

2-Malgam Drive, Didsbury, Manchester, M20 5GN.

FLOOD RISK ASSESSMENT



A. Ul-Haq; I.Eng, MICE

12 December 2022

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First Issue	-	28 January 2022	AUH
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1. Introduction:

This Flood Risk Assessment has been prepared in support of the planning application for a rear kitchen extension at 2 Malgam Drive, Didsbury, Manchester M20 5GN.

The planning application no. 134099/FH/2022 was approved on 15 August 2022 with conditions. The condition no. 4 states;

No development shall commence until the flood risk assessment (dated 28th January 2022) has been updated and re-submitted to and approved in writing by the local planning authority. For the avoidance of doubt, as per the government standing advice, the assessment must include the following updates:

- *Provide a plan showing the finished floor levels (FFLs). FFLs should take into consideration predicted flood levels and should be set to an appropriate level, this may be either no lower than existing internal FFLs of the adjoining dwelling or 300 millimetres (mm) above the estimated flood level. All levels should be in m AOD.*
- *If you cannot raise FFLs 300 mm above the estimated flood level, you should demonstrate flood resilience and resistance measures in your design. Use the following guidance:
https://www.gov.uk/guidance/flood-risk-assessment-standing-advice#extra_flood-resistance-and-resilience-measures*
- *Consideration of flood safety measures (such as signing up for EA flood warnings) where required.*

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

2. Site Location:

The site is a semi-detached property that lies on the border of Manchester and Stockport, in East Didsbury, a popular residential suburb of Manchester.

Grid Reference: SJ 84625 89560

Eastings/Northings: 384625/389560

Elevation: The threshold level of property is at 32.220m above ordinance datum (A.O.D).

The primary and high schools are located within walking distances. It has excellent transport links as the A34, M60 and M56 only a few minutes away. The River Mersey meanders around the site on three sides and is closest to the site on South side, where it is approximately 170 metres from the site.



Location Plan

3. Development Proposals:

The development proposal is for a ground floor rear kitchen extension, comprising a floor area of 11.32Sq.m.

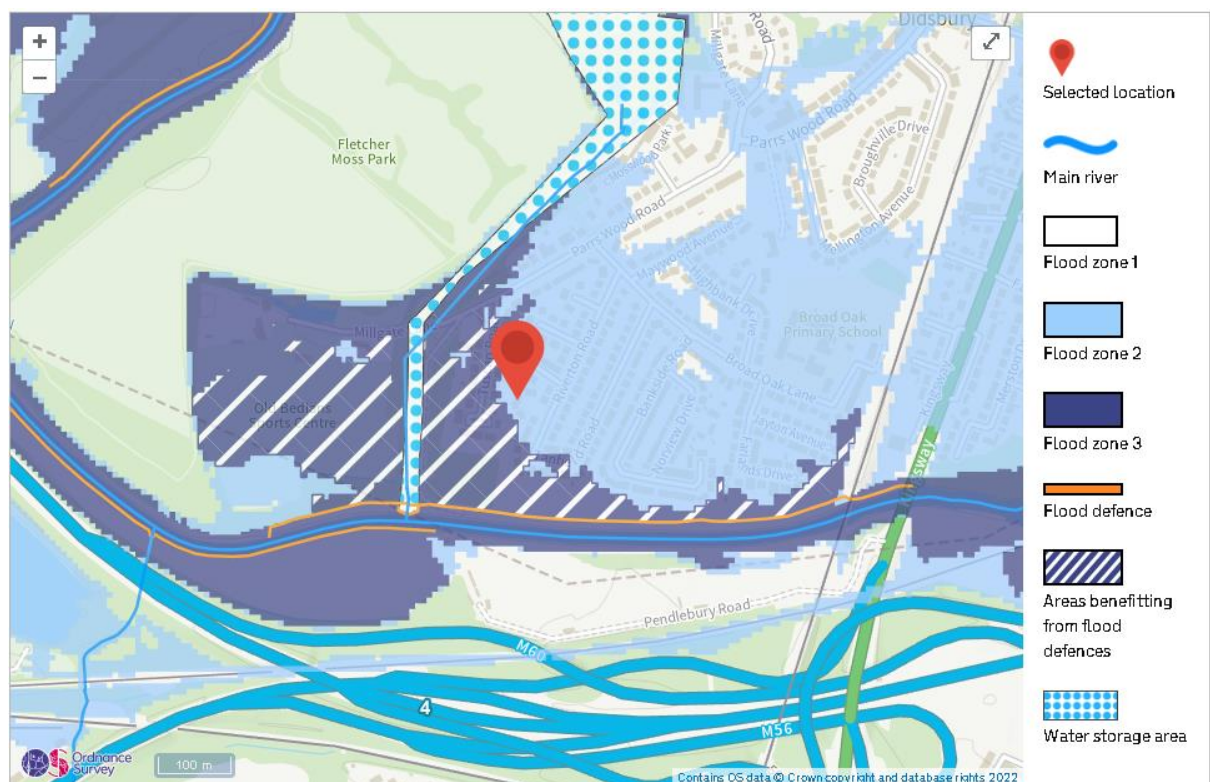
The current floor area of the dwelling (without the proposed extension) is 66.00Sq.m.

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. (Land shown in light blue on the Flood Map)

The figure-1 below shows the flood zones and flood defences within the proximity of the site. It also shows the areas that have benefitted from flood defences and water storage areas.

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 existing floor area of the property is 66.0 Square metres. The proposed kitchen extension has a floor area of 5.60 Square metres, resulting in total floor area of 71.60 Square metres.

Therefore, it 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.

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 can be seen from Paragraph 5 above, an Exception Test is not required to be passed.

8. Flood Zone Maps:

The proposed development 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 risk of very low flooding from the surface water, see fig-2 below.

Fig-2



Extent of flooding from surface water

● High ● Medium ● Low ○ Very low ⊕ Location you selected

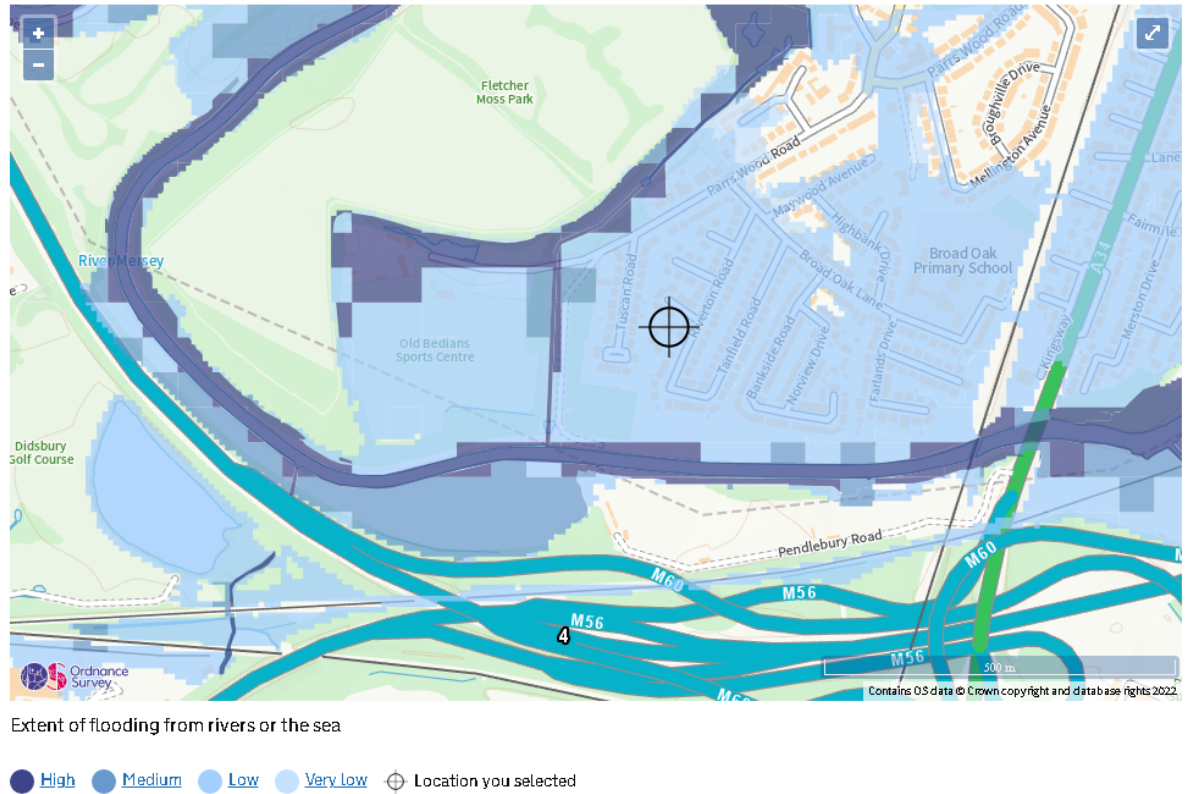
According to the Environment Agency’s website, the depth of water due to surface water flooding, in a low risk scenario, is nil, see fig-3 below.

Fig-3



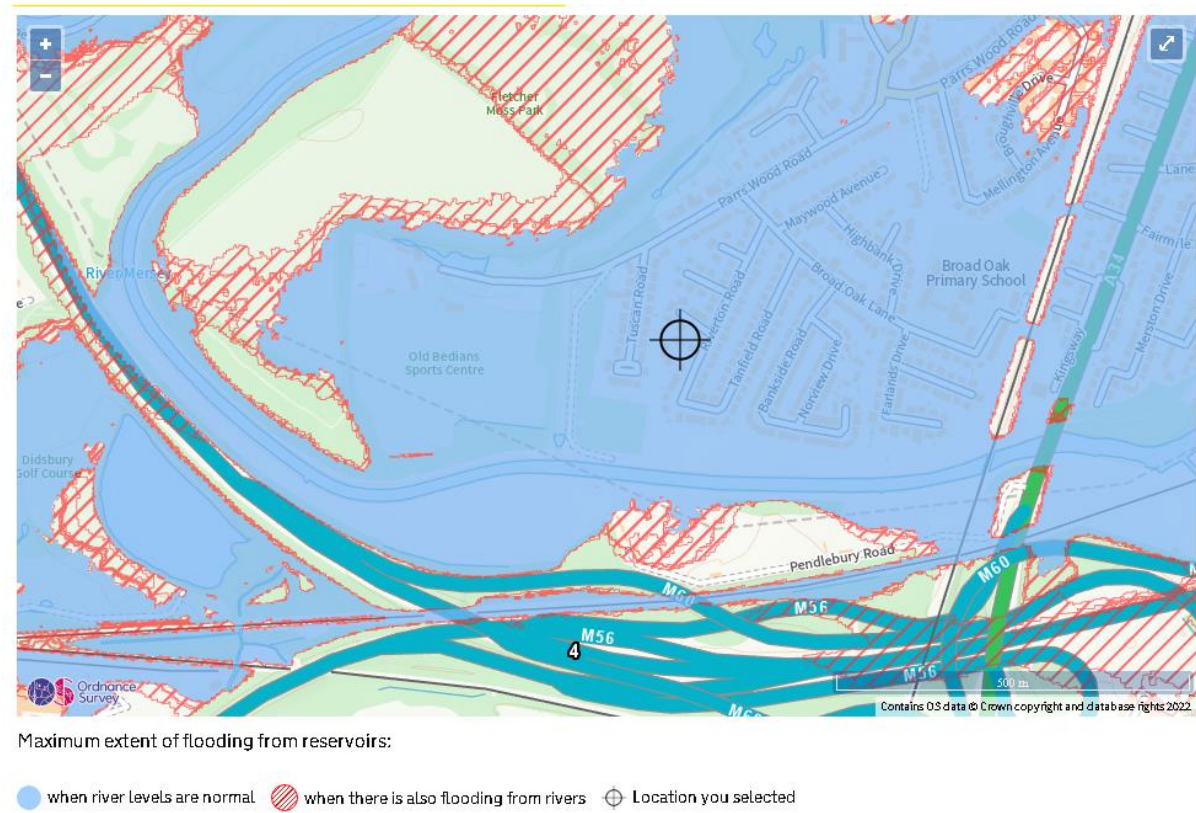
According to Environment Agency's website, the site lies within flood zone 2 (rivers or the sea). An area with low probability of flooding from rivers and sea, see fig-4 below.

Fig-4



As per the information available on the Environment Agency’s website, the site may be impacted by flooding from reservoirs when the river levels are normal, see fig-5 below.

Fig-5



Source of Flooding:

Source	Description
Surface water	Very Low (see Fig-2, page xx)
Fluvial	Very low (see Fig-4, page xx)
Ground Water	Not known
Sewer	Not knwn

9. Flood Defences and Flooding History:

9.1. Flood Defences:

The main river “Mersey” is located 180m South of the site and the flood plain is located about the same distance, to the west of the property.

The figure 6 below, provided by the Environment Agency, shows the flood defences in the vicinity of the site. The flood defence data indicates the type of flood defences and the protection level.

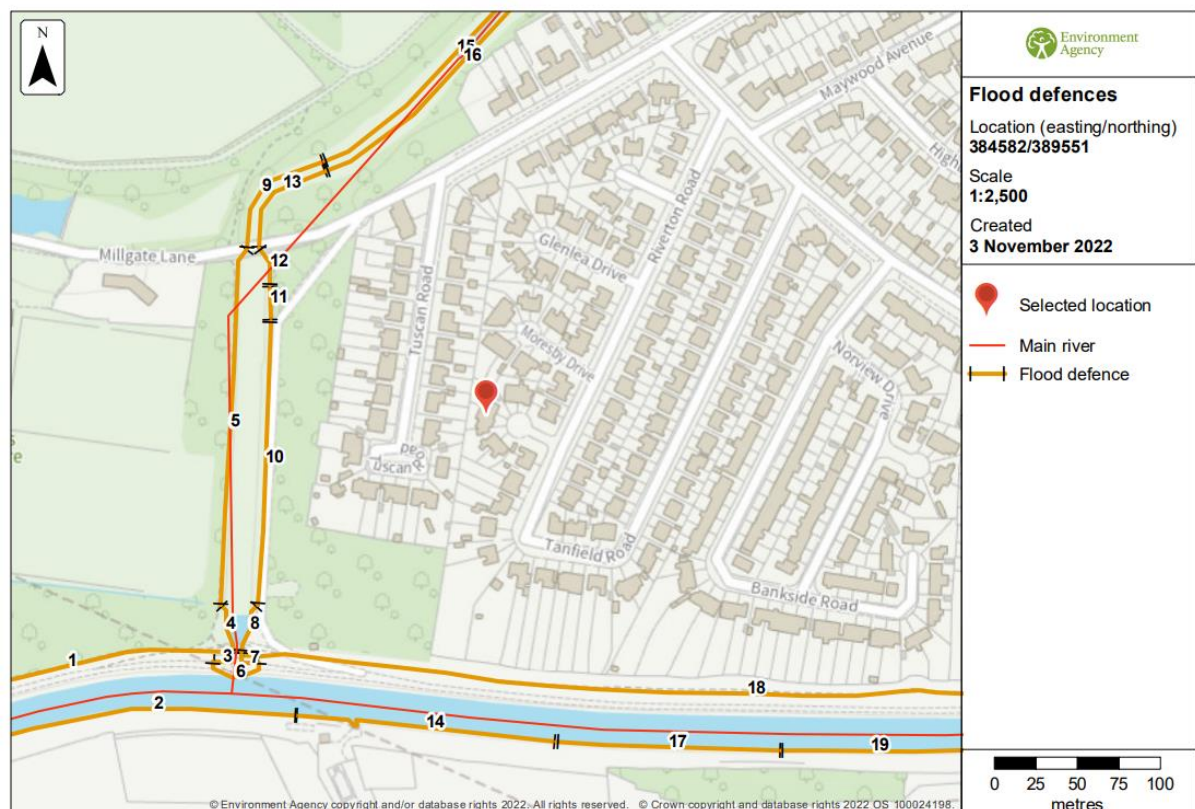
The type of flood defence to the flood plain on the west side are mainly Engineered high ground (nodes 10,12, 13 and 16) and embankment (node 11). While on the South side the northern bank of river Mersey is protected by an embankment (node 18).

The threshold level of the property is 32.22m A.O.D.

The upstream or downstream crest levels of the nodes on the West side are lower than the threshold level of the property. The level of the floodplain is much lower than the adjacent ground and the threshold level of the property.

The protective embankment on the north side of the river, has upstream crest level of 32.93m AOD and downstream crest level of 34.03. Both of these levels are higher than the threshold level of the property (32.22mAOD).

Fig-6



Flood defences data

Label	Asset ID	Asset Type	Standard of protection (years)	Current condition	Downstream actual crest level (mAOD)	Upstream actual crest level (mAOD)	Effective crest level (mAOD)
1	58974	Embankment	100		32.82	32.85	
2	122153	Embankment	100	Poor	32.29	32.84	
3	144885	Embankment	75		33.17	33.17	
4	144886	Engineered High Ground	75		33.17	31.30	
5	144887	Engineered High Ground	75		30.67	31.30	
6	146508	Spillway	100		32.81	32.81	
7	146503	Embankment	75		33.17	33.17	
8	146504	Engineered High Ground	75		33.17	31.25	
9	144888	Engineered High Ground	75		32.70	30.67	
10	183314	Engineered High Ground	75		30.63	31.25	
11	173224	Embankment	75		30.92	30.73	
12	173225	Engineered High Ground	75		30.52	30.34	
13	71380	Engineered High Ground	75		29.63	30.52	
14	121960	Engineered High Ground	100	Fair	29.63	29.76	
15	144889	Engineered High Ground	75		30.33	32.70	
16	146505	Engineered High Ground	75		29.22	29.63	
17	412608	Engineered High Ground	100	Fair			
18	122331	Embankment	50	Fair	32.93	34.03	

9.2. Flooding History:

The table below shows the recorded flood events in the area.

The first known flooding event occurred in January 1964, in this instance neither the source nor the cause of flooding is known.

The second flooding event occurred in January 2008, the source of flooding was the main river (River Mersey).

The third and last event happened in January 2021, again, the source of flooding was the main river (River Mersey).

October 2022

GMMC283815JP

Recorded Flood Outlines

Flood Event Code	Name	Start Date	End Date	Source of Flooding	Cause of Flooding
0131FEG01082	MERS	01/01/1964	02/01/1964	unknown	Unknown
EA013_21012008	EA01317_21 January 2008_River Mersey_Cheadle, Gt M	21/01/2008	22/01/2008	main river	Unknown
	Didsbury	20/01/2021	20/01/2021	main river	Other

The current owners of the property have occupied the property since 1995 and do not recall any flooding incidence.

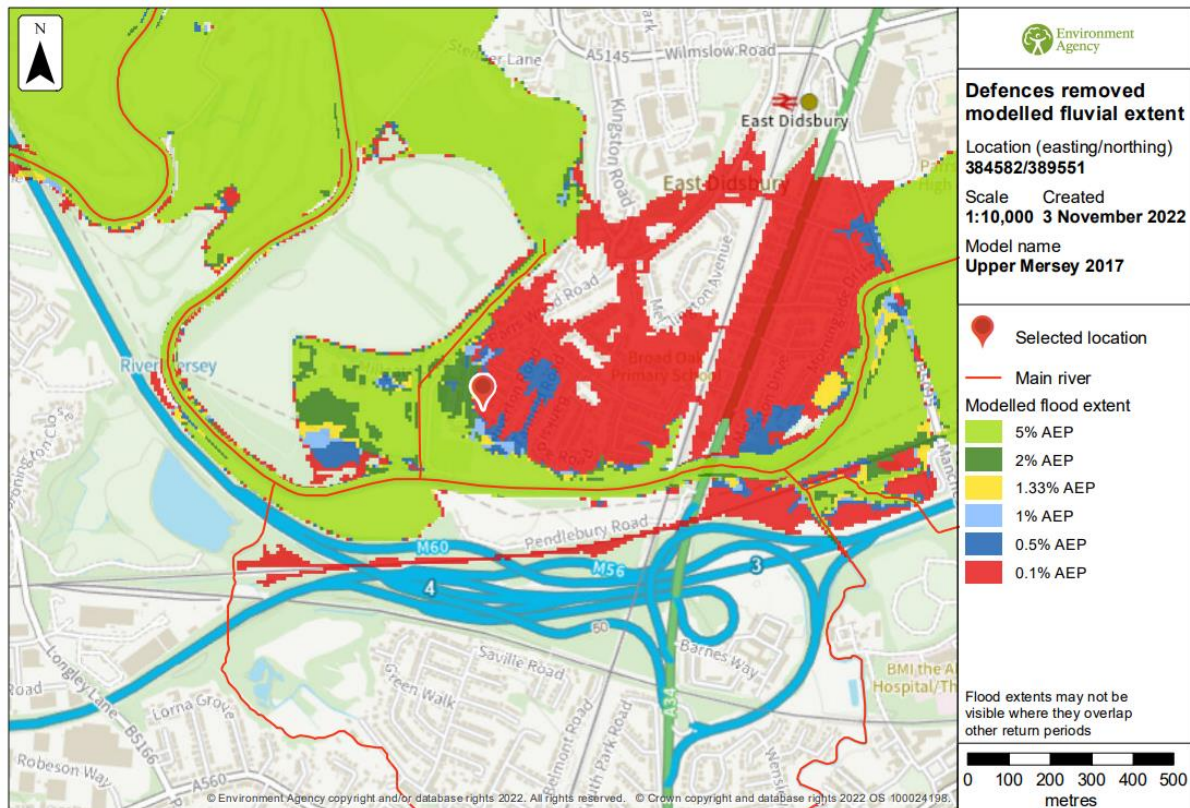
However, in January 2021, when due to exceptionally wet weather, there was a danger that River Mersey may breach the flood defences, the residents of Magam Drive and the surrounding area were asked to vacate their properties. Some residents of the area did so, whilst others didn't and remained in their houses. Fortunately, the River Mersey didn't breach the flood defences and the majority of the properties remained unaffected by the flooding.

10. Probability of Flooding:

The figure 7 below, provided by the Environment Agency, shows the flood data from the Upper Mersey 2017 model. It indicates the risk of flooding from rivers where flood defences have been removed. It also shows there is 0.1% Annual Exceedance Probability.

The Environment Agency guidance states that, Flood zone 2 shows the area at risk of flooding for an undefended flood event with: between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding.

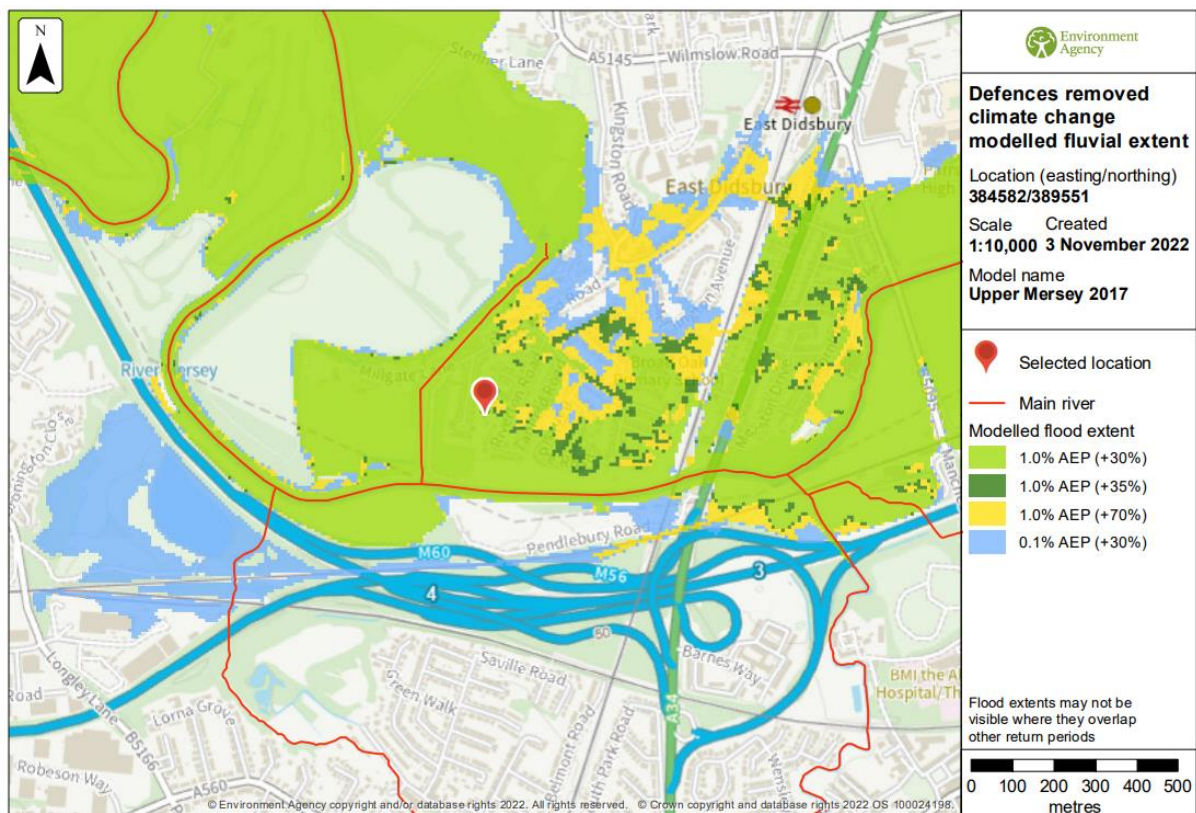
Fig-7



The figure 8 below, provided by the Environment Agency, shows the flood data from the Upper Mersey 2017 model. It indicates the risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change. It also shows there is 0.1% Annual Exceedance Probability Plus (30%) flood.

The Environment Agency guidance states that, Flood zone 2 shows the area at risk of flooding for an undefended flood event with: between a 0.1% and 1% probability of occurring in any year for fluvial (river) flooding including estimated impact of climate change.

Fig-8

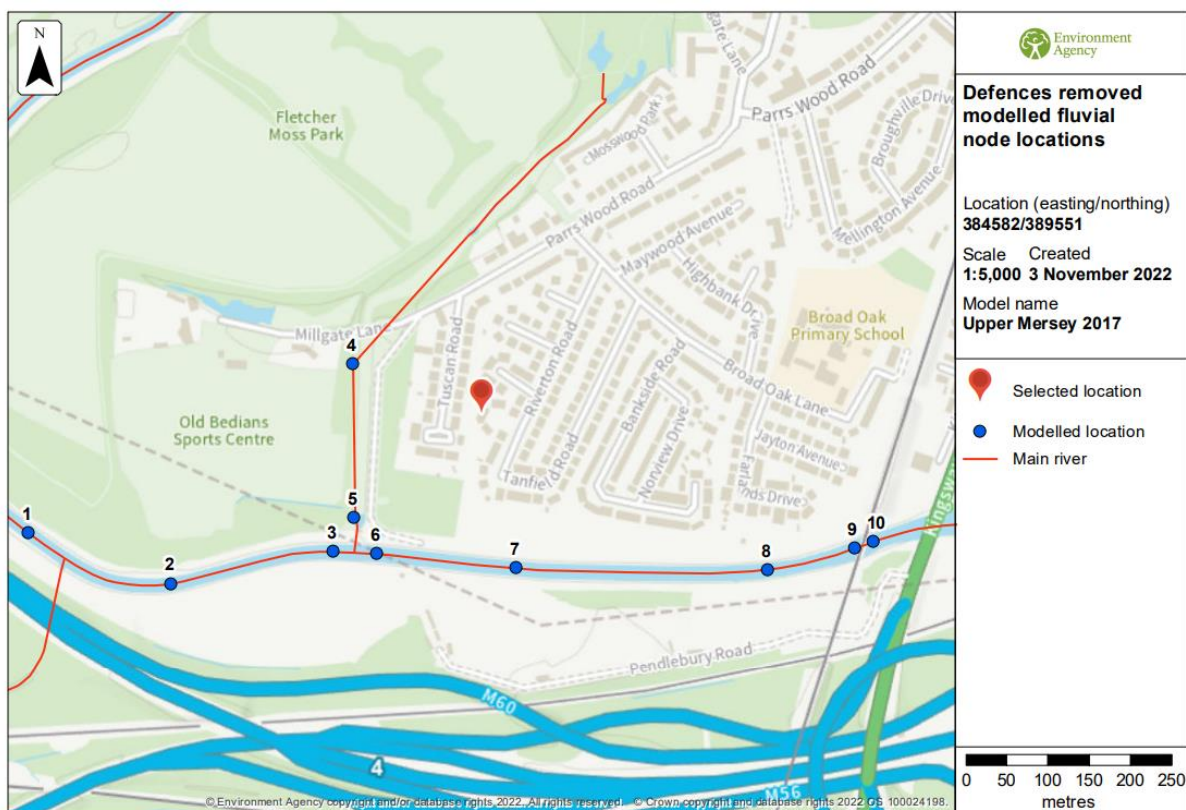


The figure 9 below, provided by the Environment Agency has flood data from the Upper Mersey 2017 model, fluvial, with defences removed. It shows the node locations to the West of the site (nodes 4 & 5) and to the South, nodes 6, 7, & 8). The accompany table on the following page shows the water levels for different Annual Exceedance Probability when the flood defences are removed.

Analysis of the data shows the property threshold level (32.22m AOD) is not exceeded by 1.0% and 0.5% AEP events.

However, for 0.1% Annual Exceedance Probability, nodes 4 % 5 are not exceeded but at nodes 6, 7 & 8 the water level exceeds the threshold level of the property. At node 6, the modelled water level would be 32.76m AOD, at node 7 it would be 32.78m AOD and at Node 8 it would be 33.08m AOD. This would result in difference of $33.08 - 32.22 = 0.86\text{m}$.

Fig-9



Modelled node locations data

Defences removed

Label	Modelled location ID	Easting	Northing	5% AEP		2% AEP		1.33% AEP		1% AEP		0.5% AEP		0.1% AEP	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1290570	384032	389405	31.31	255.22	31.51	274.20	31.61	282.40	31.65	293.33	31.80	312.64	32.53	412.60
2	1290517	384205	389344	31.61	233.40	31.80	251.95	31.88	262.78	31.94	270.52	32.08	294.02	32.74	414.02
3	1290767	384402	389383	31.81	241.33	31.95	273.72	32.01	293.26	32.05	305.86	32.16	338.62	32.76	483.94
4	1290645	384425	389610	27.29	5.45	27.65	6.99	27.81	7.51	27.92	7.84	28.23	8.56	29.40	10.76
5	1290586	384427	389424	27.33	0.50	27.67	0.50	27.82	0.50	27.93	0.50	28.23	0.50	29.40	0.50
6	1290662	384454	389381	31.81	241.33	31.95	273.72	32.01	293.26	32.05	305.86	32.16	338.62	32.76	483.94
7	1290572	384624	389363	31.84	274.86	31.96	315.90	32.03	334.46	32.06	349.86	32.16	389.98	32.78	540.08
8	1290830	384929	389361	32.10	299.93	32.25	346.30	32.32	368.75	32.37	385.86	32.50	431.33	33.08	605.67
9	1290644	385035	389387	32.29	300.28	32.46	348.20	32.54	371.64	32.60	389.64	32.74	436.68	33.35	618.73
10	1290733	385057	389394	32.43	300.28	32.66	348.20	32.77	371.64	32.85	389.64	33.06	436.68	33.93	618.73

Data in this table comes from the Upper Mersey 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

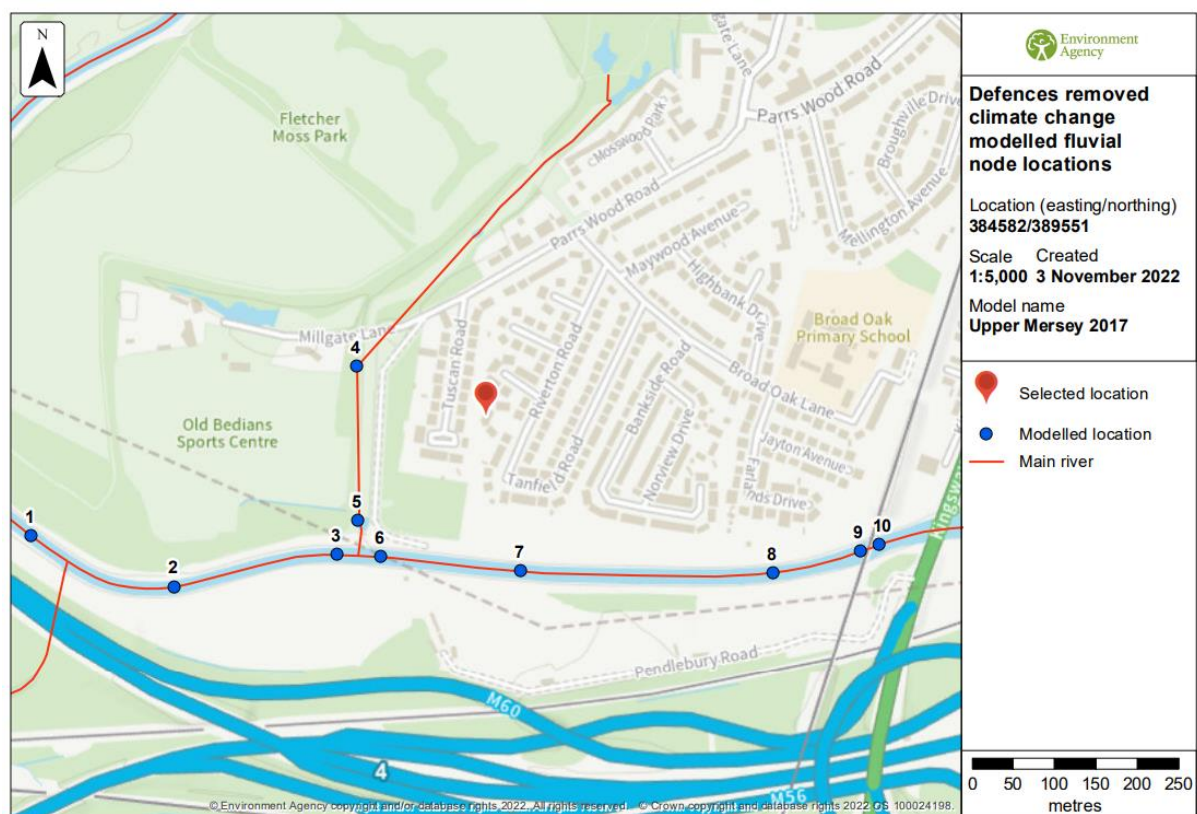
The figure 10 below, provided by the Environment Agency has flood data from the Upper Mersey 2017 model, fluvial, with defences removed climate change. It shows the node locations to the West of the site (nodes 4 & 5) and to the South, nodes 6, 7, & 8). The accompany table on the following page shows the water levels for different Annual Exceedance Probability including estimated impact of climate change, when the flood defences are removed.

Figure 8 on page 14, shows that the area is impacted by 1.0% Annual Exceedance Probability + (30%).

Analysis of the data shows the property threshold level (32.22m AOD) is not exceeded by 1.0% AEP + (30%) at nodes 4 & 5. However, the modelled water level exceeds the property threshold level at nodes 6, 7 & 8. The modelled water level at node 6 is 32.22m AOD, at node 7 is 32.33m AOD & at node 8 is 32.67m AOD.

This would result in a difference of $32.67 - 32.22 = 0.45\text{m}$.

Fig-10



Modelled node locations data

Defences removed climate change

Label	Modelled location ID	Easting	Northing	1.0% AEP (+30%)		1.0% AEP (+35%)		1.0% AEP (+70%)		0.1% AEP (+30%)	
				Level	Flow	Level	Flow	Level	Flow	Level	Flow
1	1290570	384032	389405	32.03	341.59	32.07	357.01	32.46	402.05	33.10	495.84
2	1290517	384205	389344	32.28	330.47	32.35	340.71	32.67	401.09	33.27	506.50
3	1290767	384402	389383	32.33	387.75	32.39	400.88	32.70	469.65	33.28	586.05
4	1290645	384425	389610	28.72	9.38	28.82	9.54	29.32	10.39	29.89	12.41
5	1290586	384427	389424	28.72	0.50	28.82	0.50	29.32	0.50	29.90	0.50
6	1290662	384454	389381	32.33	387.75	32.39	400.88	32.70	469.65	33.28	586.05
7	1290572	384624	389363	32.33	443.71	32.39	456.89	32.71	525.88	33.30	644.09
8	1290830	384929	389361	32.67	494.96	32.73	510.96	33.02	589.49	33.52	729.39
9	1290644	385035	389387	32.93	504.58	32.98	521.49	33.28	602.82	33.75	753.99
10	1290733	385057	389394	33.38	504.58	33.46	521.49	33.85	602.82	34.50	753.99

Data in this table comes from the Upper Mersey 2017 model.
Level values are shown in mAOD, and flow values are shown in cubic metres per second.
Any blank cells show where a particular scenario has not been modelled for this location.

11. Conclusion:

- The area of the new extension is 11.32 Sq.m, which will be built over the existing impermeable area, as such there is no increase in the surface water run-off.
- The site is at very low risk of flooding from surface water or fluvial flooding.
- As the proposed extension is considered a minor extension to existing residential dwelling, it is recommended that finished floor level of the proposed extension is set no lower than that of existing dwelling.
- The historic flood records provided by the Environment Agency, indicate that the site of the proposed development has not been affected by flooding in the past.
- As noted on paragraph 10, pages 15 & 16, the analysis of the data provided by the Environment Agency from the Upper Mersey modelled 2017, shows the property may be impacted from 0.1% (1 in 1000 year) Annual Exceedance Probability event, where the modelled water inundation would be 0.86m above the property threshold level.

12. Flood Risk management:

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 development;

- i. The finished floor levels of the proposed extension should be set no lower than existing floor levels.
- ii. The proposed floor should be constructed of concrete to facilitate cleaning & drying.
- iii. Any existing airbricks should be fitted with manually operated removable covers.
- iv. Any new airbricks should be anti-flood airbricks
- v. Waterproof coating to be applied to all external walls to a height of 1.0m.
- vi. Sealant should be applied around all pipe/cable/Services entry points.
- vii. Any new sockets in the new extension to be located 1.0 metre above the floor level.
- viii. The property owner and residents should sign up to the EA Flood Warning/Alert Service and have an evacuation plan.

The above measure will provide protection to the property against the probability of flooding from rivers at 0.1% AEP (1 in 1000 year event) when defences are removed and will also protect in the event of 1.0% AEP (1 in 100 year event) plus 30% for climate change when defences are removed.

Appendix A: Planning Drawings – Location Plan



Appendix B: Planning Drawings – Existing and Proposed Plans



A Planning application was approved in April 2022 for the kitchen extension, half the size as proposed here.
Application No. 132646/FH/2022.



- 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. All new brickwork to match and bond into existing. The proposed walls to achieve "U" value of 0.28W/m2K.
 5. New external walls to be 300mm thick, consisting of 100mm thick thermolite or similar blocks to outer and inner leaf, 100mm cavity with drytherm or similar insulation.
 6. Brickwork to outer-leaf to DPC level only.
 7. Internal face of inner leaf to have 12.5mm plasterboard & skim.
 8. All internal dimensions shown are brickwork to brickwork.
 9. Stainless steel double triangular wall ties at 750mm horizontal & 450mm vertical centres. Ties at reveals to be at 300mm centres.
 10. All new cavities to be suitably closed and protected by DPC.
 11. Catnic or similar lintels to be provided over the new door & window openings.
 12. Minimum bearing to any beam or lintol to be 150mm.
 13. All exposed steelwork to be protected by 2 layers of 12.5mm plasterboard & skimmed to provide 30minutes fire resistance.
 14. 6mm M.S. straps to span 3 joists to be used to fix the roof to the walls.
 15. The kitchen to be fitted with an extractor fan of 30 l/s adjacent to hob or sink's elsewhere.
 16. The 42mm Dia. 90W/60V waste to discharge to new gully.
 17. All electrical work to be undertaken by a competent person and a completion certificate must be produced to the Local Authority Building Inspector.
 18. All gas works to be undertaken by a trained person on "Safe Gas Register".
 19. All new heating appliances to be fitted with independent thermostatic control valves.
 20. New window assemblies to achieve "U" value of 1.8W/m2K and have argon gas filled cavities.
 21. The kitchen to be fitted with 2No. roof windows as shown on the plan, the windows shall be electrical operated.
 22. The existing part of kitchen shall be fitted with new window, 1.225x1.225m (20th floor area to open).
 23. The kitchen door shall be 1.372m wide combined door/fixed window frame.
 24. The proposed external drainage pipe below ground shall be 100mm diameter of clay or plastic.

P3	09.06.22	AUH	AUH	A note regarding the previous Planning approval issued between the plans.
P2	07.06.22	AUH	AUH	The internal width of extension increased from 2.50m to 4.84m.
P1	04.04.22	AUH	AUH	Proposed drainage amended due to change of roof of proposed extension, from pitched roof to flat roof.
No	DATE	DRAWN	CHK'D	AMENDMENT

AWING STATUS

Planning

CLIENT Mr M.Ahmed

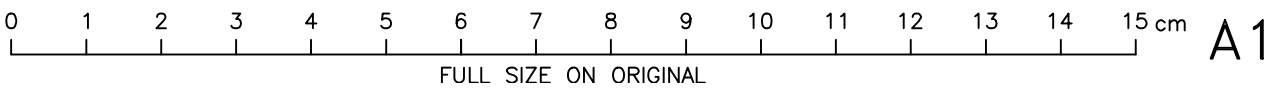
PROJECT
2 Malgam Drive, Didsbury,
Manchester M20 5GN

DRAWN A. Ul-Haq

TITLE
Proposed Single Storey Rear Kitchen
Extension

Existing & Proposed Plans - Sheet 1 of 2

SCALE 1:50	DRAWING No 2021/05/01	DATE June 2021	AMD P3
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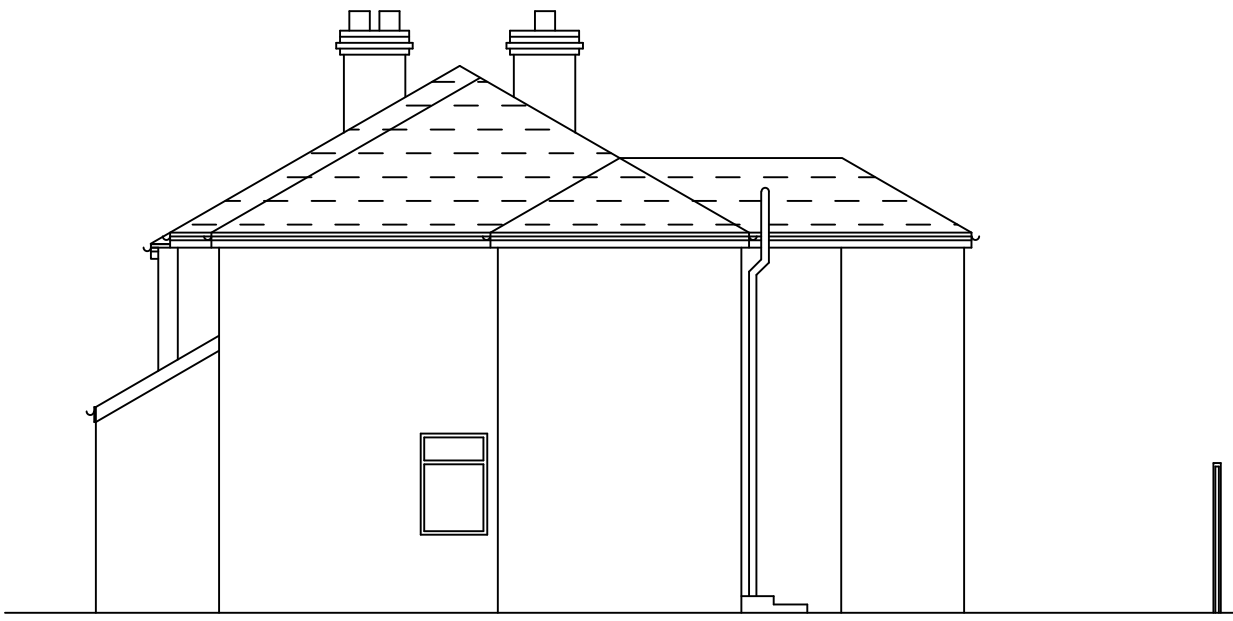
Appendix C: Planning Drawings – Elevations and Sections



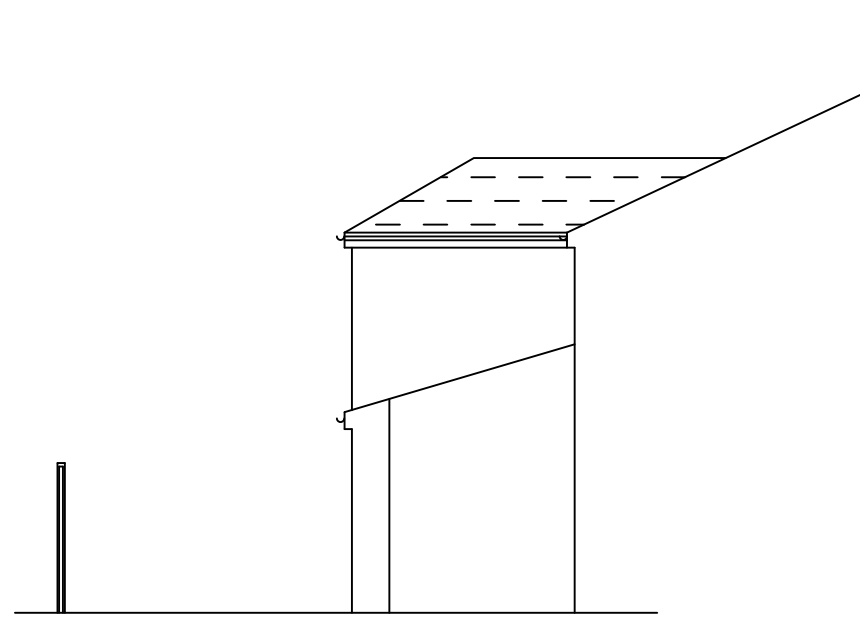
Exist. Front Elevation



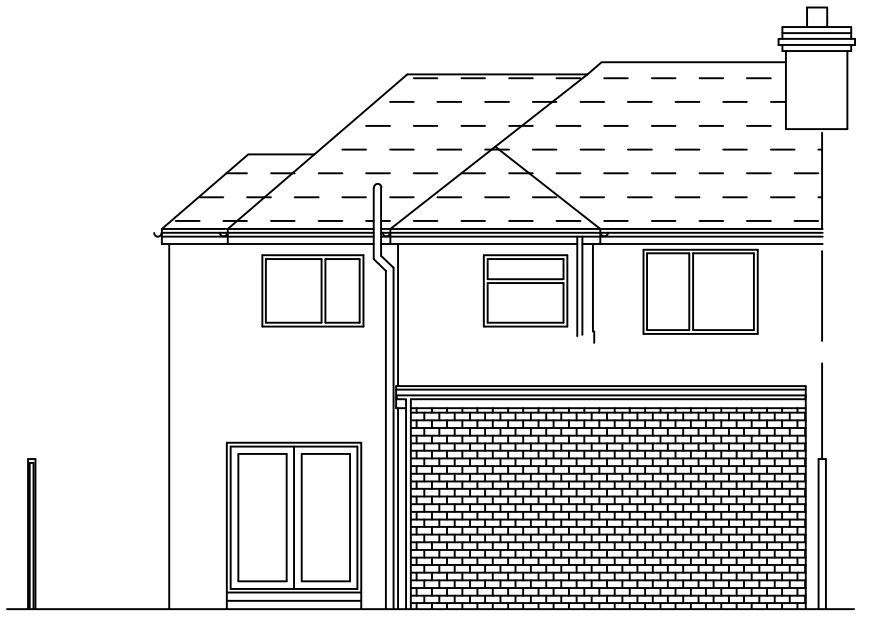
Exist. Rear Elevation



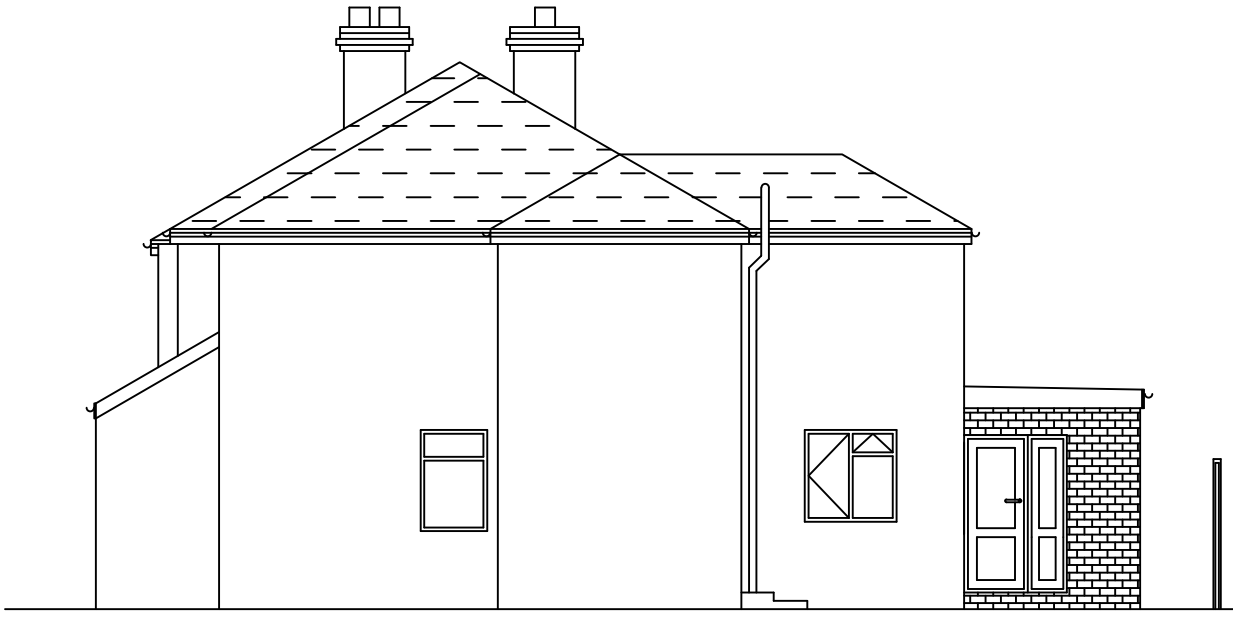
Exist. East Elevation



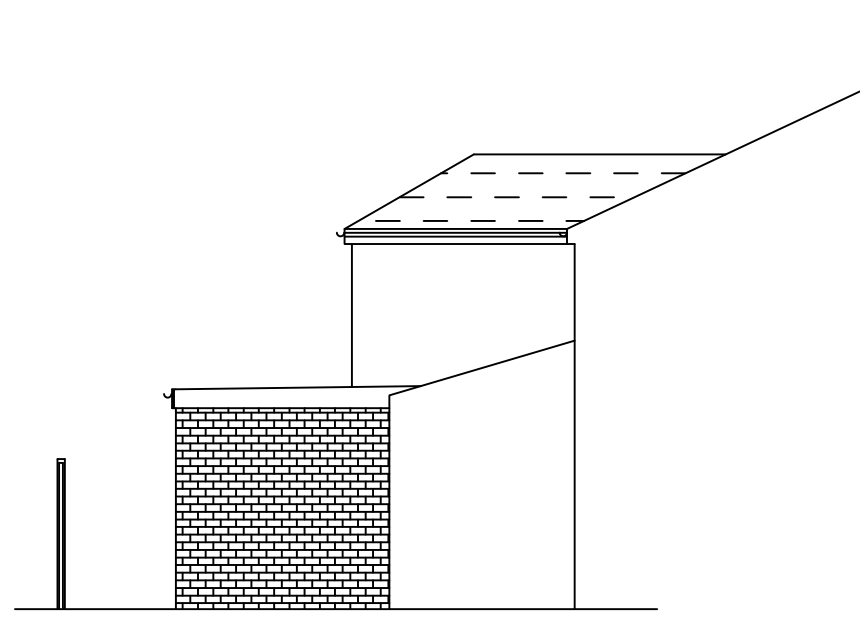
Exist. West Elevation



Proposed Rear Elevation

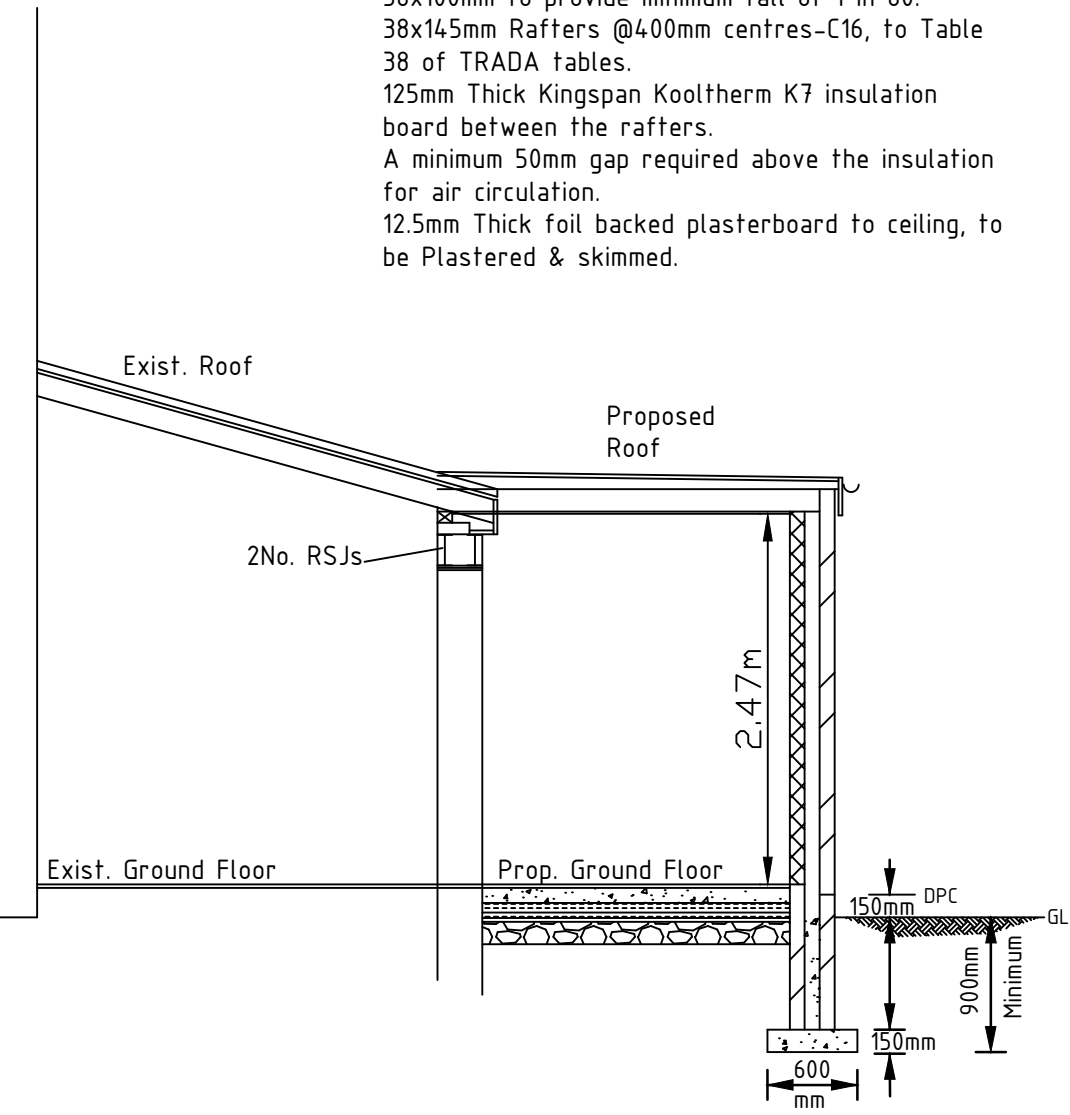


Proposed East Elevation

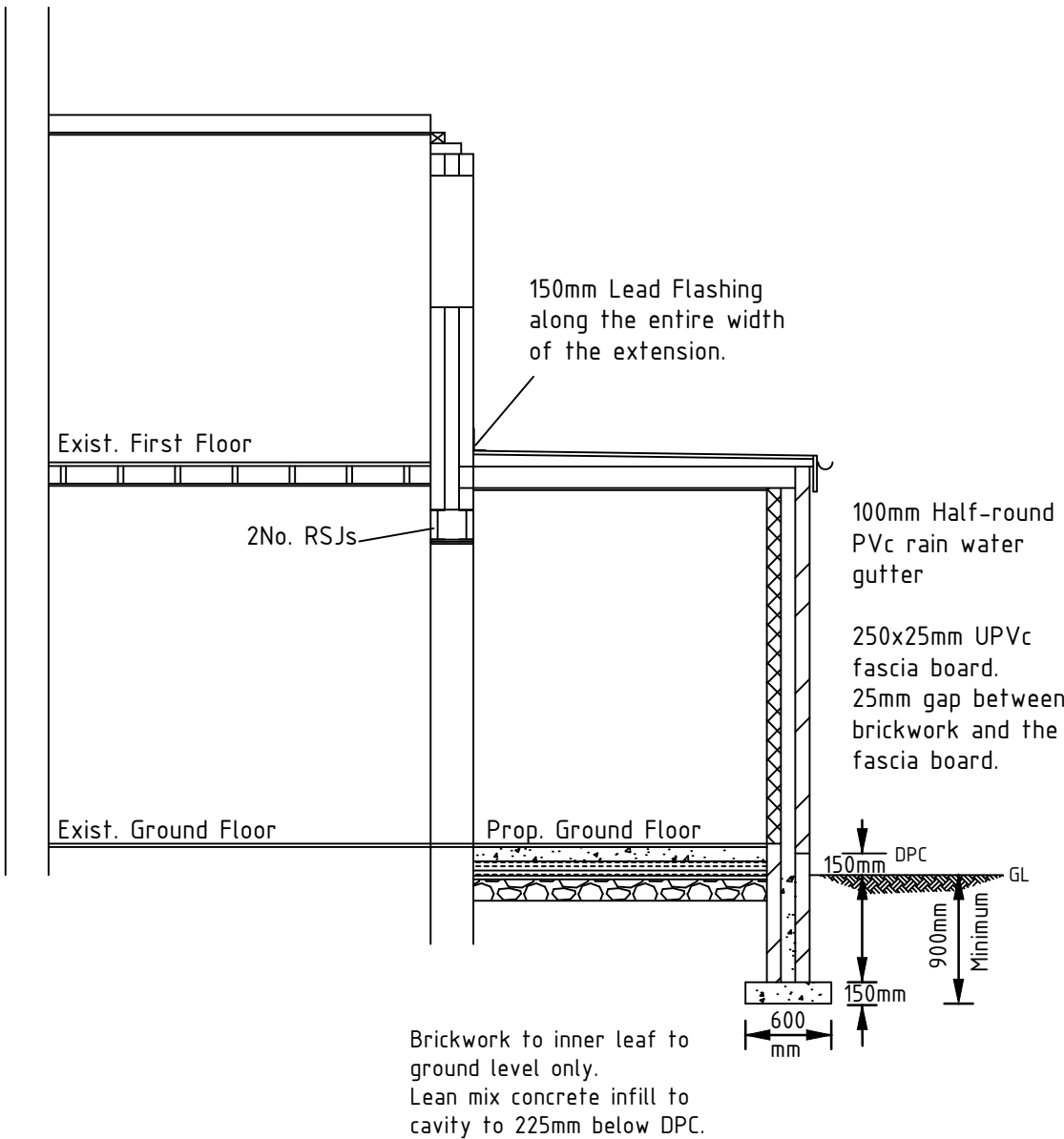


Proposed West Elevation

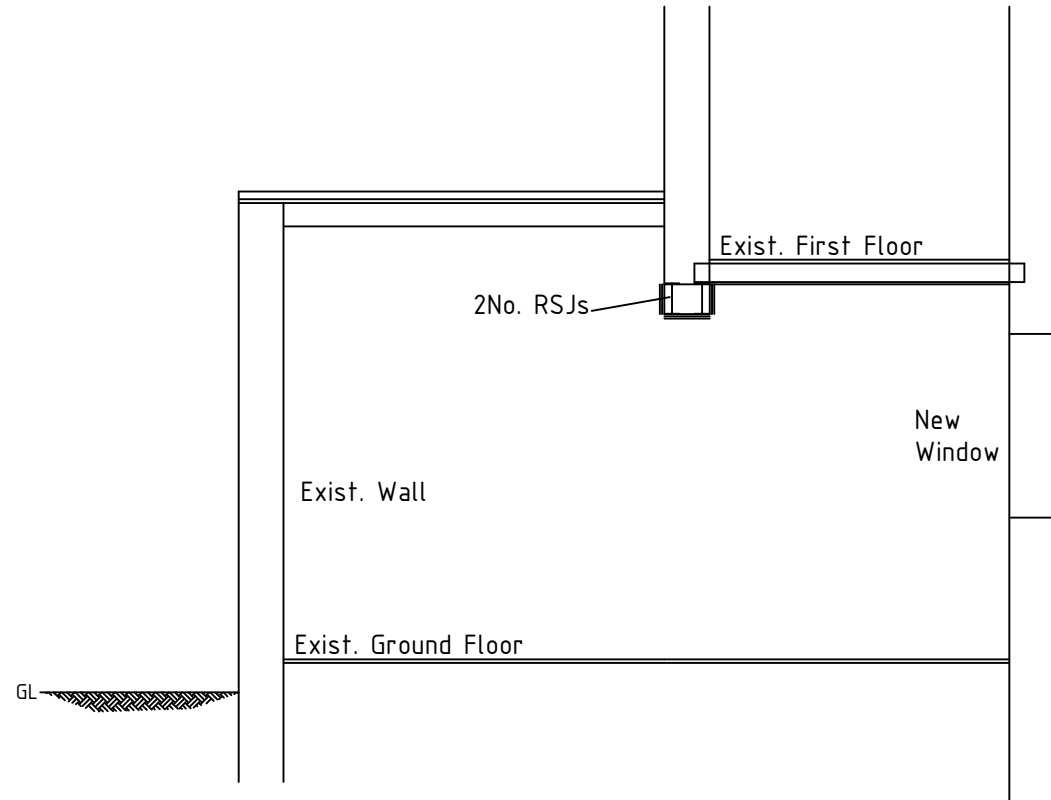
Roof Construction:
EPDM or similar approved roofing felt.
12mm Thick external plywood board.
Timber fairings starting at 38x50mm and ending at 38x100mm to provide minimum fall of 1 in 80.
38x145mm Rafter @400mm centres-C16, to Table 38 of TRADA tables.
125mm Thick Kingspan Kooltherm K7 insulation board between the rafters.
A minimum 50mm gap required above the insulation for air circulation.
12.5mm Thick foil backed plasterboard to ceiling, to be Plastered & skimmed.



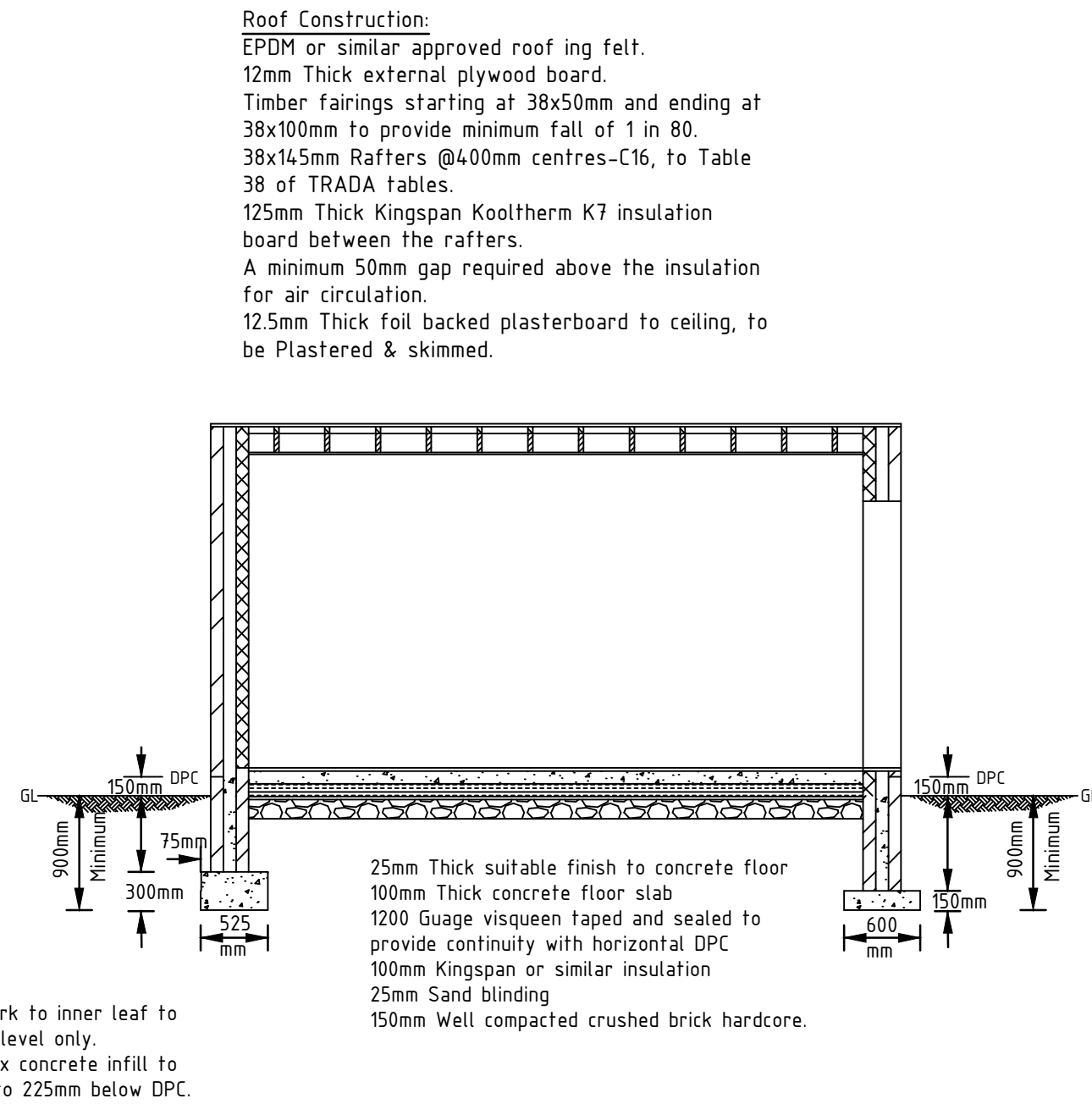
Section A-A



Section B-B



Section C-C



Section D-D

NOTES				

P3	09.06.22	AUH	AUH	Section C-C amended.
P2	07.06.22	AUH	AUH	The internal width of extension increased from 2.50m to 4.84m.
P1	04.04.22	AUH	AUH	Roof of the proposed extension changed from pitched roof to flat roof.
No	DATE	DRAWN	CHK'D	AMENDMENT

DRAWING STATUS	
Planning	

CLIENT	Mr M.Ahmed
PROJECT	2 Malgam Drive, Didsbury, Manchester M20 5GN
DRAWN	A. Ul-Haq
CHKD	AUH

TITLE			
Proposed Single Storey Rear Kitchen Extension.			
Existing & Proposed Elevation and Proposed Sections			
Sheet 2 of 2			
SCALE	DRAWING No	DATE	AMDT
Elevations=1:100 Sections = 1:50	2021/05/02	June 2021	P3