.00	5.400	0.700
s1			5.300	0.919
out			5.200	0.853

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)
1.000	roof/pave 2 front	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
1.003	s1	out	2.000	0.600	4.381	4.347	0.034	58.8	100	5.08	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)
1.000	1.961	15.4	1.1	0.600	0.819	0.006	0.0	18	1.141
1.003	1.006	7.9	1.1	0.819	0.753	0.006	0.0	25	0.709

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
1.003	2.000	58.8	100	Circular	5.300	4.381	0.819	5.200	4.347	0.753

Link	US Node	Node Type	DS Node	Node Type
1.000	roof/pave 2 front	Junction	s1	Junction
1.003	s1	Junction	out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)	
roof/pave 2 front	5.400	0.700	◦				
			0	1.000	4.700	100	
s1	5.300	0.919	◦	1	1.000	4.381	100
			0	1.003	4.381	100	

Manhole Schedule

Node	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)
out	5.200	0.853	1	1.003	4.347	100
			o			

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node s1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.18000	Invert Level (m)	3.400	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.500	Number Required	1
Porosity	0.95	Pit Length (m)	1.800		

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Depth (m)
roof/pave 2 rear	0.006	5.00	5.400	0.700
s1			5.300	0.919
out			5.200	0.853

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)
1.000	roof/pave 2 rear	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
1.003	s1	out	2.000	0.600	4.381	4.347	0.034	58.8	100	5.08	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)
1.000	1.961	15.4	1.1	0.600	0.819	0.006	0.0	18	1.141
1.003	1.006	7.9	1.1	0.819	0.753	0.006	0.0	25	0.709

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
1.003	2.000	58.8	100	Circular	5.300	4.381	0.819	5.200	4.347	0.753

Link	US Node	Node Type	DS Node	Node Type
1.000	roof/pave 2 rear	Junction	s1	Junction
1.003	s1	Junction	out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)	
roof/pave 2 rear	5.400	0.700	◦				
			0	1.000	4.700	100	
s1	5.300	0.919	◦	1	1.000	4.381	100
			0	1.003	4.381	100	

Manhole Schedule

Node	CL (m)	Depth (m)	Connections	Link	IL (m)	Dia (mm)
out	5.200	0.853	1	1.003	4.347	100
			o			

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node s1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.18000	Invert Level (m)	3.400	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.500	Number Required	1
Porosity	0.95	Pit Length (m)	1.800		

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
roof/pave 1 front	0.006	5.00	5.400	1200	0.700
s1			5.300		0.919
out			5.200		0.853

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)
1.000	roof/pave 1 front	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
1.003	s1	out	2.000	0.600	4.381	4.347	0.034	58.8	100	5.08	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)
1.000	1.961	15.4	1.1	0.600	0.819	0.006	0.0	18	1.141
1.003	1.006	7.9	1.1	0.819	0.753	0.006	0.0	25	0.709

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
1.003	2.000	58.8	100	Circular	5.300	4.381	0.819	5.200	4.347	0.753

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
1.000	roof/pave 1 front	1200	Manhole	Adoptable	s1	Junction
1.003	s1		Junction		out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
roof/pave 1 front	5.400	0.700	1200				
					0	1.000	4.700 100
s1	5.300	0.919			1	1.000	4.381 100
				0	1.003	4.381	100

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
out	5.200	0.853		1	1.003	4.347	100
				°			

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node s1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.18000	Invert Level (m)	3.400	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.500	Number Required	1
Porosity	0.95	Pit Length (m)	1.800		

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	100	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	40	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	20.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	0.600
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
roof/pave 1 rear	0.006	5.00	5.400	1200	0.700
s1			5.300		0.919
out			5.200		0.853

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)
1.000	roof/pave 1 rear	s1	5.000	0.600	4.700	4.381	0.319	15.7	100	5.04	50.0
1.003	s1	out	2.000	0.600	4.381	4.347	0.034	58.8	100	5.08	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)
1.000	1.961	15.4	1.1	0.600	0.819	0.006	0.0	18	1.141
1.003	1.006	7.9	1.1	0.819	0.753	0.006	0.0	25	0.709

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)
1.000	5.000	15.7	100	Circular	5.400	4.700	0.600	5.300	4.381	0.819
1.003	2.000	58.8	100	Circular	5.300	4.381	0.819	5.200	4.347	0.753

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Node Type
1.000	roof/pave 1 rear	1200	Manhole	Adoptable	s1	Junction
1.003	s1		Junction		out	Junction

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
roof/pave 1 rear	5.400	0.700	1200				
				0	1.000	4.700	100
s1	5.300	0.919		1	1.000	4.381	100
				0	1.003	4.381	100

Manhole Schedule

Node	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
out	5.200	0.853		1	1.003	4.347	100

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	20.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	0	0	0
100	40	0	0

Node s1 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.18000	Invert Level (m)	3.400	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.18000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	1.500	Number Required	1
Porosity	0.95	Pit Length (m)	1.800		