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PROPOSED RESIDENTIAL EXTENSION

82 BEVERLY ROAD, MANCHESTER

FLOOD RISK ASSESSMENT

December 2022

Commissioned by: Hanif Al Imam

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1.0 INTRODUCTION AND DEVELOPMENT DESCRIPTION

1.1 Project Introduction and Objectives

Hanif Al Imam has commissioned NSugg Ltd. to undertake a Flood Risk Assessment (FRA) to support a planning application for a residential extension at 82 Beverly Road, Manchester. This document represents a site-specific FRA for the proposed development and has been undertaken in accordance with the relevant planning policy and guidance outlined below.

1.2 Planning Policy and Guidance

1.2.1 National Planning Policy

The National Planning Policy Framework (NPPF)¹ and associated Planning Practice Guidance for Flood Risk² aim to steer new development to areas with the lowest risk of flooding.

New development must also ensure that flood risk is not increased elsewhere, and where appropriate, planning applications should be supported by a site-specific Flood Risk Assessment.

The NPPF recommends that development should only be allowed in areas at risk of flooding where the FRA (and the sequential and exception tests, as applicable) can demonstrate that:

- a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
- b) the development is appropriately flood resistant and resilient;
- c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
- d) any residual risk can be safely managed; and
- e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

The guidance confirms that major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate.

1.2.2 Environment Agency Policy and Guidance

The Environment Agency's guidance for FRAs³ confirms that planning applications for the following development proposals must be supported by a FRA:

- Development in Flood Zone 2 or 3 including minor development and change of use
- Development sites of more than 1 hectare (ha) in Flood Zone 1

¹ Ministry of Housing, Communities & Local Government, March 2012 (last updated: July 2021), National Planning Policy Framework.

² Ministry of Housing, Communities & Local Government, March 2014 (last updated: August 2022), Planning Practice Guidance, Flood Risk and Coastal Change.

³ Environment Agency, March 2014 (last updated: February 2017), Guidance – Flood Risk Assessments if you're applying for planning permission.

- Development sites less than 1 ha in Flood Zone 1, including a change of use in development type to a more vulnerable class (for example from commercial to residential), where they could be affected by sources of flooding other than rivers and the sea (for example surface water drains, reservoirs)
- Development in an area within Flood Zone 1 which has critical drainage problems as notified by the Environment Agency

The Agency's guidance supports the NPPF and specifies the requirements for FRAs based on the level of flood risk and the vulnerability of the proposed development to flooding.

The Environment Agency has prepared flood risk standing advice for minor residential extensions⁴ which is relevant to the proposed development; this FRA has been prepared in accordance with the Agency's standing advice.

1.2.3 Local Policy and Guidance

The following documents provide local flood risk policy and guidance for development within Manchester:

- Manchester City, Salford City and Trafford Councils Level 1⁵ and Level 2⁶ Hybrid Strategic Flood Risk Assessments (SFRAs) present a summary of the local hydrology, potential sources of flood risk across the region and flood risk information for planning.
- Manchester City Council's Core Strategy Development Plan Document (adopted July 2012) presents current local planning policy. Policy EN14: Flood Risk, states:
 - *In line with the risk-based sequential approach contained within PPS25, development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding; this should take account of all sources of flooding identified in the Manchester-Salford-Trafford Strategic Flood Risk Assessment (SFRA).*
 - *In addition to the requirements for site-specific Flood Risk Assessments (FRAs) set out in PPS25, an appropriate FRA will also be required for all development proposals, including changes of use, on sites greater than 0.5ha within Critical Drainage Areas (CDAs) and Canal Hazard Zones identified in the SFRA.*
 - *All new development should minimise surface water run-off, including through Sustainable Drainage Systems (SUDS) and the appropriate use of Green Infrastructure. Developers should have regard to the surface water run-off rates in the SFRA User Guide. In CDAs, evidence to justify the surface water run-off approach / rates will be required.*
 - *The City of Manchester contains many sections of rivers which are culverted or 'hidden'; where these are indicated in the SFRA beneath the proposed development site, further investigation will be required and the development proposal should take this into account; where feasible and appropriate development should seek to open up culverted/hidden rivers to reduce the associated flood risk and danger of collapse, taking advantage of opportunities to enhance biodiversity and Green Infrastructure.*

⁴ Environment Agency, April 2012 (last updated: February 2022), Guidance, Preparing a Flood Risk Assessment: Standing Advice.

⁵ JBA Consulting, March 2010, Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, Level 1 SFRA, Final.

⁶ JBA Consulting, March 2011, Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, Level 2 SFRA, Final.

1.3 Site Location

The application site is located at 82 Beverly Road, Manchester M14 6TH as shown on the Site Plan within Figure 1. The site is located within the residential suburb of Fallowfield, Manchester, approximately 5km south-east of the city centre.

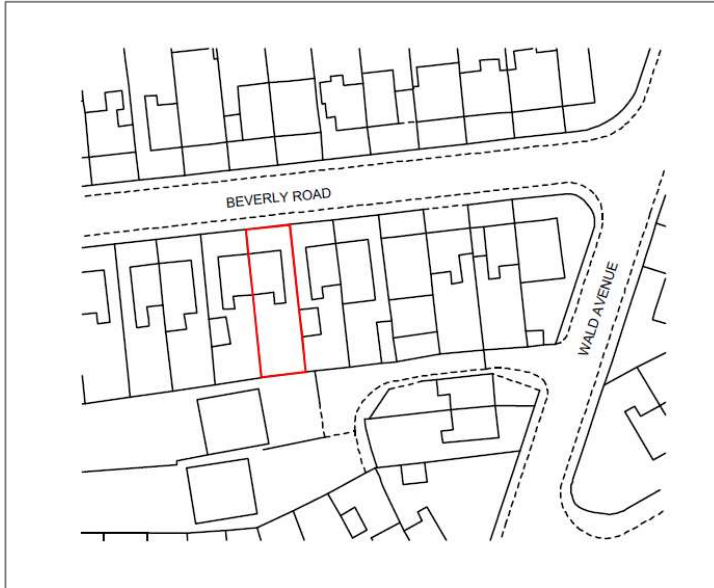


Figure 1. Site Location Plan (extracted from planning drawings prepared by Irasia Designs)

The Environment Agency's on-line flood map for planning indicates that the application site extends into Flood Zone 2, defined as land with a medium probability of flooding from rivers or the sea.

The National Planning Policy Framework (NPPF) and associated technical guidance confirms that all applications for proposed new development within Flood Zone 2 or 3 and development proposals exceeding one hectare within Flood Zone 1 must be accompanied by a site-specific Flood Risk Assessment.

1.4 Topography and Existing Land Use

Review of Ordnance Survey mapping indicates that the local topography falls gently to the, with a ground level of approximately 42mAOD within the area of proposed development.

Figure 2 presents an extract of the Environment Agency's LIDAR topographic data, which confirms a ground level of between 41.80mAOD and 41.85mAOD within the area of proposed development.



Figure 2. Environment Agency LIDAR Topographic Data

The application site comprises a semi-detached residential property and the footprint of proposed development is limited to an area of the rear garden, within the curtilage of the property, as indicated within the site plans in Appendix 1.

1.5 Hydrological Features

The application site lies within the surface water catchment of Cringle Brook, which flows in a westerly direction, passing approximately 60m north of the site. Cringle Brook is classified as a main river and flows in an open channel in the vicinity of the site but is largely culverted through Manchester. A minor, unnamed tributary, classified as an ordinary watercourse, discharges into Cringle Brook approximately 70m north of the site.

Ordnance Survey mapping indicates that Cringle Brook (culverted) discharges into Chorlton Brook in the south-west of the city, with Chorlton Brook ultimately discharge to the River Mersey.

The Environment Agency's LIDAR topographic data (Figure 2) indicates that the bank elevation of Cringle Brook in the vicinity of the site, is approximately 40.0m AOD. This compares to a site level of 41.80m AOD to 41.85m AOD.

No other watercourses or significant surface water features have been identified in the vicinity of the application site.

The local hydrological setting is presented in Figure 3 below.

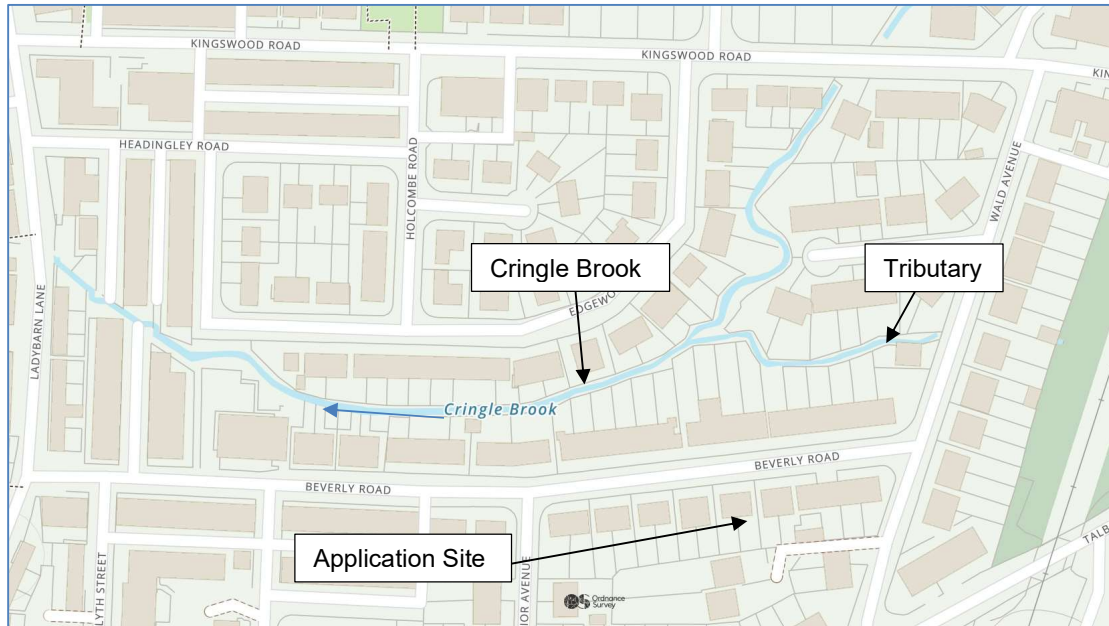


Figure 3. Local Hydrological Setting

1.6 Proposed Development and Flood Risk Vulnerability Classification

The proposed development comprises demolition of the existing small rear extension and the erection of a single storey rear extension to 82 Beverly Road, to provide a kitchen-dining area. Existing and proposed layout plans are included within Appendix 1.

In terms of flood risk vulnerability classification, residential dwellings are classified as 'more vulnerable'. This is discussed further in Section 2.3.

2.0 FLOOD RISK ASSESSMENT

2.1 Sources of Information

In addition to the flood risk planning policy and guidance outlined in Section 1.2, the following sources of information have been consulted during the preparation of this FRA:

- Environment Agency website – for information regarding surface water, reservoir and fluvial/tidal flood risk and outline flood zone maps.

The Environment Agency was consulted on 13th December 2022 to obtain site-specific predicted flood water levels (Product 4 data). The Environment Agency has a response time of approximately four weeks and, due to this delay, the FRA has been completed in advance of receipt of the Product 4 data. It is recommended that the flood risk mitigation measures be reviewed following receipt of this information; this is discussed further in Section 2.4.

2.2 Flood Hazard

All potential sources of flooding to the application site are considered within this section of the report.

2.2.1 Environment Agency Flood Zone Map and Fluvial/Tidal Flood Risk

The application site is not coastal or in the vicinity of a tidal watercourse and is not therefore at risk of tidal flooding.

The Environment Agency flood zone map presents information regarding the fluvial (river) flood risk to the application site and is included as Figure 4 below. The flood zone map indicates that the application site is located partially within Flood Zone 2, defined as land with a medium probability of flooding from rivers (between 0.1% and 1.0% annual probability of flooding). The flood zones are associated with Cringle Brook and tributary.

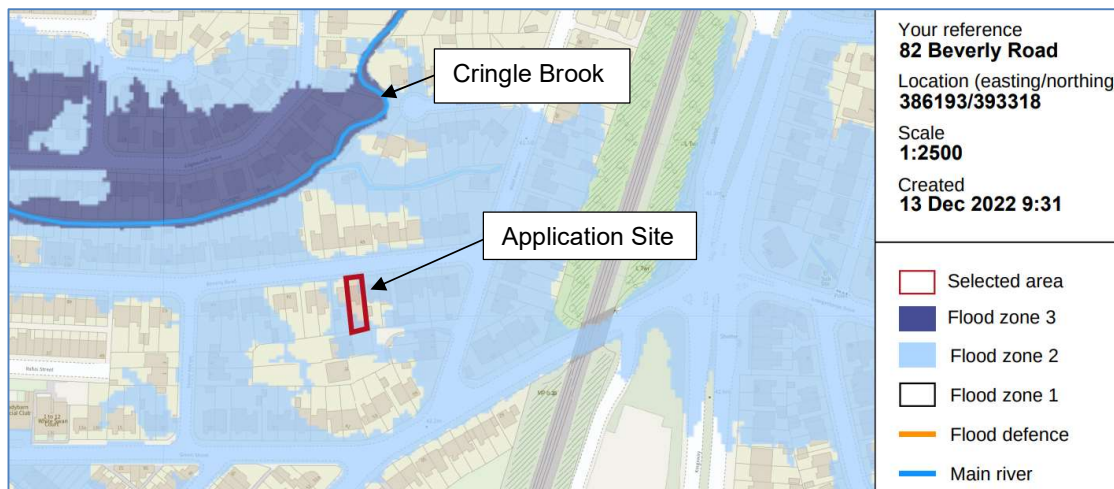


Figure 4. Environment Agency Flood Zone Map⁷

⁷ www.flood-map-for-planning.service.gov.uk accessed 13th December 2022.

The Environment Agency's flood zone map does not take into account the presence of any local flood defences. Figure 5 presents the Environment Agency's fluvial flood map, which takes account of any flood defences; this confirms that the application site has a very low risk (<0.1% annual probability of flooding) to low risk (between 0.1% and 1.0% annual probability of flooding) of flooding from rivers.

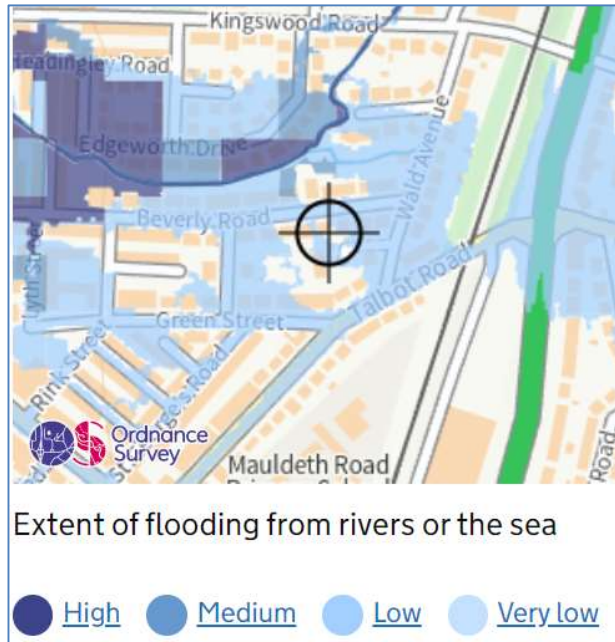


Figure 5. Environment Agency River Flood Map

Due to the Environment Agency's delayed response times, this FRA has been prepared in advance of receipt of the site-specific Product 4 data, which is likely to include predicted peak flood water levels for the site.

However, in the absence of other information, the design flood event, which is represented by the 1% annual probability event with allowance for long-term climate change (i.e. the future Flood Zone 3 extent), is generally accepted to be equivalent to the present-day Flood Zone 2 extent. Flood Zone 2 of Cringle Brook, as indicated on Figure 3, extends around the northern and eastern boundaries of the application site and encroaches into the south-western part of the site. The outer limit of Flood Zone 2 adjacent to the area of proposed development, as indicated on Figure 3, approximately coincides with a topographic elevation of 41.8mAOD (based on LIDAR data). Therefore, assuming the design flood water level is equivalent to the present-day Flood Zone 2 extent, the peak design flood water level at the application site can be inferred as **41.8mAOD**. This is comparable to current site levels of 41.80mAOD to 41.85mAOD within the area of proposed development. The Environment Agency's flood zone map indicates that the area of proposed development is on the outer limit of Flood Zone 2; predicted peak flood water depths during the design flood event would therefore be shallow (<100mm) based on the available mapping.

Appropriate fluvial flood risk mitigation is detailed in Section 2.4.

As discussed above, it is recommended that this design flood water level be reviewed on receipt of the Environment Agency's site-specific data (Product 4 data).

2.2.2 Other Potential Sources of Flooding

The local SFRA and online flood maps have been reviewed to identify any other potential sources of flood risk to the application site and evidence of historic flood events in the local area. This information is presented in Table 1 below.

Table 1: 82 Beverly Road, Manchester – Potential Sources of Flooding

Potential Source	Potential Risk at Application Site?	Reasoning
Fluvial Flooding	Yes	The application site is located on the outer limit of Flood Zone 2 associated with Cringle Brook. The risk of fluvial flooding is discussed in Section 2.2.1.
Tidal Flooding	No	The application site is not coastal or in the vicinity of a tidal watercourse.
Flooding from High Groundwater	No	Section 2.5.1 of the Level 1 SFRA states there are no known reports of groundwater flooding in Manchester. Drawing GW2_1 of the Level 1 SFRA identifies areas at risk of groundwater flooding across the region. This confirms that the application site is not within an area identified as having shallow groundwater or at risk of groundwater rebound or at risk of groundwater flooding. No below-ground development is proposed; therefore, the risk of groundwater flooding to the development is considered very low.
Surface Water Flooding	No	The Environment Agency's online mapping confirms that the application site has a very low risk of surface water flooding. This is discussed further below.
Flooding from Artificial Drainage Systems	No	Section 2.4 of the Level 1 SFRA indicates that sewer flooding is known to have occurred within the suburb of Fallowfield, which includes the application site. The Level 2 SFRA also confirms that the application site lies within the Levenshulme and Fallowfield Critical Drainage Area (CDA). This extensive CDA has been identified due to historic flooding of properties and the railway at Fallowfield, the presence of a significant surface water flooding hotspot in Levenshulme and the presence of four postcode areas with over 10 properties affected in the DG5 register of sewer flooding incidents. However, the Environment Agency's surface water flood map (Figure 6 below) and the local topography confirms that the application site is locally elevated above Beverly Road, with the local road network acting as flood flow routes for any exceedance flows. Therefore, the risk of flooding from drains and sewers is considered low.
Flooding due to Infrastructure Failure	Yes	The Environment Agency's online mapping indicates that the application site is within the predicted maximum extent of flooding of local reservoir(s), when there is also flooding from rivers. This is discussed below.

Table 1 confirms that the only significant potential sources of flooding identified within the application site are fluvial flooding associated with Cringle Brook and flooding due to failure of local reservoir(s), only when there is also river flooding. The risk of flooding from Cringle Brook is discussed above in Section 2.2.1, with flood risk mitigation measures presented in Section 2.4.

Figure 6 presents the Environment Agency's reservoir flood map and indicates that the application site is within the predicted maximum flood extent of local reservoir(s) when there is also flooding from rivers. In England, reservoirs that are capable of holding 25,000m³ or more of water are regulated under the Reservoirs Act 1975, as amended by the Flood and Water Management Act, 2010. These reservoirs are registered with the Environment Agency and subject to inspection and supervision by reservoir engineers. Therefore, due to the tight regulations on periodic inspections and maintenance of the reservoirs, the probability of reservoir failure is very low and the risk of flooding to the application site from reservoirs is considered low and acceptable.

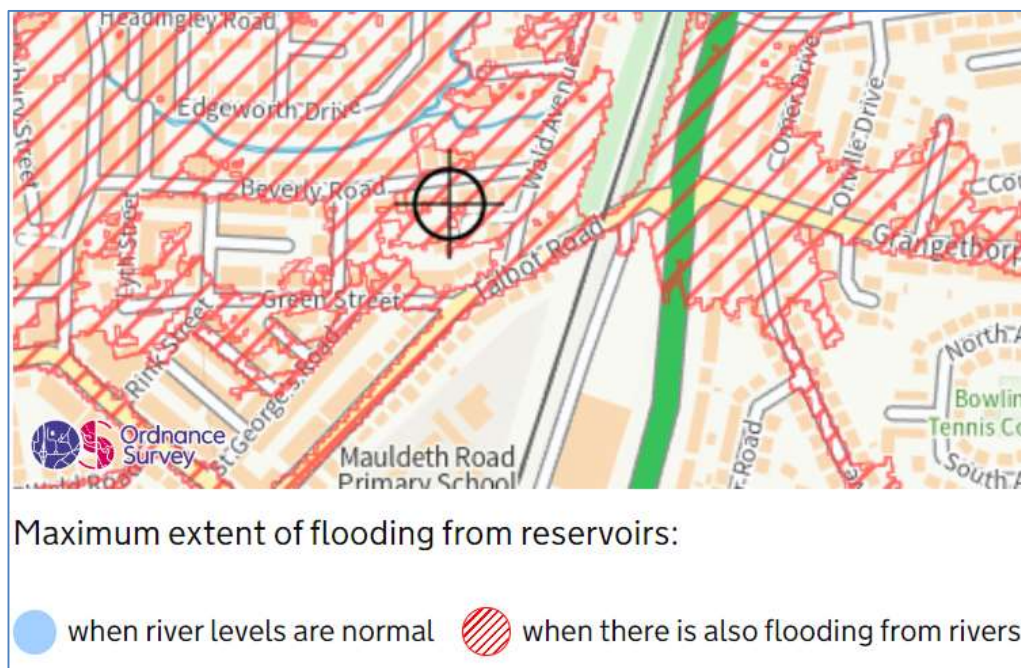


Figure 6. Environment Agency Reservoir Flood Map

Figure 7 presents the Environment Agency's surface water flood map for the application site; this indicates that the risk of surface water flooding within the area of proposed development is very low (<0.1% annual probability). A number of the surrounding roads, including Beverly Road, are identified as potential surface water flood flow routes, with a low or medium risk of surface water flooding.

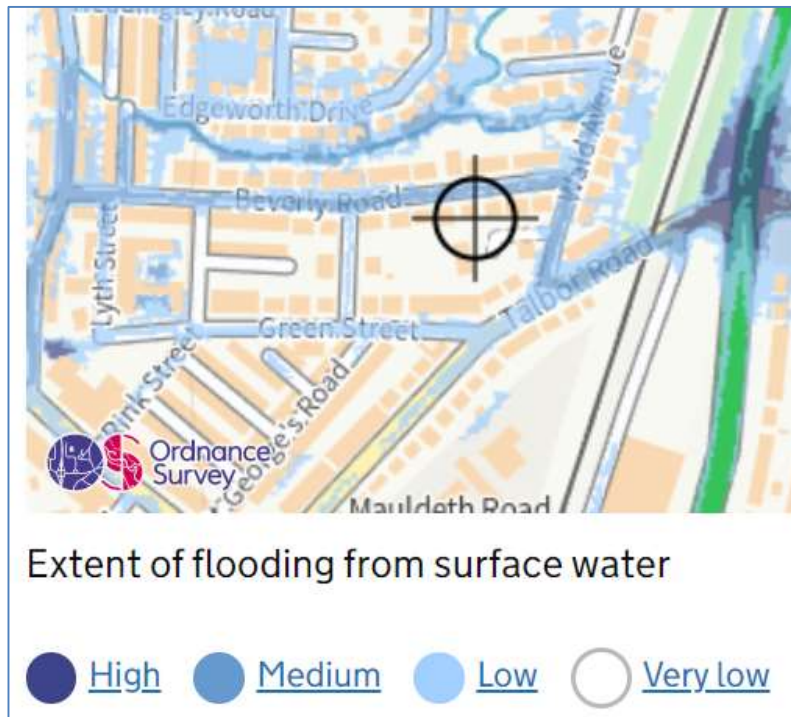


Figure 7. Environment Agency Surface Water Flood Map

2.2.3 Historic Flooding

Review of the Environment Agency's online historic flood map confirms that the application site is not within, or in the vicinity of, an area that has previously recorded flooding⁸.

The application site lies outside of the Environment Agency's Flood Warning Area for Cringle Brook at Fallowfield.

2.2.4 Climate Change

The Environment Agency's climate change allowances guidance⁹ confirms that rainfall, sea levels and river flows are predicted to increase as a result of climate change, which must be considered throughout the lifetime of the proposed development. The application site lies within the Upper Mersey Management Catchment, where river flows are predicted to increase by between 41% (central allowance) and 85% (upper end allowance) by the 2080s.

The Environment Agency's guidance states that the central climate change allowance (41%) should be applied to 'more vulnerable' development in Flood Zone 2.

In the absence of the Environment Agency's site-specific Product 4 data and predicted peak flood water levels, this FRA has followed the generally accepted approach of assuming the present-day Flood Zone 2 extent is equivalent to the future Flood Zone 3 extent, when climate

⁸<https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/HistoricFloodMap&Mode=spatial> accessed 15th December 2022.

⁹ Environment Agency, February 2016 (last updated: May 2022), Guidance: Flood Risk Assessments: Climate Change Allowances.

change is taken into consideration. Therefore, the design flood water level for the development, equivalent to the 1% annual probability event plus climate change, is based on the present day 0.1% annual probability (Flood Zone 2) peak flood water level. This is detailed above in Section 2.2.1.

2.3 The Sequential Test & Environment Agency Flood Zone Compatibility

As set out in the NPPF, the aim of the sequential test is to steer new development to areas with the lowest probability of flooding (Flood Zone 1). However, the Environment Agency's guidance confirms that the flood risk sequential test does not apply to householder development including extensions to the existing dwelling.

Table 2 of the NPPF Technical Guidance² confirms that 'more vulnerable' land uses are considered appropriate development within Flood Zone 2.

However, it is recognised that the application site lies on the outer limit of medium probability fluvial Flood Zone 2 and therefore appropriate flood risk mitigation measures are outlined in Section 2.4.

2.4 Flood Risk Mitigation

The following flood risk mitigation measures are based on the Environment Agency's flood risk standing advice for minor residential extensions and should be incorporated into the proposed development:

- The finished floor level within the extension shall be no lower than the ground floor level of the existing property.
- The design flood water level for the lifetime of the development is estimated as 41.8mAOD, which is approximately equivalent to the current site levels. It is recommended that flood resistant design be incorporated to at least 300mm above the design flood water level (i.e. to at least 42.1mAOD). Flood resistant design measures include products for the temporary sealing of building apertures and entrances, including the use of airbrick covers, wall sealant systems and flood doors. Such measures should prevent flood water from entering the property to the design height. Further details are available within Environment Agency Science Report SC040066/SR *Improving the Flood Performance of New Buildings* (2007) and all products should be designed and manufactured in accordance with British Standard BS 851188-1:2019+A1:2021 *Flood Resistance Products – Building Products, Specification*. **The design flood water level, and appropriate flood resistant/resilient design measures, should be reviewed on receipt of the Environment Agency Product 4 data confirming the predicted peak flood water level for the site based on hydraulic modelling.**

The application site does not lie within an Environment Agency Flood Warning Area and the measures recommended above should ensure that the development remains safe and dry during the design flood event. Therefore, a Flood Warning & Evacuation Plan is not considered necessary for the development.

3.0 SUMMARY AND CONCLUSIONS

This report represents a site-specific Flood Risk Assessment to support the proposed development of a single storey residential extension to 82 Beverly Road, Manchester M14 6TH. This FRA has been prepared in accordance with current national and local policy and guidance including the Environment Agency's flood risk standing advice for minor residential extensions.

The Environment Agency flood zone map for planning indicates that the application site extends into Flood Zone 2; therefore, a detailed site-specific FRA is required.

A review of all potential sources of flooding to the application site has been undertaken and the only significant potential source of flooding is identified as fluvial flooding from Cringle Brook. The Environment Agency has been consulted to obtain site-specific predicted fluvial flood water level data (Product 4 data); however, no response has been received at the time of reporting. Therefore, this FRA has been prepared assuming that the present-day Flood Zone 2 extent represents the future Flood Zone 3 extent, when long-term climate change is taken into consideration.

An approximate design flood water level (equivalent to the 1% annual probability flood event plus climate change) has therefore been estimated from the present-day Flood Zone 2 extent as 41.8mAOD. This is approximately equivalent to current site levels within the area of proposed development. However, this estimated design flood water level should be reviewed on receipt of the Environment Agency's Product 4 data.

The design flood water level is used to inform the recommended flood risk mitigation measures for the development, which are as follows:

- The finished floor level within the extension shall be no lower than the ground floor level of the existing property.
- Flood resistant design shall be incorporated to at least 300mm above the design flood water level (i.e. to at least 42.1mAOD). Flood resistant design measures include products for the temporary sealing of building apertures and entrances, including the use of airbrick covers, wall sealant systems and flood doors. Such measures should prevent flood water from entering the property to the design height. The design flood water level, and appropriate flood resistant/resilient design measures, should be reviewed on receipt of the Environment Agency Product 4 data confirming the predicted peak flood water level for the site based on hydraulic modelling.

The application site is not within an Environment Agency Flood Warning Area and there is no evidence of historic flooding from any source at the application site.

This FRA concludes therefore, that the proposed development of a minor residential extension, classified as 'more vulnerable' development, at 82 Beverly Road, Manchester, is appropriate and sustainable with regards to flood risk.

4.0 CLOSURE

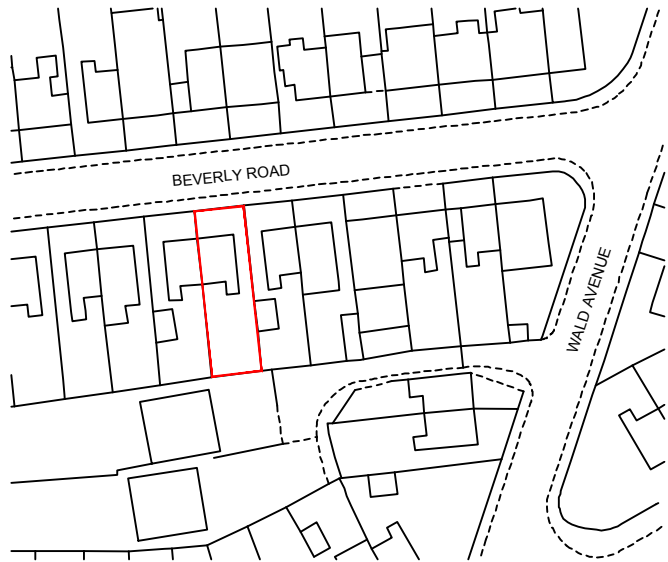
This report has been prepared by Nicola Sugg (trading style of NSugg Limited) with all reasonable skill and care, and in accordance with the services agreed with Hanif Al Imam. Relevant information provided by Irasia Designs has been accepted in good faith as being accurate and valid. This report is based on the relevant guidance and legislation in force at the date of the report and should be reviewed if such guidance and legislation are amended or superseded.

NSugg Ltd do not warrant that the advice in this report will guarantee the availability of flood insurance either now or in the future.

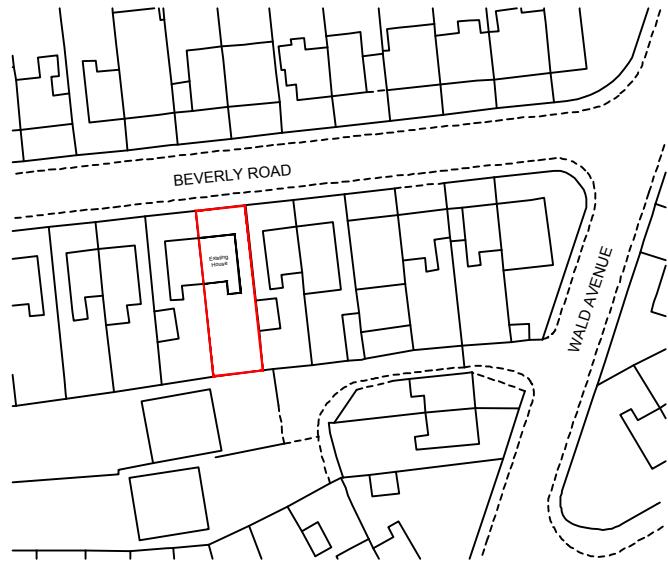
It will be the owner's /occupier's responsibility to ensure the recommended flood risk mitigation measures outlined within this FRA are implemented and to maintain the site drainage system throughout the lifetime of the development.

This report is for the exclusive use of Hanif Al Imam and Irasia Designs; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Nicola Sugg.

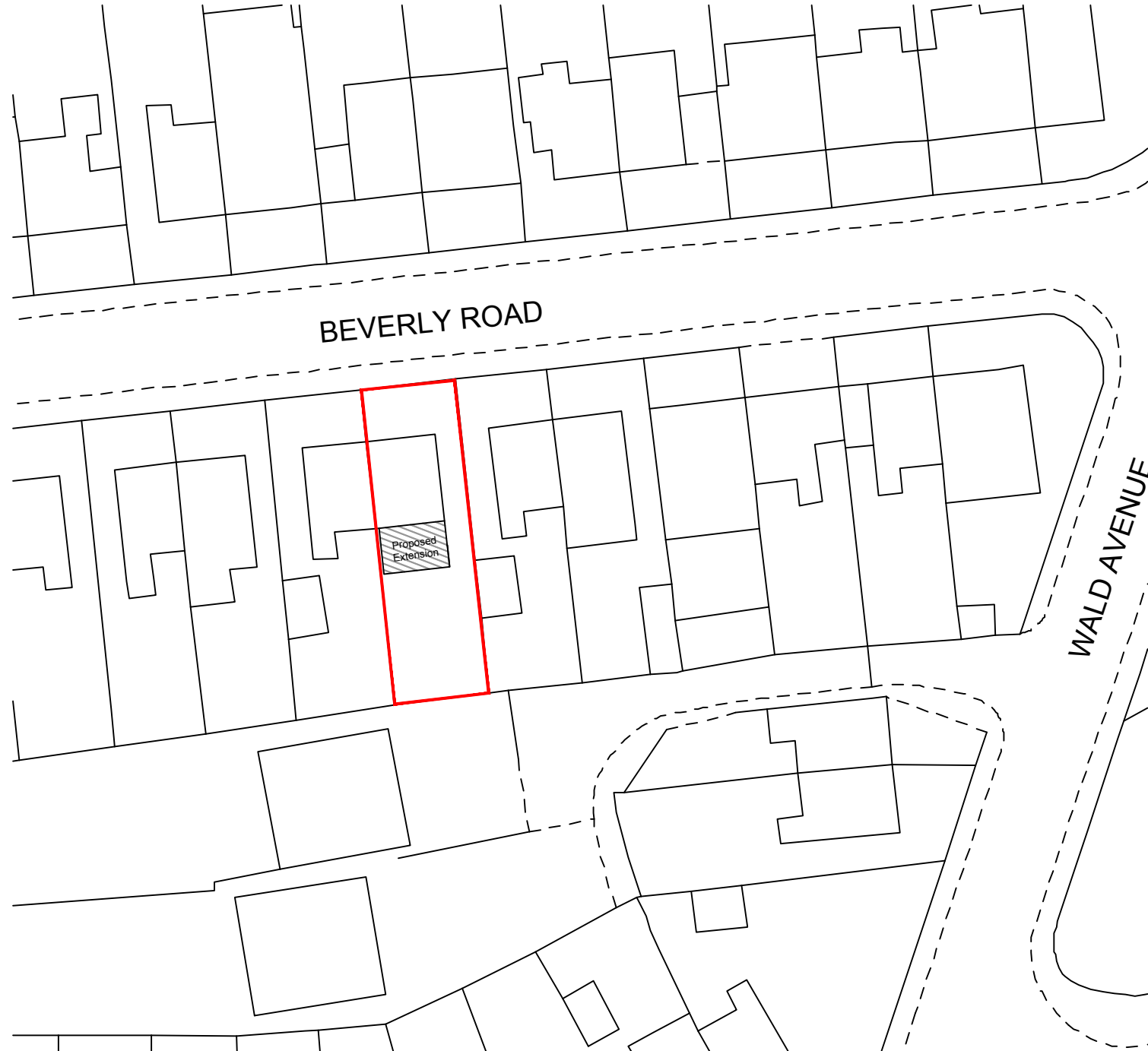
APPENDIX 1



1 Location Plan
Scale: 1:1250



2 Existing Site Plan
Scale: 1:1250



3 Proposed Block Plan
Scale: 1:500

Key	
	Proposed single storey rear extension



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Site Plans

Drawing No: **pln016.01** /
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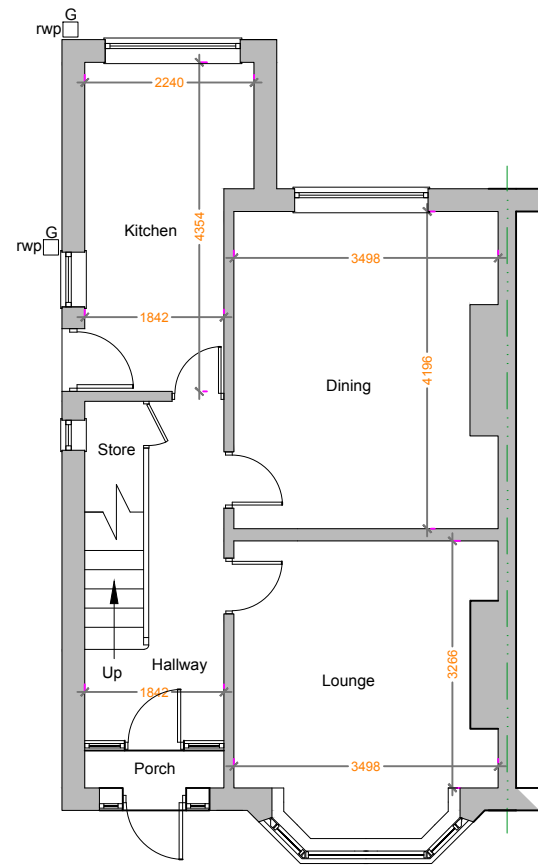
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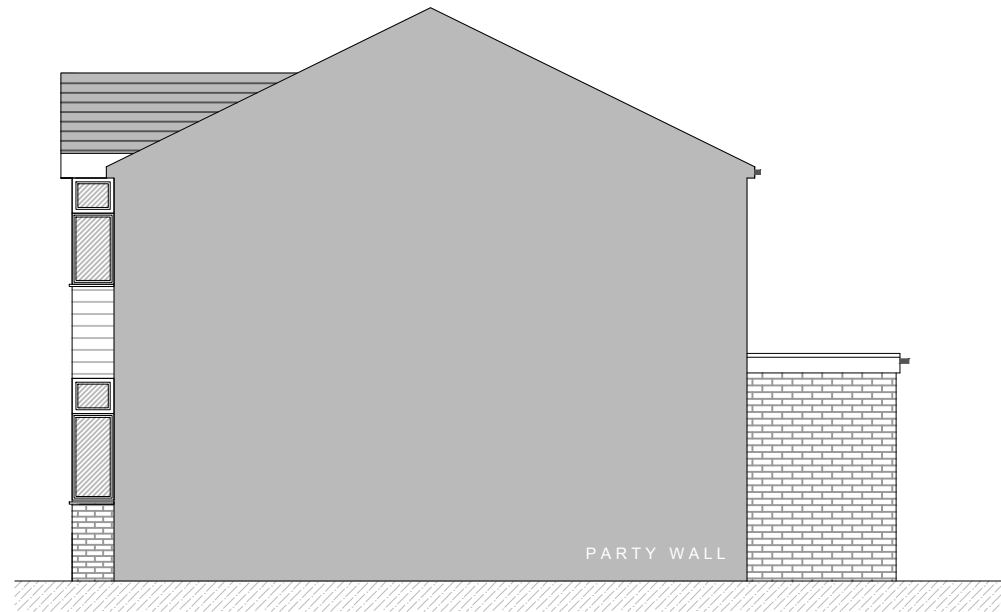
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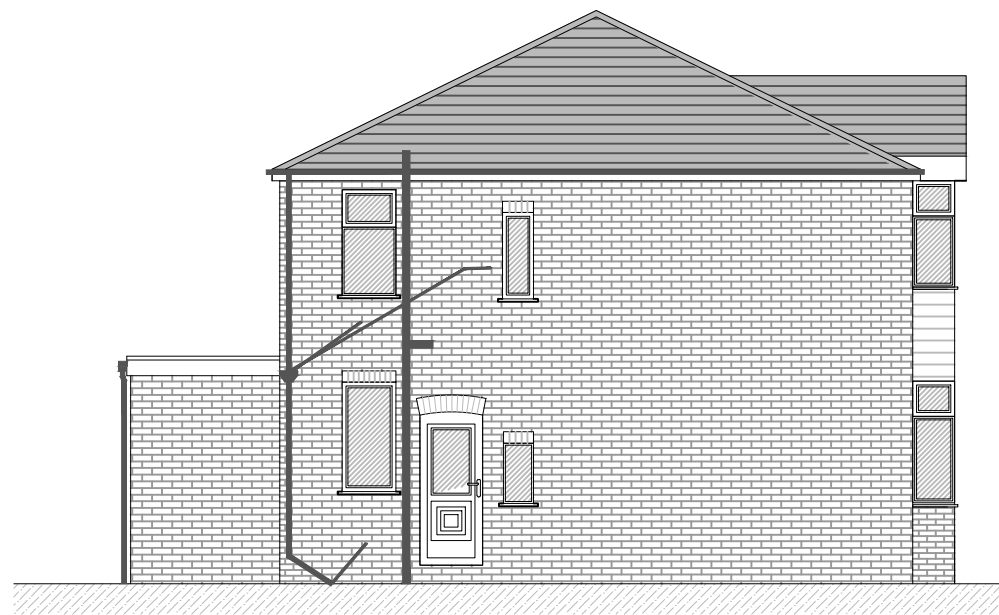
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2 Existing Side Elevation
Scale: 1:100

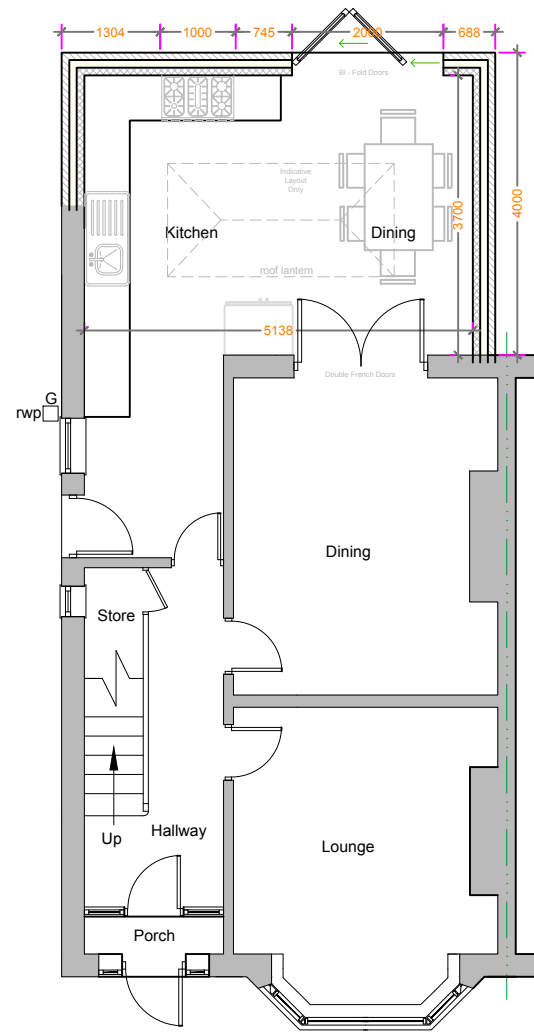


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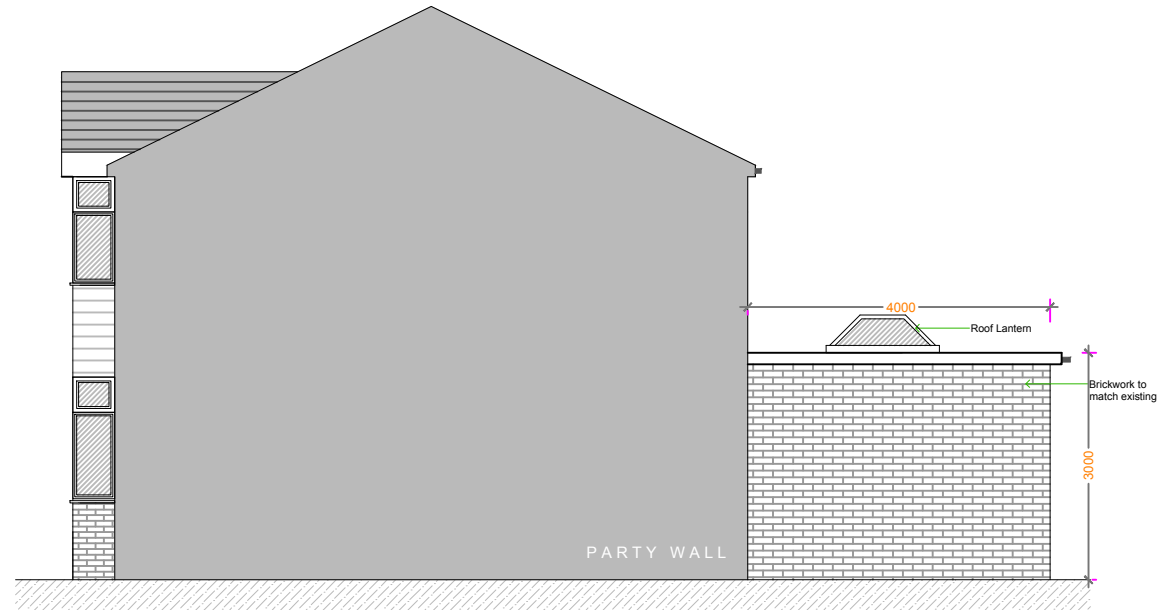


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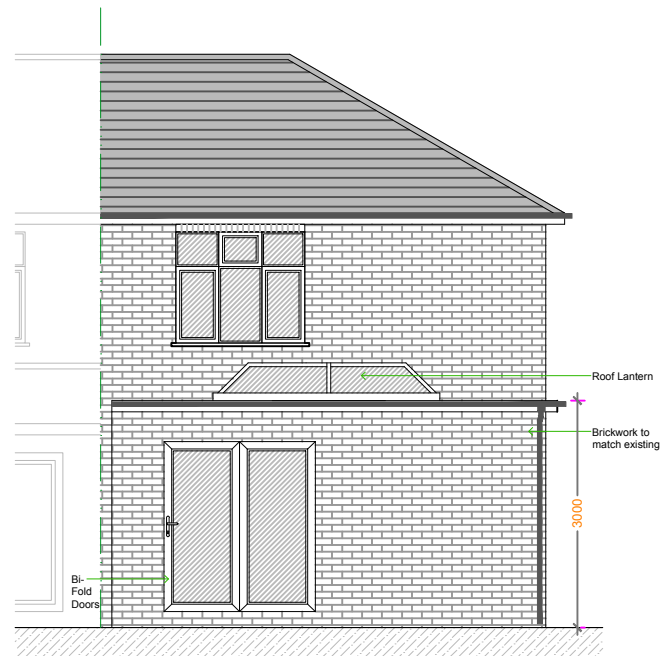
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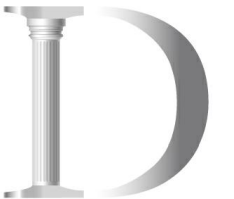
2 Existing Side Elevation
Scale: 1:100



3 Existing Rear Elevation
Scale: 1:100



4 Existing Side Elevation
Scale: 1:100



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**Proposed Plan
& Elevations**

Drawing No: pln016.03 /

Scale: 1:100 @ A3

Issue Date: 11.11.22

Drawn: IS

Checked: --

Revision Notes

Date	Rev	By	Description

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