

42 Grangethorpe Drive, Burnage, Manchester, M19 2NE.

FLOOD RISK ASSESSMENT



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20 October 2024

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1. Introduction:

This Flood Risk Assessment has been prepared in support of the planning application for a two storey side extension and rear dormer at 42 Grangethorpe Drive, Burnage, Manchester, M19 2NE.

The Flood Risk Assessment has been prepared in accordance with Environment Agency's National Planning Policy Framework (NPPF).

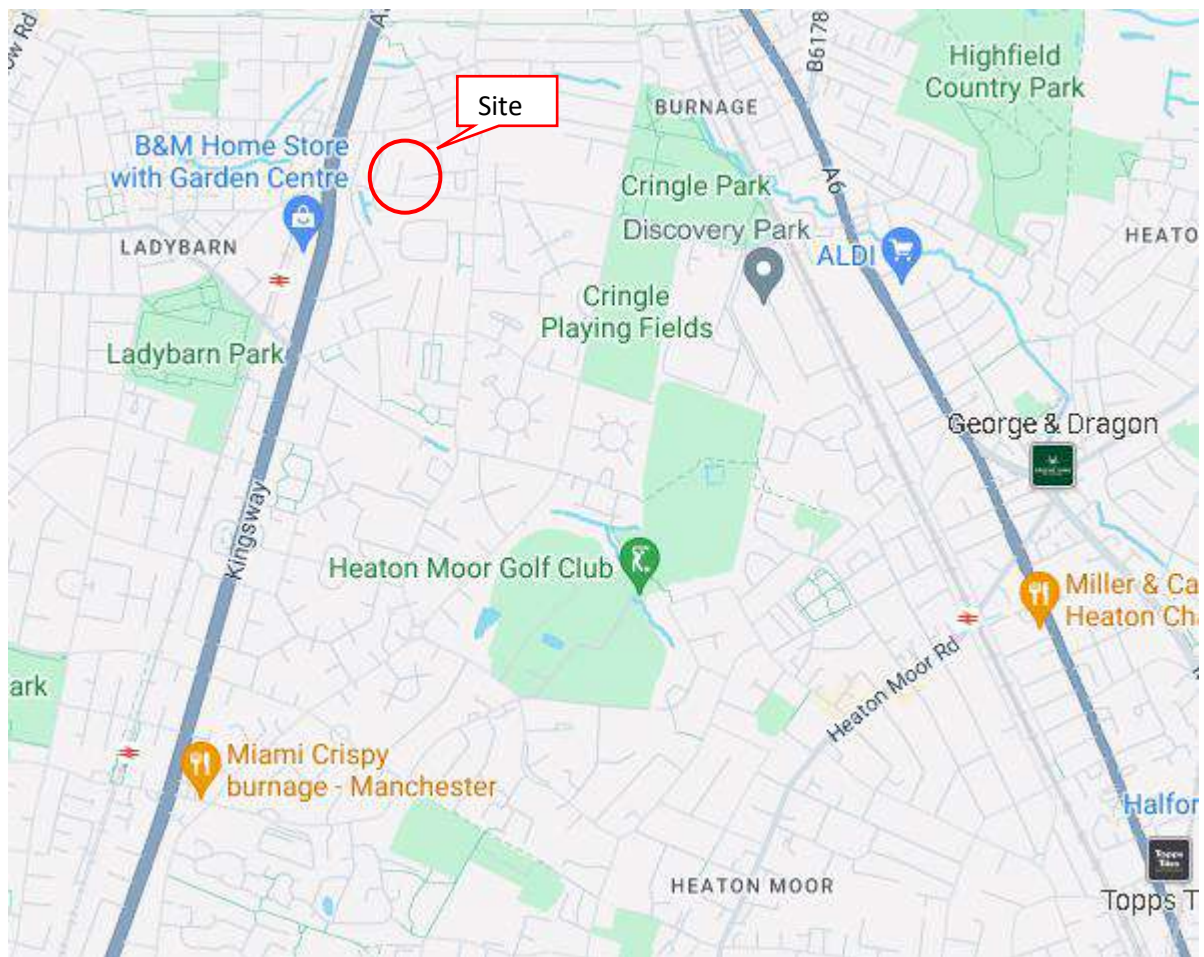
2. Site Location:

The site is semi-detached private dwelling house.

Grid Reference: SJ 865932

Eastings/Northings: 386537/393295

Elevation: The existing threshold level of the property is 43.664m AOD.



Location Plan

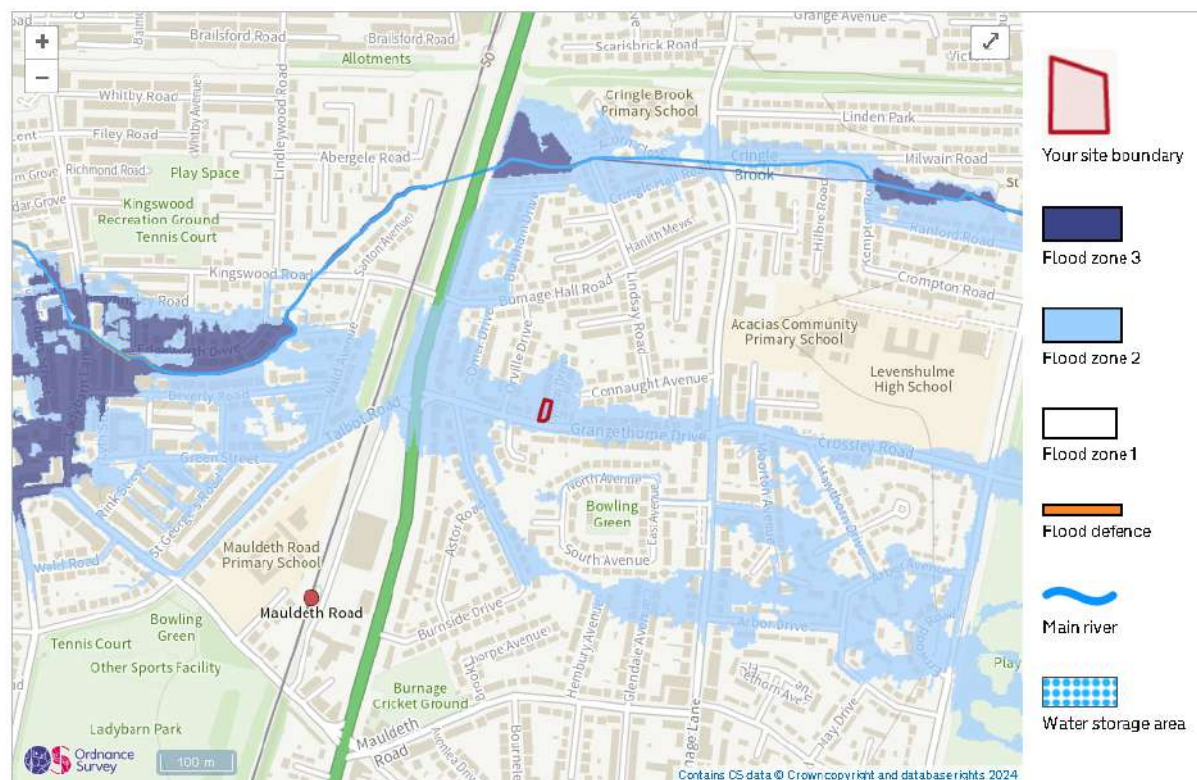
3. Development Proposals:

The development proposal is for a double storey, side extension and rear dormer to a private dwelling house, to form additional living space. The proposed extension comprises of 24.00Sqm extension on the ground floor, 32.20Sq.m on the first floor and dormer of 13.20Sq.m.

4. Flood Zone Allocation:

Based on the latest Flood Zone Mapping from the Environment Agency, the site lies within flood zone 2 (rivers or the sea), meaning “Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding.

Fig-1



According to Environment Agency’s guidelines, a flood risk assessment is required for developments in flood zone 2 or 3 including minor developments and change of use. The proposed development is classed as “minor extension”. A minor development is defined by the Environment Agency’s guidelines as “a minor extension (household extensions or non-domestic extensions less than 250 square metres) in flood zone 2 or 3.” As stated in Section 3 above, the total floor area of the proposed extension (comprising all three floors is 69.20 q.m .

Therefore, the proposed extension is considered to be a “minor extension”, as such it is recommended to follow the Environment Agency’s standing advice.

5. Vulnerability Classification:

Table 2 of the Planning Practice guidance (PPG), reproduced below, states the Vulnerability Classification of various developments.

The Flood risk vulnerability classification classifies the site as “More vulnerable”. The More vulnerable are described as “Buildings used for dwelling houses, student halls of residence, drinking establishments, night clubs and hotels”. Therefore, the Environment Agency’s standing advice should be followed.

Table 2: Flood risk vulnerability and flood zone “incompatibility”

Flood Zones: Flood Risk Vulnerability Classification

	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	√	√	√	√	√
Zone 2	√	Exception Test required	√	√	√
Zone 3a †	Exception Test required	X	Exception Test required	√	√
Zone 3b*	Exception Test required*	X	X	X	√*

Key:

√ Exception Test is not required

“†” In Flood Zone 3a essential infrastructure should be designed and constructed to remain operational and safe in times of flood.

“*” In Flood Zone 3b (functional floodplain) essential infrastructure that has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

As can be seen from the Table 2 above, an Exception Test is not required.

6. Sequential Test:

Under the NPPF, all new planning applications should undergo a “Sequential Test”. This test should be implemented by local planning authorities with a view to locating particularly vulnerable new developments (e.g., residential, hospitals, mobile homes etc.) outside of the floodplain.

The Sequential Test does not need to be applied for individual developments on sites which have;

- (i) been allocated in development plans the sequential test, nor for
- (ii) **application for minor development**, such as this development, or alternatively
- (iii) a “change of use”.

It should be noted that paragraph 164 of the NPPF (revised 2019) states: Applications for some minor developments and change of use should not be subject to the Sequential or Exception Tests but should still meet the requirement for site specific flood risk assessment.

7. Exception Test:

As stated in paragraph 5 above, an Exception Test is not required to be passed.

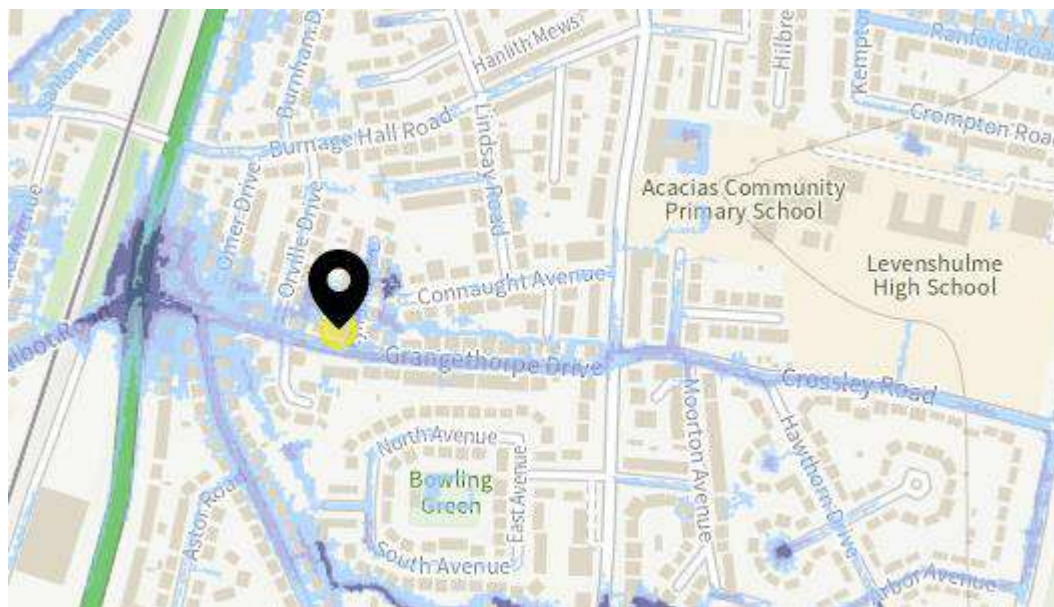
8. Flood Zone Maps:

As stated in paragraph 4 above, the site is located within Flood Zone 2 (medium risk of flooding) and is considered to be 'More vulnerable' according to NPPF guidelines. The figures below indicate the potential sources of flooding to the site.

As per the information available on the Environment Agency's website, the site is at a medium risk of flooding from the Surface Water, refer fig-2 below.

It means that there is 1.0% to 3.30% chance of flooding each year.

Fig-2



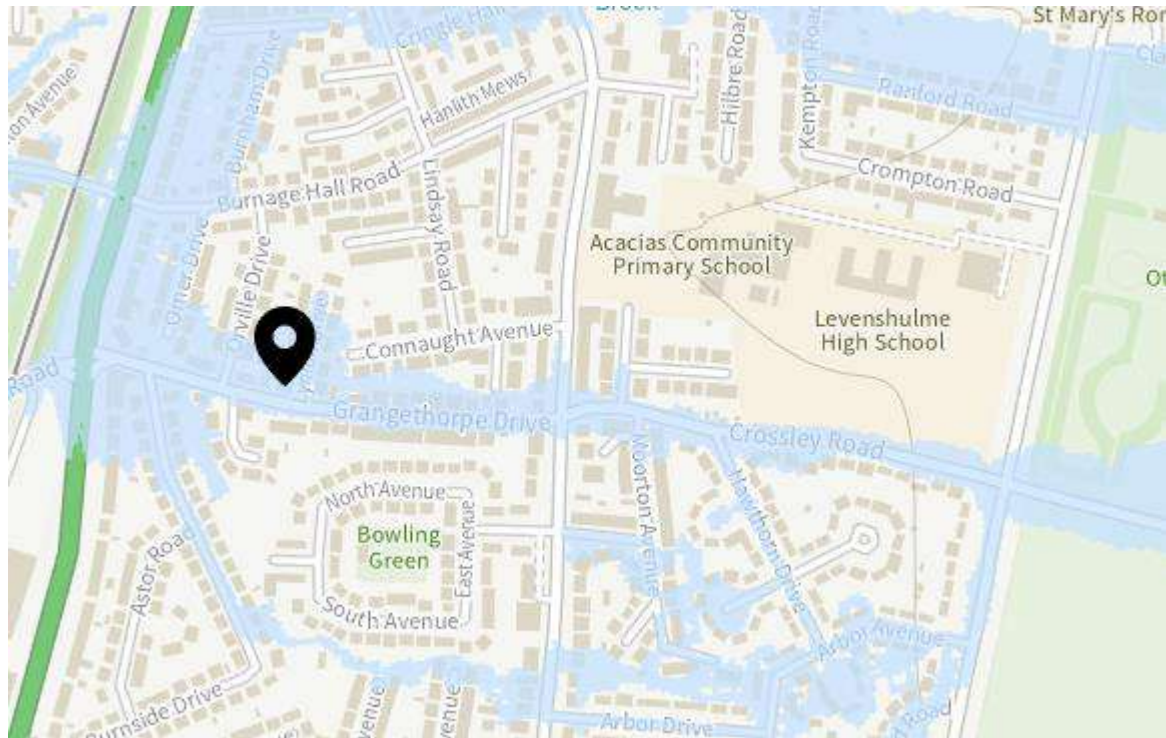
Key

Surface water

-  Extent
-  High risk
More than 3.3% chance each year
-  Medium risk
Between 1% and 3.3% chance each year
-  Low risk
Between 0.1% and 1% chance each year
-  Depth

As per the information available on the Environment Agency's website, the site may be impacted by flooding from reservoirs when there is also flooding from the rivers. However, there is no risk of flooding from the reservoirs when the river levels are normal, refer to fig-3 below.

Fig-3



Key

Reservoirs



Extent



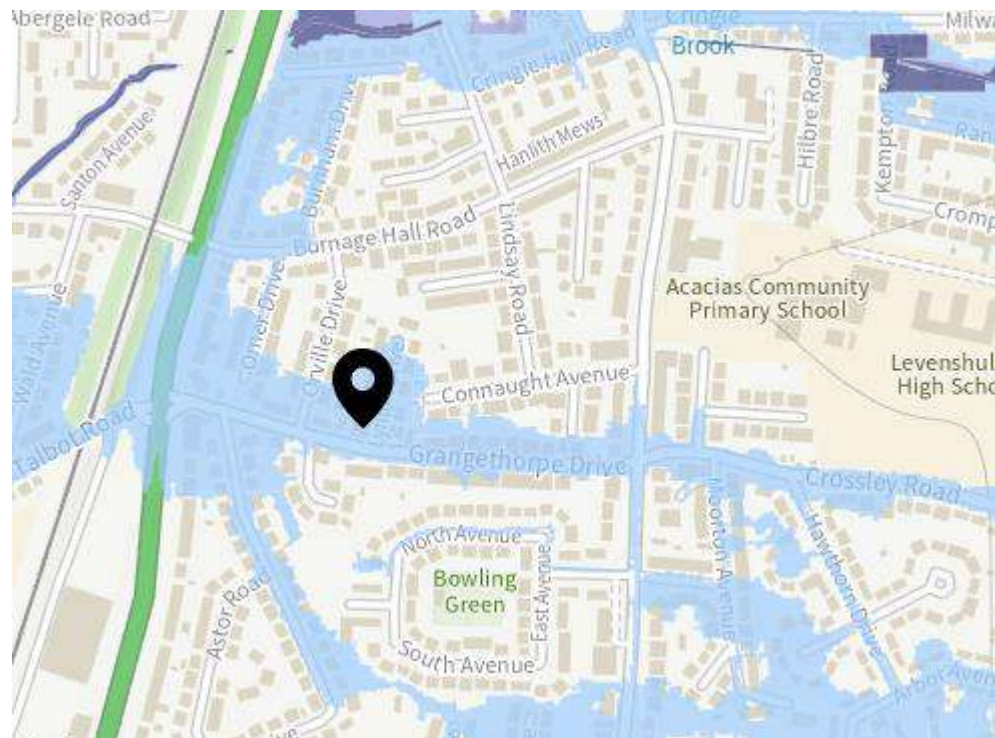
When river levels are normal



When there is also flooding from rivers

According to Environment Agency's website, the site lies within flood zone 2 (rivers or the sea). An area with low probability of flooding from rivers or the sea, see fig-4 below.

Fig-4



Key

Rivers and the sea

- ⊙ Extent
- High risk
More than 3.3% chance each year
- Medium risk
Between 1% and 3.3% chance each year
- Low risk
Between 0.1% and 1% chance each year
- Very low risk
Less than 0.1% chance each year

The main river “Cringle Brook” is located approximately 400m to the North of the site and flows from East to West.

A watercourse “Willow Brook” runs approximately 100m to the West of the site, it flows from southeast to northwest.

The local topography indicates general fall from East to West.

Source of Flooding:

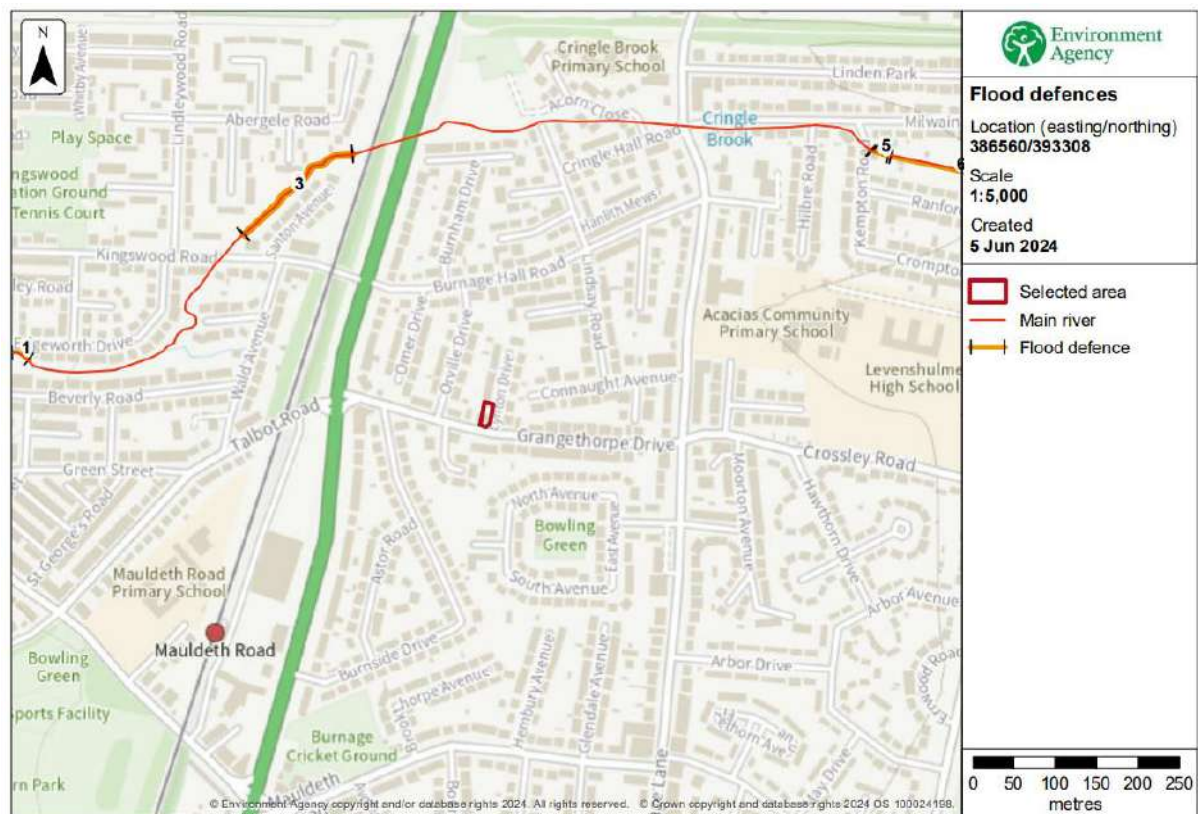
Source	Flood Risk
Surface water	Medium (see Fig-2, page 6)
Fluvial	Low (see Fig-4, page 8)
Reservoirs	Only when there is also flooding from rivers (Fig-3, Page 7).
Ground Water	Unlikely
Sewers	Not known

9. Flood Defences and Flooding History:

9.1 Flood Defences:

The main river “Cringle Brook” is located approximately 400m to the North. The figure 5 below, provided by the Environment Agency, shows the flood defences along Cringle Brook, to the northwest and northeast of the site. The flood defences are in the form of “Engineered High Ground”.

Fig-5



9.2 Flooding History:

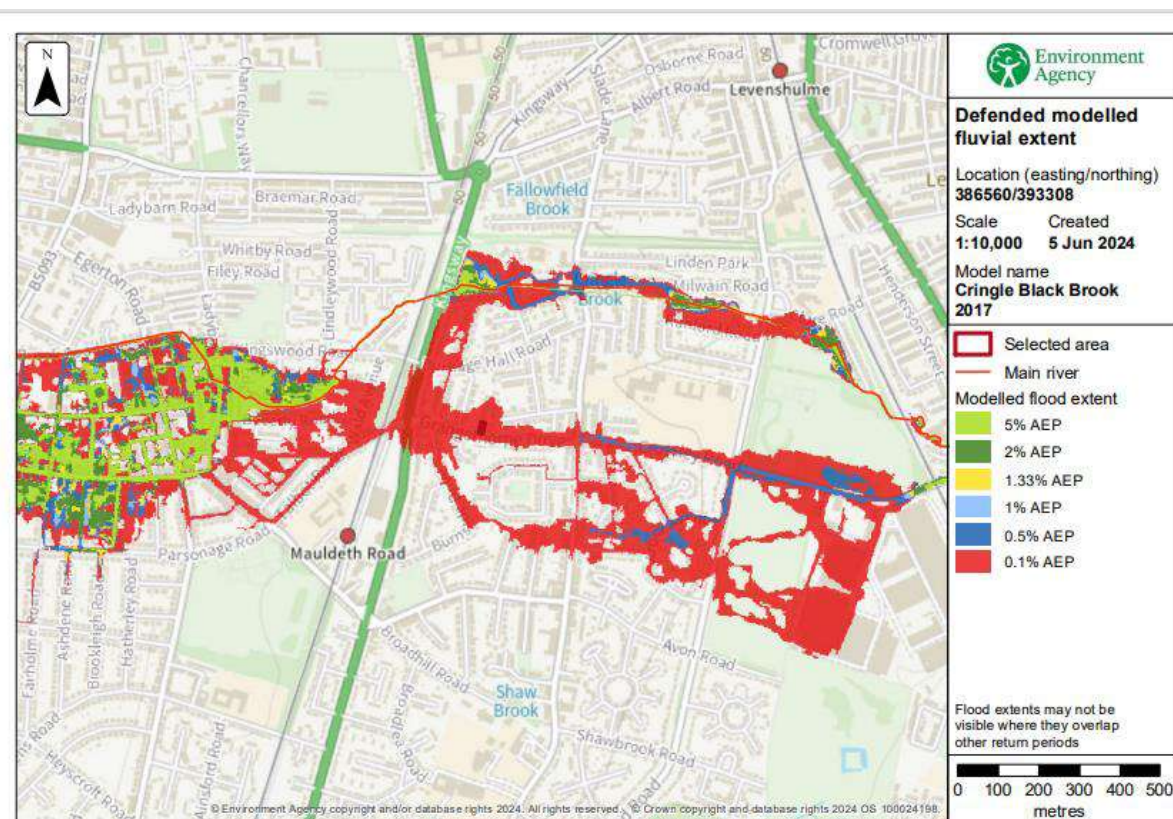
The Environment Agency has not provided any historic flooding records. Therefore, it is assumed that the site has not been subject to flooding from Cringle Brook in the past.

10. Probability of Flooding:

The figure 6 below, provided by the Environment Agency, shows the extent of fluvial flooding in the defended model scenario, i.e. when the flood defences are employed. It shows 0.1% Annual Exceedance Probability (AEP).

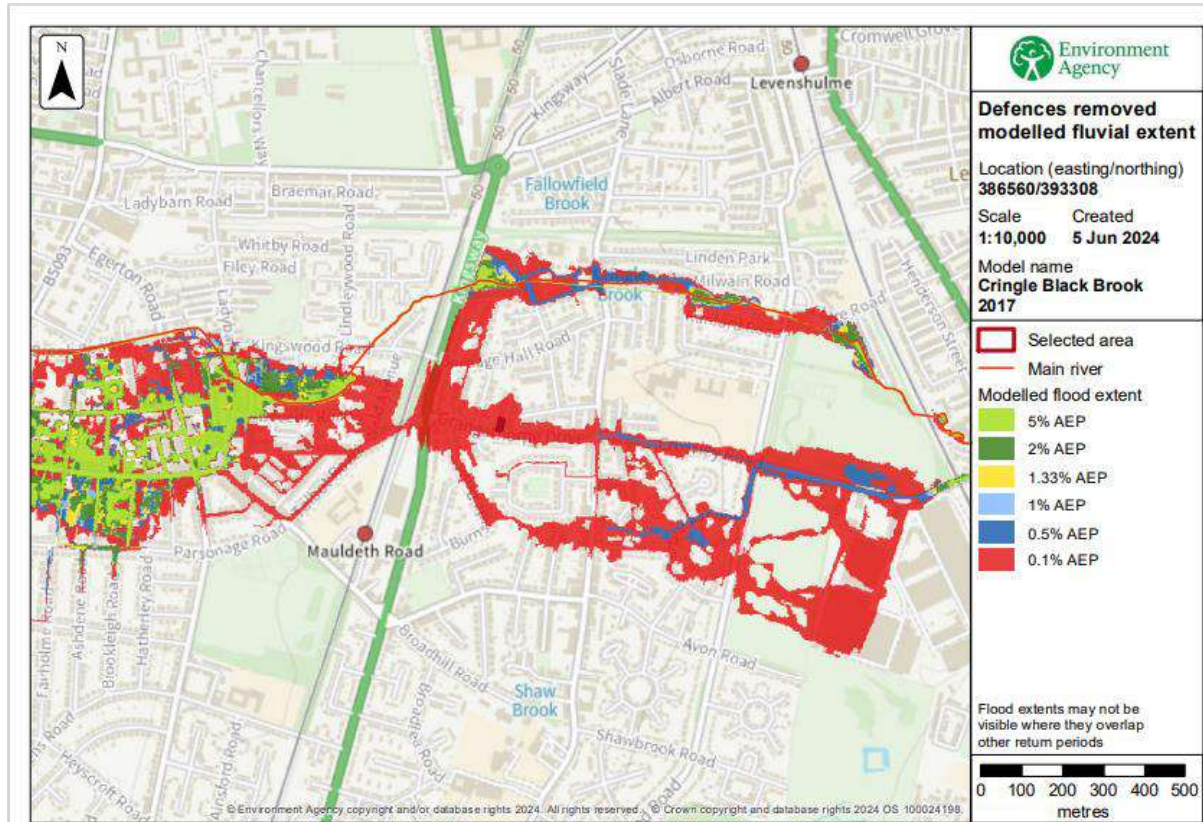
The Environment Agency guidance states the definition of Flood Zone 2, Medium probability as, “Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding.

Fig-6



The figure 7 below, provided by the Environment Agency, shows the extent of fluvial flooding when the flood defences are removed. It shows 0.1% Annual Exceedance Probability (AEP).

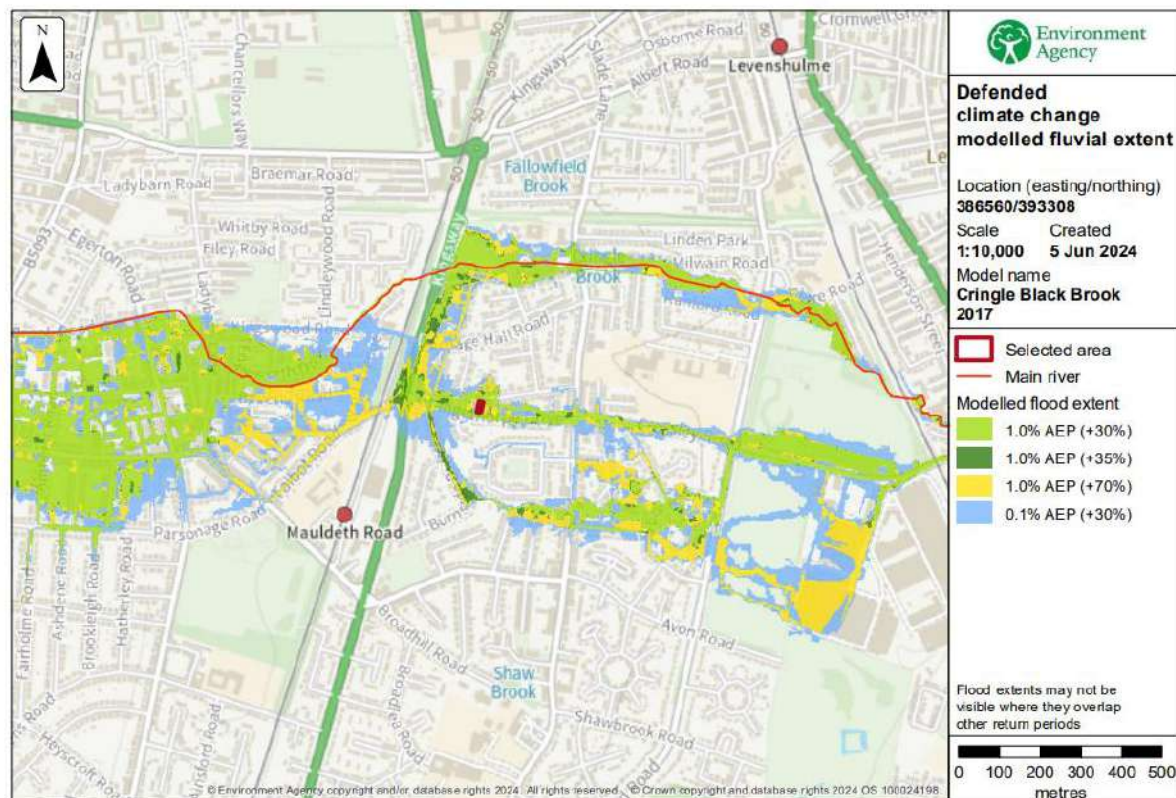
Fig-7



The figure 8 below, provided by the Environment Agency, shows the extent of fluvial flooding in the defended model scenario with varying percentage allowance for the climate change. It shows 1.0% Annual Exceedance Probability (AEP) with 30 to 70% allowance for climate change.

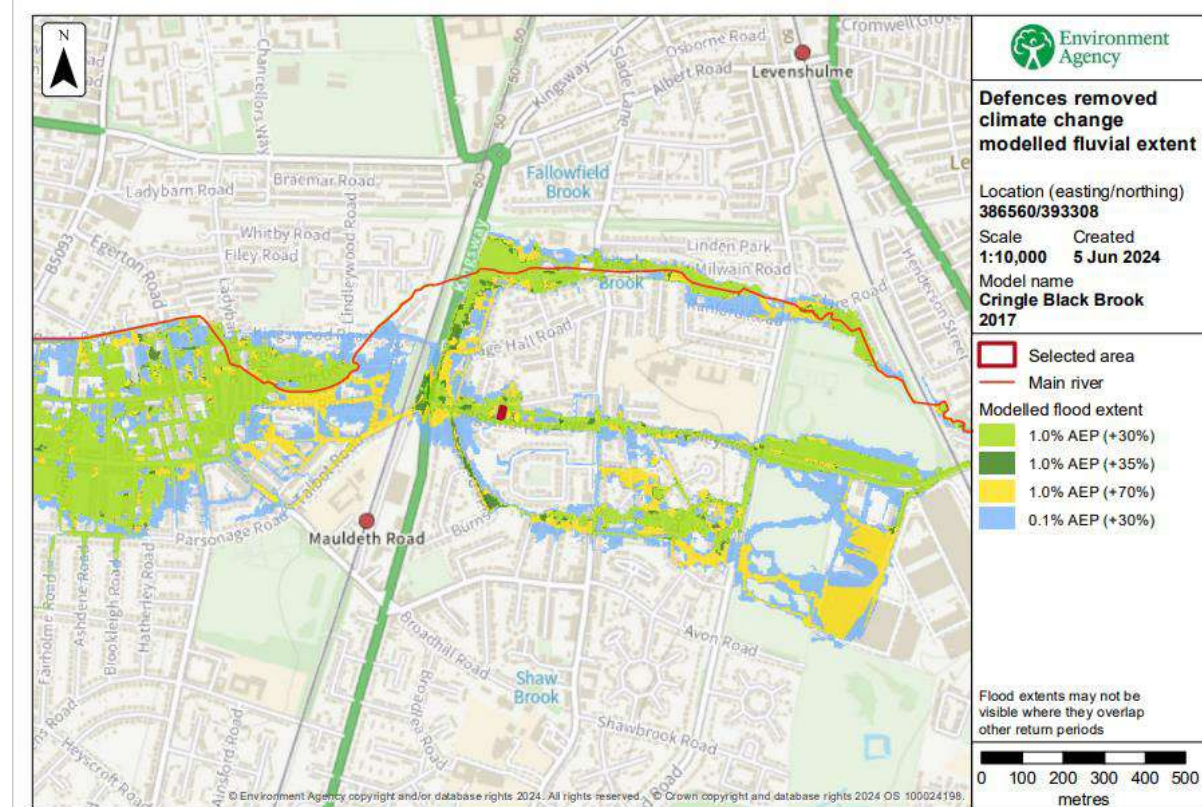
The Environment Agency guidance states the definition of Flood Zone 2, Medium probability as, “Land having between a 1% and 0.1% annual probability of river flooding; or land having between a 0.5% and 0.1% annual probability of sea flooding.

Fig-8



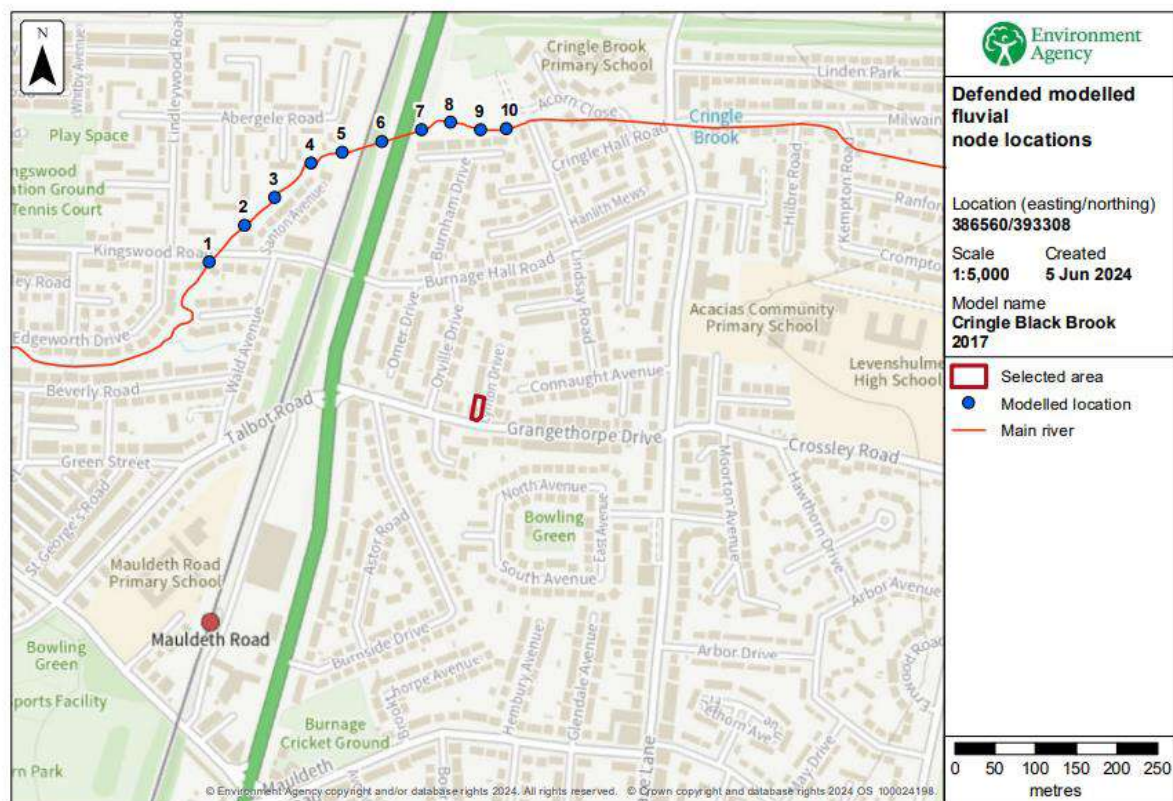
The figure 9 below, provided by the Environment Agency, shows the extent of fluvial flooding in the defences removed model scenario with varying percentage allowance for the climate change. It shows 1.0% Annual Exceedance Probability (AEP) with 30 to 70% allowance for climate change.

Fig-9



The figure 10 below provided by the Environment Agency, shows node location for the flooding levels in the defended model for fluvial flooding. Nodes 7, 8, 9 and 10 show that at 1.0% AEP (1 in 100 years), the flood levels are 44.16, 44.18, 44.18 and 44.18m respectively. For 0.5% AEP (1 in 200 years), the flood levels are 44.40, 44.41, 44.42 and 44.41m respectively. For 0.1% AEP (1 in 1000 years), the flood levels are 44.99m for all of the above nodes.

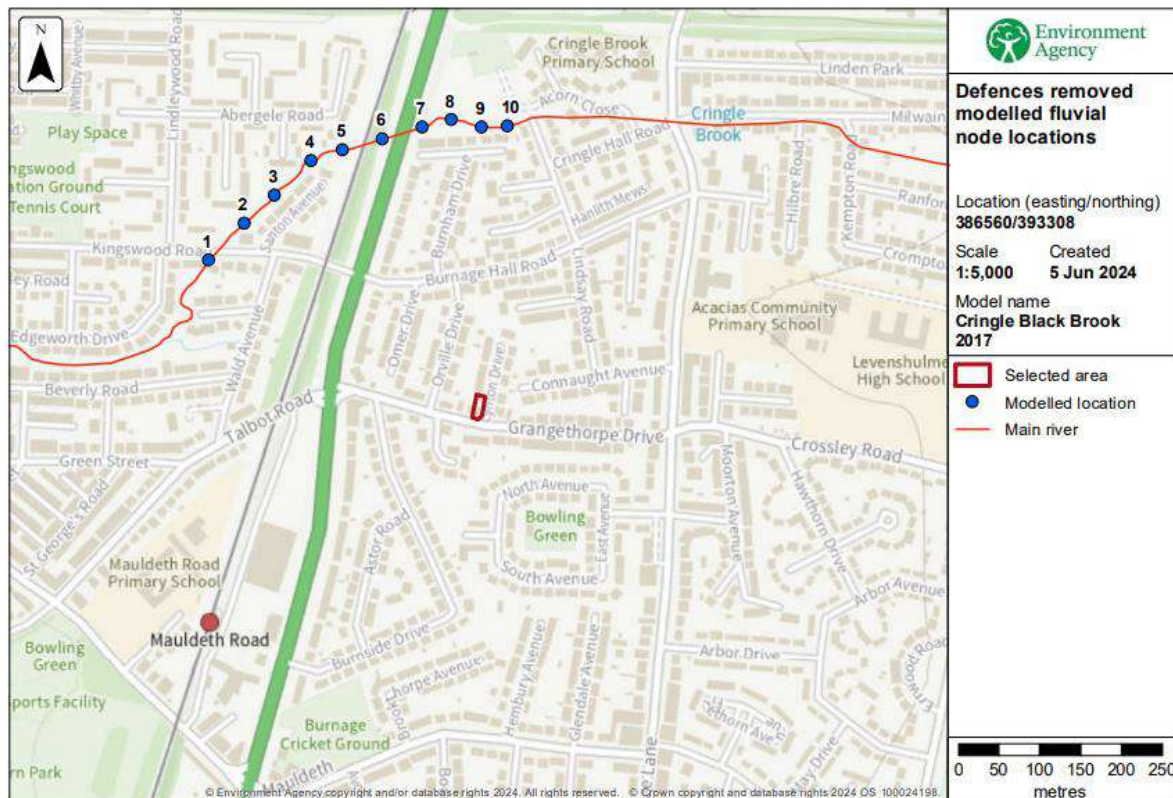
Fig-10



As we consider 1.0% AEP (1 in 100 years), the flood levels range from 44.16 to 44.18m AOD. As the property threshold level is 43.664m AOD, this would result in inundation of 0.496 to 0.498m.

The figure 11 below provided by the Environment Agency, shows node location for the flooding levels with flood defences removed model for fluvial flooding. Nodes 7, 8, 9 and 10 show that the flood levels for the nodes are same as for the earlier defended model. 1.0% AEP (1 in 100 years), the flood levels are 44.16, 44.18, 44.18 and 44.18m respectively. For 0.5% AEP (1 in 200 years), the flood levels are 44.40, 44.41, 44.42 and 44.41m respectively. For 0.1% AEP (1 in 1000 years), the flood levels are 44.99m for all of the above nodes.

Fig-11



As we consider 1.0% AEP (1 in 100 years), the flood levels range from 44.16 to 44.18m AOD. As the property threshold level is 43.664m AOD, this would result in inundation of 0.496 to 0.498m.

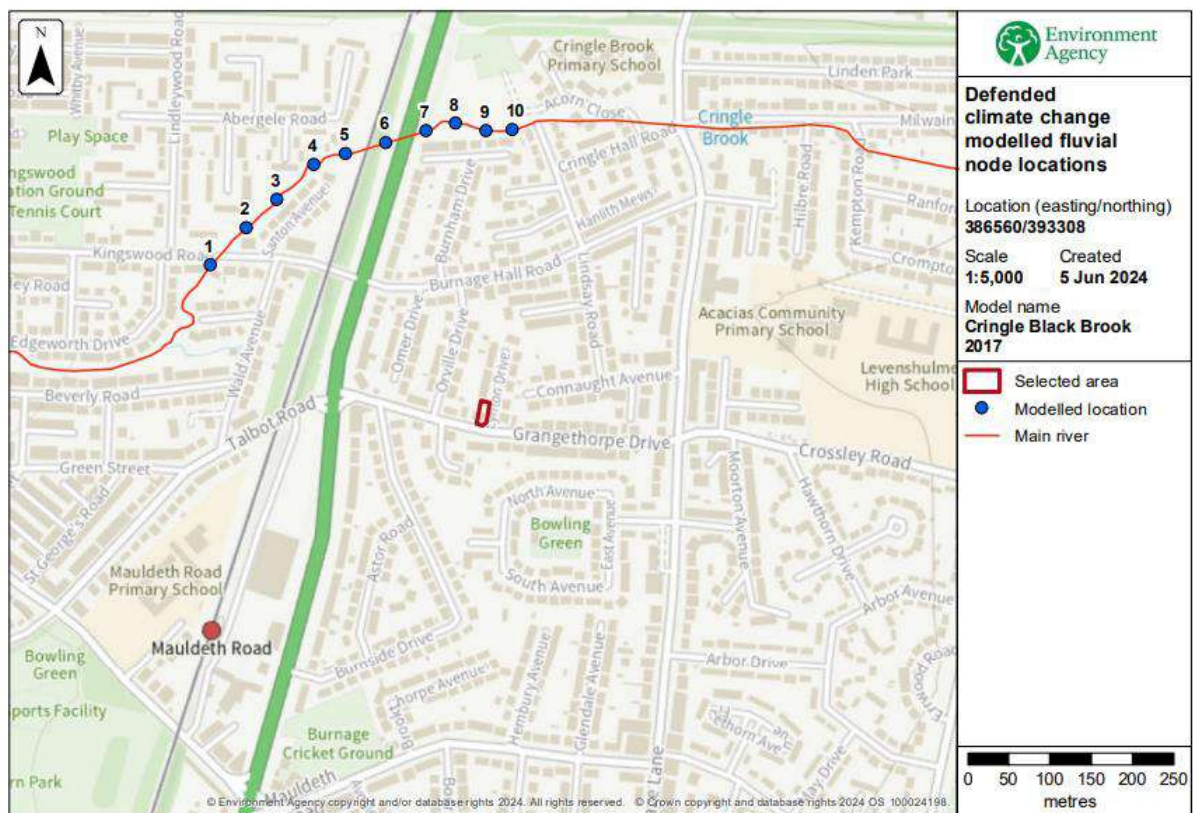
The figure 12 below provided by the Environment Agency, shows node location for the flooding levels in the defended model for fluvial flooding with climate change. Nodes 7, 8, 9 and 10 show that at 1.0% AEP (1 in 100 years) +30% for climate change, the flood levels are 44.58, 44.59, 44.59 and 44.59m respectively.

1.0% AEP (1 in 100 years) +35% for climate change, the flood levels are 44.64, 44.65, 44.65 and 44.65m respectively.

1.0% AEP (1 in 100 years) +70% for climate change, the flood levels are 44.86, 44.87, 44.87 and 44.86m respectively.

For 0.1% AEP (1 in 1000 years) +30% for climate change, the flood levels are 45.10m for all of the above nodes.

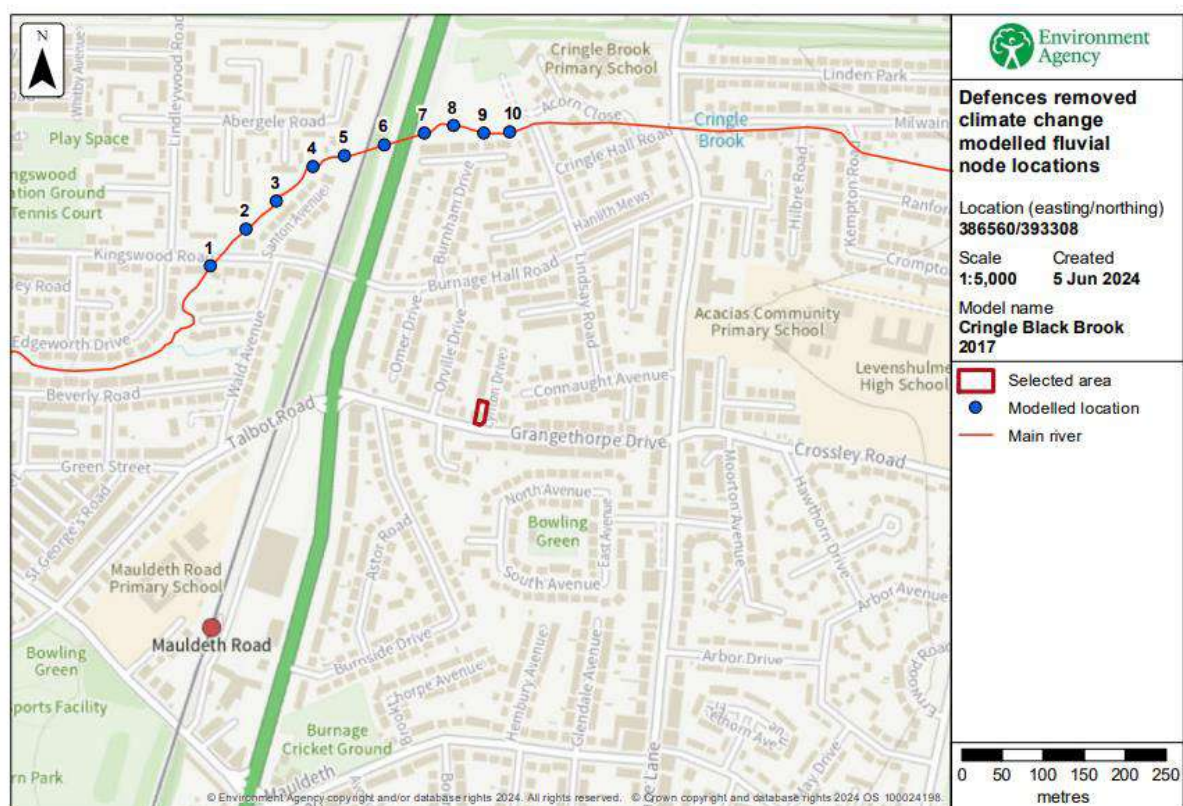
Fig-12



As we consider 1.0% AEP (1 in 100 years) +30% for climate change, the flood levels range from 44.58 to 44.59m AOD. As the property threshold level is 43.664m AOD, this would result in inundation of 0.916 to 0.926m.

The figure 13 below provided by the Environment Agency, shows node location for the flooding levels in the defences removed model for fluvial flooding with climate change. Nodes 7, 8, 9 and 10 show that the flood levels are the same as per the defended model. For 1.0% AEP (1 in 100 years) +30% for climate change, the flood levels are 44.58, 44.59, 44.59 and 44.59m respectively. 1.0% AEP (1 in 100 years) +35% for climate change, the flood levels are 44.64, 44.65, 44.65 and 44.65m respectively. 1.0% AEP (1 in 100 years) +70% for climate change, the flood levels are 44.86, 44.87, 44.87 and 44.86m respectively. For 0.1% AEP (1 in 1000 years) +30% for climate change, the flood levels are 45.10m for all of the above nodes.

Fig-13



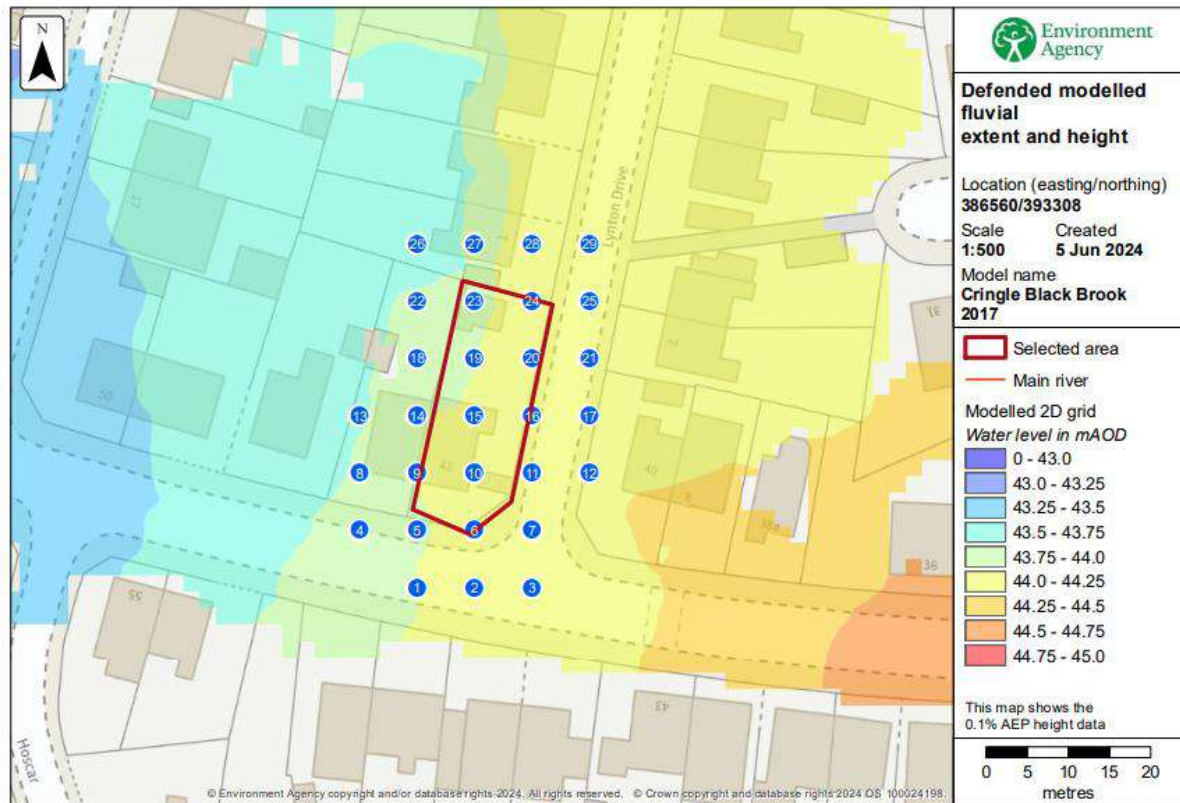
As we consider 1.0% AEP (1 in 100 years) +30% for climate change, the flood levels range from 44.58 to 44.59m AOD. As the property threshold level is 43.664m AOD, this would result in inundation of 0.916 to 0.926m.

The figure 14 below provided by the Environment Agency, shows extent and height of flooding. It shows the impact to property ranging from 43.50m to 44.25m AOD, in the defended model for fluvial flooding.

The extent of flooding for 1.0% or 0.5% AEP is not shown.

For the 0.1% (1 in 1000 years) AEP, the levels range between 43.61 to 44.13m AOD.

Fig-14

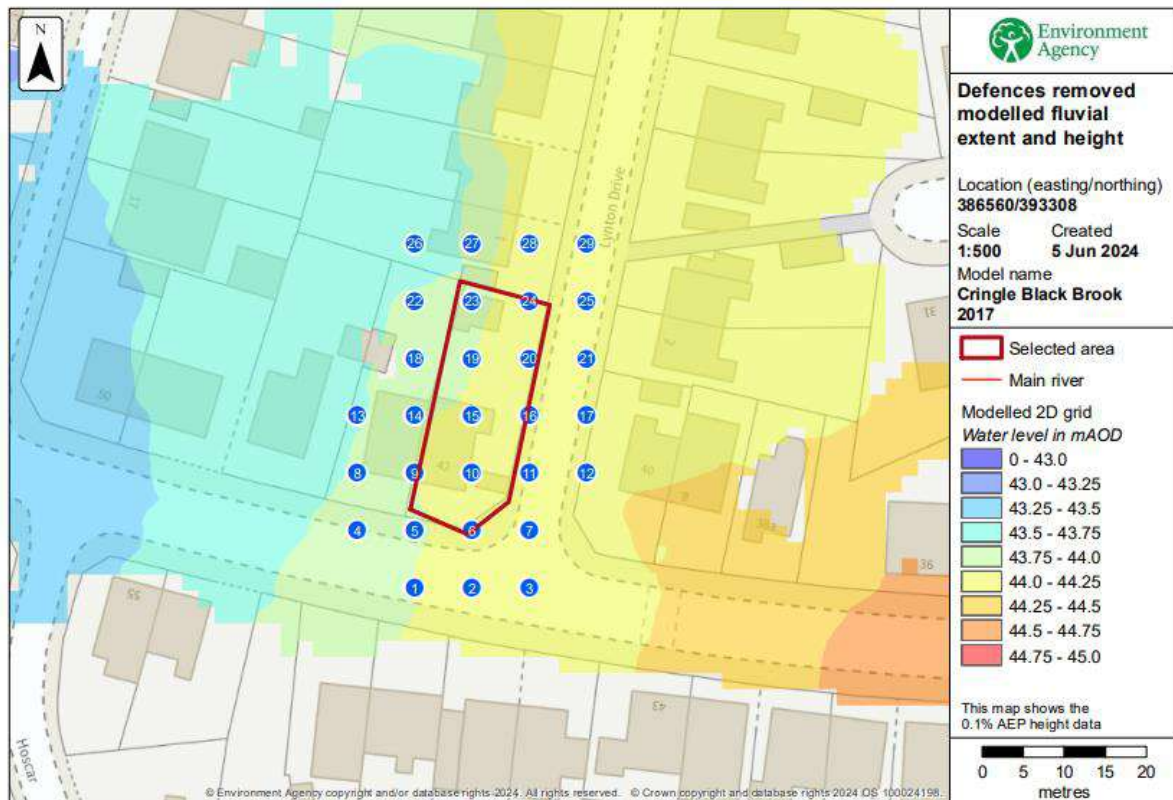


The maximum height of fluvial flooding in the defended scenario would be 0.586m. However when comparing to 1.0% AEP (1 in 100 years), the maximum height of flooding would be 0.466m.

The figure 15 below provided by the Environment Agency, shows extent and height of flooding. It shows the impact to property ranging from 43.50m to 44.25m AOD, in the defences removed model for fluvial flooding.

The extent of flooding for 1.0% or 0.5% AEP is not shown. For the 0.1% (1 in 1000 years) AEP, the levels range between 43.68 to 44.13m AOD.

Fig-15:



The maximum height of fluvial flooding in the defended scenario would be 0.586m. However when comparing to 0.1% AEP (1 in 100 years), the maximum height of flooding would be 0.466m.

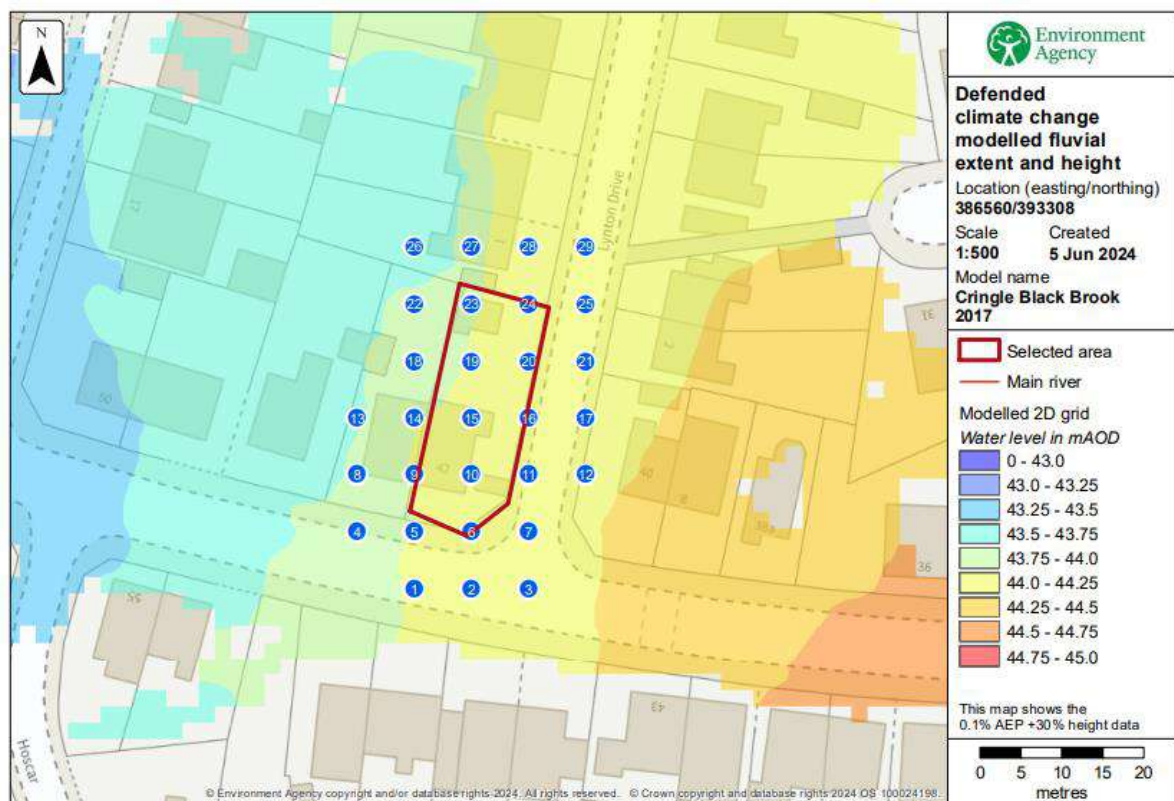
The figure 16 below provided by the Environment Agency, shows extent and height of flooding in the defended model with climate change.

It shows the impact to property ranging from 43.50m to 44.25m AOD, in the defences removed model for fluvial flooding.

The depth of flooding for 1.0% AEP (+70%), range from 0.00 to 0.24m.

The depth of flooding for 0.10% AEP (+30%), range from 0.01 to 0.46m and the height varies between 43.67 to 44.15m AOD.

Fig-16:



The maximum height of fluvial flooding in the defended scenario would be 0.586m.

The figure 17 below provided by the Environment Agency, shows extent and height of flooding in the defences removed model with climate change.

It shows the impact to property ranging from 43.50m to 44.25m AOD, in the defences removed model for fluvial flooding, similar to that in the defended model.

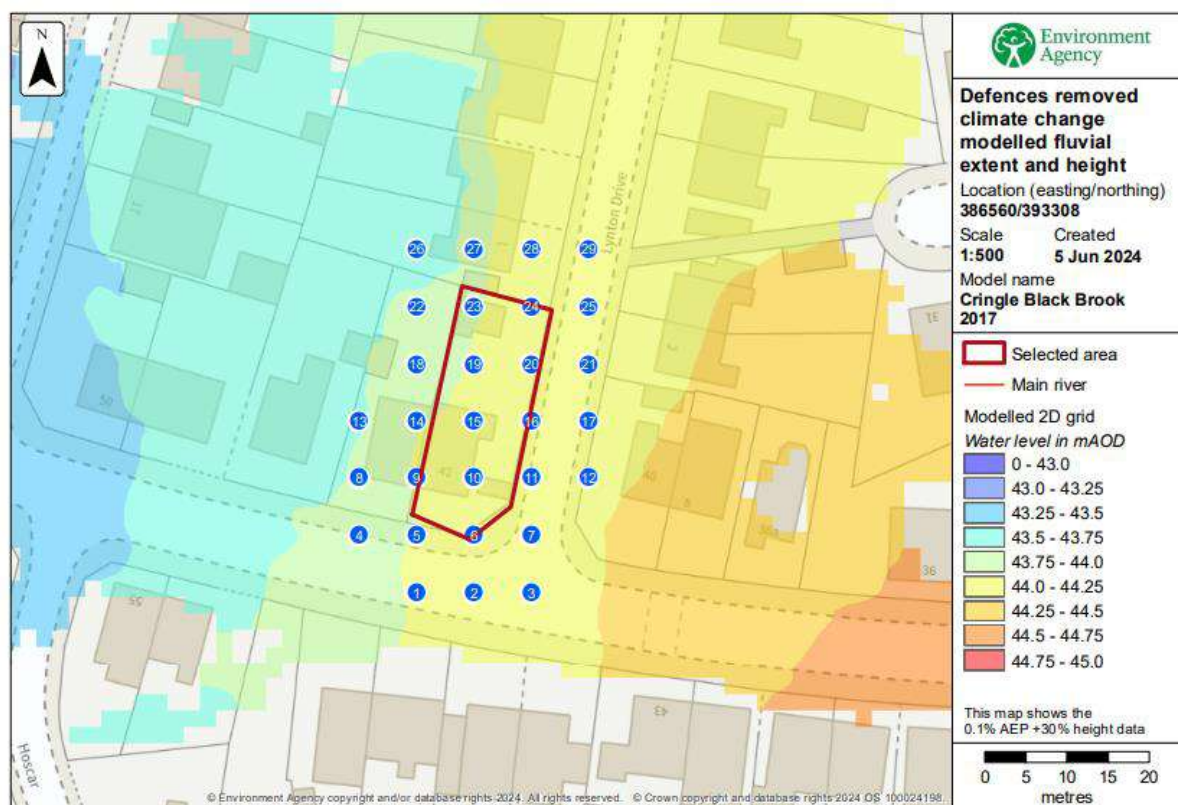
The data for depth and height of flooding for 1.0% AEP (+30%), is incomplete. From the available information, it shows the depth ranging from 0.00 to 0.24m and height from 43.37 to 43.98m AOD.

The data for depth and height of flooding for 1.0% AEP (+35%), is similarly incomplete. From the available information, it shows the depth ranging from 0.00 to 0.18m and height from 43.38 to 44.05m AOD.

The height of flooding for 1.0% AEP (+70%), varies from 43.44 to 44.06m AOD.

The height of flooding for 0.10% AEP (+30%), varies from 43.67 to 44.15m AOD.

Fig-17:



The maximum height of fluvial flooding in the defended scenario would be 0.586m. However when comparing to 0.1% AEP (1 in 100 years) +30%, the maximum height of flooding would be 0.316m.

11. Conclusion:

- The area of the new extension at ground floor level is 24.00Sq.m, all of which will be built over the existing impermeable area, as such there will not be any increase in the surface water run-off.
- The proposed extension is considered a minor development of residential dwelling. As it is an extension to an existing dwelling house, the floor level of the extension can't be set higher than existing building. Therefore it is recommended that finished floor level of the proposed extension is set no lower than that of existing dwelling.
- As demonstrated by Figure-4 on page 8, the site is at low risk of flooding from fluvial flooding.
- The Environment Agency has not provided any historic flooding records. Therefore, it is assumed that the site has not been subject to flooding from Cringle Brook or the Willow Brook, in the past.
- As noted in paragraph 10, the analysis of the data provided by the Environment Agency shows the property may be impacted from fluvial flooding in various scenarios, such as, 1.0% (1 in 100 year) Annual Exceedance Probability event and 1.0% (1 in 100 year) Annual Exceedance Probability+30% for climate change event. However, there doesn't appear to be any difference in the defended model or flood defences removed models. The worst case situation appears to be as shown by figure 12, page 17, where for the fluvial flooding for the 1.0% (1 in 100 year) Annual Exceedance Probability+30% for climate change event, for the defended and defences removed model, water inundation would likely to be 0.926m above the property threshold level.

12. Flood Risk Management Measures:

The property is located in Flood Zone 2, therefore, it should be noted that the risk of flooding to the property is generally considered to be low to moderate. However, the following mitigation measures are recommended to be incorporated into the proposed extension and where possible into the existing property.

- i. The Environment Agency guidelines states that finished floor level should be a minimum of whichever is higher of 300mm above the:

Average ground level of the site

Adjacent road level to the building

Estimated river or sea flood level

As it is an extension to an existing dwelling house, the floor level of the extension can't be set higher than existing building. Therefore it is recommended that finished floor level of the proposed extension is set no lower than that of existing dwelling.

- ii. The external doors to the property to be fitted with Nautilus 400 or similar approved flood barrier system to a height of 1.0m from finished floor level (optional).
- iii. All windows to the new extension, within 900mm of finished floor level, should have water-tight seals at the joints with the walls, (optional for the existing building).
- iv. The ground floor of the proposed extension should be constructed of concrete to facilitate cleaning & drying.
- v. Any airbricks to the new extension, should be anti-flood airbricks
- vi. A layer of DPM to be installed to the inner side of all external walls of extension, to a height of 1.0m.
- vii. Sealant should be applied around all pipe/cable/Services entry points Recommended for the extension, (optional for existing building).
- viii. Any new sockets in the new extension to be located a minimum of 1.0m above the finished floor level.
- ix. It is advised that water butts should be used at the RW Pipes, to the side elevation of the property, to harvest the rainwater, which can be used to water the plants and the lawn. It may also be used to clean the hard surfaces in the side and rear of the house.

The above measure will provide protection to the property against the probability of flooding from rivers at 1.0% AEP (1 in 100 year event) plus 30% for climate change event.

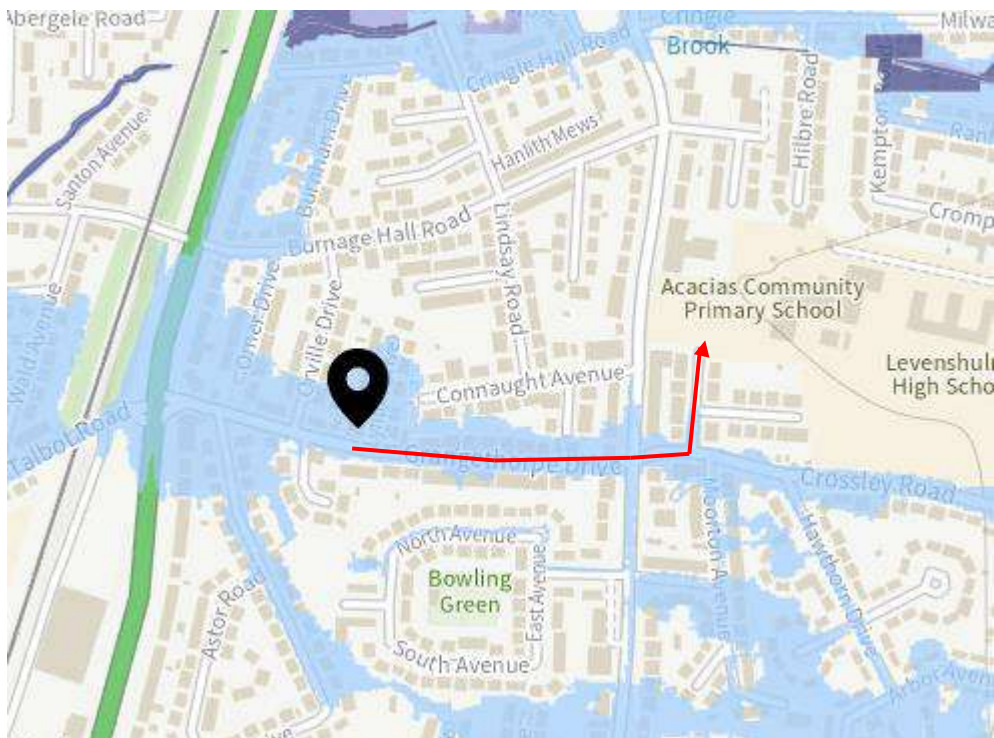
13. Flood Evacuation Plan:

13.1 Acacia Community Primary School is in walking distance of the proposed site and is in Flood Zone 1, see figure 18 below.

13.2 The address is: Acacia Community Primary School, Alexandra Drive, Manchester M19 2WW

13.3 It is recommended that you exit the property and walk East on Grangethorpe Drive for about 240.00 metres, cross Burnage Lane to go onto Crossly Road and walk for another 60.0 metres , then turn left onto Alexandra drive and walk approximately 80.0 metres to enter into the grounds of Acacia Community Primary School. A total distance of about 380metres approximately.

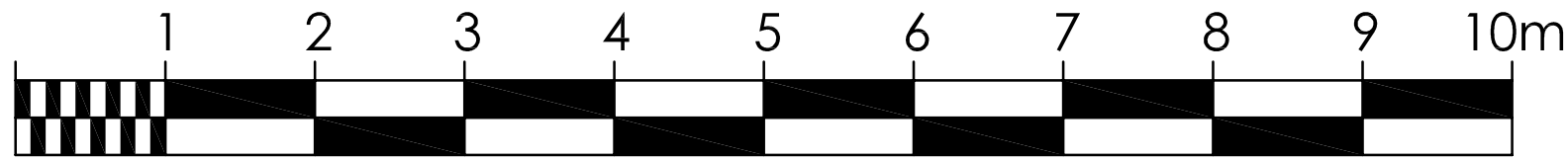
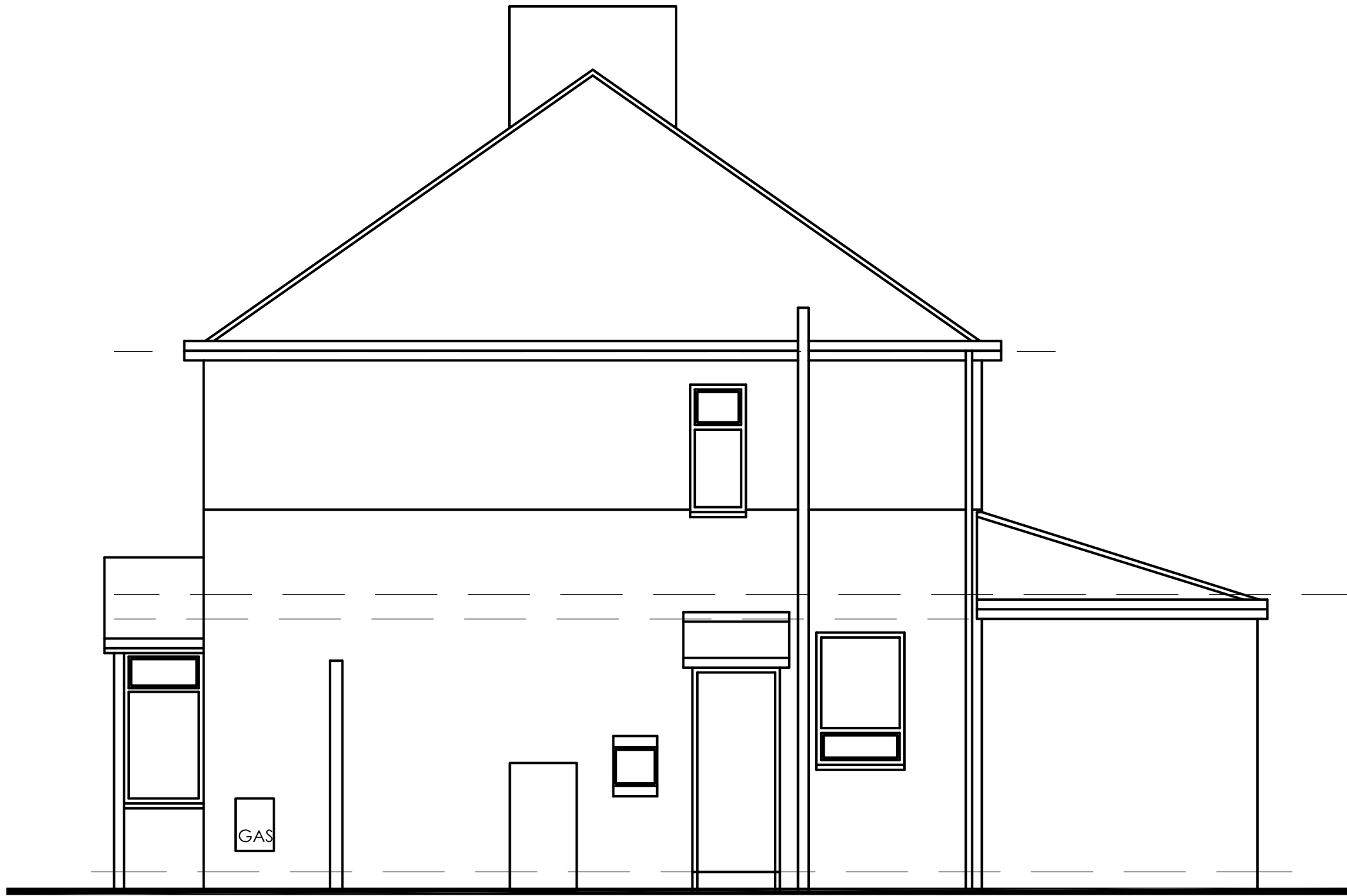
Fig-18



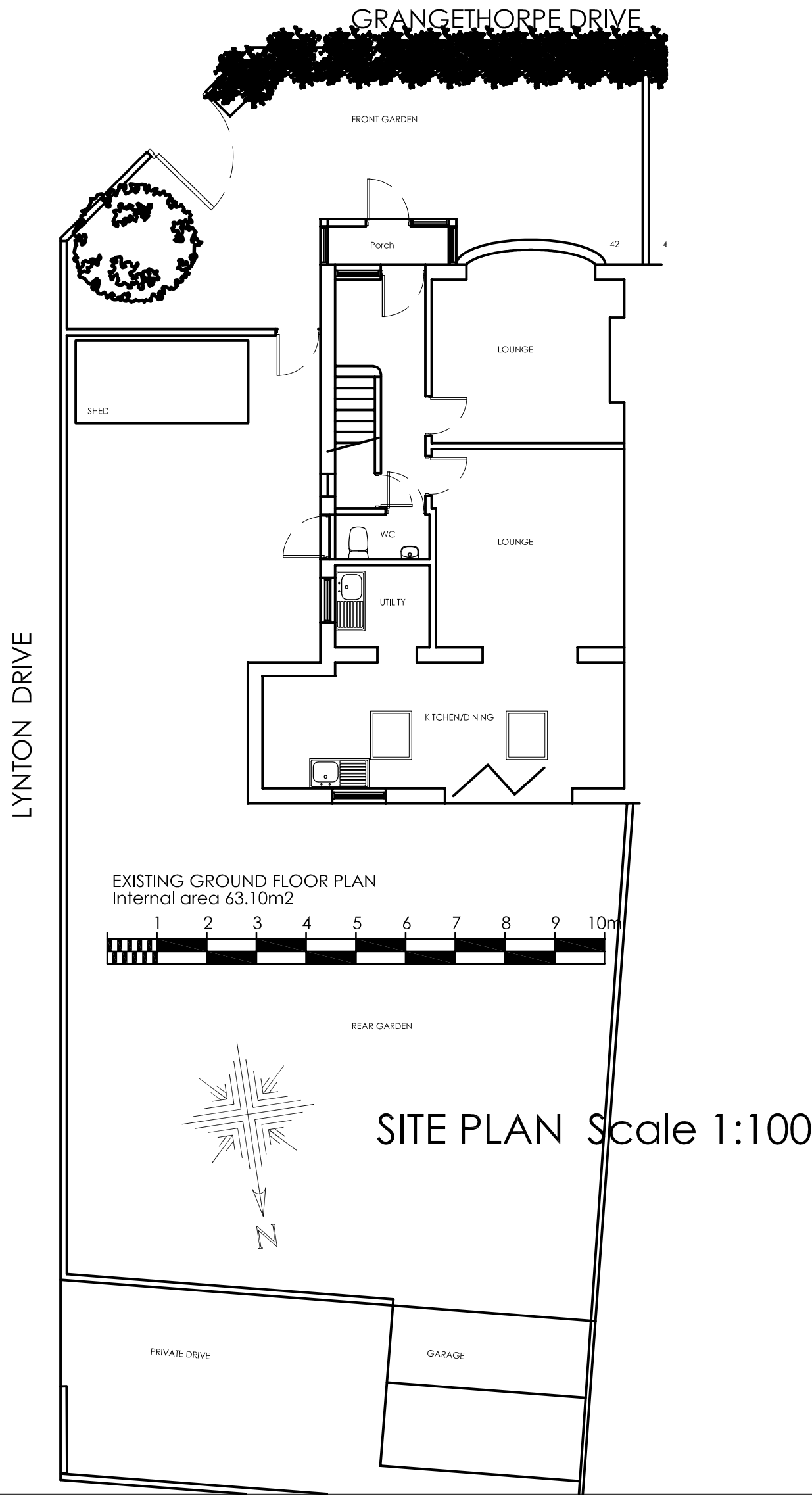
Appendix A: Drg. No. 01.24 GD 101 – Existing Elevations and Site Plan:



EXISTING REAR ELEVATION



EXISTING GABLE ELEVATION



EXISTING FRONT ELEVATION

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levels at connection points before work starts.

This drawing must be read with and checked
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drawings provided.

The Contractor is to comply in all respects
with the current Building Regulations whether
or not specifically stated on these drawings.

This drawing is not intended to show details
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depicted must be investigated by the Contractor
and suitable methods of foundation be provided.

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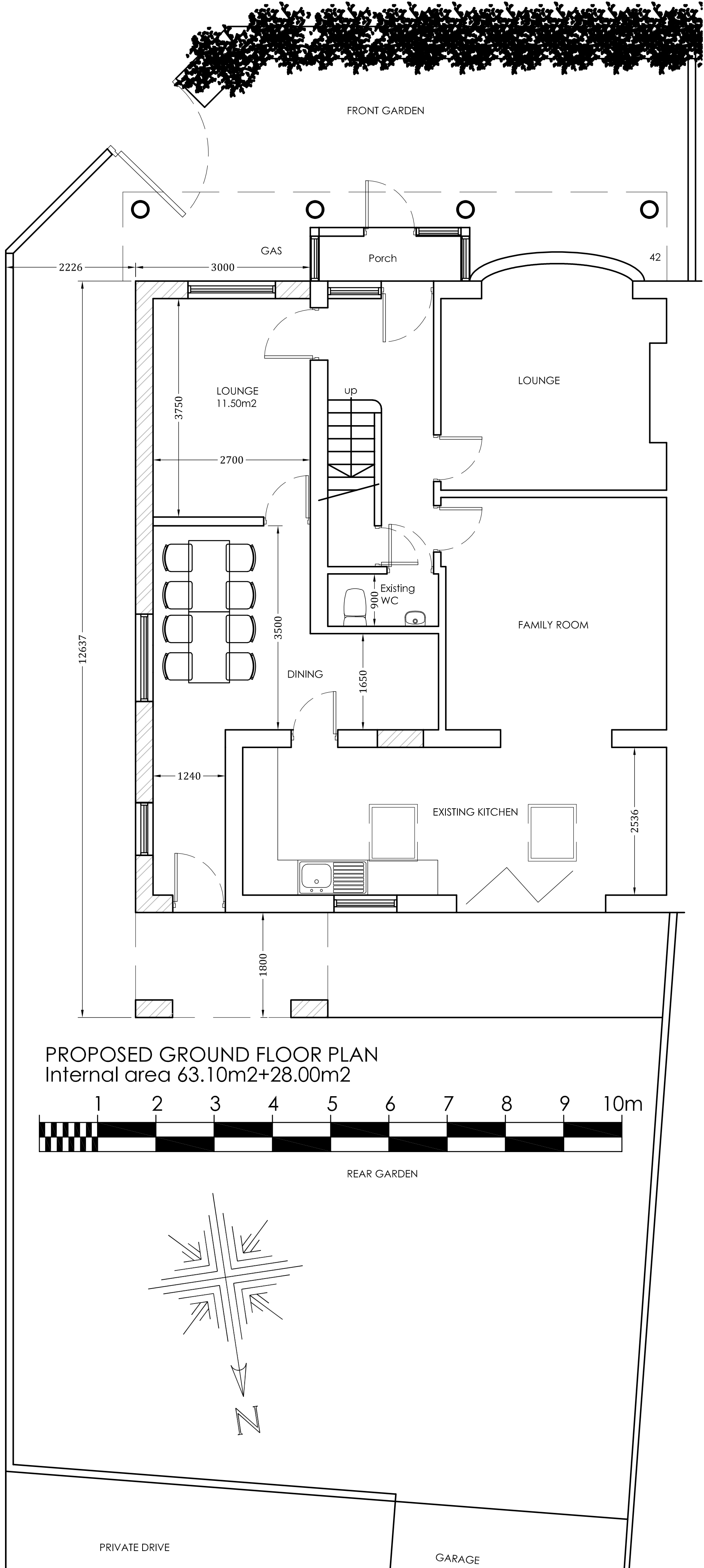
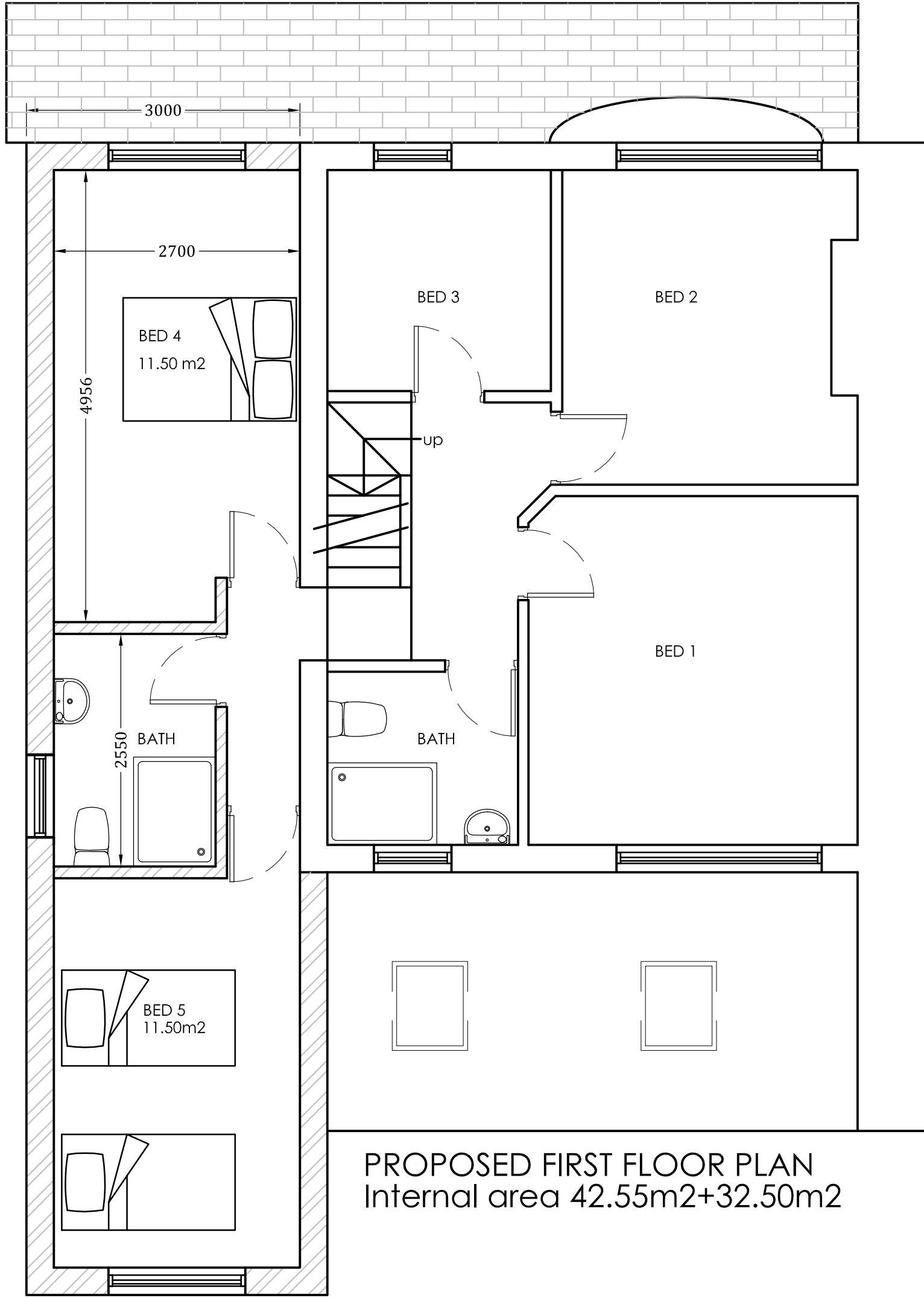
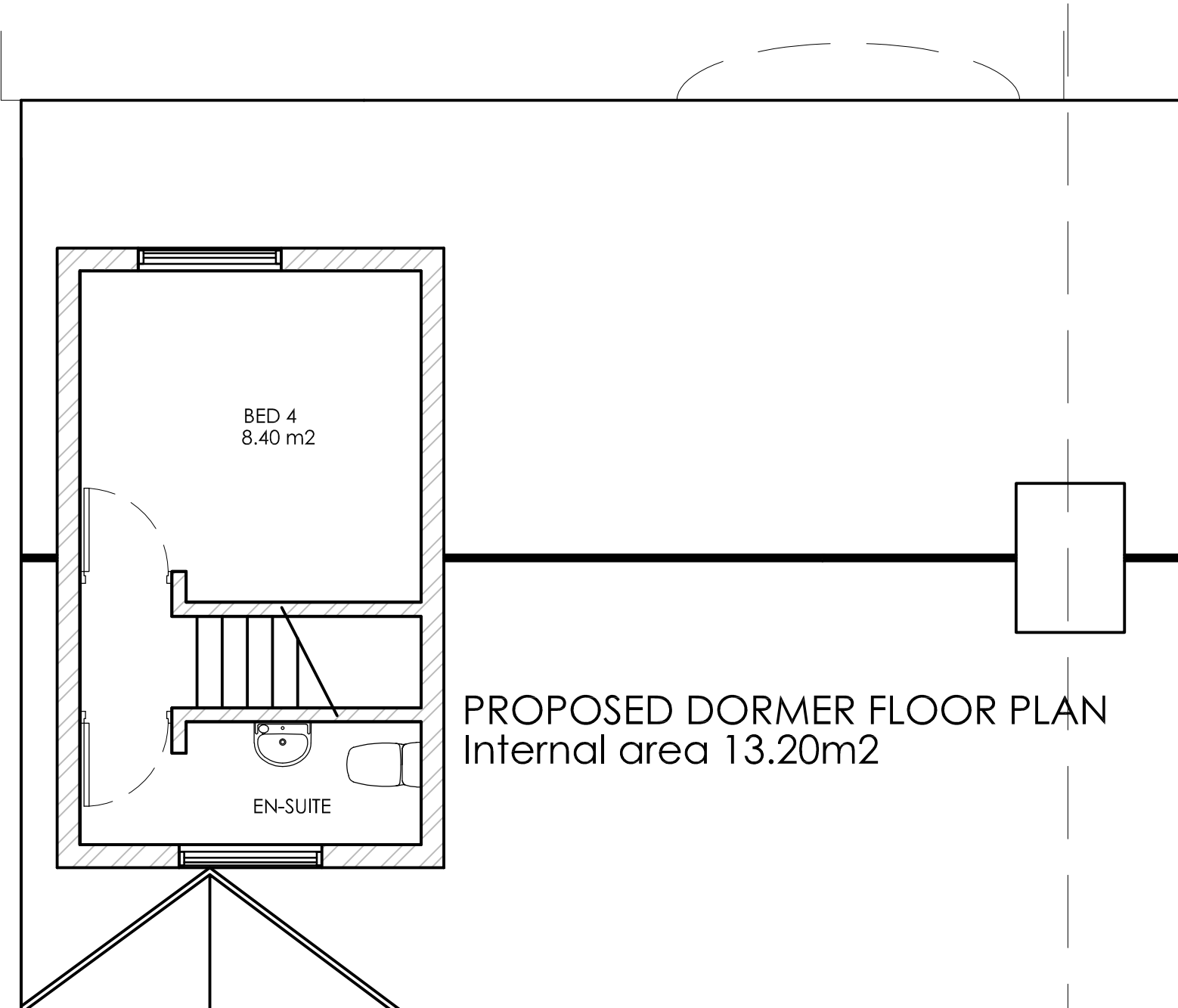
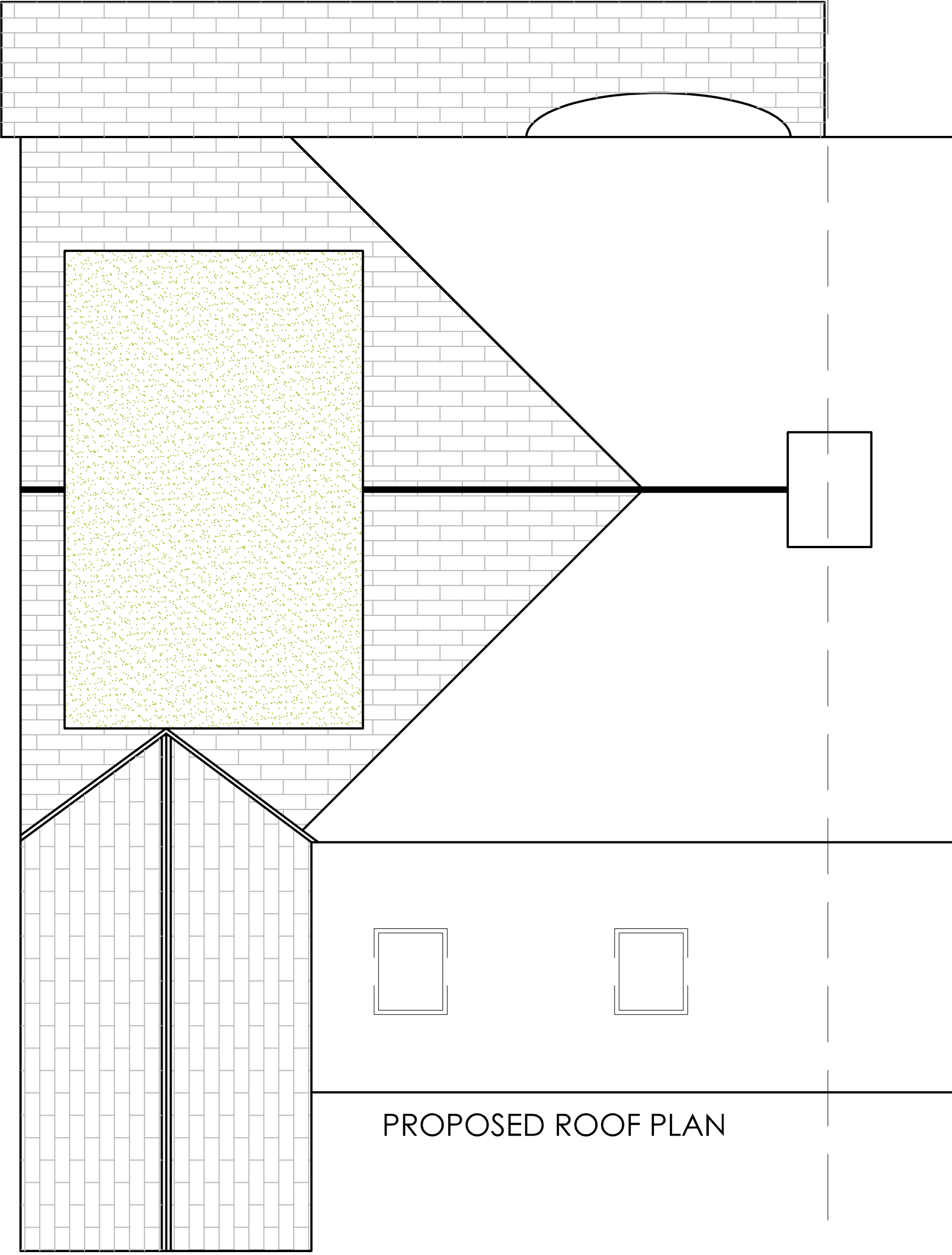
Site 42 Grangethorpe Drive Manchester M19 2NE			
Title Proposed Two Storey Side Extension Existing Elevations and Site Plan			
Checked	Drawn By	Scale	Date
	SRN	1:50 @A1	Mar 24
Drawing Number			Rev.
01.24 GD 101			--

Appendix B: Drg. No. 01.24 GD 103 – Proposed Floor Plans:

GRANGETHORPE DRIVE

FRONT GARDEN

LYNTON DRIVE



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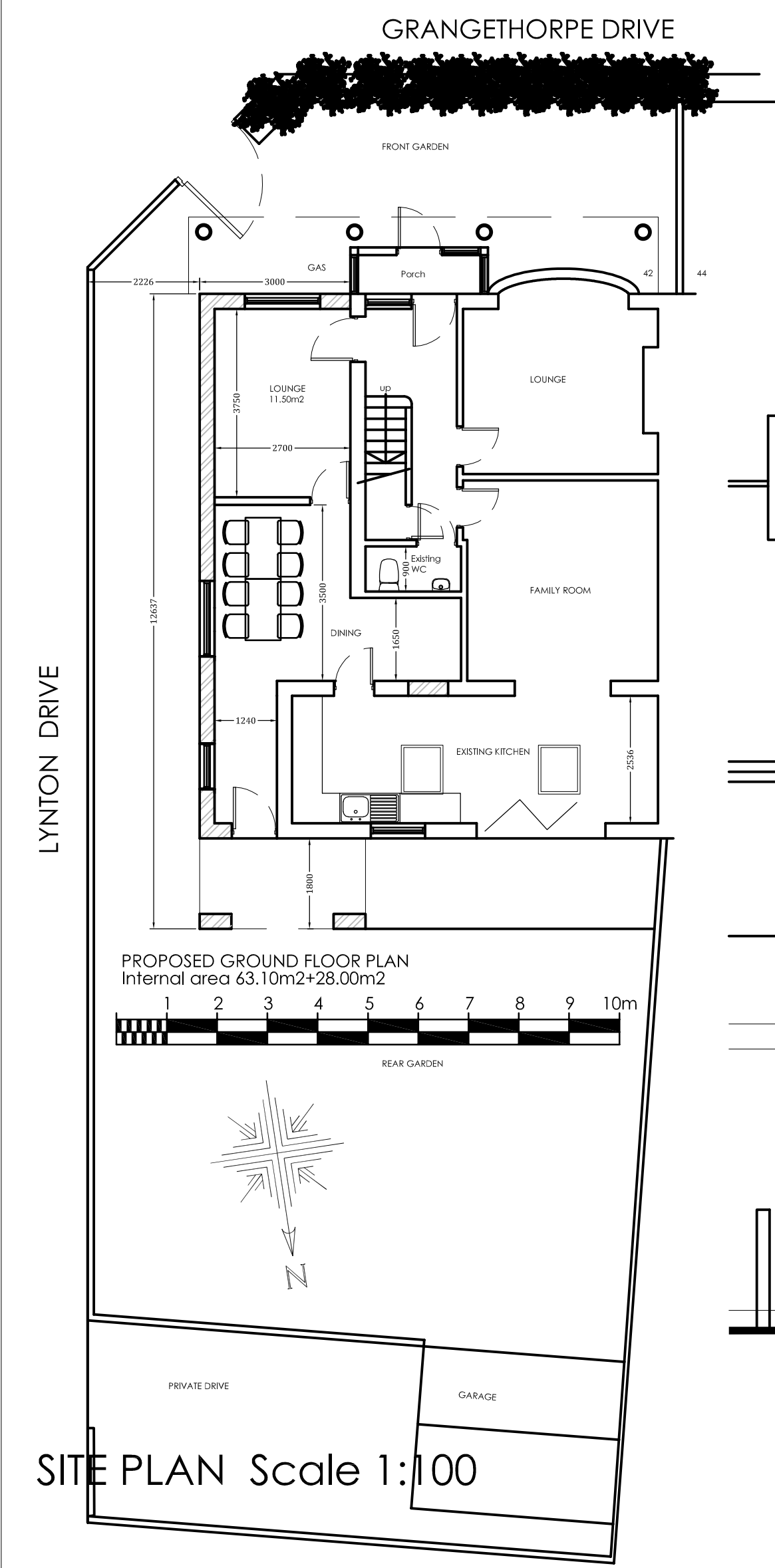
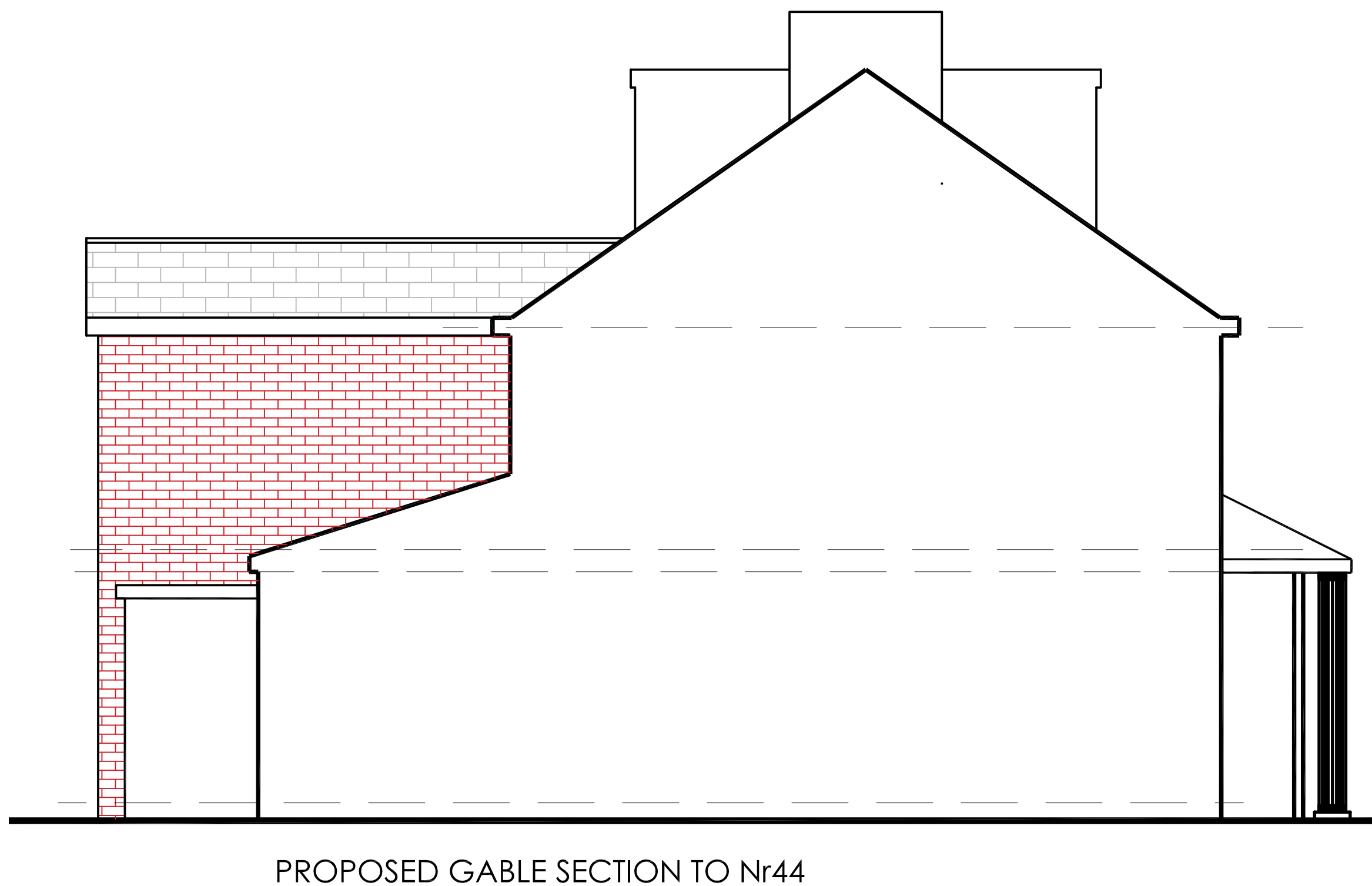
Mobile 07710131750
Email office@richmond-consultants.co.uk

Site
42 Grangethorpe Drive
Manchester
M19 2NE

Title
Proposed Two Storey Side
Extension and Rear Dormer
Proposed Floor Plans

Checked	Drawn By	Scale	Date
	SRN	1:50 @A1	Apl 24
Drawing Number	01.24 GD 103		Rev. --

Appendix C: Drg. No. 01.24 GD 104 - Proposed Elevations and Site Plan:



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in whole or part without their written permission.

The Contractor is to check and verify all building
and site dimensions, levels and sewer invert
levels at connection points before work starts.

This drawing must be read with and checked
against any structural or other specialist
drawings provided.

The Contractor is to comply in all respects
with the current Building Regulations whether
or not specifically stated on these drawings.

This drawing is not intended to show details
of foundation or ground conditions. Each area
of ground relied upon to support the structure
depicted must be investigated by the Contractor
and suitable methods of foundation be provided.

THIS SCHEME IS NOT BASED ON A SURVEY
DO NOT SCALE FROM THIS DRAWING

NOTE:

Drawing Status	PLANNING SUBMISSION		
Construction Status			
Rev.		By	Date

**RICHMOND
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Site
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Manchester
M19 2NE

Title
Proposed Two Storey Side
Extension and Rear Dormer
Proposed Elevations and Site Plan

Checked	Drawn By	Scale	Date
	SRN	1:50 @A1	Apl 24
Drawing Number			Rev.
01.24 GD 104			--

Appendix C: Drg. No. 2024/03/01 – Drainage Plan:



- NOTES
1. Do not scale from this drawing.
 2. The Contractor must check all dimensions on site prior to starting any works.
 3. The Contractor must comply with all current Health & Safety legislation.
 4. The foundations within 1.0m of drain pipe to be taken down to invert level..
 5. The existing pipe below ground, from the 100mm dia. S&V pipe shall be surrounded in 150mm concrete.
 6. The proposed RW Pipes to the gable end of the house shall have water butts.

No	DATE	DRAWN	Chk'D	AMENDMENT

DRAWING STATUS
Planning

CLIENT	
PROJECT 42 Grangethorpe Drive, Burnage, Manchester. M19 2NQ	
DRAWN A. Ul-Haq	CHKD AUH

TITLE			
Drainage Plan			
SCALE	DRAWING No	DATE	AMDT
1:50	2024/03/01	June 2024	