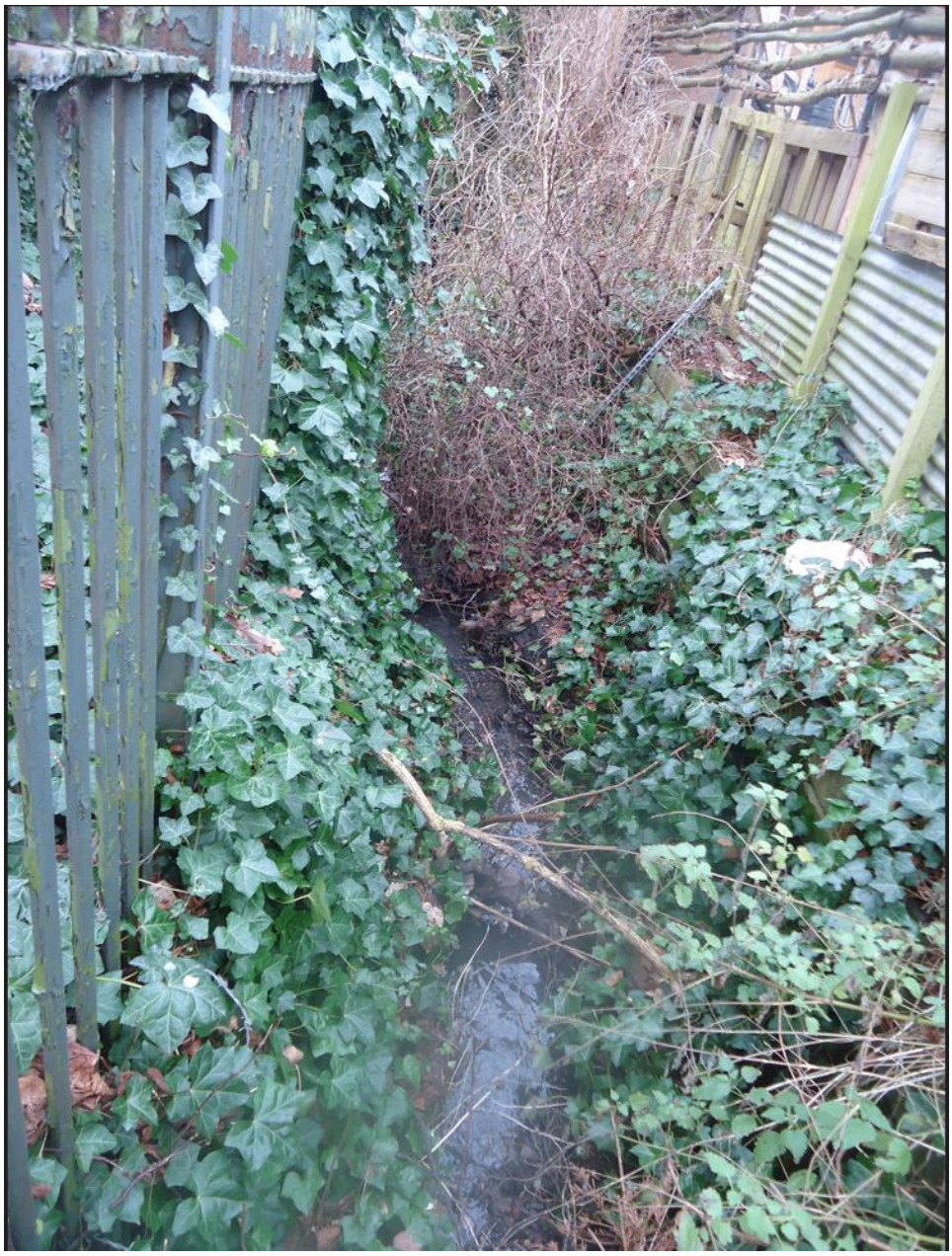
Land Adjacent to 17 Omer drive, Burnage, Manchester, M19 2JN.

FLOOD RISK ASSESSMENT



Willow Brook with the proposed site to the right.

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27 January 2023

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1. Introduction:

This Flood Risk Assessment has been prepared in support of the planning application for a new dwelling house on a plot of land adjacent to 17 Omer Drive, Burnage, Manchester, M19 2JN.

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

2. Site Location:

The site is currently a plot of land that is used for the purposes of a garden centre.

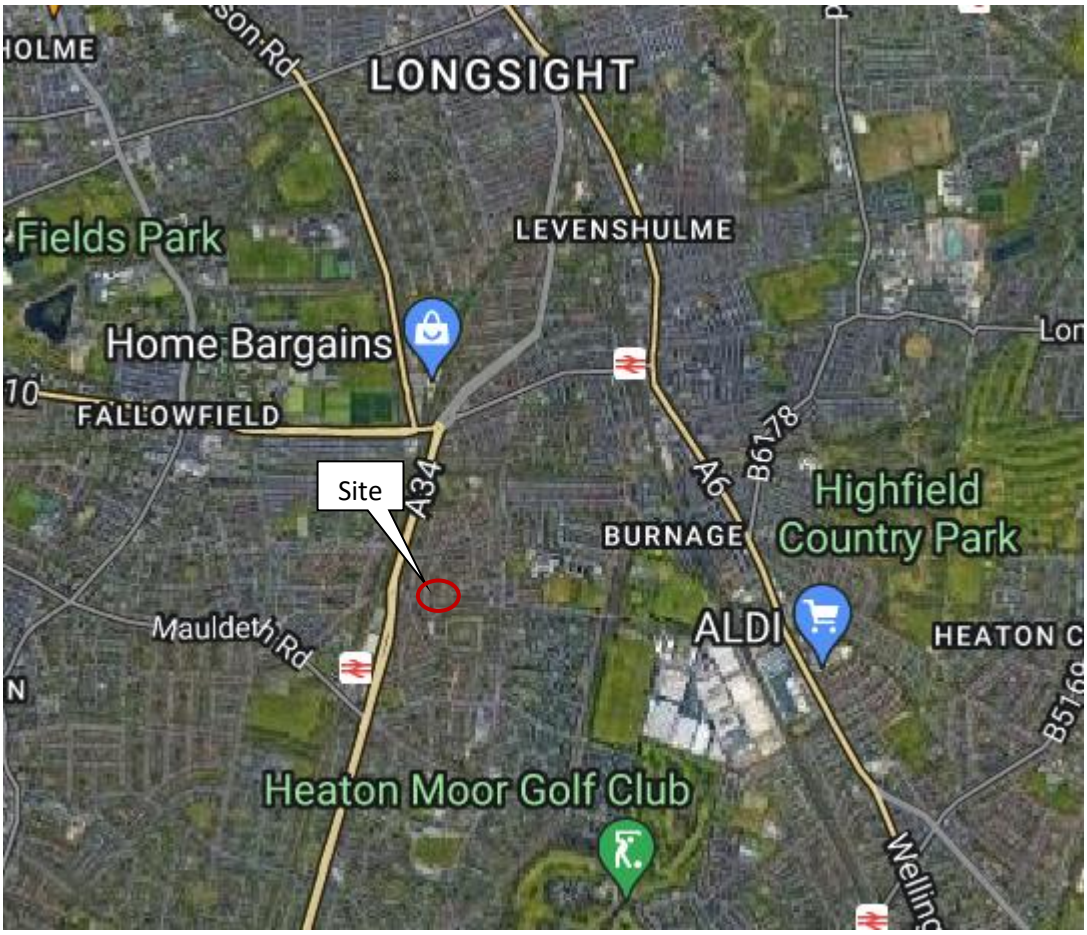
Grid Reference: SJ 86433 93346

Eastings/Northings: 386433/393346

Elevation: The plot levels range from 42.40m to 42.45m AOD.

The proposed threshold level of property is set 300mm above the existing ground at 42.800m above ordinance datum (A.O.D).

The whole area of Grangethorpe Drive and adjoining area slopes from East to West.



Location Plan

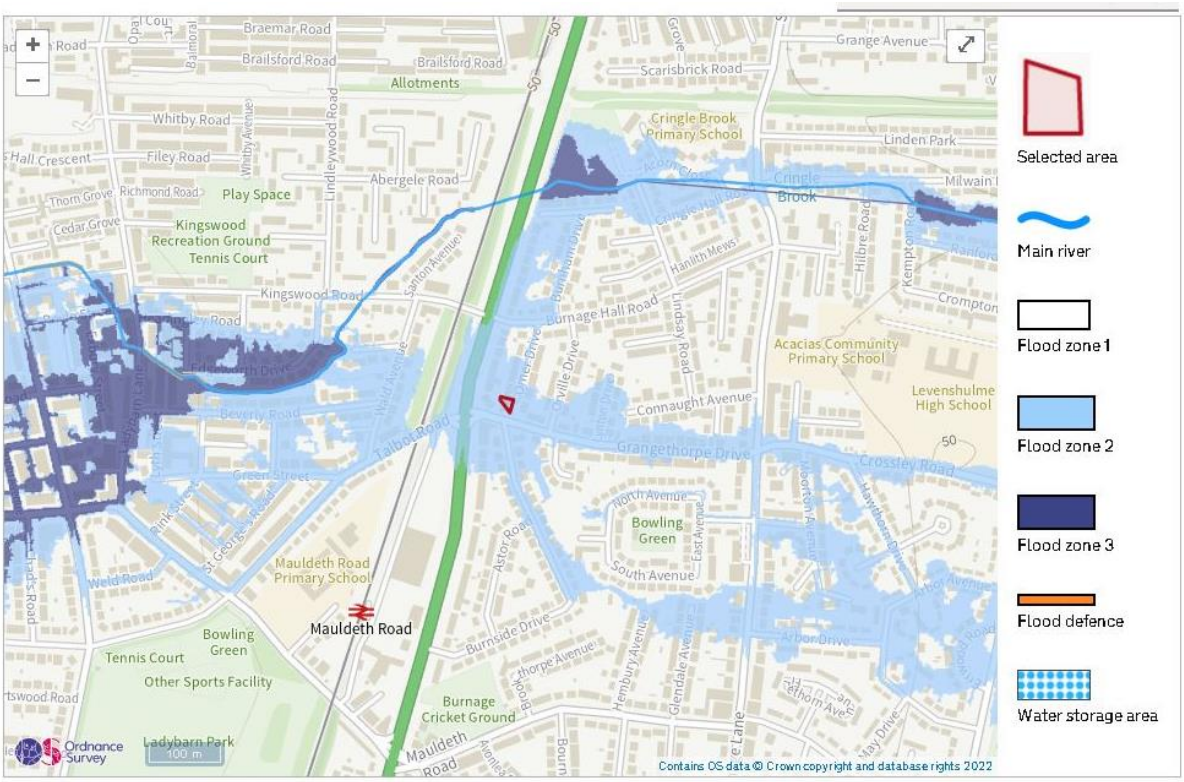
3. Development Proposals:

The development proposal is for a two storey, two bedroom dwelling house.
The site area is 182.0Sq.m, the floor area is 40.0Sq.m and the hardstanding is another 42.0Sq.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)

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 (houshold 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 40.0 Square metres, the total size of the plot is 182.0Sq.m .
Therefore, it is considered to be a "minor extension", as such it is recommended to follow the Envronment 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

	Essentila 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:

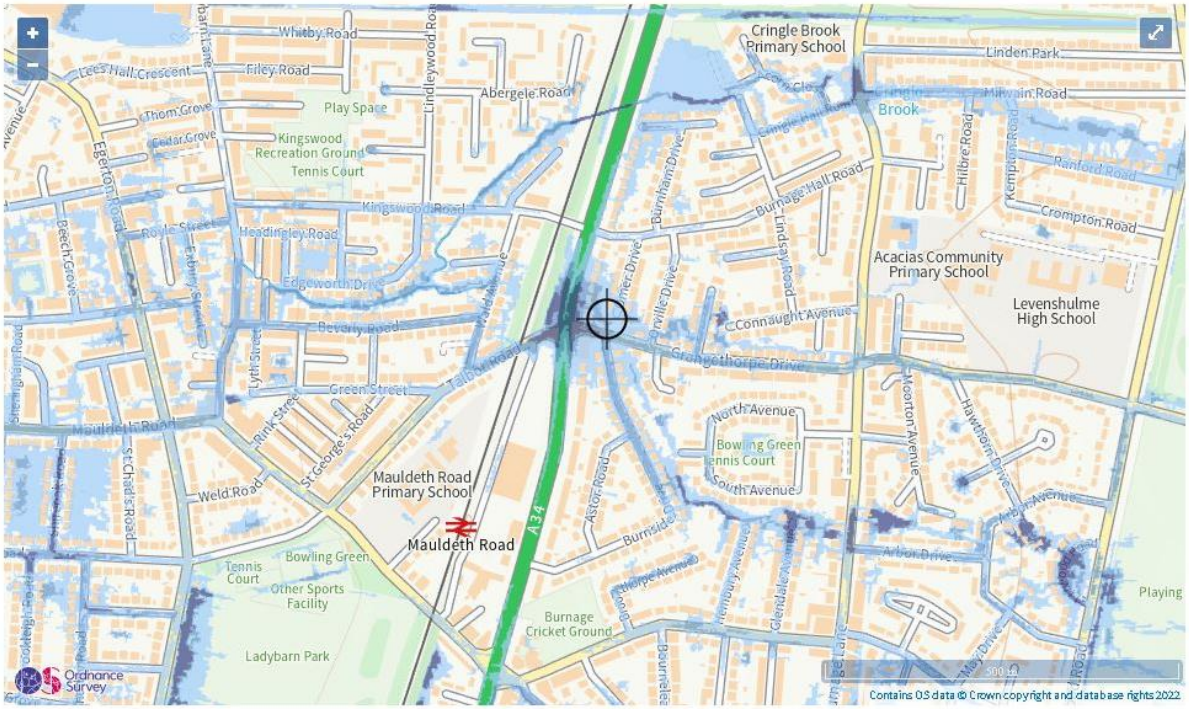
As stated in paragraph 5 above, an Exception Test is not required to be passed.

8. Flood Zone Maps:

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 low flooding from the Surface Water, refer 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 300 to 900mm, see fig-3 below.

Fig-3

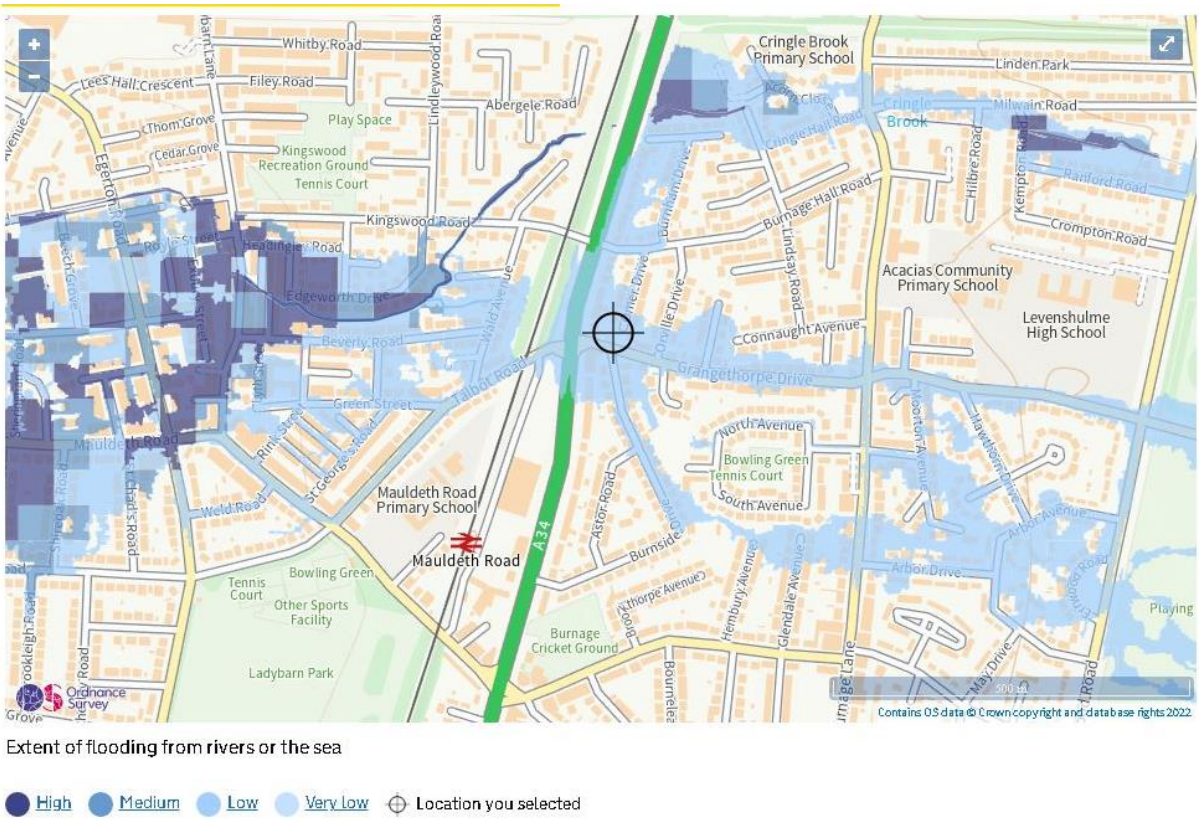
Surface water flood risk: water depth in a low risk scenario

Flood depth (millimetres)

Over 900mm 300 to 900mm Below 300mm Location you selected

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



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-5 below.

Fig-5

Maximum extent of flooding from reservoirs:

when river levels are normal | when there is also flooding from rivers | Location you selected

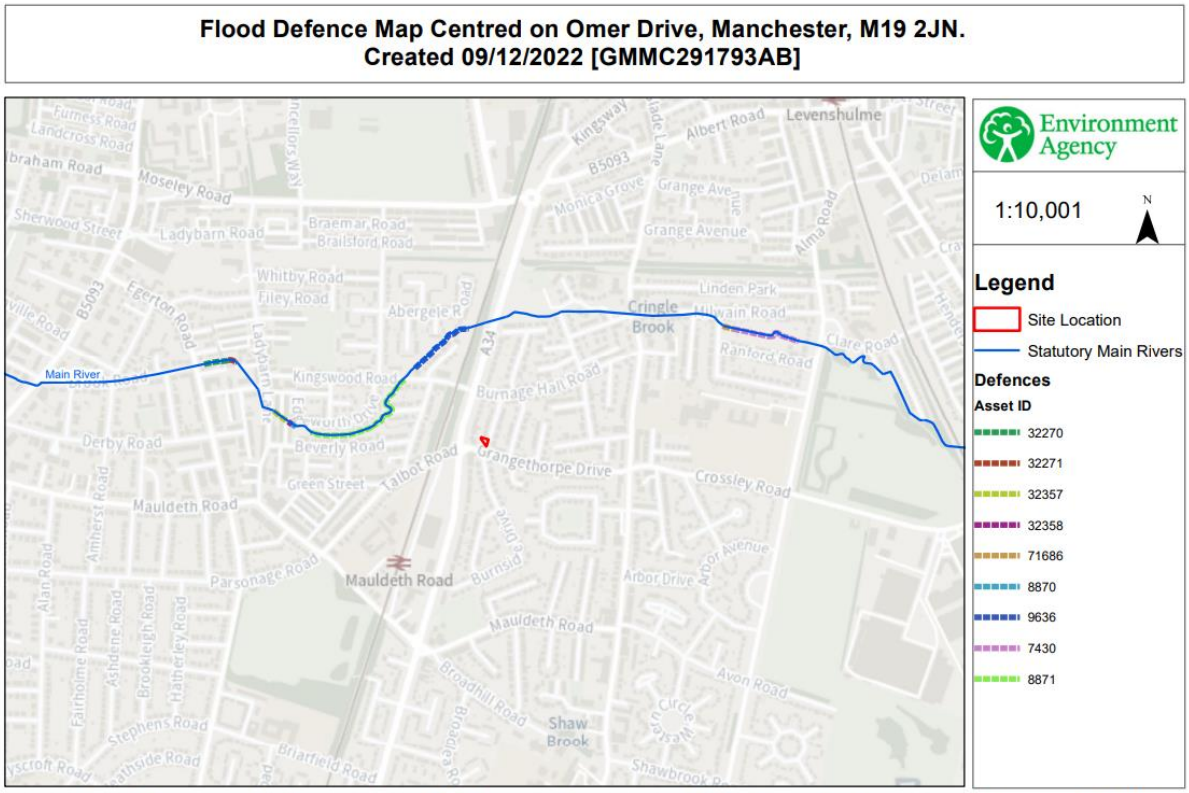
Source of Flooding:

Source	**Flood Risk**
Surface water	Low (see Fig-2, page 6)
Fluvial	Low (see Fig-4, page 8)
Reservoirs	Only when there is also flooding from rivers.
Ground Water	Not known
Sewer	Not knwn

9. Flood Defences:

The main river "Cringle Brook" is located more than 250m to the North/Northwest of the site.
The figure 6 below, provided by the Environment Agency, shows the flood defences in the vicinity of the site. The nearest flood defences are shown aprroximately 250m away in the Northwestern direction, which started in 2004. The flood defences are in the form of "Engineered high ground" with upstream crest level of 40.26m AOD and downstream crest level of 43.83m AOD.
Similarly,there are flood defences on the Northeast side of the site which again started in 2004. The flood defences are in the form of a wall with upstream crest level of 40.71m AOD and downstream crest level of 40.72m AOD, refer to the table in Appendix A.

Fig-6



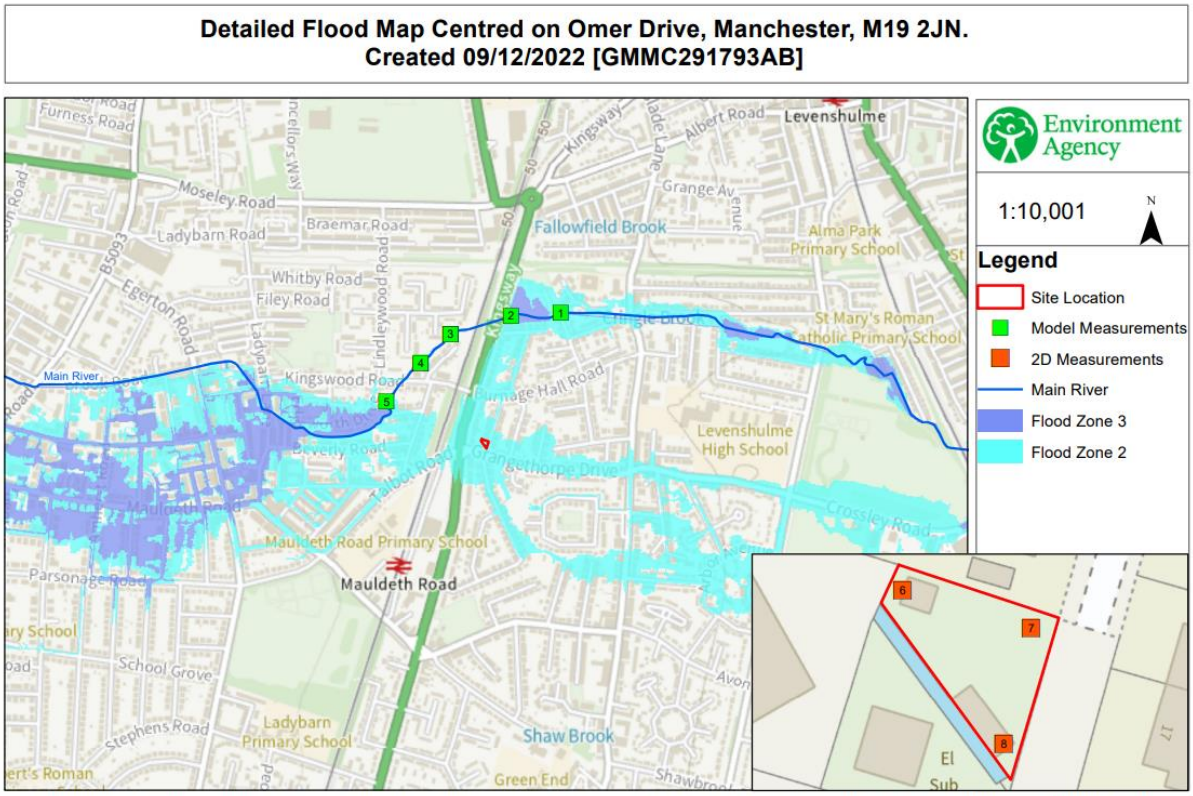
A minor brook abuts the Southwest boundary of the site is, "Willow Brook". The environment Agency has not provided any information regarding the Willow brook. The brook was inspected on 23 January 2023 during dry weather conditions. The brook had very low flow in it and as can be seen from the photo on the front page of this report, there is 1.0m or more high wall to the side of the site with water level in the brook being more than 1.0m lower than the existing site levels.

10. Probability of Flooding:

The figure 7 below, provided by the Environment Agency, shows the nodes for the flood data within the site. The flood data provided is shown in the table attached in Appendix A. The flood data is centred on Omer Drive, the data is from the Cringle Brook Model of 2017.

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-7



The information provided by the Environment Agency (and attached in Appendix A), shows the flood data from the Cringle Brook model of 2017. The data is shown for three nodes (6, 7 and 8) within the site.
It indicates the risk of flooding from rivers where flood defences have been removed, including estimated impact of climate change.

The analysis of the data shows that in the 1.0% (1 in 100 years) Annual Exceedance Probability (AEP) plus 30% for Climate change, the flood level would be 42.34m AOD. As the property threshold level is 42.80m AOD, it is not likely to be impacted.
However, for 0.1% (1 in 1000 years) Annual Exceedance Probability, node 6 indicates a flood level of 101.00m AOD. This shows a flood of biblical proportions. If this event was to take place, it will not only inundate Burnage but will result in most of Manchester under

many metres of water. The value of 101.0m AOD, for this node appears to be an error. It is not possible for one corner of site (of this size) to have flood level of 101.0m whilst the other two corners (nodes 7 and 8) have water level of 42.95m AOD.
With nodes 7 and 8 showing a probable flood level of 42.95m AOD, this will impact the proposed dwelling house by a depth of 150mm.

11. Drainage Strategy:

11.1Surface water:

The existing site is made up of permeable area, therefore the rainwater soaks into the ground.

The guidelines for the discharge of surface water stipulates;
First option - Infiltration into the ground
If that is not possible, then discharge into a water course
And if that is not possible then discharge into a surface water sewer
And if that is not possible, then into a combined sewer.

The proposed surface water run-off from the site shall be discharged into the ground via a soakaway using "Wavin Aquacell" or a similar approved storage system.
As can be seen from the surface water run-off calculations below, the discharge from the site is very low, less than 1.0 litre/second.

11.2 Surface Water Drainage calculations:

Area of the building (Roof) = 40.0Sq.m

Area of hard-standing = 41.0Sq.m

Total impermeable area = 81.0Sq.m

Garden area = 88.0Sq.m

Total site area = 182.0Sq.m

Therefore, total impermeable area = 182.0 – 88.0 = 94.0Sq.m

Effective Area = 100% of Roof area + 80% of hard area + 30% of the garden area.

Therefore Effective area = 40+ (54*80%) + (88*30%) = 40+43.2+26.4 = 109.60Sq.m, Say 110.0Sq.m

Proposed flow at 1 in 30 years return period;

Q = 2.78Ai

Q = 2.78*(110/10000)*29.20 = 0.89 litres/second.

12. Conclusion:

- The proposed development with the site area of 182.0Sq.m, is considered a minor development of residential dwelling, it is recommended that finished floor level of the proposed development is set 300mm above the existing ground level (refer to paragraph 13.i below).

- As demonstrated in paragraph 10, the site is at low risk of flooding from surface water or fluvial flooding.

- The proposed site area is 182.0Sq.m, with the water butts proposed, the discharge of surface water into the ground would be very low, less than 1.0 litre per second.

- As noted in paragraph 10, the analysis of the data provided by the Environment Agency from the Cringle Brook model of 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 0.150mm above the property threshold level.

- Whilst there is no historic flooding information available for the willow brook which abuts the site on the South side, There was one incident of localised flooding in October 2001, about 300metres to the West of the site. This was caused by a blockage of the Cringle brook at that location.

13. 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 development;

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

   The finished floor level has been set 300mm above the existing average site level.

ii. In order to comply with SuDs, a Soakaway is proposed for the discharge of the surface water into the ground, together with water butts to harvest the rainwater from the roof.

iii. The external doors to the property to be fitted with Nautilus 400 or similar approved flood barrier system to a height of 800mm from finished floor level.

iv. All windows within 750mm of finished floor level, should have water-tight seals at the joints with the walls.

v. The proposed ground floor should be constructed of concrete to facilitate cleaning & drying.

vi. Any new airbricks should be anti-flood airbricks

vii. A layer of DPM to be installed to the inner side of all external walls to a height of 1.0m.

viii. Sealant should be applied around all pipe/cable/Services entry points.

ix. Any new sockets in the new extension to be located a minimum of 750mm above the finished floor level.

x. The new soil & vent pipe shall be fitted with a non-return valve

xi. To mitigate any flooding from the Willow brook, it is proposed that a 1.0m high Nautilus 400 or similar approved flood barrier system be installed along the bank of the brook for the entire length of the site.

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.

14. Flood Evacuation Plan:

13.1Acacia Community Primary School is in walking distance of the proposed development and is in Flood Zone 1 (Figure 15).

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 south on Omer Drive and turn left onto Grangethorpe Drive, a walk of about 360.0metres. Then turn left onto Burnage Lane and walk for about 100.0 metres, then turn right onto Alexandra drive and walk approximately 50.0 metres to enter into the grounds of Acacia Community Primary School.

Appendix A: GMMC291793AB Table provided by the Environment Agency

					Undefended														Defended															
Map Reference	Model Node Reference	Easting	Northing	Data	50 % AEP (1 in 2 year)	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow	50 % AEP (1 in 2 year)	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% increase in flow
1	ea013_0238_CRINO1_2872d	386624	393662	Modelled Water Level (m aodN)	43.05	43.17	43.44	43.64	43.69	43.94	44.09	44.18	44.59	44.65	44.87	44.42	45.00	45.13	43.05	43.17	43.44	43.64	43.69	43.94	44.09	44.18	44.59	44.65	44.87	44.42	45.00	45.13
				Modelled Flow (cumecs)	1.87	2.41	3.01	3.41	3.48	3.91	4.18	4.34	4.81	4.85	5.03	4.68	5.12	5.16	1.87	2.41	3.01	3.41	3.48	3.91	4.18	4.34	4.81	4.85	5.03	4.68	5.12	5.16
2	ea013_0238_CRINO1_2546	386502	393656	Modelled Water Level (m aodN)	42.53	42.78	43.29	43.56	43.63	43.92	44.08	44.18	44.59	44.64	44.86	44.41	44.98	45.10	42.53	42.78	43.29	43.56	43.63	43.92	44.08	44.18	44.59	44.64	44.86	44.41	44.98	45.10
				Modelled Flow (cumecs)	2.01	2.56	3.17	3.20	3.20	3.22	3.20	3.19	3.86	3.95	4.73	3.74	5.56	6.55	2.01	2.56	3.17	3.20	3.20	3.22	3.20	3.19	3.86	3.95	4.73	3.74	5.56	6.55
3	ea013_0238_CRINO1_2387	386354	393611	Modelled Water Level (m aodN)	41.47	41.57	41.68	41.73	41.74	41.79	41.81	41.82	41.87	41.87	41.90	41.85	41.91	41.92	41.47	41.57	41.68	41.73	41.74	41.79	41.81	41.82	41.87	41.87	41.90	41.85	41.91	41.92
				Modelled Flow (cumecs)	2.01	2.56	3.23	3.54	3.62	3.91	4.07	4.16	4.53	4.58	4.77	4.37	4.87	4.96	2.01	2.56	3.23	3.54	3.62	3.91	4.07	4.16	4.53	4.58	4.77	4.37	4.87	4.96
4	ea013_0238_CRINO1_2284	386281	393540	Modelled Water Level (m aodN)	40.73	40.92	40.92	40.97	40.98	41.03	41.06	41.07	41.14	41.15	41.21	41.11	41.33	41.39	40.73	40.92	40.92	40.97	40.98	41.03	41.06	41.07	41.14	41.15	41.21	41.11	41.33	41.39
				Modelled Flow (cumecs)	2.01	2.56	3.23	3.55	3.62	3.91	4.07	4.16	4.53	4.58	4.77	4.37	4.87	4.96	2.01	2.56	3.23	3.55	3.62	3.91	4.07	4.16	4.53	4.58	4.77	4.37	4.87	4.96
5	ea013_0238_CRINO1_2156	386197	393446	Modelled Water Level (m aodN)	40.21	40.34	40.49	40.55	40.57	40.60	40.62	40.63	40.67	40.68	40.70	40.66	40.75	40.79	40.21	40.34	40.49	40.55	40.57	40.60	40.62	40.63	40.67	40.68	40.70	40.66	40.75	40.79
				Modelled Flow (cumecs)	2.15	2.72	3.47	3.80	3.86	4.12	4.30	4.37	4.73	4.79	5.06	4.57	5.54	5.79	2.15	2.72	3.47	3.80	3.86	4.12	4.30	4.37	4.73	4.79	5.06	4.57	5.54	5.79
6	2D Measurements	386431	393351	Modelled Water Level (m aodN)									42.34	42.35	42.60		101.00	101.00									42.34	42.35	42.60		42.95	43.14
7		386444	393347	Modelled Water Level (m aodN)													42.95	43.14													42.95	43.14
8		386441	393335	Modelled Water Level (m aodN)									42.34	42.35	42.60		42.95	43.14									42.34	42.35	42.60		42.95	43.14

Model data taken from Cringle Brook 2017

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes:

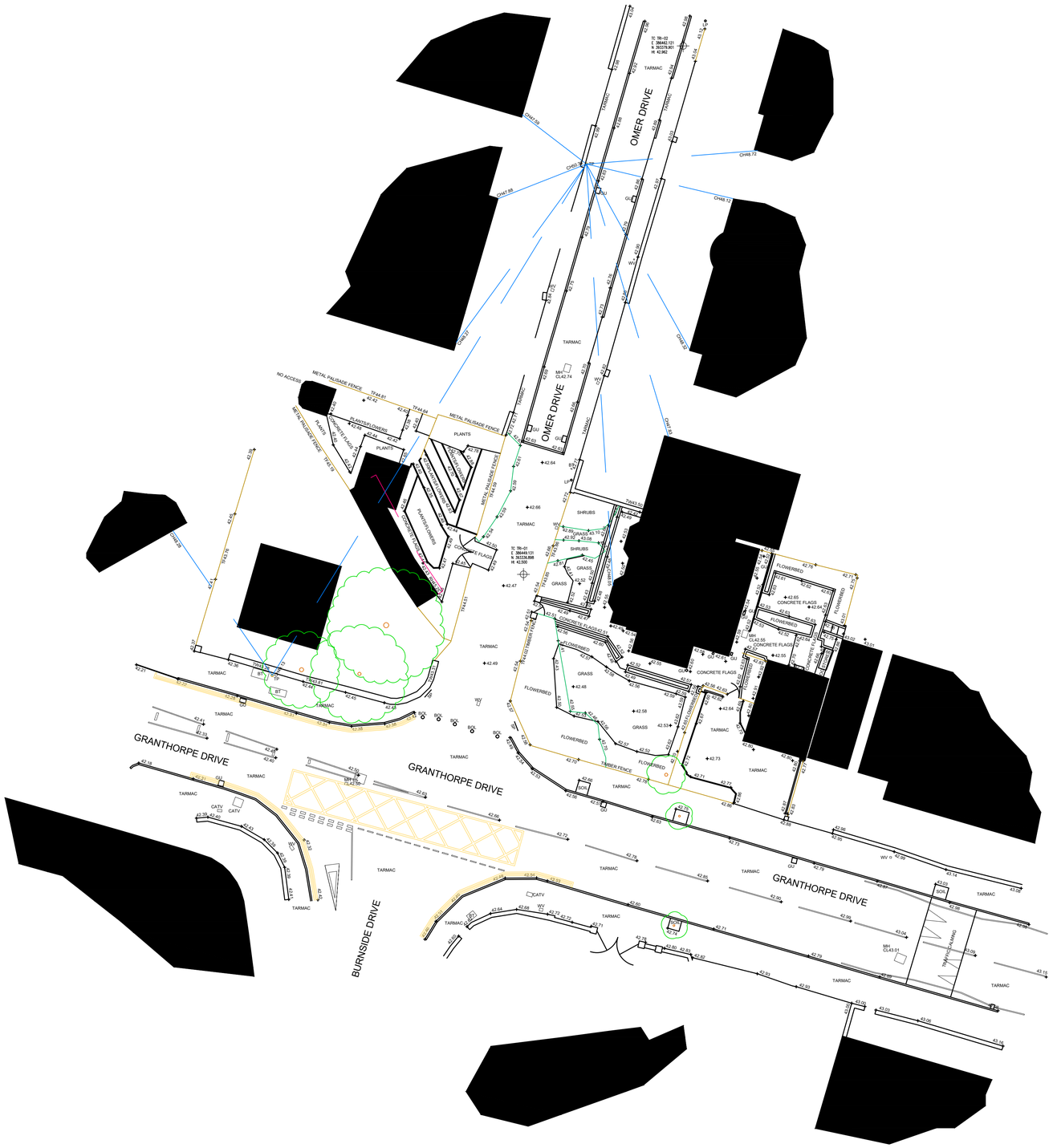
*Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

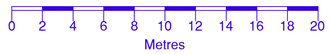
Root Defences

Start Date	Asset Type	Asset ID	Standard of Protection	Upstream Actual Crest Level (m aod)	Downstream Actual Crest Level (m aod)
01/01/2004	Wall	32070	100	39.28	39.21
01/01/2004	Wall	32071	100	39.73	39.40
01/01/2004	Wall	32357	100	40.97	40.67
01/01/2004	Wall	32358	100	40.71	40.72
01/01/2004	Engineered High Ground	71886	100	48.71	47.89
01/01/2004	Wall	8670	100	39.83	39.84
01/01/2004	Engineered High Ground	9636	100	41.26	43.83
01/01/2004	Natural High Ground	7430	100	47.83	50.40
01/01/2004	Natural High Ground	8671	100	41.17	39.56

Appendix B: Topographical Survey

All Dimensions to be checked on site. Walls shown on plans are not to be assumed to be solid & should be checked for thickness, construction, load bearing capacity & stability.





ABBREVIATIONS

AB	Air Brick
BOL	Bollard
BT	BT Cover
CATV	Cable TV Cover
CH	Cable Height
ch	Ceiling Height
CL	Cover Level
EH	Eaves Height
GU	Gully
LP	Lamp Post
MH	Man Hole
RH	Ridge/Roof Height
RWP	Rain Water Pipe
SP	Sign Post
SVP	Soil Vent Pipe
TF	Top of Fence
TW	Top of Wall
WV	Water Valve

NOTE

All levels and coordinates relate to OSGB36(15) using GNSS data.

Levels defining edge of carriageway are observed at channel (bottom of kerb).

Rev. 0 Description. Issued

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Project Description

Site Survey

Drawing Title

Existing
Site Layout

Scale	Date	Drawn By
1:200@A1	24/10/2022	SN

Drawing Number

TRI-3909-01

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