FLOOD RISK ASSESSMENT & Throughflow Screening & SUDS Strategy

Richmond SFRA 2020/21 & LP21 compliant London Plan SI.12 and SI.13 compliant

Minor connection extension to existing garage to incorporate it as habitable but non-sleeping on ground floor area

Upper floor extensions

Defended section of River Crane: no flood compensation required in accordance with EA guidance and Householder extension requirements

Ground floor no lower than existing Flood resilience for full height of new ground floor

ΑT

27 Cole Park Road, Twickenham TW1 1HP

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If this report has been released electronically, the appendices referred to herein can be found in the annexed zip folder/s as .pdf or .dwg files. If this report has been released in hard copy the appendices will be bound into the back of this report. Plans may be annexed separately as A1 or A0 copies where a bound-in A3 copy is not appropriate.

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1.0 Scope

This report contains the details of a flood risk assessment statement for planning carried out by Flint Energy Limited ("FE Ltd") for 27 Cole Park Road, Twickenham TW1 1HP, henceforth referred to as "the site" in this report.

This report has been prepared for 50 Degrees North Architects and must not be relied upon by any other party without the explicit written permission of FE Ltd.

All parties to this report do not intend any of the terms of the Contracts (Right of Third Parties Act 1999) to apply to this report.

Please note this report does not purport to provide definitive legal advice nor can it be used to demonstrate that the site will never flood in the future or provide exact specifications / warranties for the products used.

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2.0 Introduction

The information source used to undertake this FRA & SUDS / Drainage Strategy has been collected from the following sources:

- British Geological Survey Website;
- EA Website:
- Richmond Strategic Flood Risk Assessment 2020 / 2021
- DRAIN LONDON Preliminary (Surface Water) Flood Risk Assessment for London Borough of Richmond. (GLA & Environment Agency, June 2011)
- Internet mapping and searches

3.0 Existing Site Status and Environmental Setting

3.1 Site Location and Topography

This site is an existing dwelling with part hardstanding and part soft landscaping in FZ2 partly defended.

The River Crane and River Crane flood defences are located c. .

Topography Requirement

The scheme is an extension to an existing dwelling in FZ2 defended which already has an upper level as safe refuge and a full topographic survey is not required because a raised floor level is not an option that is feasible or required.

There remains no requirement for the extension to have to raise flood levels to above the 1in100year+NEWcc flood level. Extension finished floor level to be no lower than existing.

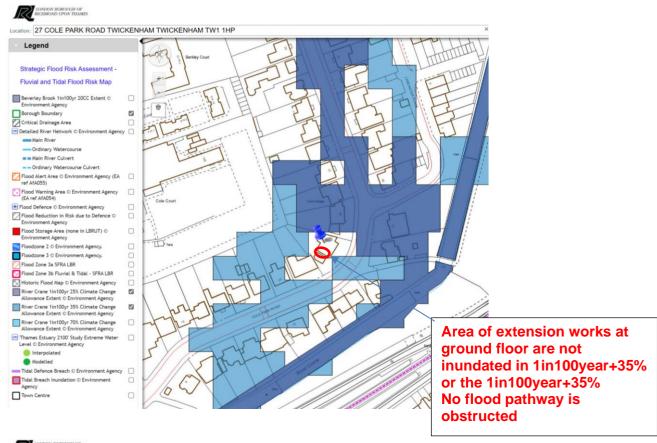
A full topographic survey is not required based on the nature of the scheme given no comparison of flood heights vs a structure relative to ordnance datum is required for a FZ1 setting.

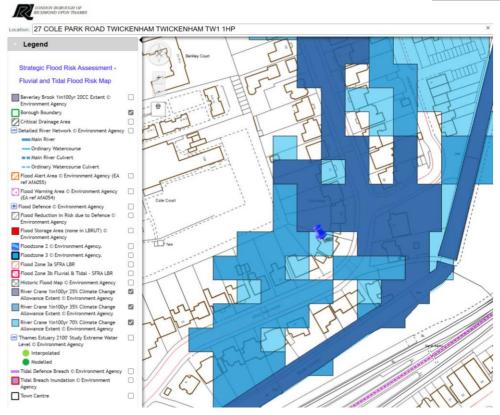
3.2 Flood Status including new climate change allowances

The site is partly in defended FZ2 (new climate change allowances) and adjacent to FZ1.

This is all corroborated by the Richmond SFRA 2020 / 2021.

- 1in100year+25%cc: very small part of rear garden inundated
- 1in100year+35%cc: site partly inundated; area of extension is not inundated
- 1in100year+70%cc: site mostly inundated





3.3 Geology, SPZ's and Throughflow Zones

Based on BGS mapping, surrounding borehole records and the council SFRA, the site is underlain by:

Bedrock: London Clay

Superficial deposits: Kempton Park Gravels

Strata and Flood Risk:

There will be no groundwater body displaced by the scheme (no lower ground structures) and hence there will be no increased risk of flooding from the scheme from groundwater to surrounding areas. Site is within EA less than 25% susceptibility to groundwater flooding.

Strata and Drainage / SUDS

Given the main Bedrock is London Clay and the site is adjacent to the River Crane, it is entirely appropriate that these strata are not to be relied upon for infiltration. No BRE365 testing is required. Soakaways will not work and are not appropriate at this site.

However, the new Richmond SFRA 2020/21 includes new Throughflow Zone to consider the soil throughflow of perched water within the upper levels of clay.

The property itself is not within the Richmond Throughflow

But the site is partly within a Richmond Throughflow zone: see specific section on Throughflow Screening.

3.4 Existing Drainage

The site is an existing operating residential property. It has connections to the adjacent sewers in Cole Park Road.

There is no evidence of any existing SUDS.

The site currently discharges 100% unattenuated by a combination of:

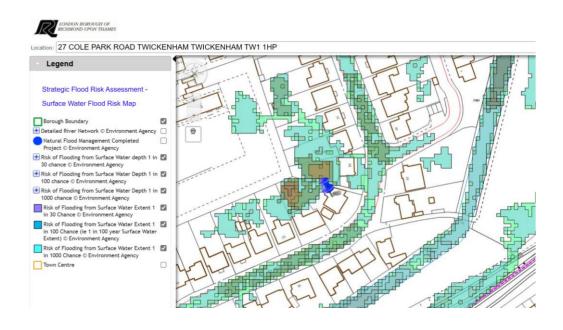
- Low Order Storms: natural on site interception from vegetation, soil infiltration and roof with RWP's direct to sewer
- Higher Order Storms: majority to sewer as existing

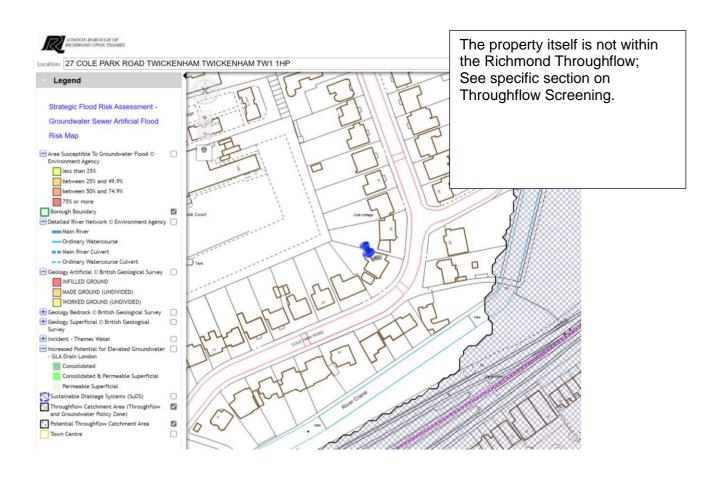
The scheme does not need to alter the connections.

3.5 Summary of other Flood Risks Posed to and From Site and Scheme

Flood Sources	Site Status	Comment on flood risk posed to / from the development
Groundwater	Site is not within an area of high potential for elevated groundwater flooding (less than 25% zone) No works pose an increased risk to or from groundwater flooding Site is within Richmond Throughflow	Scheme will not increase the risk posed to or from groundwater No lower ground structures Suitable waterproofing of ground extension slab But Richmond require Throughflow Screening
Artificial Sources	Site is within EA general Reservoir Flood Warning area No other artificial sources with likely flood flowpaths that could reach the site	Low Risk
Climate Change	Included in the flood modelling extents 40% used in the SUDS storage calculations	Development will manage the peak flow and volume of discharge from the site Low risk posed to and from the development

Richmond SFRA Surface Water Layers





4.0 Throughflow Screening & Flood Defence Easement

4.1 Throughflow Screening

Of relevance to the Throughflow screening, site and scheme specifically:

- The site is an existing property
- The actual property is not within the Throughflow zone
- The site has existing impermeable areas that are a loading on the site
- The scheme does not involve any lower ground structures

No additional ground investigation is required at this stage to verify this assessment; no additional groundwater monitoring or modelling would be required for this type of scheme in this geological setting.

The scheme will not increase the risk posed from this source to surrounding areas.

Risk posed to the scheme itself

Given the site specific groundwater setting, the scheme will be able to address the appropriate waterproofing with standard construction materials and methods; it is a low hazard to the scheme at this site.

No further Throughflow assessment is required based on site and scheme specifics.

5.0 SUDS Strategy

5.1 Existing site

The existing landscaping comprises existing impermeable hardstanding and porous planted garden areas.

5.2 SUDS Assessment and Specifications

Formal infiltration is not feasible due to the geology and site constraints.

The nature of the structural specification for such a small majority upper extension also means that any additional weight at height would require additional concrete and steel. The roof areas are also pitched which makes green / sedum not fasible.

In addition, for such a small area, it is therefore not sustainable to incorporate additional sedum / green roofs because of the embodied carbon increase which would not be offset by the amount of biodiversity and SUDS gain.

The site still discharges via gravity given the invert of the lowest element of drainage on site is still higher than the invert of final manhole invert on site.

There is an assumed rainwater system that drains from the rainwater pipes (RWP's) at the rear and discharges to the garden / under the house under gravity and from the RWP at the front of the house to communicate with the sewer in the road.

The most sustainable approach is a re-use of the existing system with betterment i.e. the maximisation of porous and permeable areas can be complemented with additional Source Control SUDS storage.

The scheme is a minor scheme to an existing dwelling. Additional formal extensive SUDS would not be commensurate with the scale and sensitivity of the scheme.

Retain all existing porous grassed / planting areas

However, to meet council policy, use the EA's specific "Guidance on the permeable surfacing of front gardens"

Any new permeable surfacing can be constructed following the guidance

http://www.communities.gov.uk/publications/planningandbuilding/pavingfrontgardens

5.3 Flood resilience for extension / refurbishment flood future-proofing

Given the scheme is a refurbishment of an existing property but with extensions, the following flood resilient measures will be incorporated where feasible / where works are required

- Electrics to be installed top-down where feasible
- Non-return valves as standard for ground floor
- Any new waterproofing to be installed to above ground level as appropriate
- Plasterboards will be installed in horizontal sheets on ground & basement rather than conventional vertical installation methods to minimise the amount of plasterboard that could be damaged in a flood event
- Wall sockets will be raised to as high as is feasible and practicable in order to minimise damage if flood waters inundate the property
- Any wood fixings on the ground floor will be robust and/or protected by suitable coatings in order to minimise damage during a flood event
- Only if required: the concrete sub floor will likely be laid to fall to drains or gullies which will remove any build-up of ground water to a sump pump where it will be pumped into the mains sewer. This pump will be fitted with a non-return valve to prevent water backing up into the property should the mains sewer become full

6.0 Summary

The scheme will be flood future-proofed for the lifetime of the scheme.

There is no other raising of the ground in the floodplain.

The scheme can include additional informal Source Control SUDS as necessary through the detailed design stages.

Water Butts could also be added to reduce the demand on drinking water.

Throughflow Screening:

The extension is not within the Throughflow area. The site specific groundwater setting and scheme specifics mean the additional horizontal extension will not have an impact on a throughflow area that could result in an increase in flooding off site.

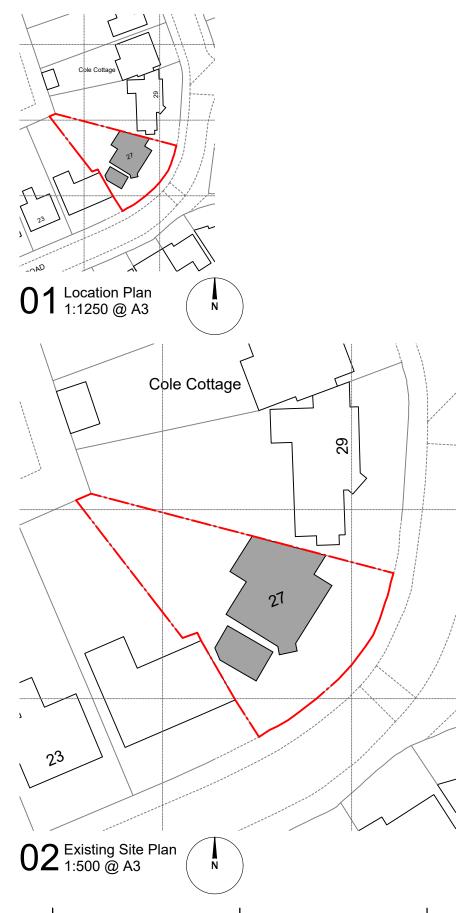
- No further calculations are required
- The scheme includes full height flood resilience
 - o There is not a need to compare site and floor levels to any flood levels

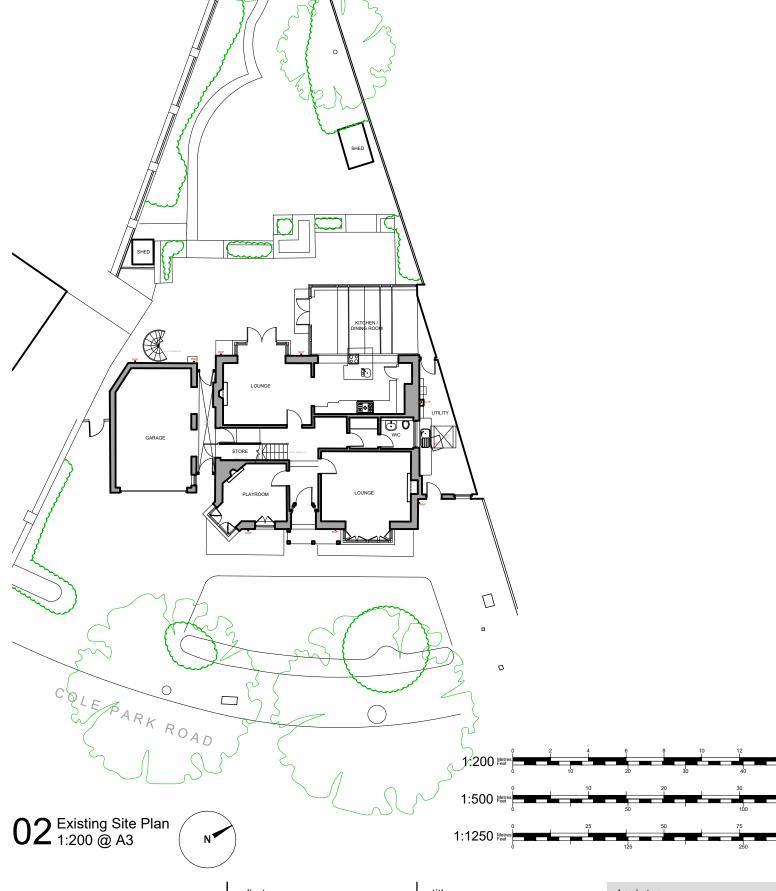
The scheme will result in a better flood protected and lifetime flood future-proofed property than existing.

Based on the likely flooding risk, it is considered that the proposed development can be constructed and operated safely in flood risk terms, without increasing flood risk elsewhere and is therefore appropriate development in accordance with the NPPF/PPG.

APPENDICES

APPENDIX A





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info@50degrees.co.uk 020 8744 2337

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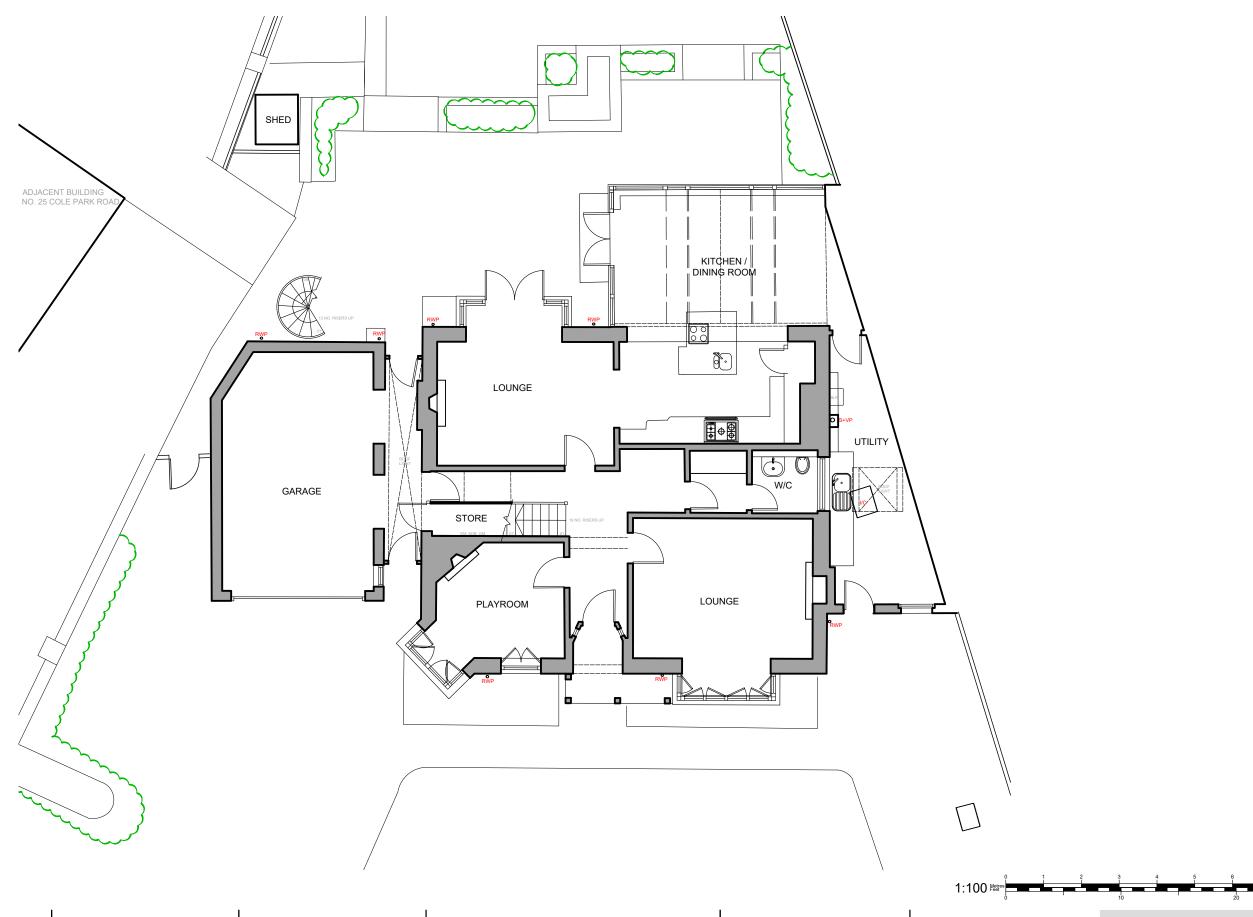
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EXISTING SITE & LOCATION PLANS

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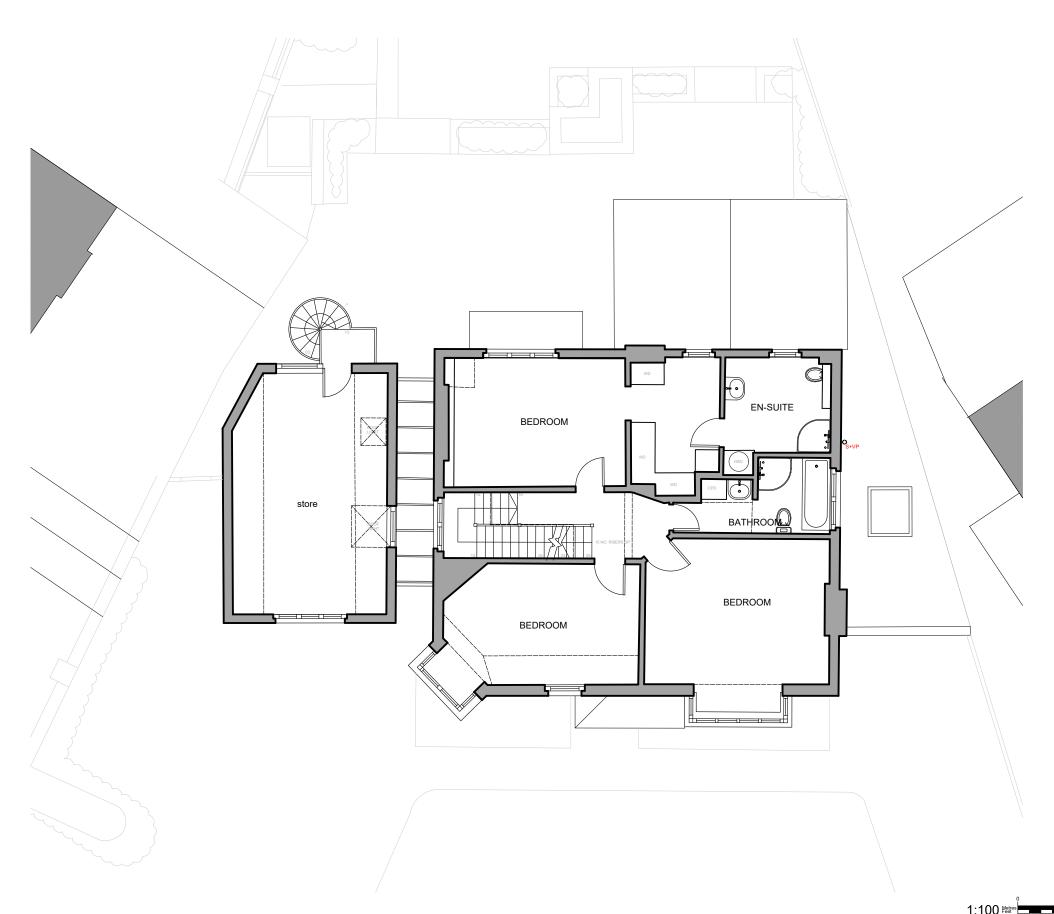
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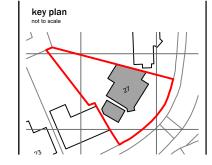
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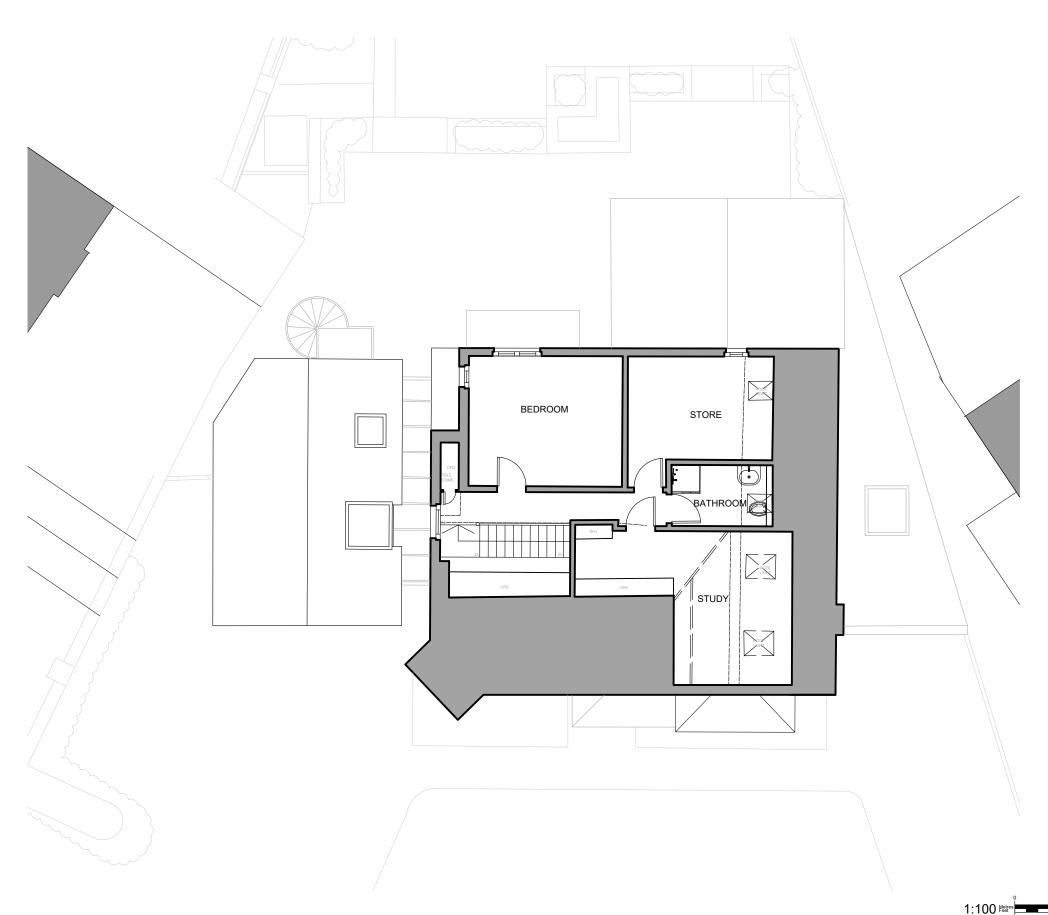
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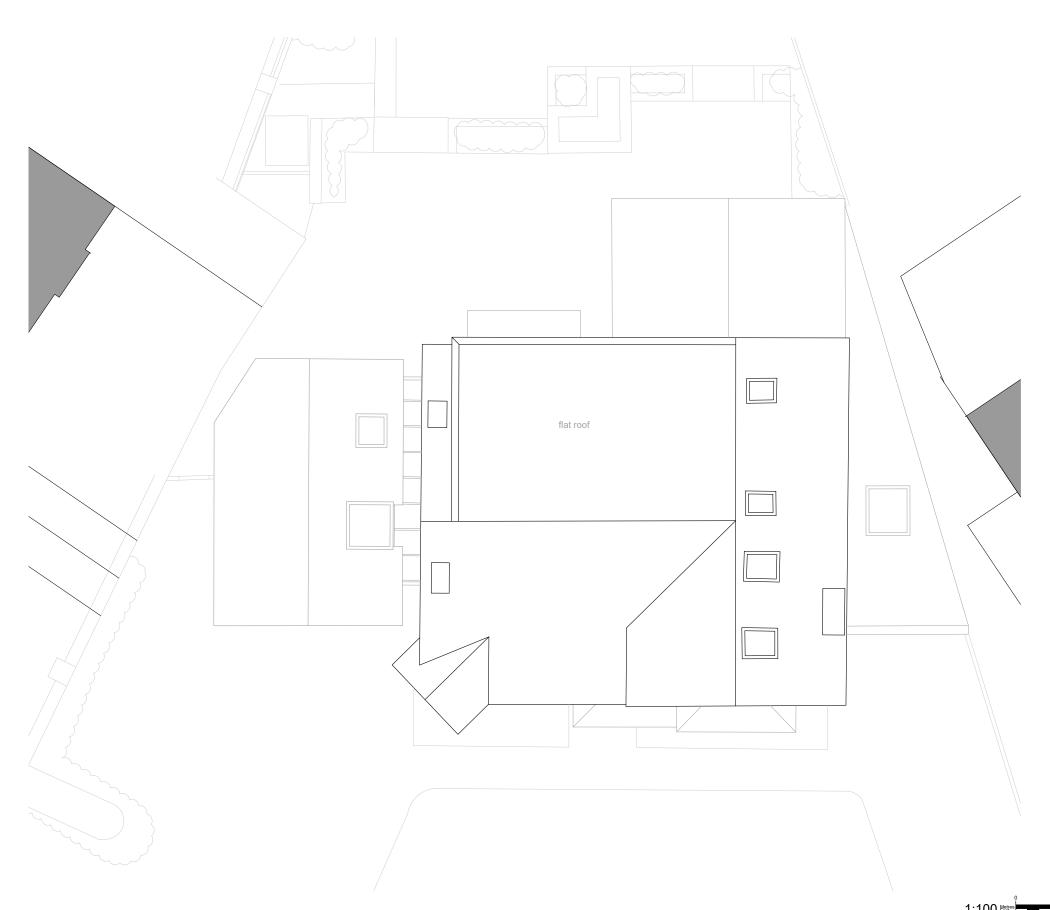
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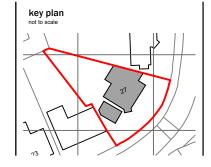
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01 Existing Front Elevation E1 1:100 @ A3



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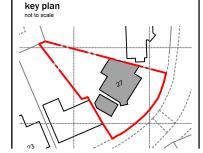
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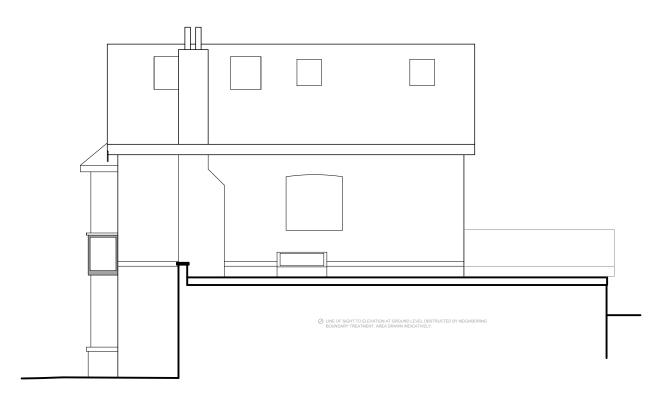
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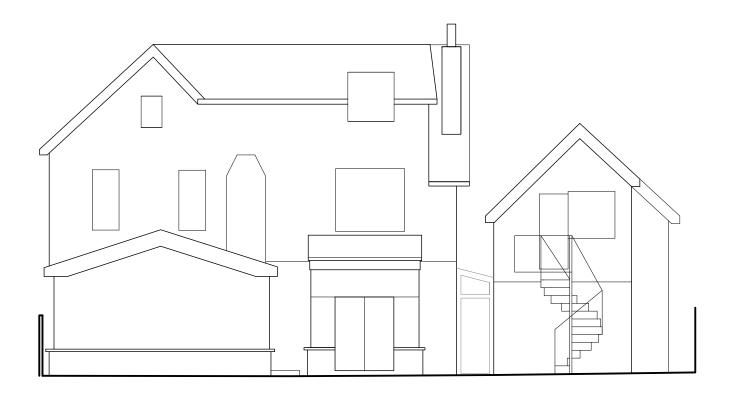
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02 Existing Side Elevation E4 1:100 @ A3



01 Existing Rear Elevation E3 1:100 @ A3

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50° North Architects The Hut, 187 Kew Road Richmond, Surrey TW9 2AZ

info@50degrees.co.uk 020 8744 2337

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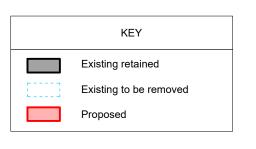
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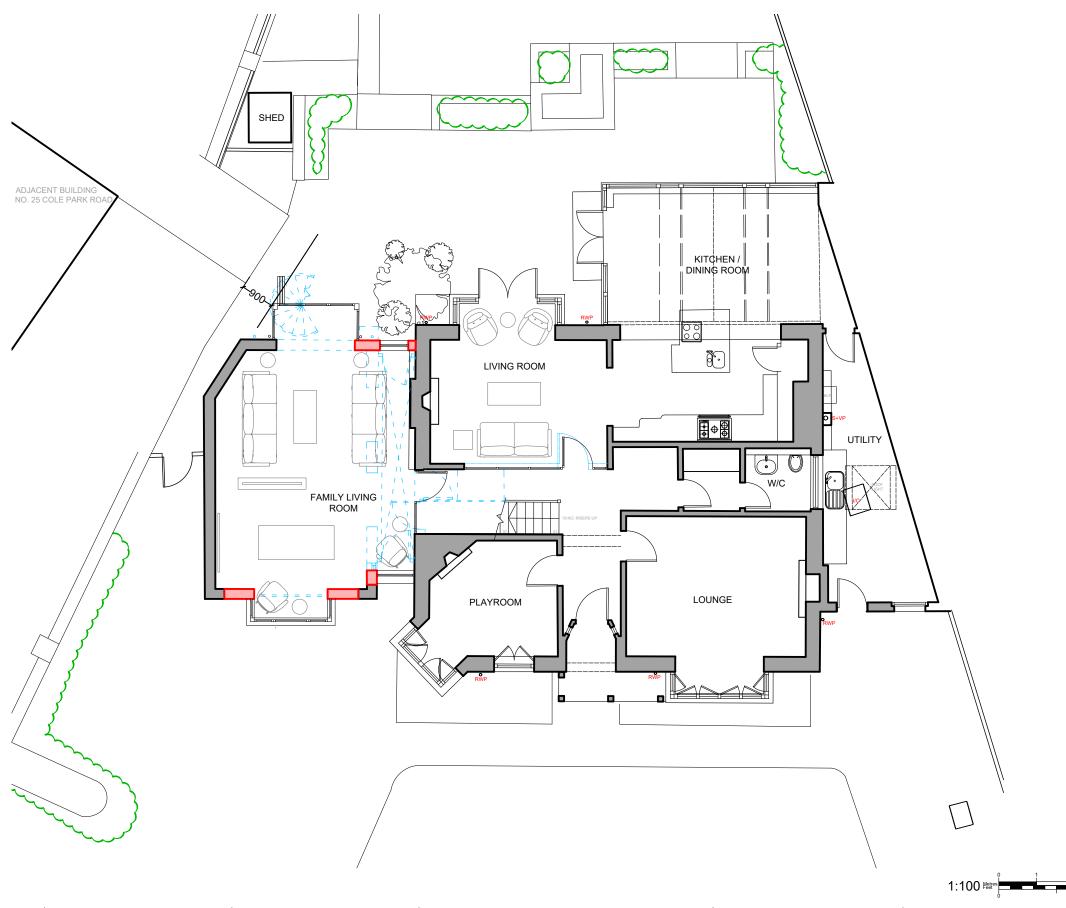
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APPENDIX B





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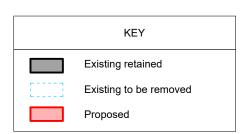
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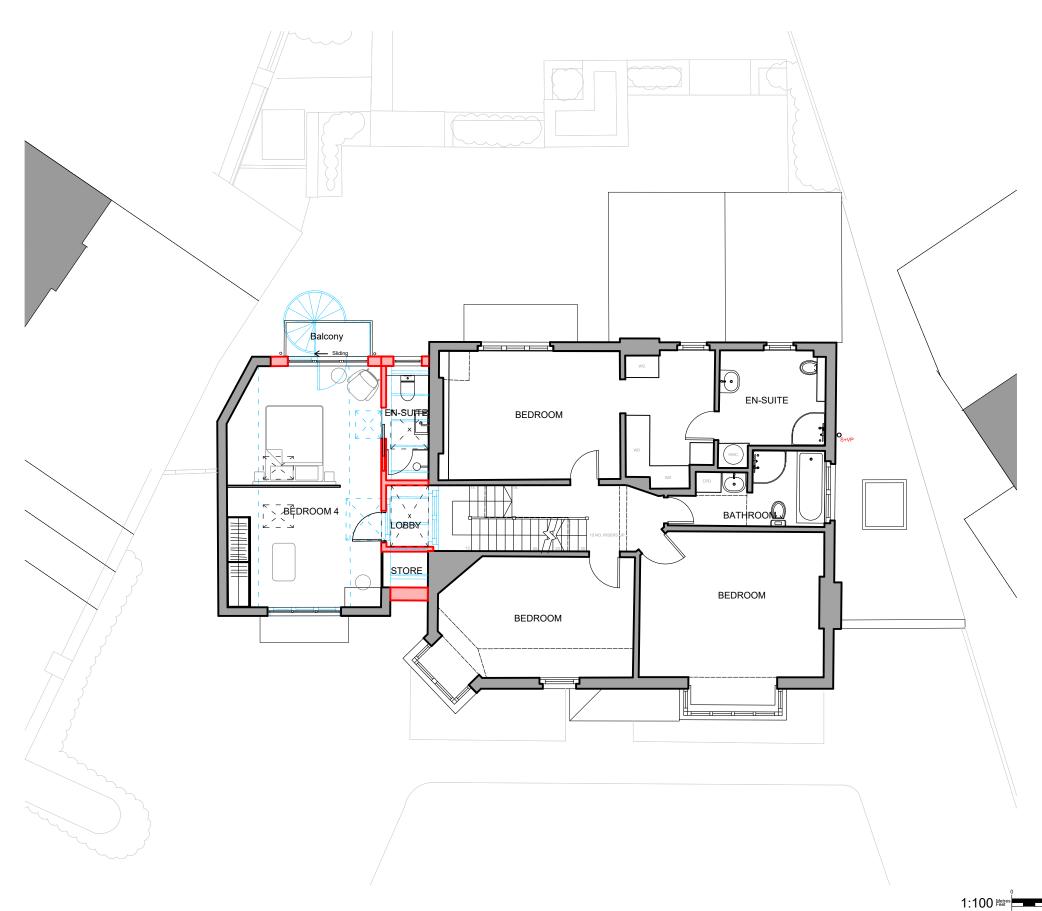
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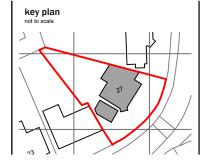
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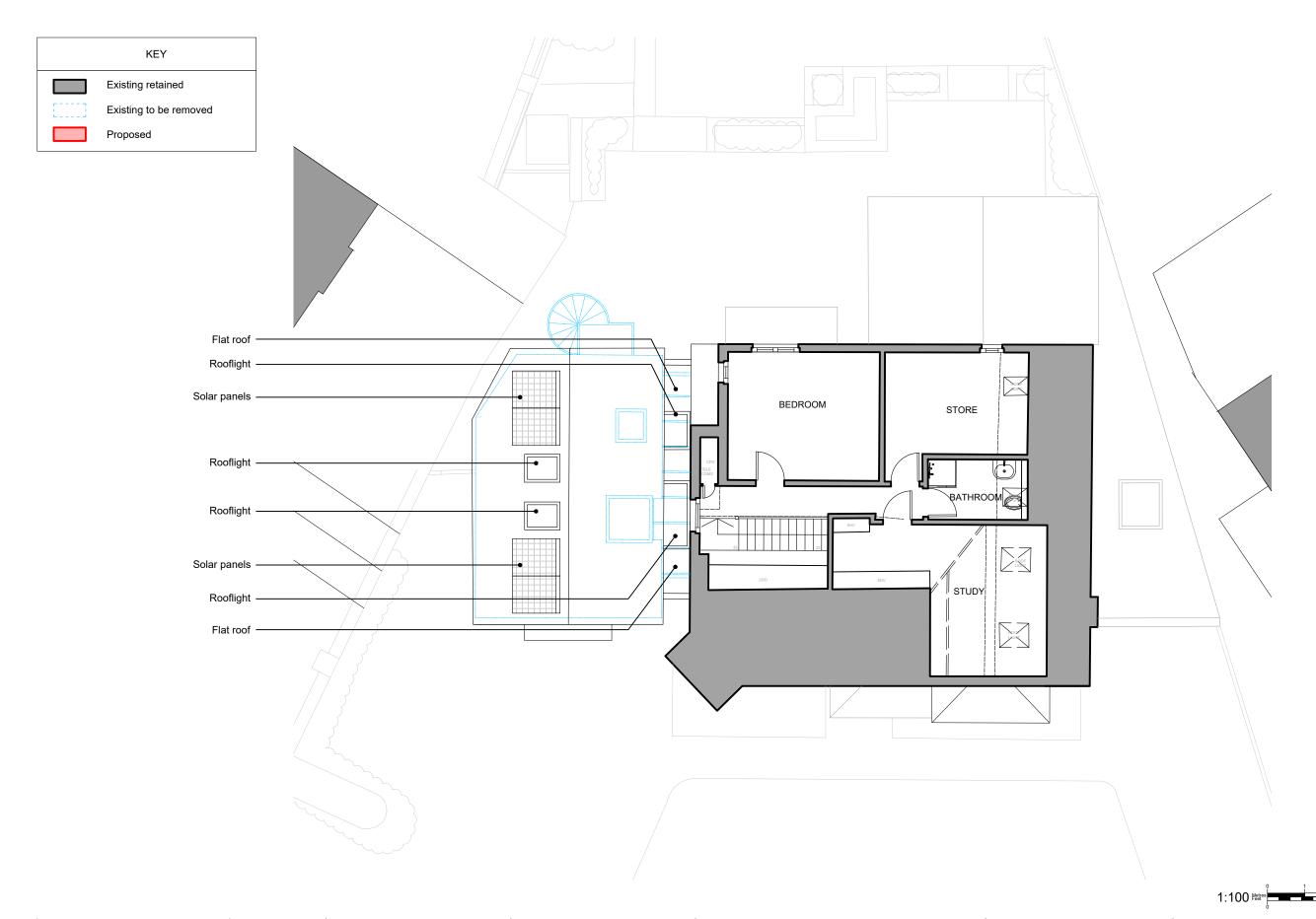
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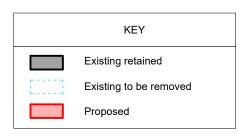
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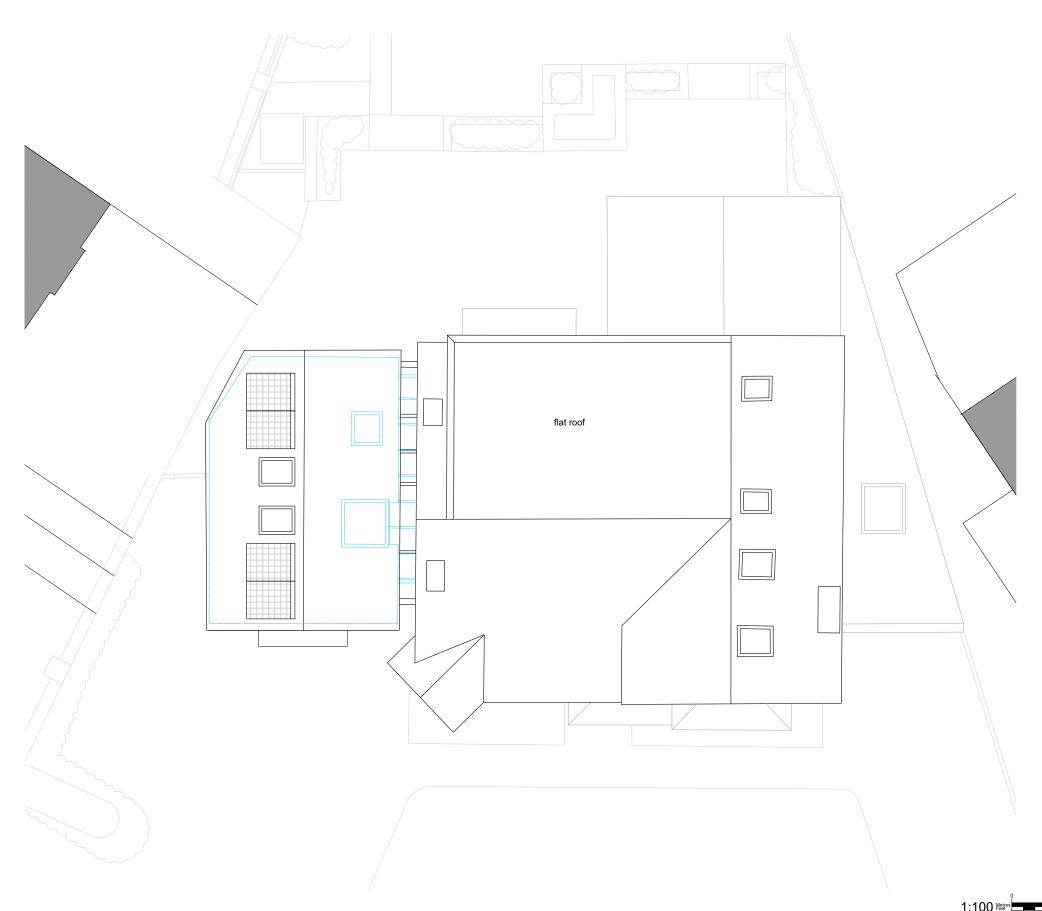
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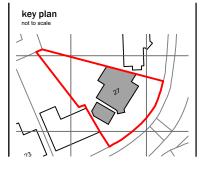
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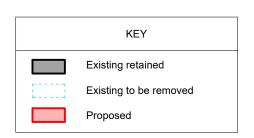
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02 Proposed Side Elevation E2 1:100 @ A3



Proposed Front Elevation E1 1:100 @ A3



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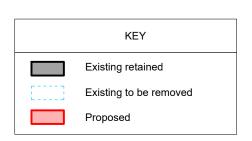
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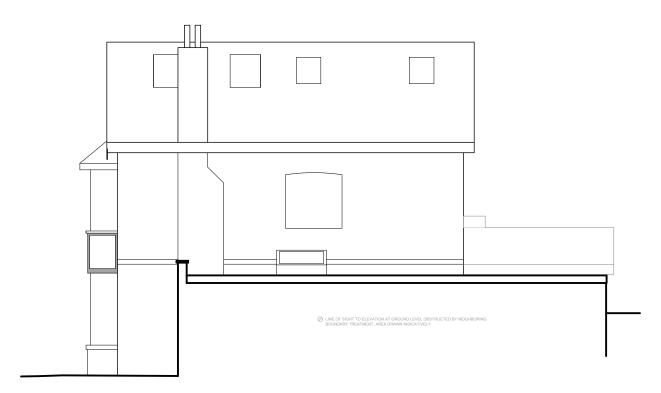
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02 Proposed Side Elevation E4 1:100 @ A3



Proposed Rear Elevation E3 1:100 @ A3



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