

**PROPOSED SIDE AND REAR EXTENSION
8 EDENHURST AVENUE, LIVERPOOL, KNOWSLEY, MERSEYSIDE, L16 2LA
FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY
OCTOBER 2025**

REPORT REF: 1112-01

CLIENT: Robert Parle

ENGINEER: Antony Riozzi – Arbtech
Arbtech,
Unit 3,
Well House Barns,
Chester,
CH4 0DH

Tel: Tel: 01244 747080

Email email@arbtech.co.uk

Report Prepared By:



.....
Antony Riozzi, BEng (Hons)

REGISTRATION OF AMENDMENTS

REV	COMMENTS AND ANY CHANGES	PREPARED BY:
First Issue OCTOBER 2025	For Planning Application	AR

Contents

EXECUTIVE SUMMARY	2
INTRODUCTION.....	3
SITE DESCRIPTION	4
POLICIES	6
FLOOD RISK TO THE SITE	8
FLOOD RISK FROM THE DEVELOPMENT	10
CONSIDERATION OF SUSTAINABLE DRAINAGE SYSTEMS.....	11
DRAINAGE STRATEGY	12
FLOOD MITIGATION MEASURES.....	14
REFERENCES.....	15

APPENDICES

- A. SITE LOCATION PLAN & SITE LAYOUT
- B. UNITED UTILITIES WATER RECORDS
- C. DRAWING 1001-001 – PROPOSED DRAINAGE STRATEGY
- D. ATTENUATION VOLUME CALCULATIONS

EXECUTIVE SUMMARY

Flood Risk

1. This Flood Risk Assessment has been carried out in accordance with the requirements of the National Planning Policy Framework (Ref. 4) and its companion document the National Planning Practice Guidance (Ref. 17).
2. The Environment Agency flood maps show that the site is located within Flood Zone 2, where there is a medium probability of fluvial flooding (annual probability between 1 in 100 and 1 in 1,000). The proposed development (rear and side extension) is classified as “less vulnerable”, making it compatible with this flood zone.
3. The vulnerability of the development to flooding from other sources, including pluvial (surface water), sewerage, groundwater, and artificial water bodies, has been assessed. All of these sources are considered low risk, particularly with the implementation of mitigation measures. Proposed measures include retrofitting SuDS pods to new downpipes to manage runoff from the increased impermeable area.

Summary of Flood Risk to the Development

Location/Flood Risk	Access and Parking	Proposed Development
Fluvial (Main River)	Medium (Flood Zone 2)	Medium (Flood Zone 2)
Pluvial/Surface Water	Low	Low
Groundwater	Very Low	Very Low
Sewerage	Very Low	Very Low
Artificial Water Bodies	Low	Low

INTRODUCTION

1.1 This Flood Risk Assessment (FRA) has been prepared for the proposed rear and side extension at 8 Edenhurst Avenue, Liverpool, Knowsley, Merseyside, L16 2LA. A site location plan and proposed layout are provided in Appendix A.

1.2 This FRA has been carried out in accordance with the requirements of the National Planning Policy Framework (NPPF, Ref. 4) and its companion document the National Planning Practice Guidance (NPPG, Ref. 17).

1.3 Reference has been made to the Environment Agency's flood maps and the Environment Agency Standing Advice for Local Planning Authorities (Development and Flood Risk – England, Ref. 5).

1.4 The purpose of this report is to provide relevant information to satisfy the requirements of these conditions, including consideration of fluvial, pluvial, groundwater, sewerage, and artificial water body flood risk.

1.5 The assessment has been prepared using our best engineering judgement. However, there are levels of uncertainty inherent in historical data and predictive methods. This report is based on the following information:

- British Geological Survey (BGS) mapping
- Environment Agency Flood Zone Maps
- Local site observations

1.6 All comments and opinions contained in this report, including any conclusions, are based on the information available to ARB at the time of writing. Conclusions may differ if further information becomes available, or if the information used is found to be inaccurate, incomplete, or misleading. ARB accepts no liability in such cases.

1.7 This report has been prepared for the benefit of the client named above and relevant statutory authorities involved in approvals for the proposed development. Third parties should not use or rely upon the contents of this report without prior written consent from ARB.

1.8 ARB accepts no responsibility or liability for:

- a. Consequences of this report being used for any purpose other than that for which it was commissioned; or
- b. Reliance on this document by any third party without ARB's written approval.

SITE DESCRIPTION

Site Location and Surroundings

2.1 The site is located within a residential area at 8 Edenhurst Avenue, Liverpool, Knowsley, Merseyside, L16 2LA. The site comprises the rear and side garden area of the existing dwelling. Surrounding properties are predominantly residential. There are no significant watercourses within immediate proximity. Refer to Appendix A for a site location plan and proposed layout.

Site Description

2.2 The proposed development area is located within the curtilage of the existing dwelling. The site currently comprises maintained garden areas and some hardstanding. The proposal includes a rear and side extension to the existing dwelling, with associated alterations to the existing hardstanding areas. Existing access is retained from Edenhurst Avenue.

2.3 The site lies within the administrative boundary of Knowsley Metropolitan Borough Council.

Topography

2.4 No detailed topographical survey was available at the time of writing this report; the site is generally level with a gentle slope away from the existing dwelling.

Geology

2.5 The British Geological Survey (BGS) mapping indicates the site is underlain by the Wilmslow Sandstone Formation (sandstone, Triassic period).

2.6 Superficial deposits comprise Till, Devensian – Diamicton. These are sedimentary deposits from the Quaternary period (approximately 116–11.8 thousand years ago).

Hydrology and Hydrogeology

2.7 The site lies on a low permeability sandstone bedrock with diamicton superficial deposits. Groundwater flooding is considered unlikely in this area according to the Environment Agency Long Term Flood Risk data.

2.8 Flooding from nearby rivers or streams is limited; the site is located in Flood Zone 2.

2.9 Surface water runoff from the site is currently managed via existing permeable areas and garden drainage.

Existing Drainage

2.10 United Utilities (UU) is responsible for the operation and maintenance of public sewers within the Knowsley area.

2.11 The nearest public sewer is a combined and surface water sewer located in Edenhurst Avenue, adjacent to the site boundary.

2.12 Copies of UU sewer record plans are included in Appendix B.

Artificial Water Bodies and Reservoirs

2.13 Flooding from reservoirs is considered unlikely in this area. Large reservoirs in England are

regulated under the Reservoirs Act 1975 (updated 2015) and are generally maintained to strict safety standards.

Surface Water Management

2.14 To mitigate increased runoff from the proposed extension, SuDS pods are proposed for the new downpipes, which will reduce the additional impermeable area and promote infiltration where feasible.

POLICIES

National Planning Policy Framework

3.1 The National Planning Policy Framework (NPPF, Ref. 4) sets out the Government's objectives for the planning system, including a presumption in favour of sustainable development. It promotes sustainable patterns of development, which avoid flood risk and take account of climate change impacts.

3.2 The NPPF requires that flood risk is considered at all stages of the planning process, ensuring that development is directed away from areas at highest risk. Reference should also be made to the National Planning Practice Guidance (NPPG, Ref. 17), which provides additional guidance on flood risk.

3.3 For the purposes of planning, areas at risk from all sources of flooding are considered. For fluvial and tidal flooding, this principally includes Flood Zones 2 and 3. Areas within Flood Zone 1 may also be considered at risk if the Environment Agency has identified critical drainage issues.

3.4 Key elements from the NPPF include:

- Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas of highest risk.
- Development should not be permitted if there are reasonably available sites in areas with lower probability of flooding.
- Local planning authorities should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk if informed by a site-specific FRA.

Flood and Water Management Act 2010

3.5 The Flood and Water Management Act 2010 (Ref. 14) provides legislation to improve flood risk management and secure water supplies in England and Wales. It promotes sustainable drainage, clarifies responsibilities for managing flood risk, and helps resolve misconnections to sewers.

3.6 The Act assigns new responsibilities to local authorities, which act as Lead Local Flood Authorities (LLFAs). Their responsibilities include:

- Preparing and maintaining a strategy for local flood risk management;
- Maintaining a register of assets affecting flood risk;
- Investigating significant local flooding incidents;
- Issuing consents for alterations to ordinary watercourses;
- Leading emergency planning and recovery following flood events.

Planning Practice Guidance on Flood Risk & Coastal Change – 2015

3.7 Guidance on sustainable drainage systems (SuDS) came into effect on 6 April 2015. Local planning policies and planning applications for major developments are expected to ensure that SuDS are implemented unless proven inappropriate. LLFAs are statutory consultees.

3.8 Local planning authorities are expected to:

- Consult the relevant LLFA on surface water management;
- Ensure proposed minimum operational standards are appropriate;

- Secure arrangements for ongoing maintenance over the lifetime of the development through planning conditions or obligations.

3.9 SuDS should be designed to ensure that maintenance and operation requirements are **economically proportionate**.

Sustainable Drainage Systems – Non-statutory Technical Standards for SuDS – 2015

3.10 The non-statutory technical standards published by Defra apply to systems draining surface water from housing, non-residential, or mixed-use developments throughout the lifetime of the development. These standards should be used alongside the NPPF and Planning Practice Guidance on Flood Risk & Coastal Change.

FLOOD RISK TO THE SITE

Fluvial Sources

4.1 The site has been assessed using Environment Agency (EA) flood maps, which provide guidance on fluvial and tidal flood risk. The results are shown in Figure 1.

4.2 The Environment Agency flood maps indicate that the site is located within Flood Zone 2, which has a medium probability of fluvial flooding (annual probability between 1 in 100 and 1 in 1,000).

4.3 The proposed development is a rear and side extension to an existing residential dwelling. Using Table 3 of the National Planning Practice Guidance (Ref. 17), the development is classified as “less vulnerable”, which is appropriate for Flood Zone 2.

4.4 In accordance with Table 3 of the National Planning Practice Guidance, the development is sequentially acceptable and an exception test is not required.

Table 1: Flood Risk Vulnerability and Flood Zone Compatibility (NPPG, Ref. 17)

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

Key: ✓ Development is appropriate; X Development should not be permitted.

Pluvial/Surface Water Flooding

4.5 Pluvial or surface water flooding occurs when rainfall exceeds the capacity of natural and engineered drainage systems. This may occur in high-intensity, short-duration storms in urban areas or long-duration, medium-intensity rainfall in rural areas where saturated ground limits infiltration.

4.6 Environment Agency Risk of Flooding from Surface Water mapping indicates that the site is **not at risk** of surface water flooding (Figure 2). Local topography directs overland flow away from the site, roughly to the south-west.

Sewer Sources

4.7 United Utilities (UU) records indicate that the nearest surface water and combined sewer is within Edenhurst Avenue. The sewer is lower than the proposed extension, and the land falls away from the site, so there is no risk of sewer flooding.

Tidal/Coastal Flooding

4.8 The site is not at risk from tidal or coastal flooding.

Groundwater Sources

4.9 According to the Environment Agency Long Term Flood Risk data, the site is unlikely to be at risk from groundwater flooding.

Artificial Water Bodies

4.10 Flooding from reservoirs is considered low risk. The Reservoirs Act 1975 (updated 2015) regulates large reservoirs in England, Wales, and Scotland, which are maintained to strict safety standards.

Surface Water Management / Mitigation

4.11 To manage runoff from the increased impermeable area, SuDS pods will be retrofitted to the new downpipes, reducing surface water runoff and supporting infiltration where possible.

FLOOD RISK FROM THE DEVELOPMENT

5.1 A site-specific Flood Risk Assessment, as outlined in the National Planning Practice Guidance (Ref. 17), should consider the following off-site impacts:

- How the proposed development and any flood mitigation measures will not increase flood risk elsewhere.
- How runoff from the completed development will be managed to avoid impacts on surrounding land or properties.
- Whether the development provides opportunities to reduce flood risk elsewhere.

5.2 The main flood risk arising from the proposed development is likely to be surface water runoff.

Existing Discharges

5.3 The site currently comprises garden areas and some hardstanding associated with the dwelling. The proposed extension will increase the impermeable area by approximately 0.0051 ha.

Climate Change

5.4 Environment Agency guidance on Climate Change Allowances supports the NPPF by providing precautionary factors for rainfall, river flow, and other flood risk parameters.

5.5 For small and urban catchments, the recommended peak rainfall intensity allowances are summarised in Table 3.

Table 3 – Peak Rainfall Intensity Allowances (1961–1990 baseline)

Time Period	Central	Upper End
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2010–2039	5%	10%
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2040–2059	10%	20%
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2060–2115	20%	40%
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5.6 For the assumed 100-year lifetime of the development, a 40% allowance for climate change has been adopted for peak rainfall intensities.

Proposed Discharges

5.7 The proposed development will result in approximately 0.016 ha of impermeable area including the existing dwelling, an increase of 0.0051ha.

5.8 Surface water drainage for the development should ensure that volumes and peak flow rates leaving the site do not exceed pre-development levels.

CONSIDERATION OF SUSTAINABLE DRAINAGE SYSTEMS

6.1 Surface water from the developed site should, as far as practicable, be managed sustainably to mimic pre-development runoff.

6.2 Part H of the Building Regulations 2002 recommends that surface water runoff should be discharged in the following order of priority:

- a) An adequate soakaway or other infiltration system; if not practicable,
- b) A watercourse; if not practicable,
- c) A public sewer.

6.3 The preferred method of infiltration requires verification of ground soakage capacity and confirmation of no contamination. Where infiltration is not viable, soakaway testing (BRE 365) or other site investigation evidence must be provided. In such cases, discharge to the nearest watercourse or public sewer may be considered.

6.4 BGS mapping indicates that the site overlying geology is Till, Devensian – Diamicton and therefore unlikely to be suitable subject to testing.

6.5 No ordinary watercourses are present within the sites boundary and therefore not a suitable means of surface water disposal.

6.6 As part of the drainage strategy, SuDS pods will be retrofitted to new downpipes to control runoff from the proposed extension and reduce peak flow rates from the site. This will follow the current discharge points for the property and existing dwelling.

DRAINAGE STRATEGY

Surface Water

7.1 The surface water strategy aims to manage runoff from the developed site in a sustainable manner, mimicking pre-development flows and limiting runoff to greenfield rates for storms up to the 1 in 100 year event, including a 40% climate change allowance.

7.2 Runoff from the extension will be collected via 4 sudpods. The attenuation system is designed to store runoff from storms up to the 1 in 100 year (+40% climate change) event.

7.3 The final discharge point will be to utilise the existing drainage system on site.

7.4 Current flows from the existing building with an impermeable area of 0.0055ha has been calculated using causeway flow and the runoff from 4 sudspods calculated to compare:

Storm Event	Pre Development (Uncontrolled Runoff) l/s	Post Development (4x SUDS PODS) l/s
1in1	0.7	0.4
1in30	2.3	0.4
1in100 + 40% CC	4.0	0.6

7.5 The proposed surface water drainage layout is shown on drawing 1001-001 (Appendix C). The SUDs strategy reduced run off from 4.0 to 2.4 l/s being a 40% reduction.

7.6 The drainage design and calculations provided are for strategy purposes only and will be refined as part of the detailed design. SUDs PODs calculation is provided in Appendix D. These are based on a quarter of the impermeable area per pod.

SuDS Pollution Control

7.7 CIRIA Manual C753 (Ref. 6) provides guidance on pollution mitigation for different land uses. Residential roof runoff requires low treatment, while hardstanding areas such as private drives require slightly higher treatment.

7.8 SuDS components will be designed to meet or exceed the pollution mitigation indices set out in Tables 26.2 and 26.3 of CIRIA C753. Likely components include:

- SUDsPODs retrofitted and included on the extension and existing building.

7.9 The proposed system provides adequate treatment to meet the required pollution indices for a residential development.

Foul Water

7.10 Foul drainage will be collected via a dedicated sewer and discharged to the existing foul sewer network. This will utilise the existing sewer connection on site.

Maintenance

7.12 The on-site drainage system will be designed in accordance with Building Regulations and remain

a private asset of the landowner. Regular inspection and maintenance will ensure the system continues to operate effectively over the lifetime of the development.

FLOOD MITIGATION MEASURES

8.1 Existing surface water overland flow will be allowed to follow the natural topography of the site. The proposed extension is located outside of the existing surface water flow paths and in an area identified as having no surface water flood risk.

8.2 Flood risk management measures for the development will include:

- The installation of a surface water drainage system to intercept runoff from roof and hardstanding areas. This will reduce the risk to the building and limit overland flow across the site.
- Finished floor levels of the extension will be set at least 150 mm above adjacent external ground levels to reduce the risk of flooding.
- External ground levels will be designed to slope away from the building, ensuring overland flow is directed away from vulnerable areas. Where flush thresholds are required, ramps or other suitable measures will prevent water ingress.

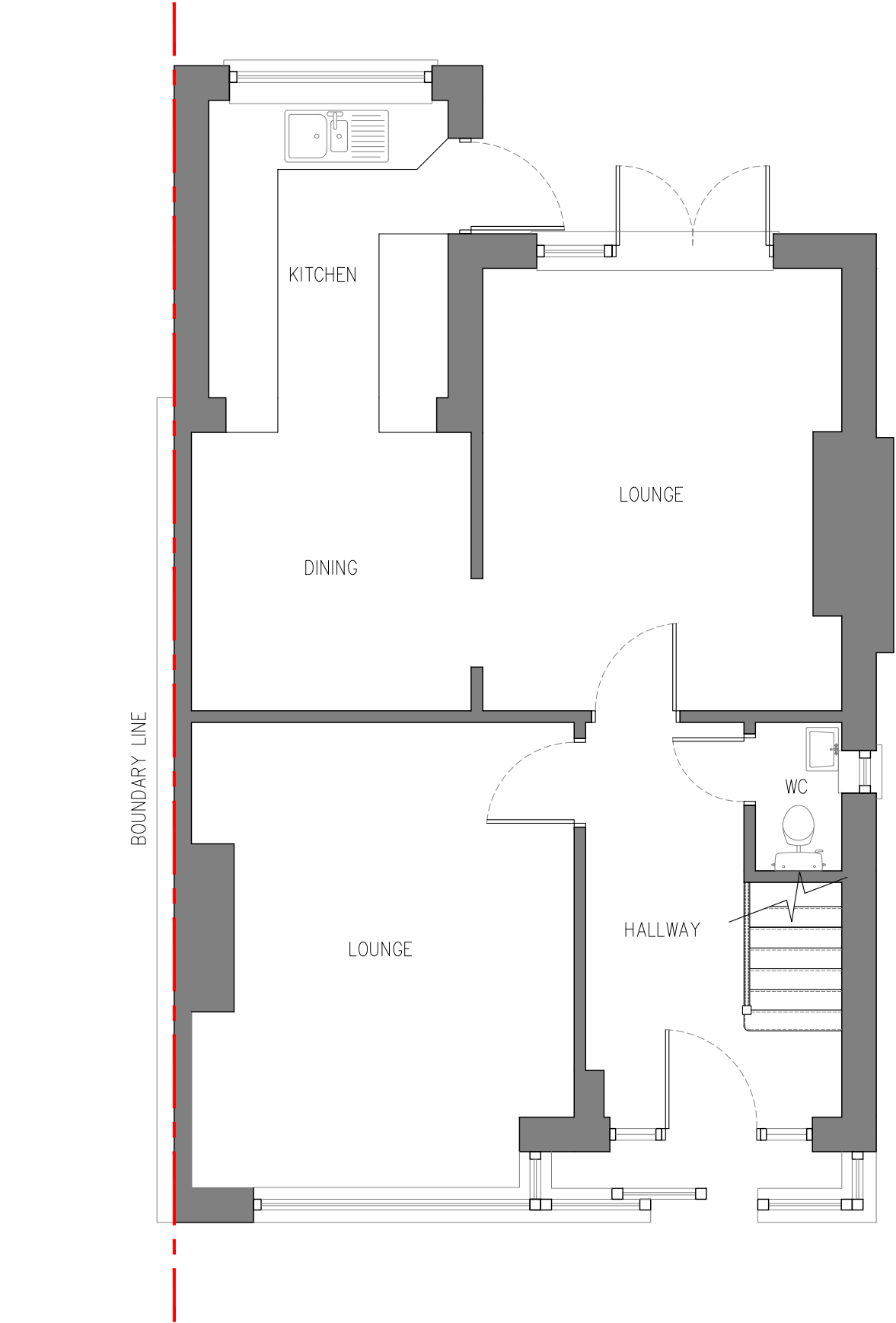
REFERENCES

9.1 The following documents have been referred to in this report:

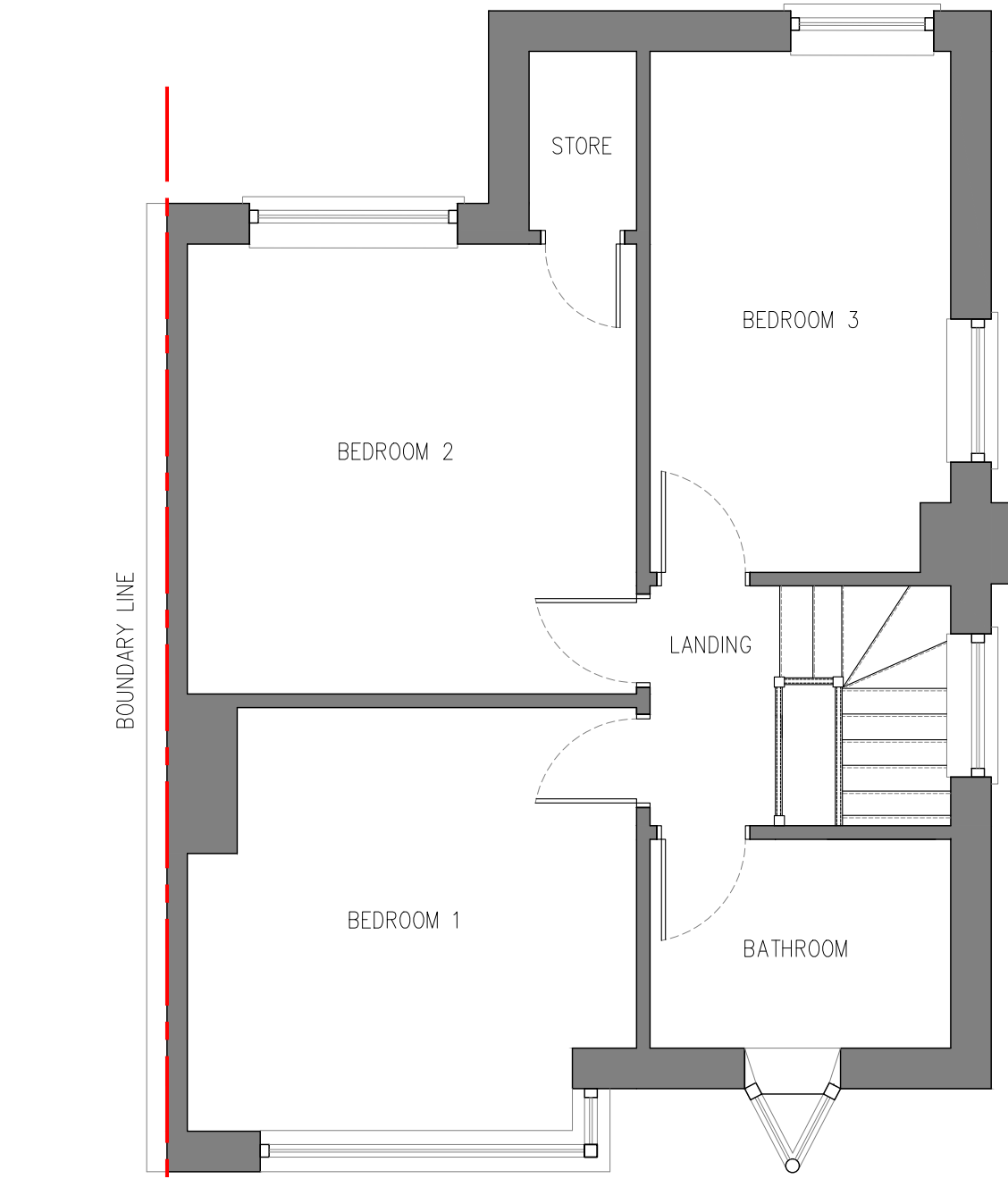
1. The Building Regulations 2000, Approved Document H
2. Sewers for Adoption, 7th Edition
3. Civil Engineering Specification for the Water Industry, 7th Edition
4. National Planning Policy Framework, March 2012
5. Environment Agency Flood Risk Standing Advice
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8. British Geological Survey – Geology of Britain Viewer,
<http://mapapps.bgs.ac.uk/geologyofbritain/home.html>
9. Design and Analysis of Urban Storm Drainage – The Wallingford Procedure, Vol.1
10. Institute of Hydrology Report No.124 – Flood Estimation for Small Catchments
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14. Flood and Water Management Act 2010
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17. Planning Practice Guidance – Flood Risk & Coastal Change, March 2015
18. Environment Agency – Flood Risk Assessments: Climate Change Allowances

APPENDIX A

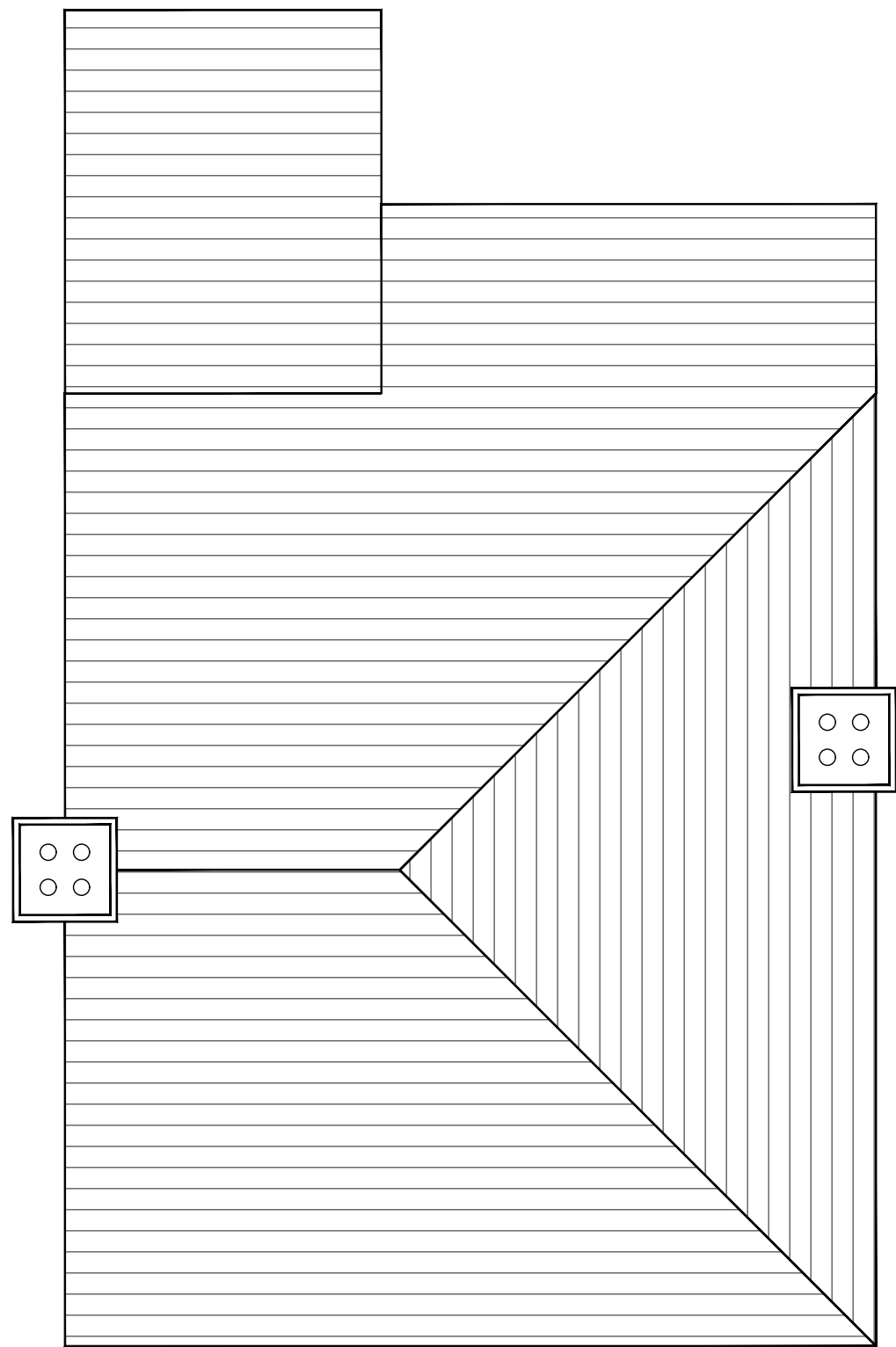
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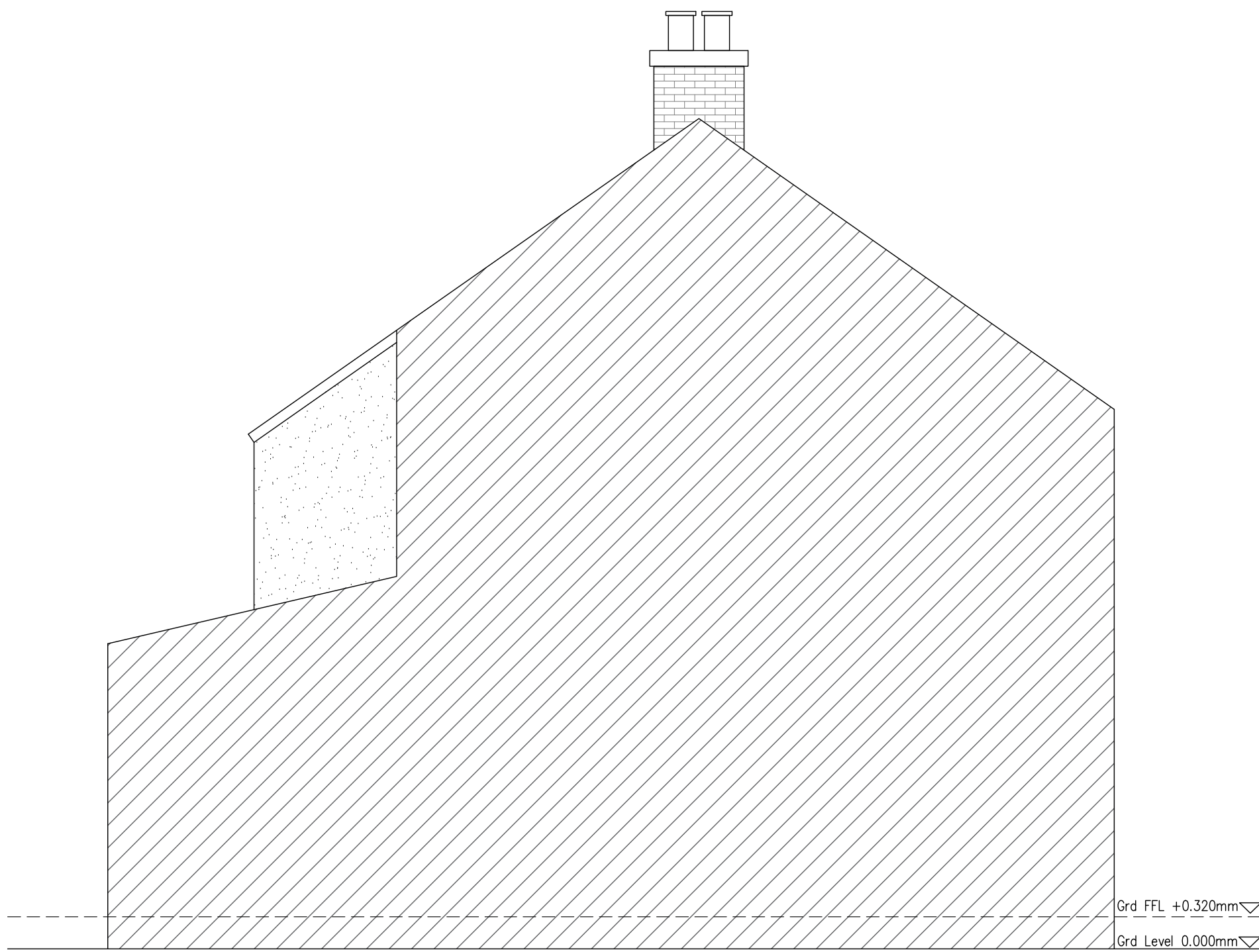
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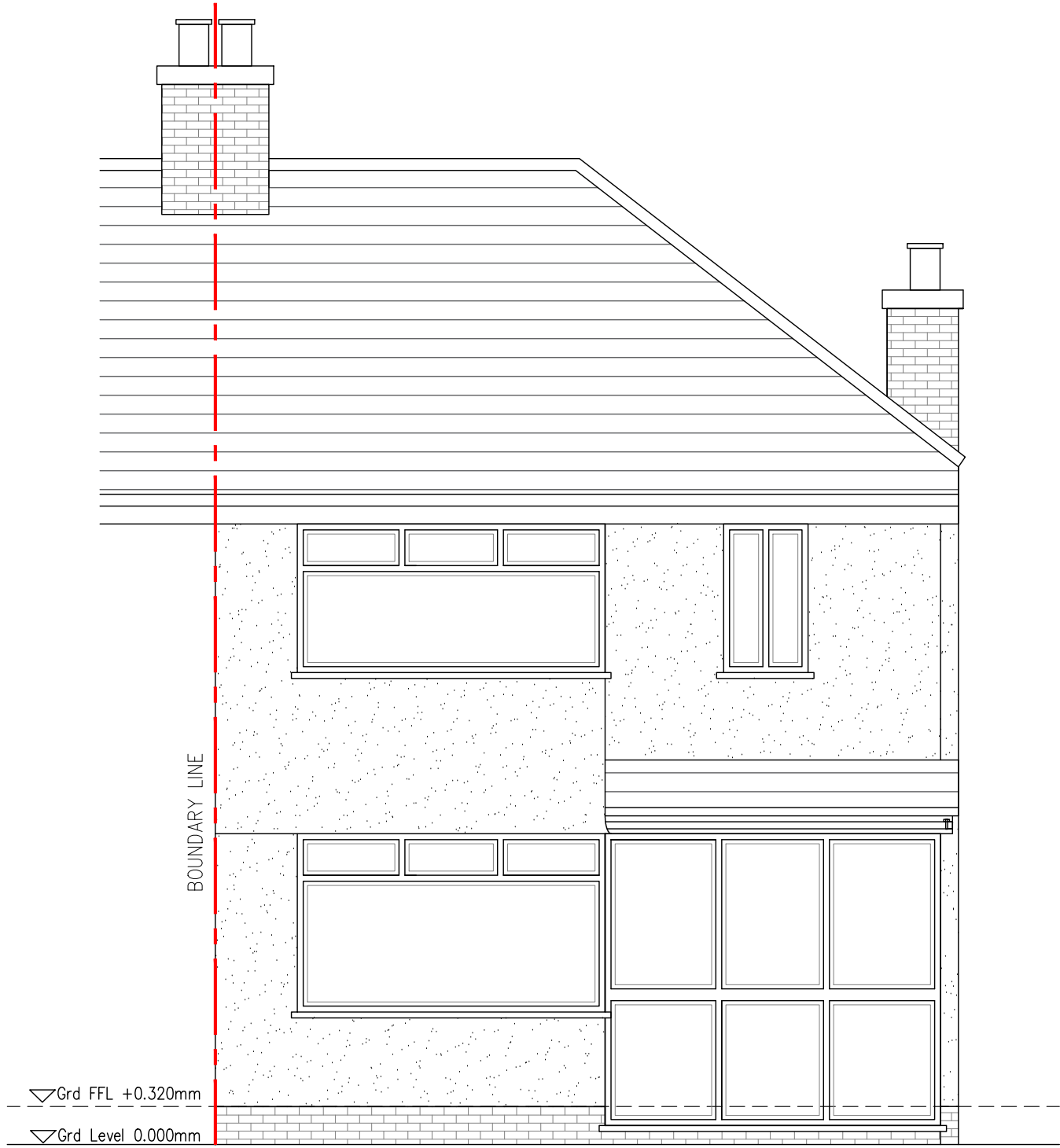
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EXISTING ROOF PLAN | SCALE 1:50



EXISTING SIDE ELEVATION | SCALE 1:50



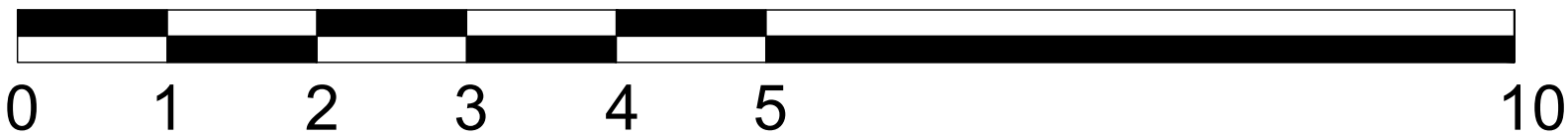
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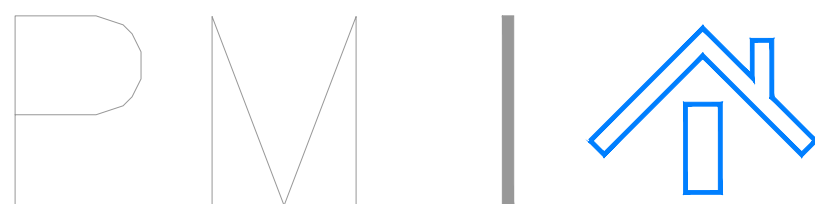
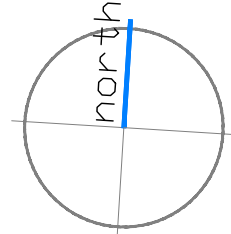
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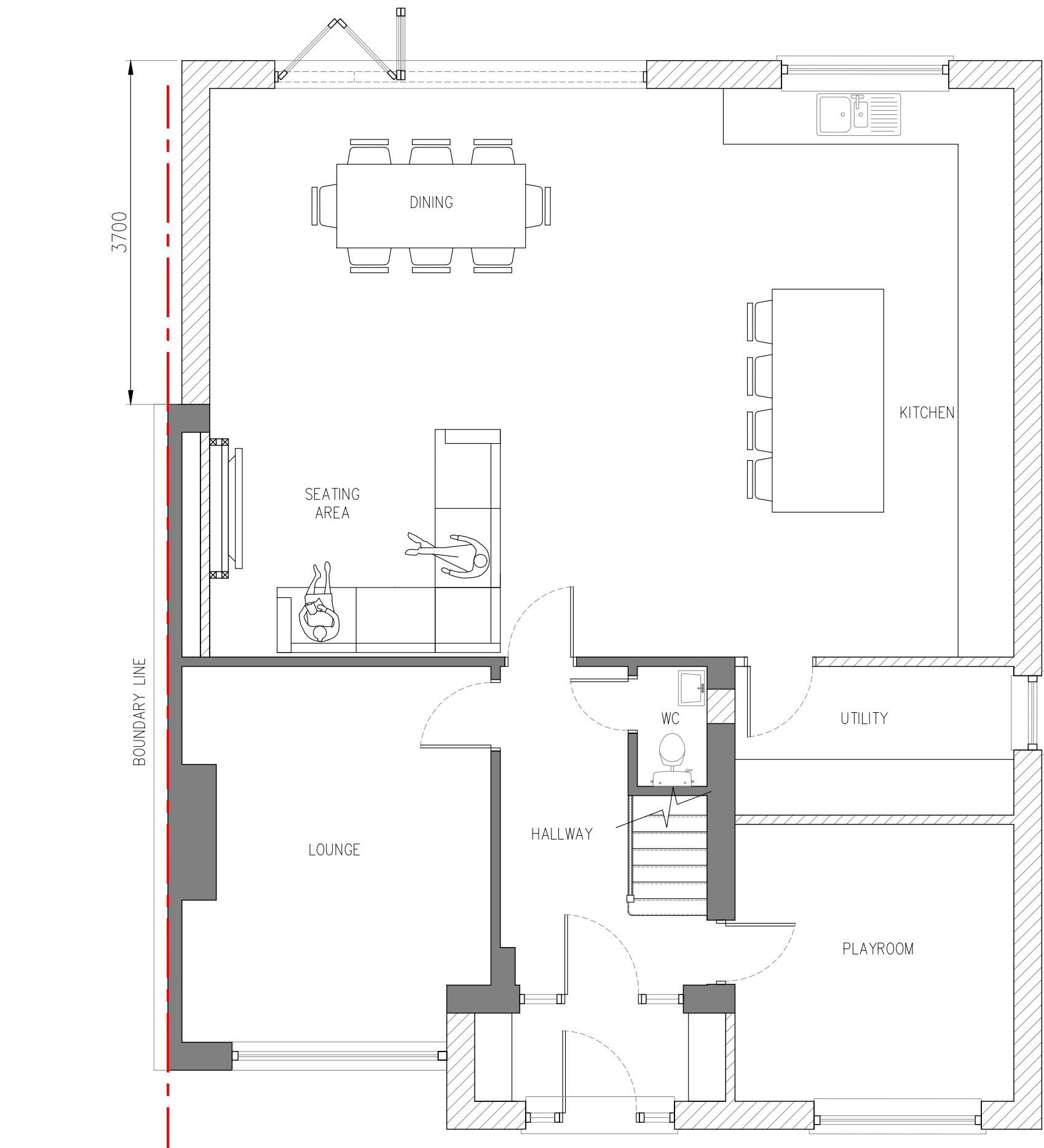
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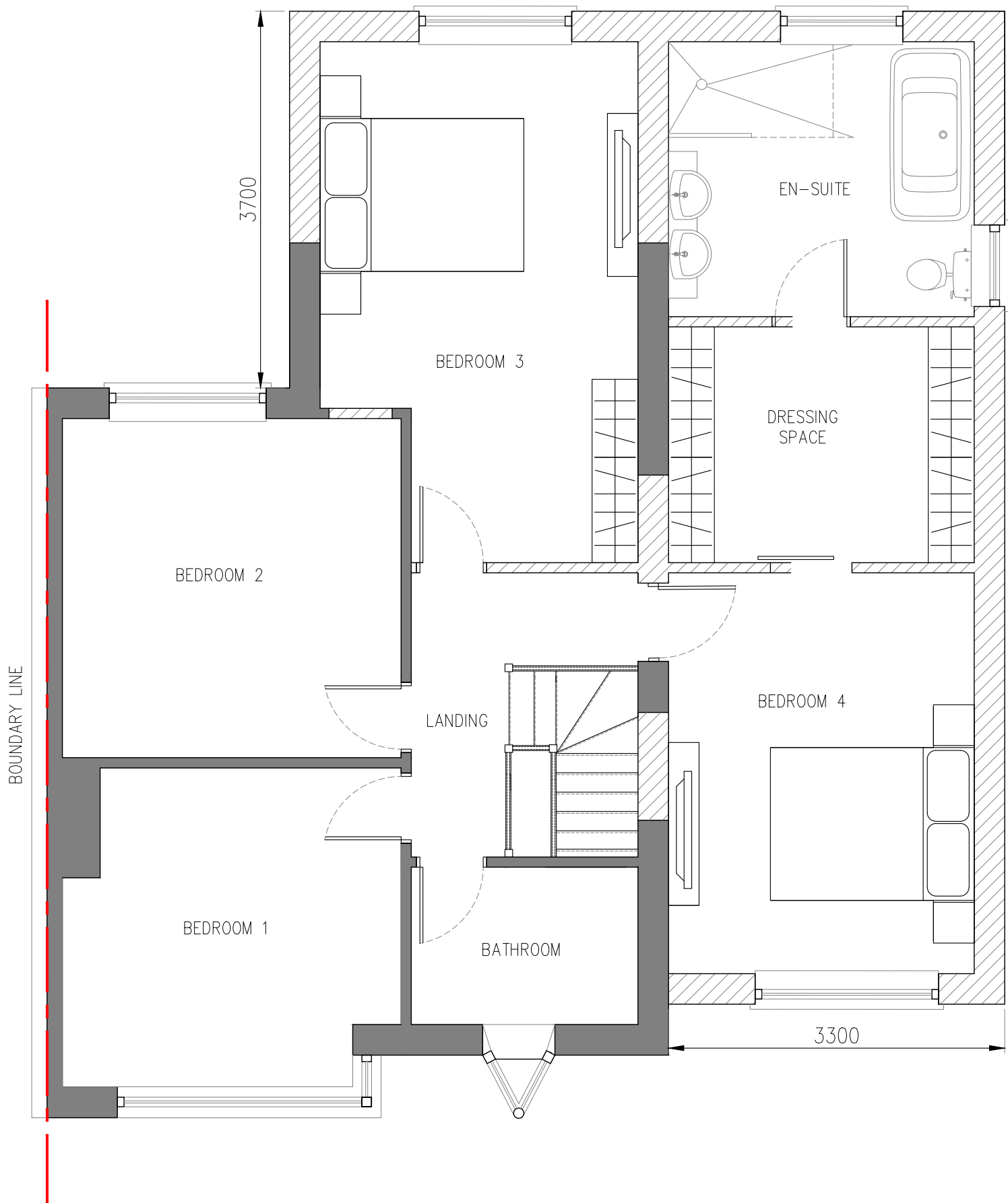
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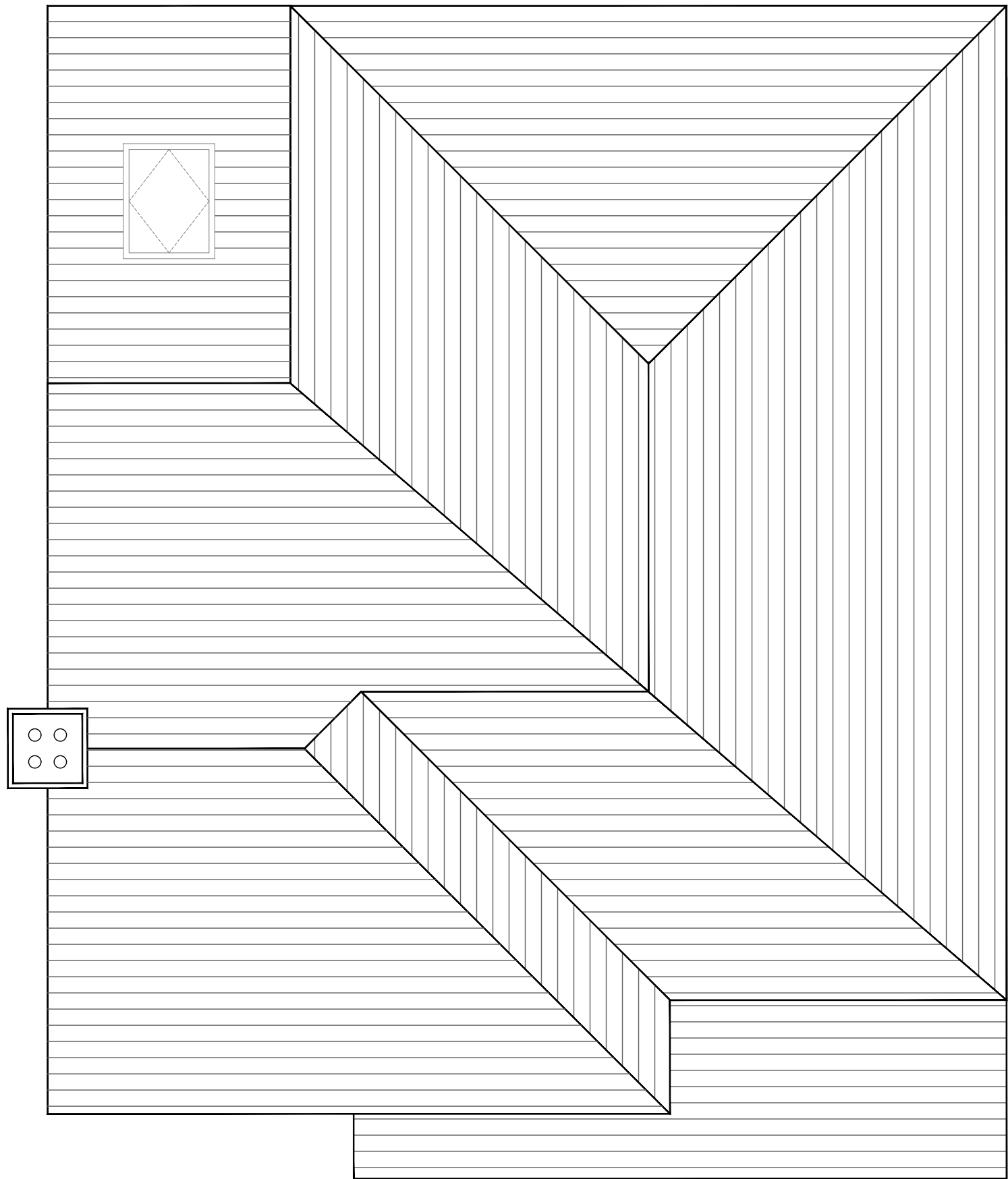
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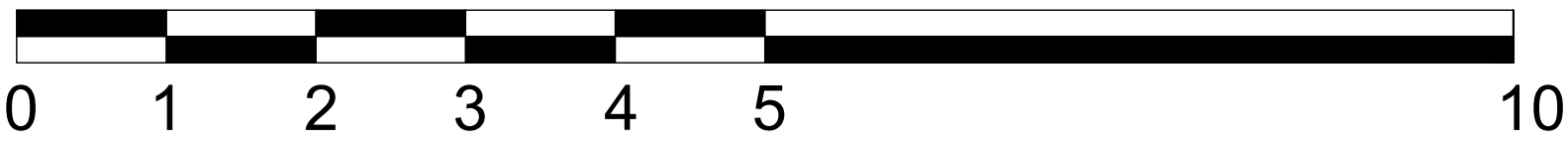
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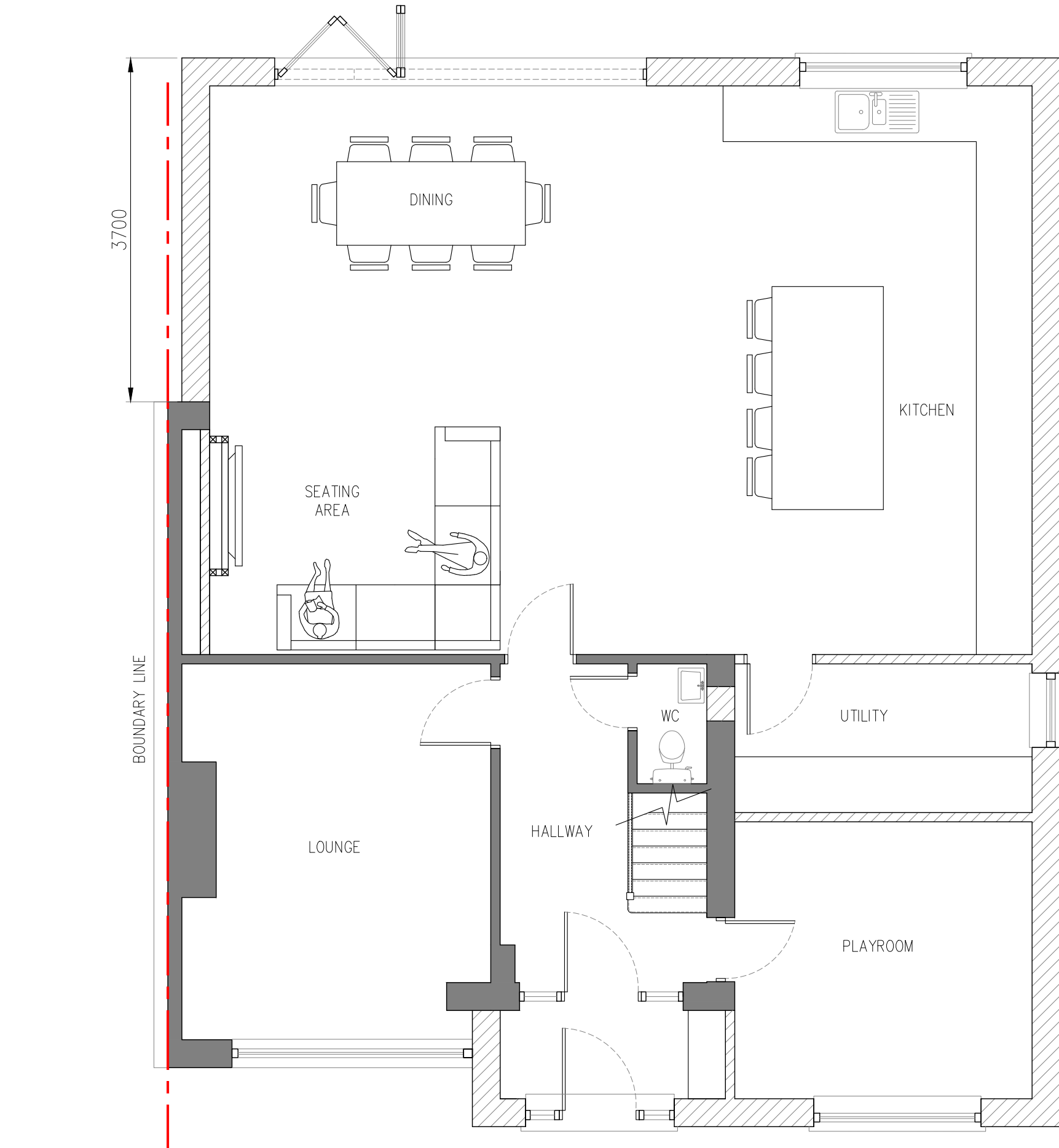
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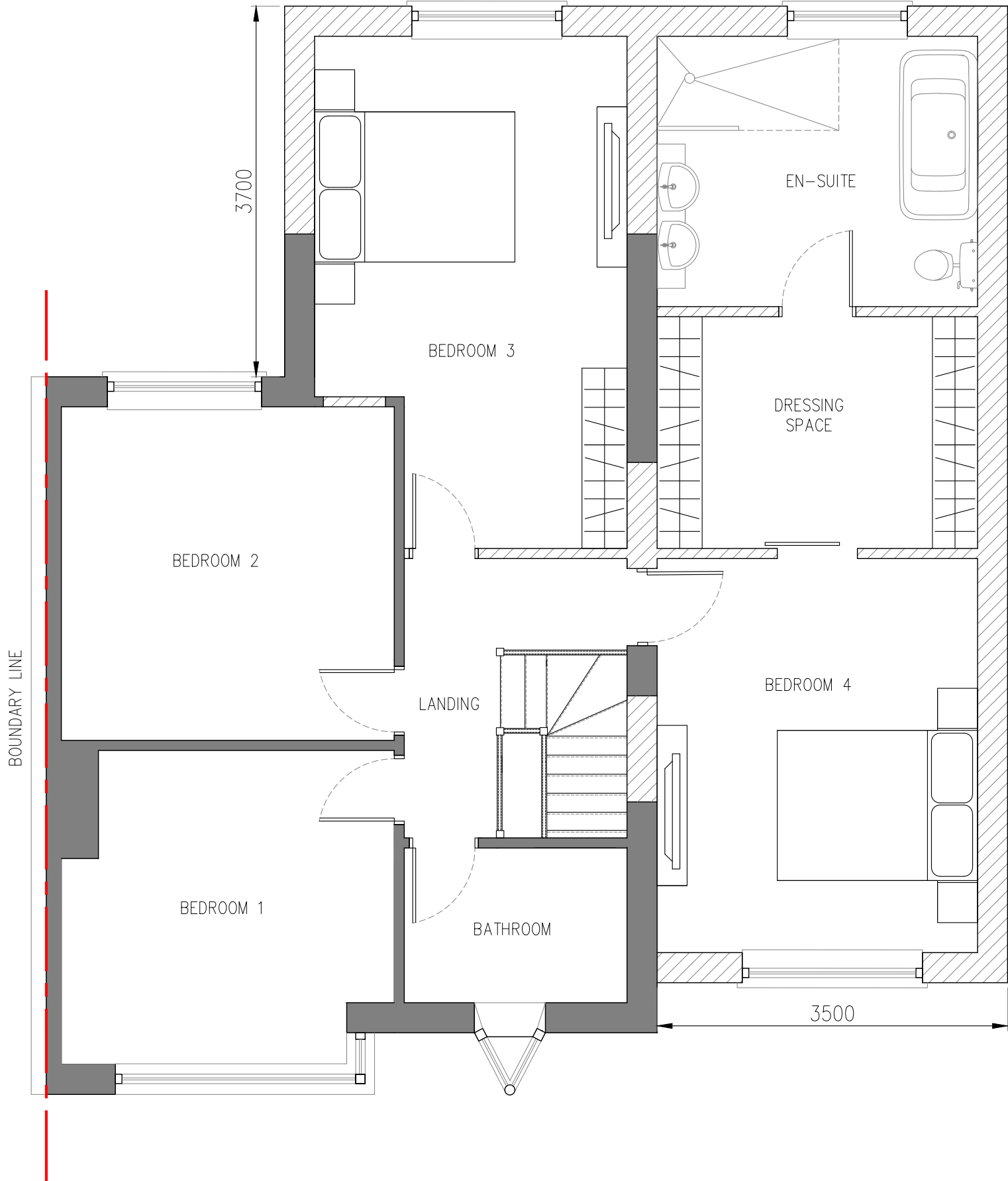
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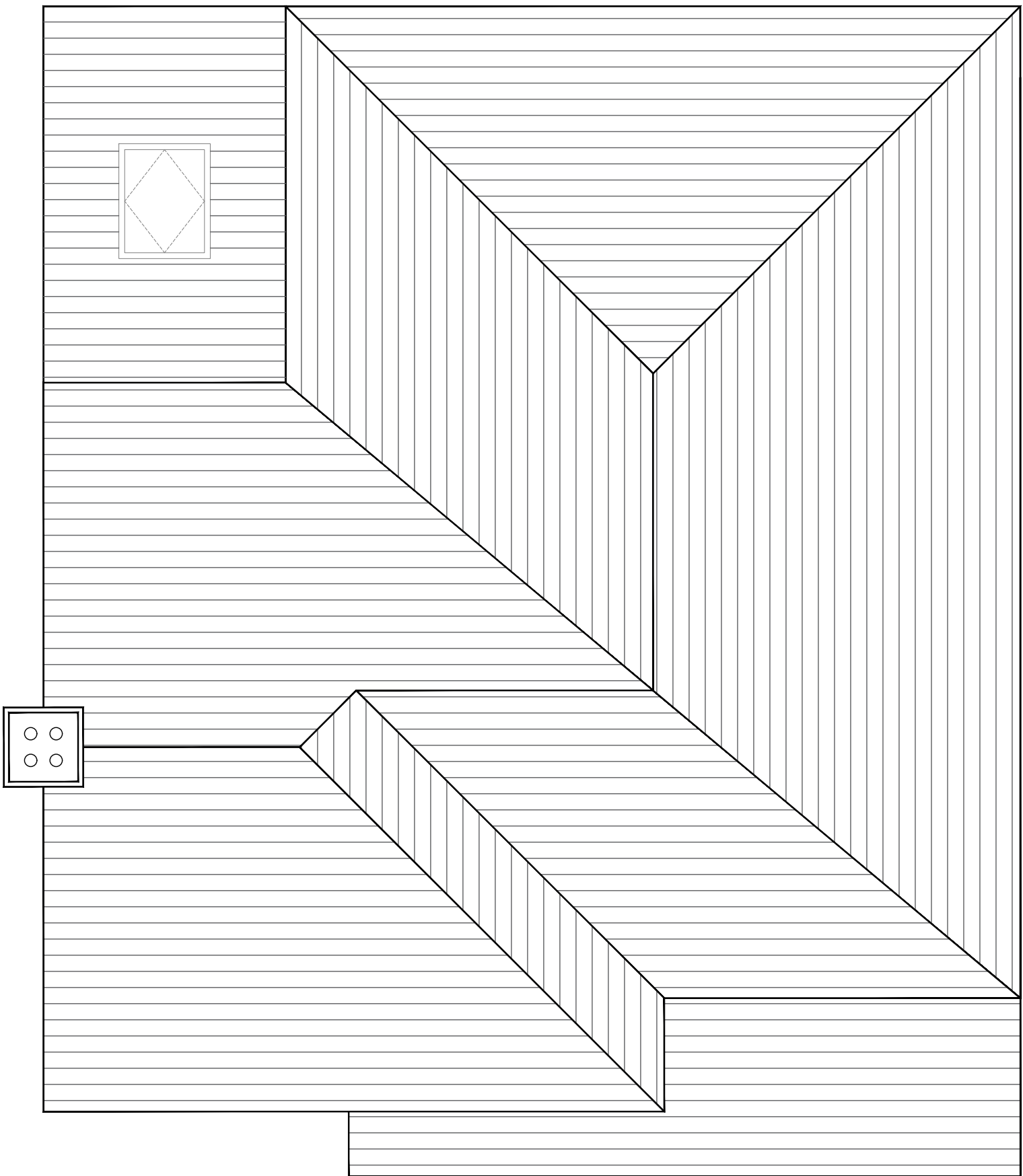
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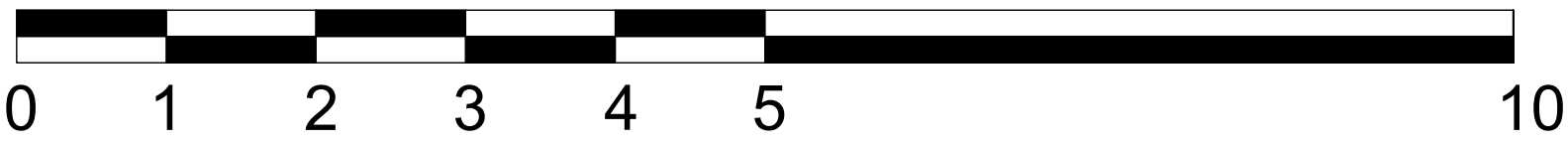
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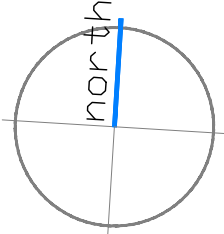
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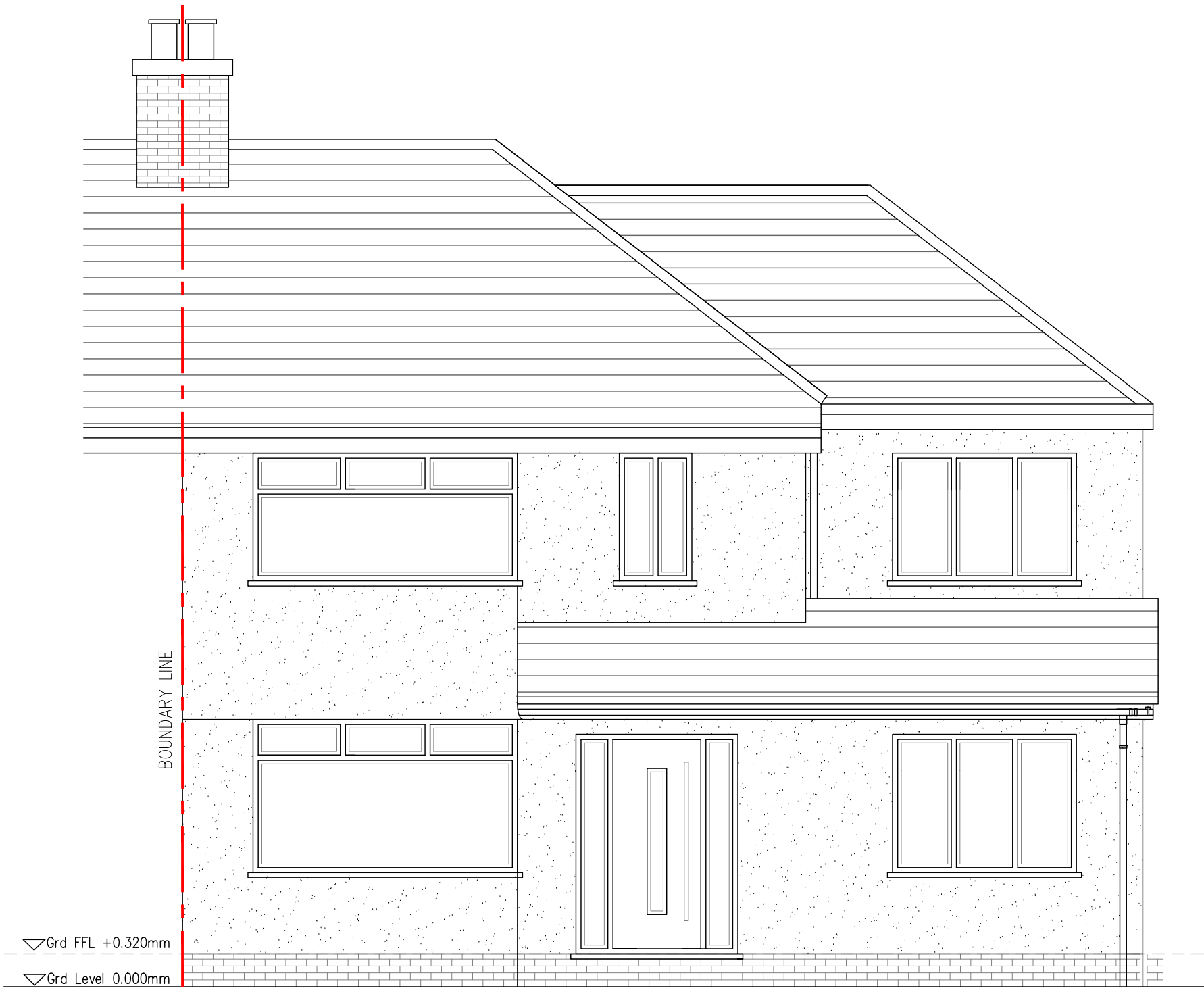
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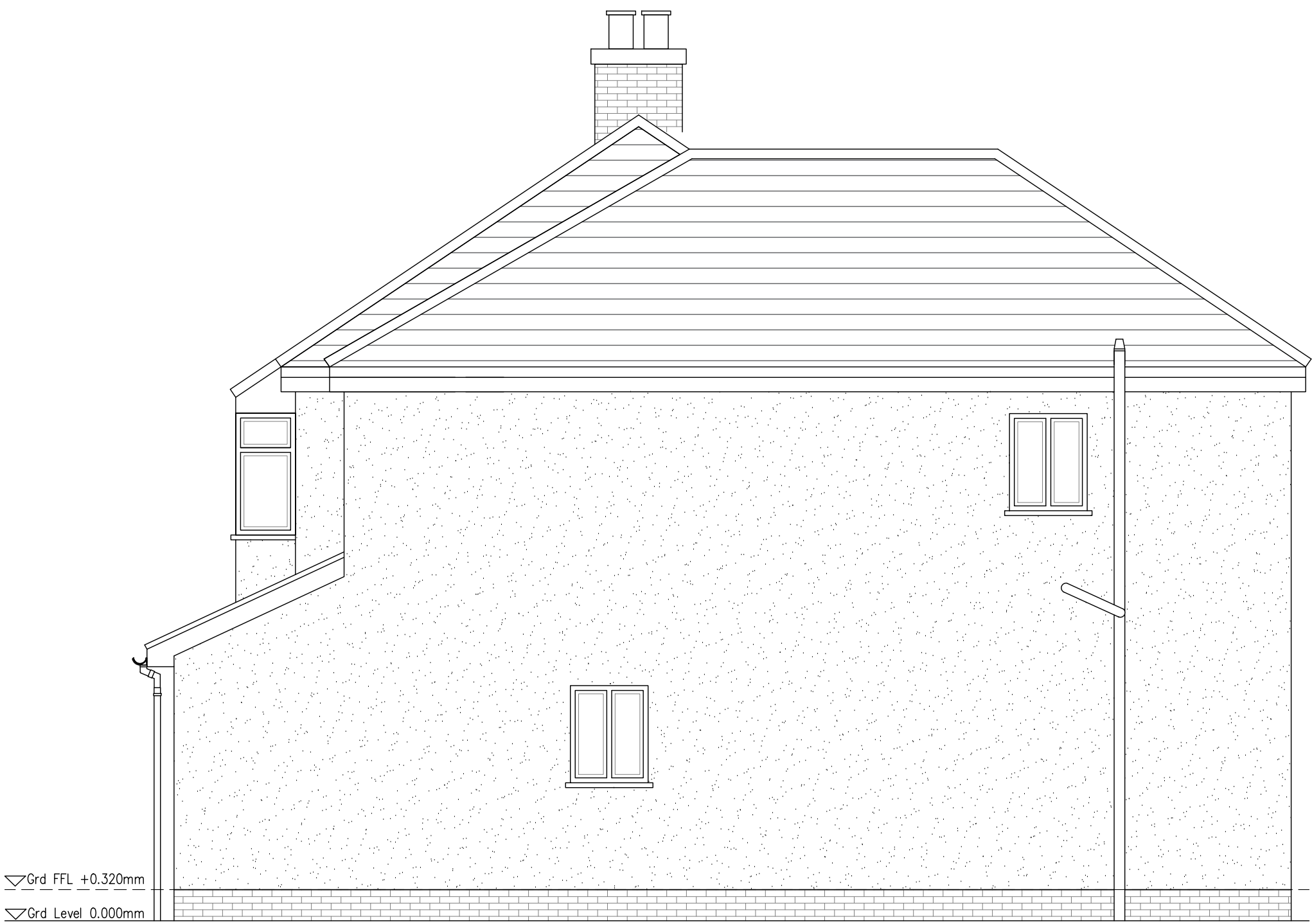
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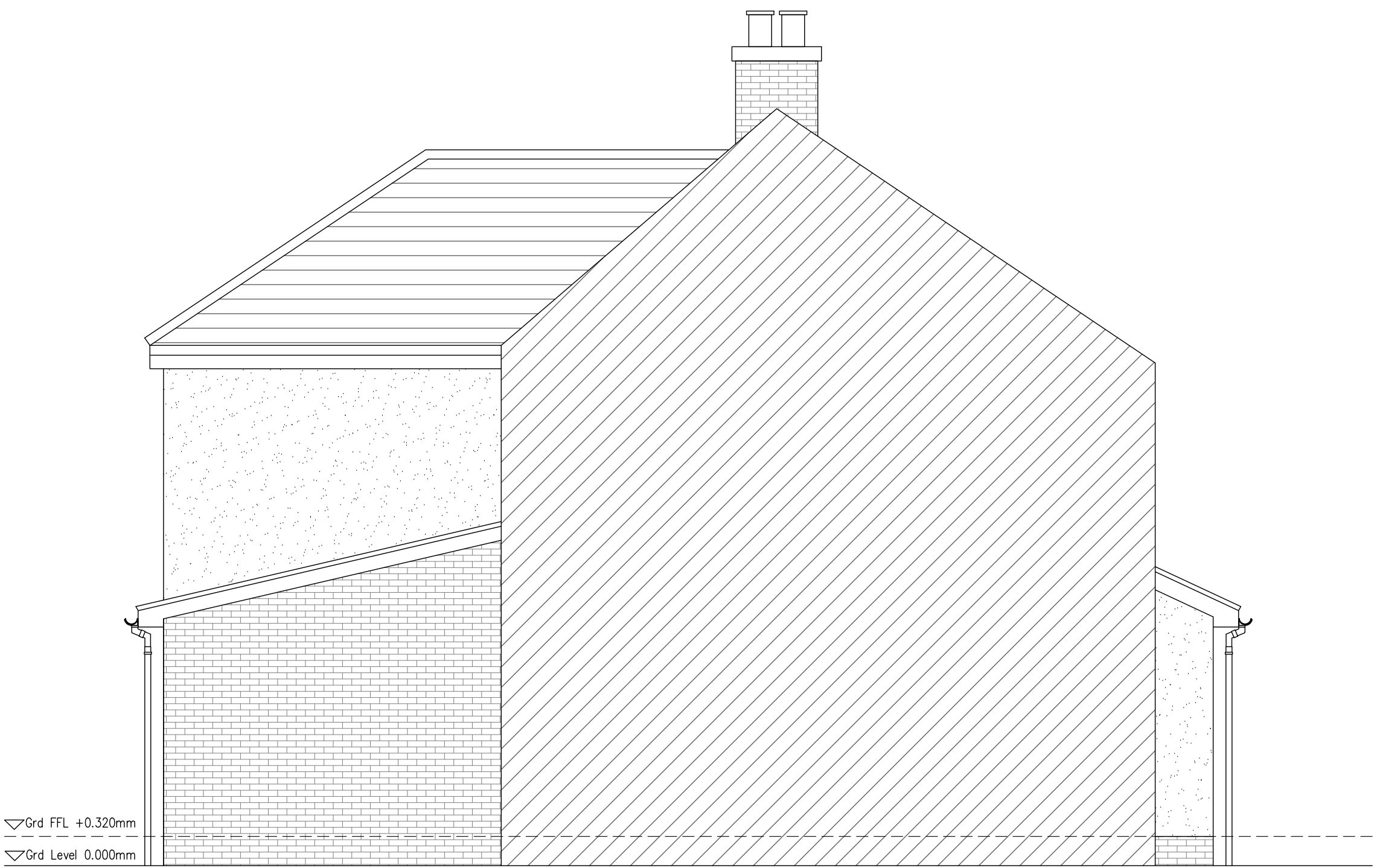
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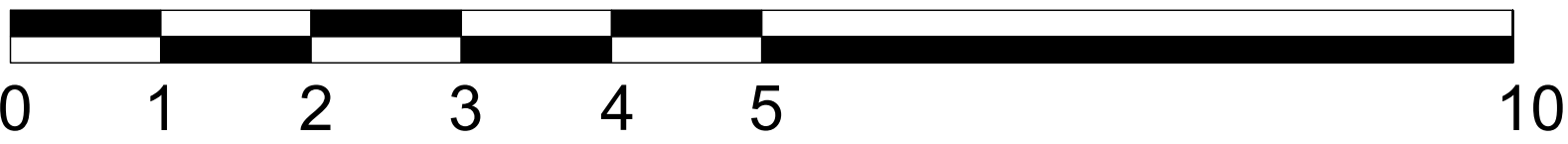
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PROPOSED REAR ELEVATION | SCALE 1:50



PROPOSED SIDE ELEVATION | SCALE 1:50



SCALE BAR 1:50

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L16 2LA

CLIENT: MR SCHOFIELD

Drawing Title
PROPOSED ELEVATIONS

Drawing No.
A103

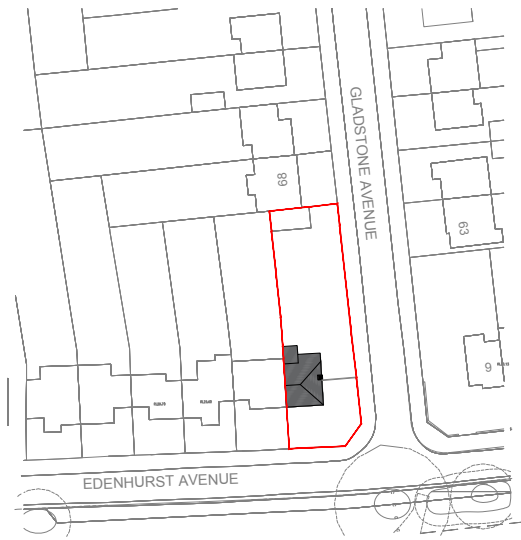
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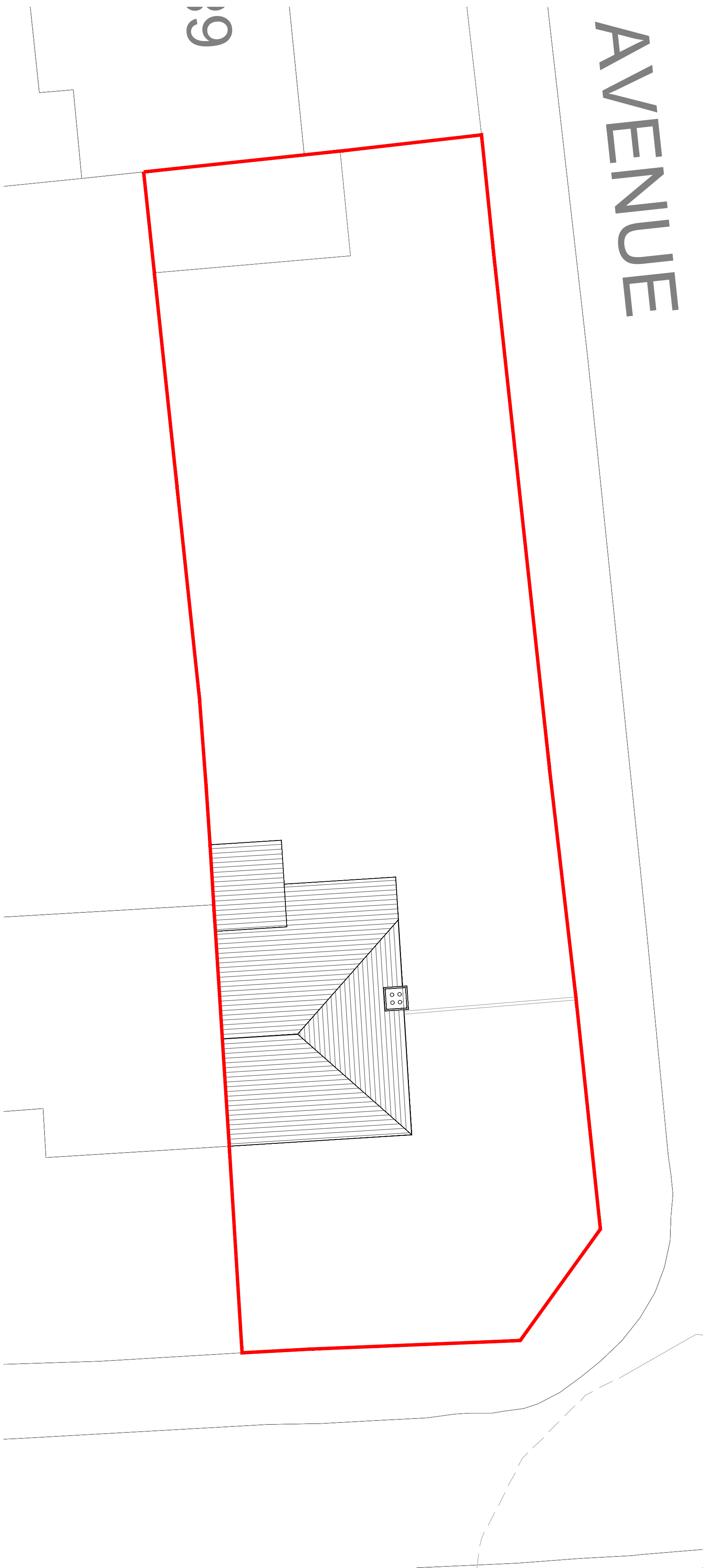
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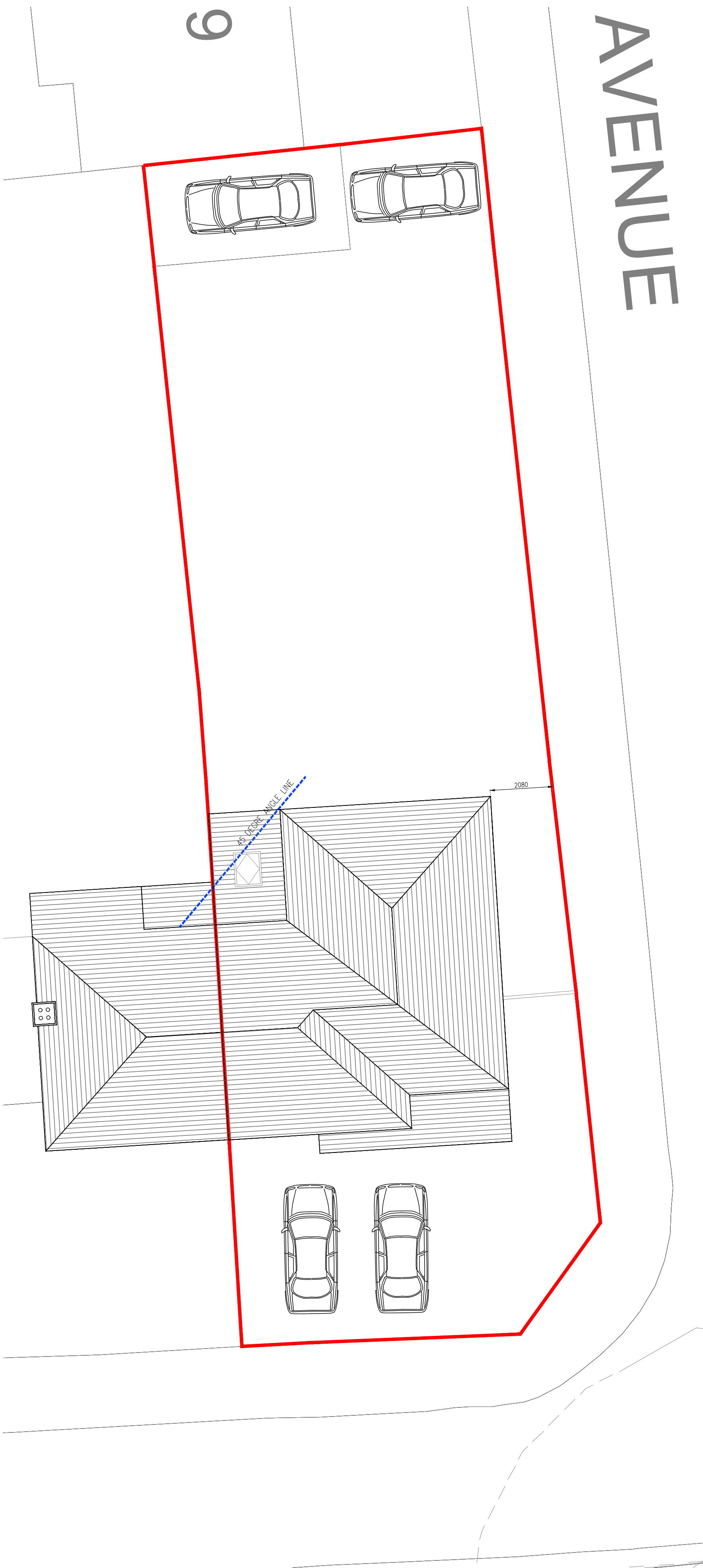
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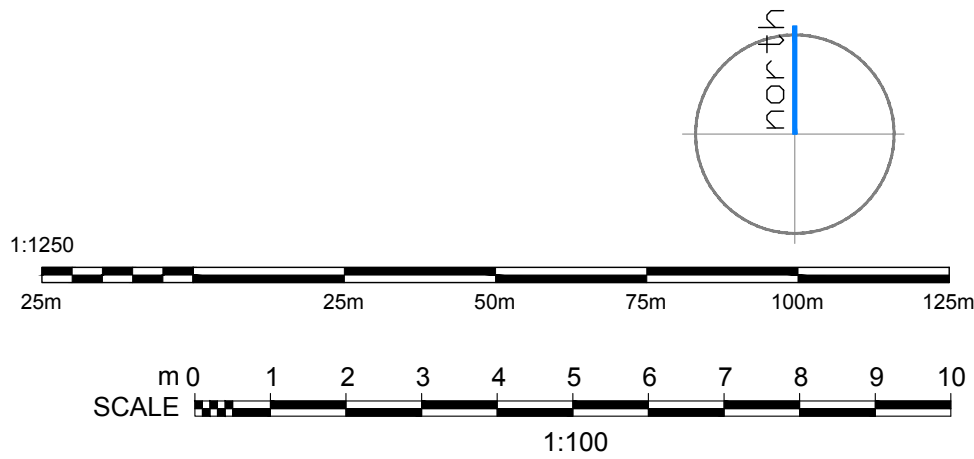
SITE LOCATION PLAN | SCALE 1:1250



EXISTING SITE PLAN | SCALE 1:100



PROPOSED SITE PLAN | SCALE 1:100



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L16 2LA

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EXISTING AND PROPOSED SITE AND LOCATION
PLANS

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APPENDIX B

Arbtech**Unit 3
Well House Barns,
Chester,
CH4 0DH****FAO:****How to contact us:****United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP****Telephone: 0370 7510101****E-mail: propertysearches@uuplc.co.uk****Your Ref: L16 2LA
Our Ref: UUPS-ORD-685838
Date: 21/10/2025****Dear Sirs****Location: 8 EDENHURST AVENUE, LIVERPOOL, L16 2LA**

I acknowledge with thanks your request dated 20/10/2025 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



Karen McCormack
Property Searches Manager

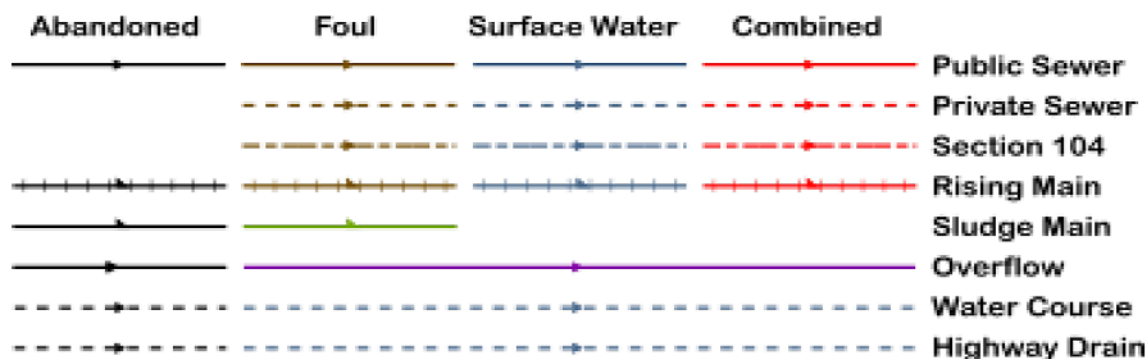
TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	DNM Network Monitoring Point
Drop Shaft	Change of Characteristic
Orifice Plate	



SEWER RECORDS

Address or Site Reference

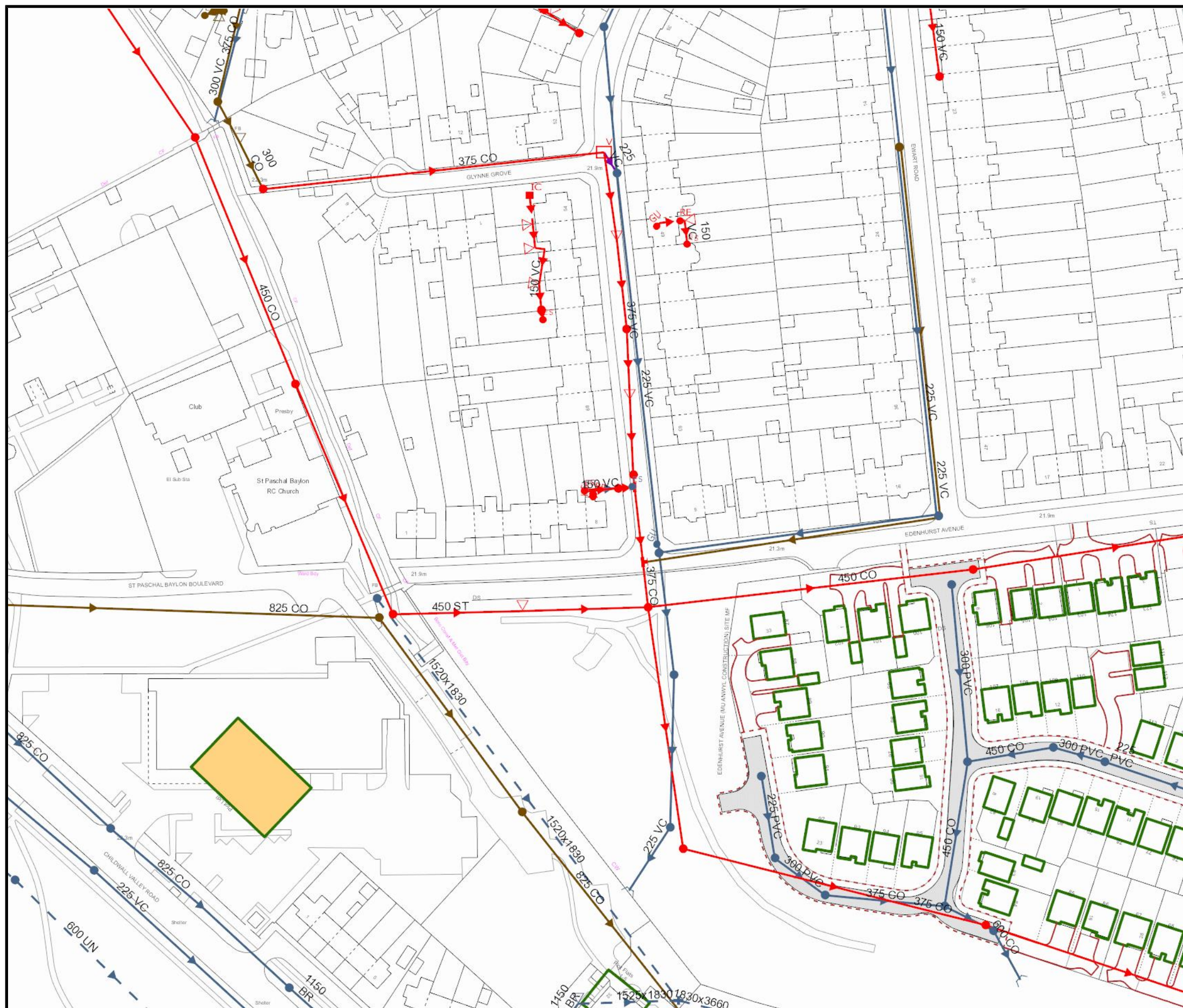
8 EDENHURST AVENUE,
LIVERPOOL,
L16 2LA

Scale: 1:1250
Date: 21/10/2025

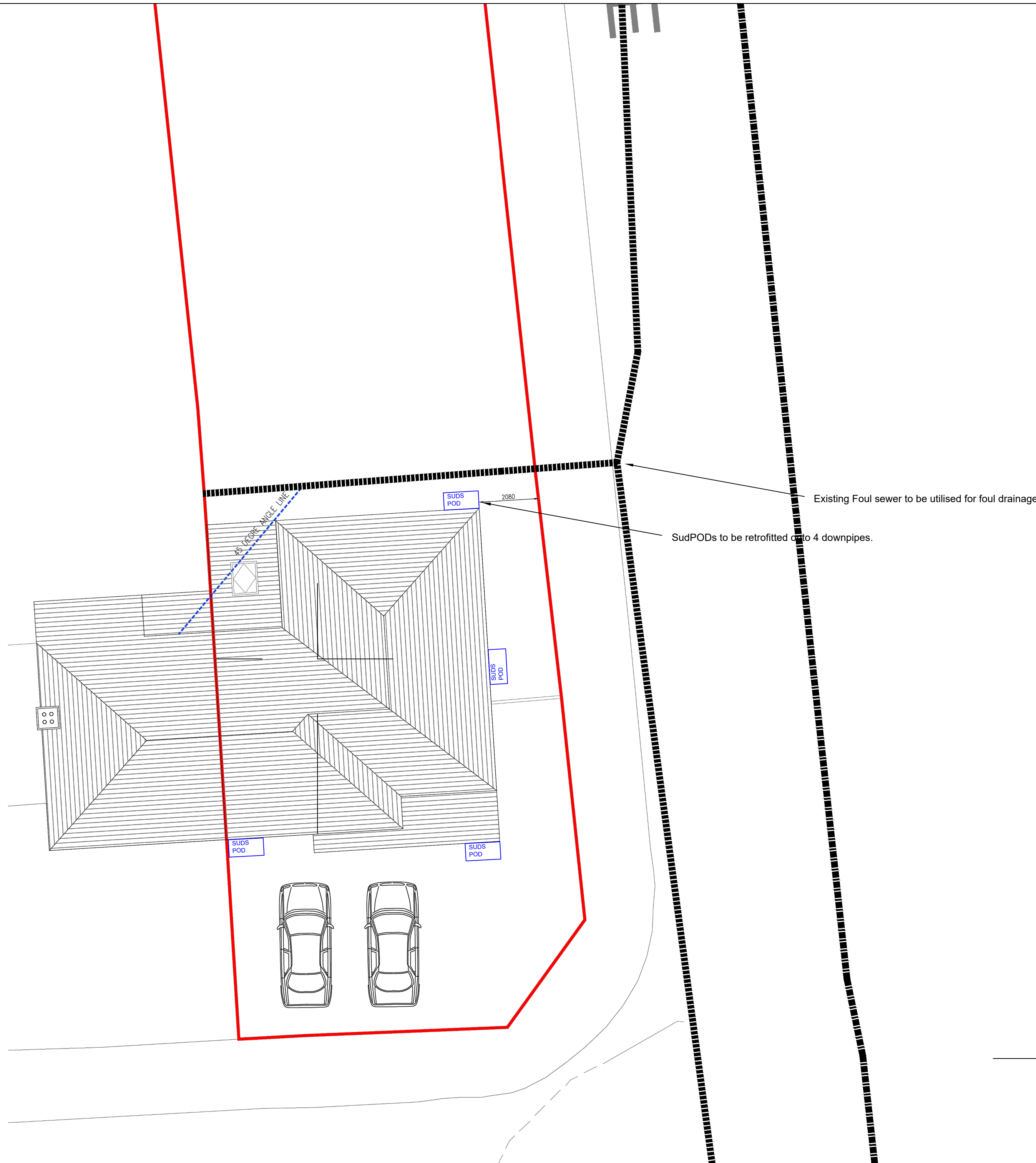
Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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APPENDIX C



Key:

Site Boundary

Existing Storm Sewer

Existing Foul Sewer

Tel: 01244 747223
Email: email@arbtech.co.uk
Arbtech,
Unit 3,
Well House Barns,
Chester,
CH4 0DH

Project Title
8_EDENHURST_AVENUE
LIVERPOOL

Drawing Title
DRAINAGE_STRATEGY

Scale	Drawn By	Designer	Check	Engineer	Check
1:100	AR				
	Date 20.10.25	Date		Date	
Job No.	Drawing No.	Revision			
1001	1001-001	—			

Original Sheet Size A2

APPENDIX D

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	40	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	1.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Node Type	Easting (m)	Northing (m)	Depth (m)	Notes
Depth/Area 1	0.003	3.00	100.000	Junction	-6.344	59.306	0.830	Auto-design is off

Simulation Settings

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

Storm Durations

15	30	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	40	0	0

Node Depth/Area 1 Online Orifice Control

Flap Valve	x	Invert Level (m)	99.170	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.008		

Node Depth/Area 1 Online Orifice Control

Flap Valve	x	Invert Level (m)	99.330	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.008		

Node Depth/Area 1 Online Orifice Control

Flap Valve	x	Invert Level (m)	99.470	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.009		

Node Depth/Area 1 Online Orifice Control

Flap Valve	x	Invert Level (m)	99.630	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.009		

Node Depth/Area 1 Online Weir Control

Flap Valve	x	Invert Level (m)	99.870	Discharge Coefficient	0.590
Replaces Downstream Link	✓	Width (m)	0.320		

Node Depth/Area 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	99.170
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.80	Time to half empty (mins)	42

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	0.4	0.0	0.830	0.4	0.0	0.831	0.0	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
240 minute winter	Depth/Area 1	152	99.364	0.194	0.1	0.0760	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
240 minute winter	Depth/Area 1	Orifice	0.1	0.4
240 minute winter	Depth/Area 1	Orifice	0.0	0.0
240 minute winter	Depth/Area 1	Orifice	0.0	0.0
240 minute winter	Depth/Area 1	Orifice	0.0	0.0
240 minute winter	Depth/Area 1	Weir	0.0	0.0

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
30 minute winter	Depth/Area 1	24	99.622	0.452	0.8	0.1770	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute winter	Depth/Area 1	Orifice	0.1	0.4
30 minute winter	Depth/Area 1	Orifice	0.1	0.2
30 minute winter	Depth/Area 1	Orifice	0.1	0.1
30 minute winter	Depth/Area 1	Orifice	0.0	0.0
30 minute winter	Depth/Area 1	Weir	0.0	0.0

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 winter	Depth/Area 1	20	99.881	0.711	1.5	0.2785	0.0000	OK

Link Event (Velocity)	US Node	Link	Outflow (l/s)	Discharge Vol (m³)
30 minute winter	Depth/Area 1	Orifice	0.1	0.5
30 minute winter	Depth/Area 1	Orifice	0.1	0.2
30 minute winter	Depth/Area 1	Orifice	0.1	0.2
30 minute winter	Depth/Area 1	Orifice	0.1	0.1
30 minute winter	Depth/Area 1	Weir	0.6	0.1