61-Grangethorpe Drive, Burnage, Manchester, M19 2NF.

FLOOD RISK ASSESSMENT

A. Ul-Haq; I.Eng, MICE 29 March 2022

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1. Introduction:

The Flood Risk Assessment has been prepared in support of the planning application for a single storey rear and side extension and first floor extension to the side, at 61-Grangethorpe Drive, Burnage, Manchester M19 2NF.

The Flood Risk Assessment has been prepared in accordance with the requirements of the National Planning Policy Framework (NPPF, July 2021) and the Environment Agency's Flood Risk Assessment (FRA) Guidance Notes and the best practices in flood risk management.

2. Site Location:

The site is a semi-detached property that lies close to the Burnage/ Followfield border, in Manchester with Manchester City Council being the local planning authority. The site lies approximately 5.0Km from the centre of Manchester. The surrounding area consists of predominantly residential use.

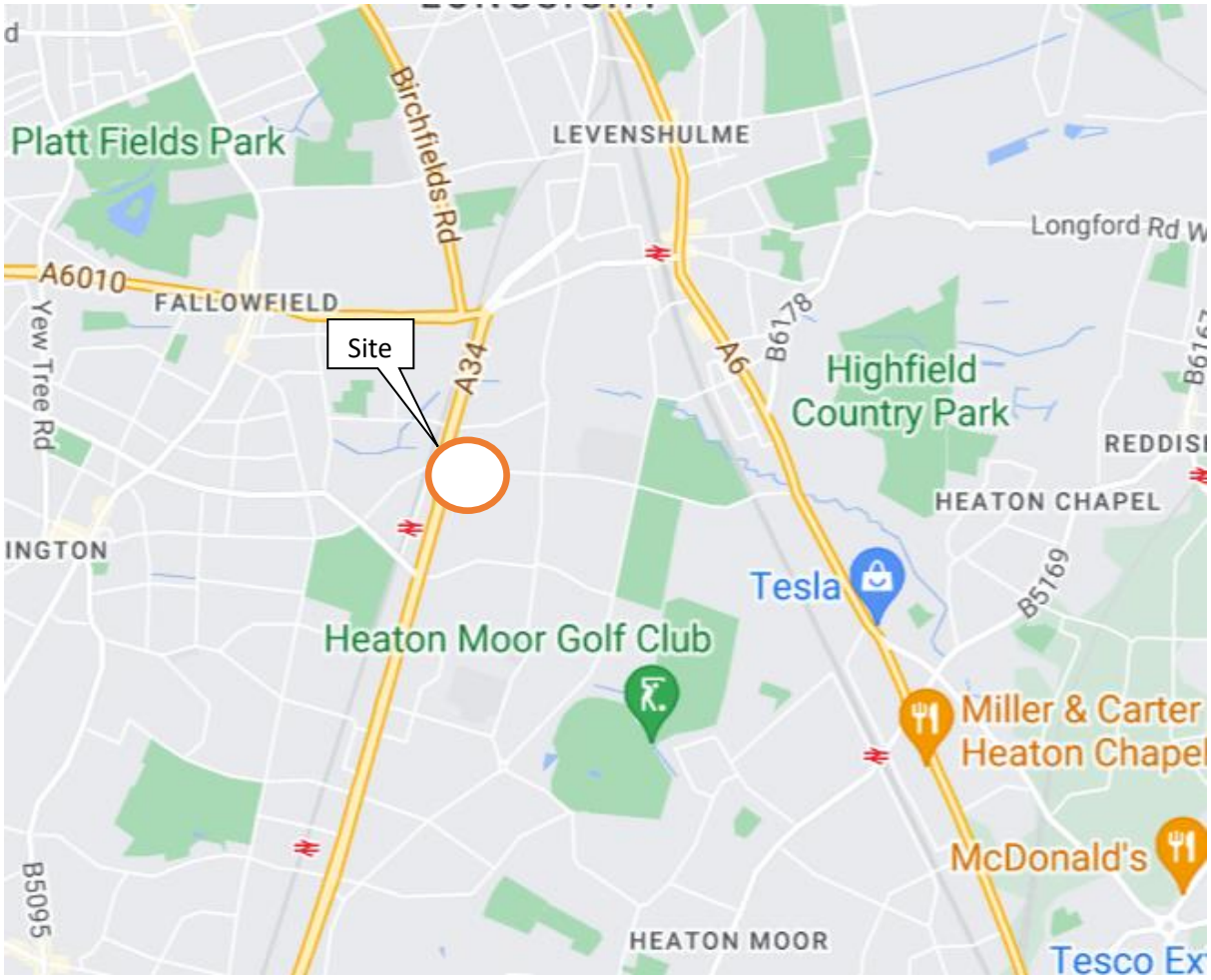
Grid Reference: SJ 86458 93294

Eastings/Northings: 386458/393294

Elevation: The site is located at 42.746m above ordinance datum.

Although there is a small watercourse adjacent to property to the North side, running East to West, a main river known as "Cringle Black Brook" is just over 350 metres to the North of the site. The main river runs East to West and flows in the westerly direction.
The whole area slopes from East to West and from South to North.

Location Plan:



3. Development Proposals:

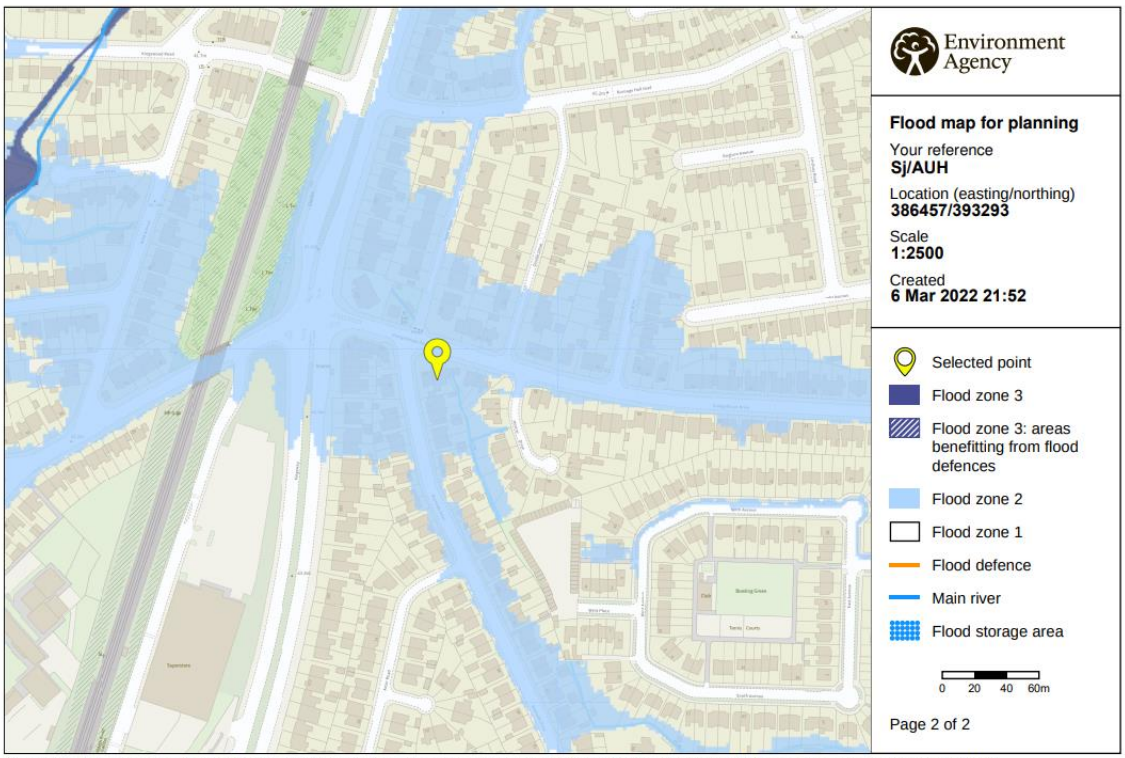
The development proposal involve:
Ground floor rear and side extensions
First floor side extension with balcony to the front
Dormer to rear and dormer window to front
New Porch
New window to existing front elevation above first floor bedroom, in the apex area
New window to front main bedroom to match ground floor
Change of front gate from hinged opening to sliding and a new pedestrian gate to the front.
The total site area is 241.0Sq.m of which 103.0Sq.m is existing dwelling house. The proposed ground floor and first floor extension to the side and rear comprises of 53.0Sq.m

All of the external surfaces of the property are currently hard paved, therefore, the proposed extension would not add any additional run-off to the existing sewer system.

4. Flood Zone Allocation:

According to Environment Agency's website, the site lies within flood zone 2, an area with a medium probability of flooding. The figure-1below shows the flood zones and flood defences within the proximity of the site. See Figure-1 below

Fig-1



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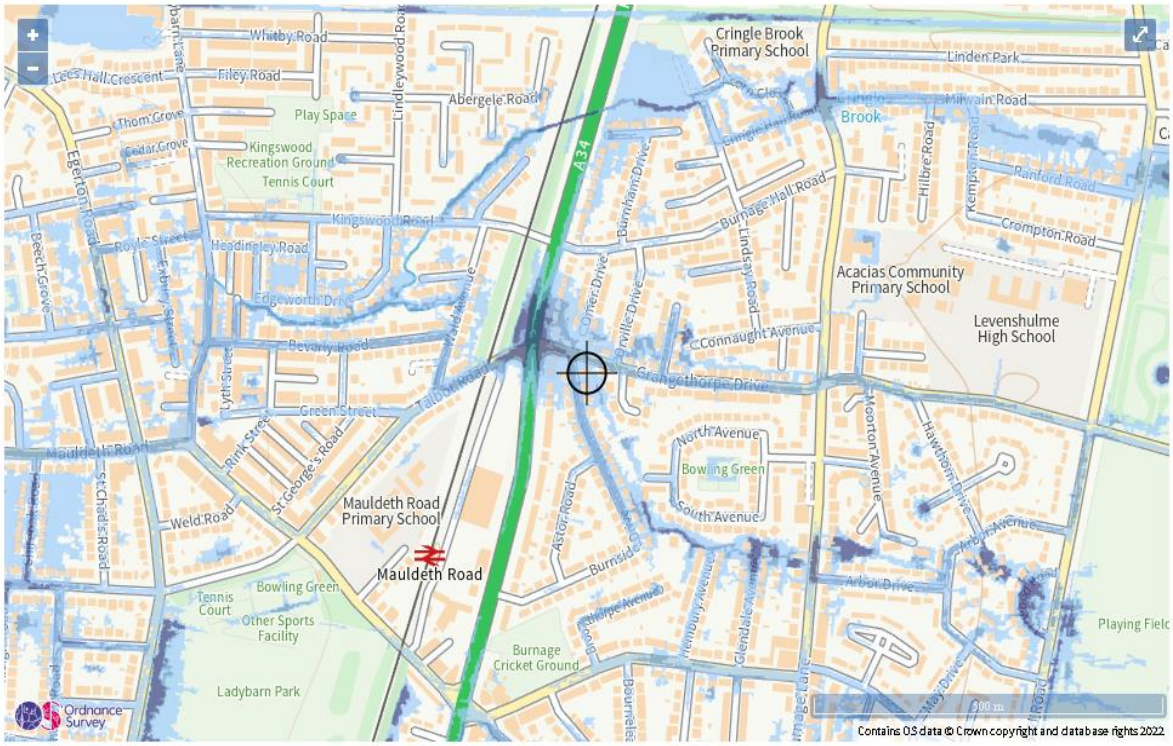
The Environment Agency's guideline states that a Flood Risk Assessment is required if a development is classed as:
"A minor development (household extension or non-domestic extension less than 250.0Sq.m) in flood zone 2 or 3."
As the proposed development is a household extension, therefore it would be considered as a minor development.

Fig-2



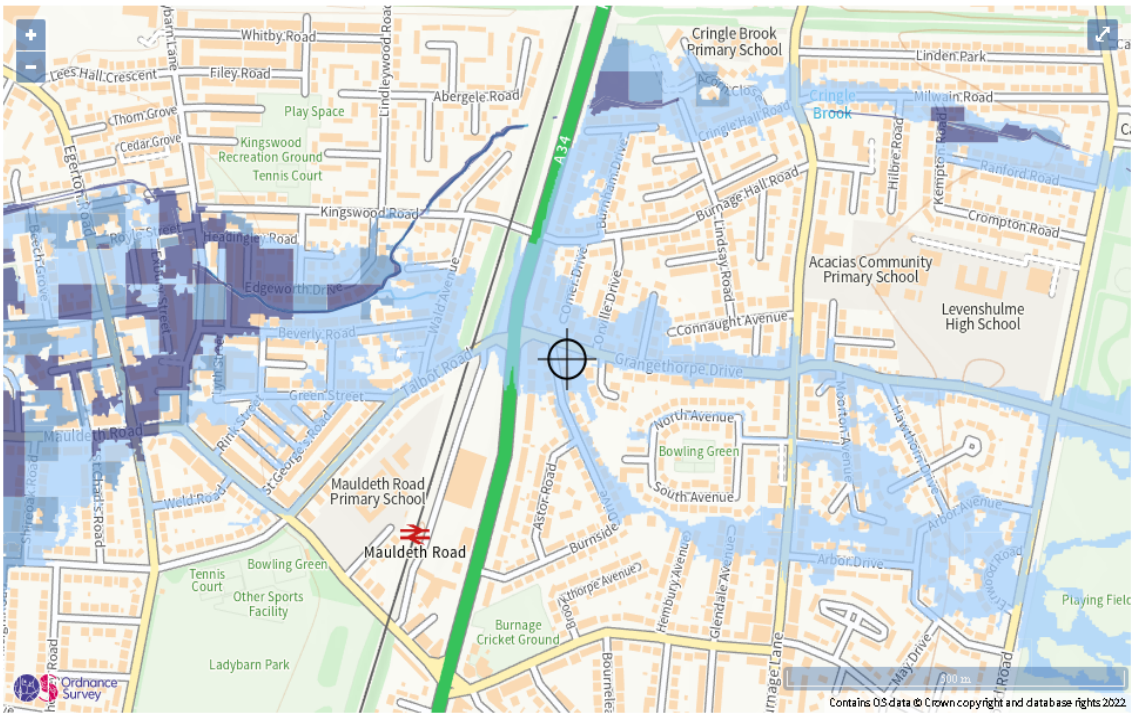
Extent of flooding from surface water

High Medium Low Very low Location you selected

According to Environment Agency's website, the site lies within low risk of flooding from surface water, see fig-2 above.

As per the information available on the Environment Agency's website, the site is at low risk of flooding from the rivers or the sea, see fig-3 below.

Fig-3



Extent of flooding from rivers or the sea

High Medium Low Very low Location you selected

As per the information available on the Environment Agency's website, the site lies within an area which at risk of flooding when there is flooding from river, see fig-4 below.

Fig-4

Maximum extent of flooding from reservoirs:

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

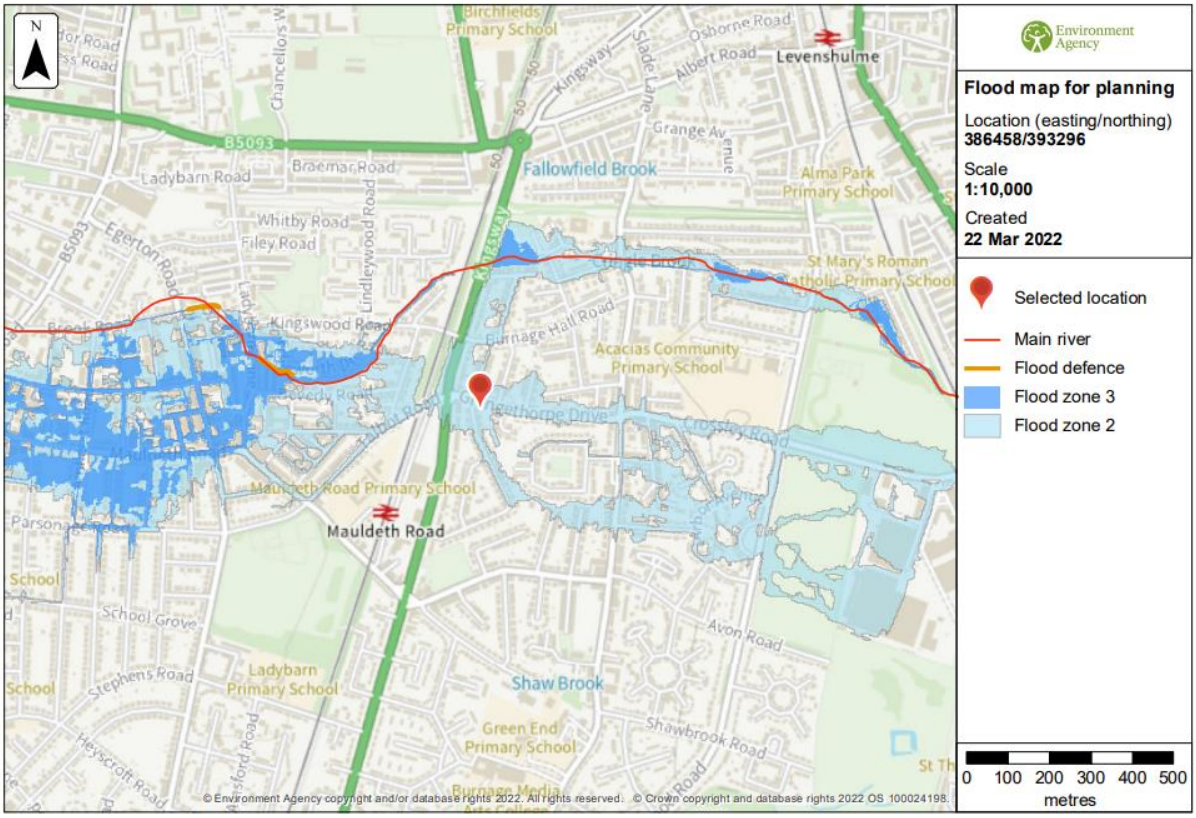
5. Table of Flood Risks from various sources:

Source of Flooding	Risk of Flooding:
Surface Water	Low
Rivers or the sea	Low
Groundwater	Not known
Reservoirs	At risk of flooding when there is flooding from the rivers.
Other sources	No other sources of flood risk known

6. Flood Zone Maps and Flood Defence Data:

The figures 5 below, received from the Environment Agency, confirms that the site lies within flood zone 2. It also indicates the flood defences in the area. The flood defences are approximately 300 metres away from the property.
Table 1 of Environment Agency's "Flood Zone and flood risk tables" confirms that the proposed site is in Zone 2 and is at risk of medium probability of flooding from river and sea. It describes this category as: Land having between 1 in 100 and 1 in 1,000 annual probability of river flooding; or land having between a 1 in 200 and 1 in 1000 annual probability of sea flooding. (Land shown in light blue on the flood Map).
However, the proposed site is not categorised as vulnerable in accordance with Environment Agency's Table 2: Flood risk vulnerability classification.

Fig-5



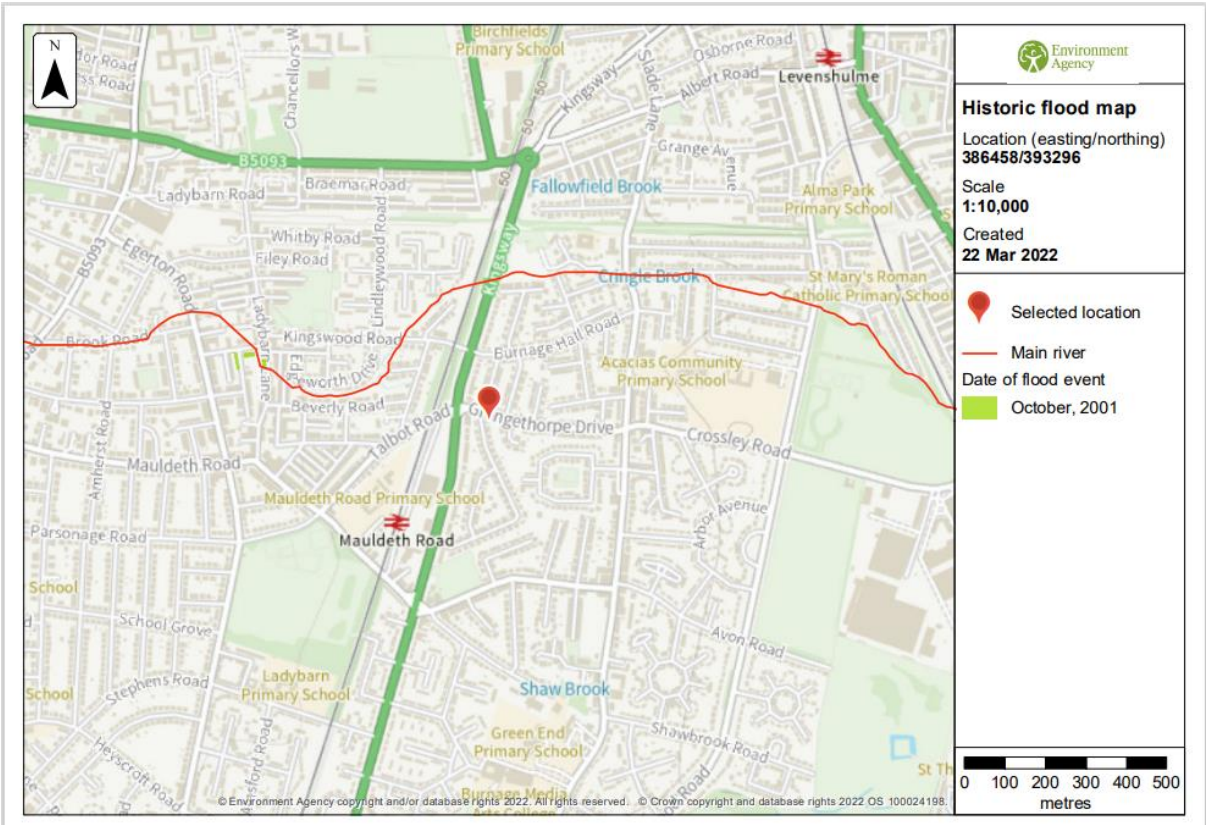
7. Flooding History of the Property:

The Figure 6 below shows the flood history of the property. The illustration below shows only one incidence of localised flooding which occurred in October 2001, some distance away from the property, due to the an obstruction blocking the channel of "Cringle Black Brook".

The property itself has not suffered from flooding.

The current owners of the property have occupied the property since March 2007 and do not recall any flooding incidents.

Fig-6



Historic flood event data

Start date	End date	Source of flood	Cause of flood	Affects location
26 October 2001	27 October 2001	main river	obstruction/blockage - channel	No

8. Flood Probability:

The figures 7, 8 and 9 below, received from the Environment Agency indicate the fluvial flooding probability as modelled with flood defences and withouth the flood defences is 0.1% in both cases. It means there is a probability of fluvial flooding of the site at 1 in 1000 years.

The nearest points to the site for model measurements are 2 and 3 (see fig-9).

The measurements for point 2 indicate that at 1 in 1000 years, the probable level of flooding would be 44.99m AOD and at 1 in 1000 years plus 30% increase, the probable level of flooding would be 45.10m AOD. The elevation of the site is 42.746m AOD, resulting in flooding of 2.244m and 2.354m respectively for 1 in 1000 years and 1 in 1000 years+30%.

The measurements for point 3 indicate that at 1 in 1000 years, the probable level of flooding would be 42.28m AOD and at 1 in 1000 years plus 30% increase, the probable level of flooding would be 42.90m AOD. As the elevation of the site is 42.746m AOD, this would result in no flooding at 1 in 1000 years but would result in flooding of 0.154m at 1 in 1000 years plus 30% increase.

Fig-7

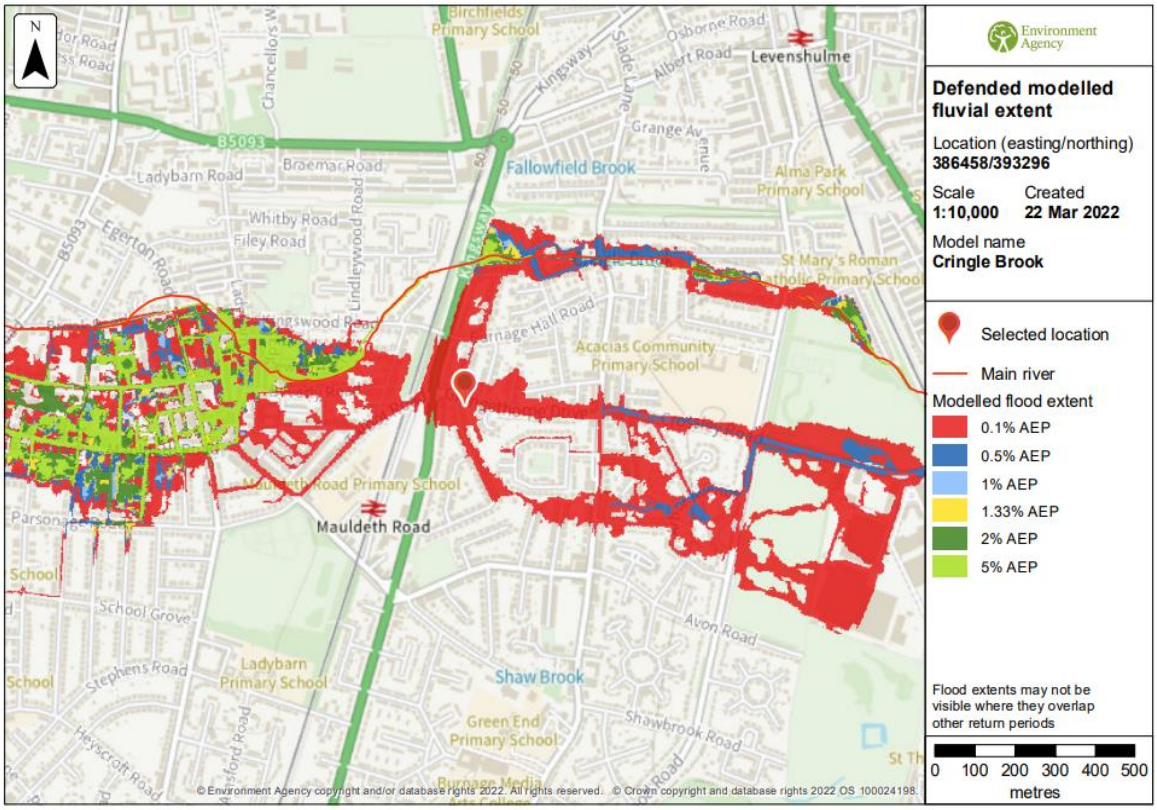


Fig-8

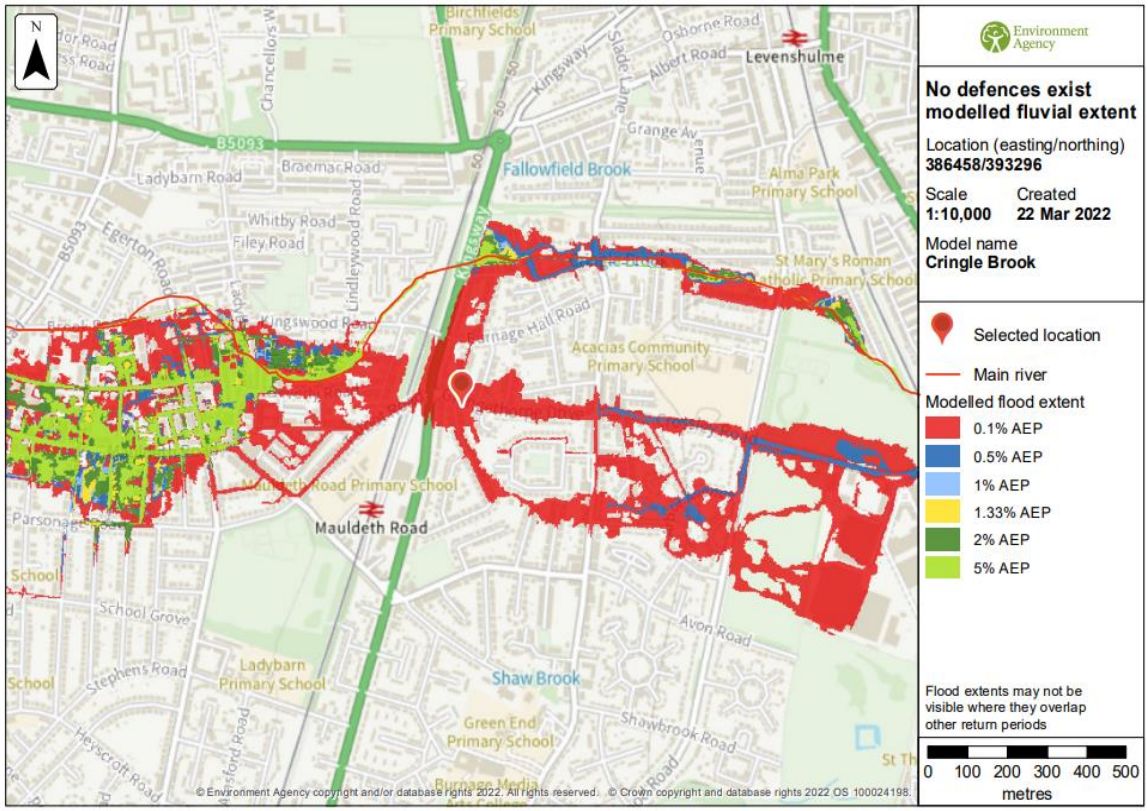

Environment Agency
No defences exist modelled fluvial extent
Location (easting/northing)
386458/393296
Scale
1:10,000
Created
22 Mar 2022
Model name
Cringle Brook
Selected location
Main river
Modelled flood extent
0.1% AEP
0.5% AEP
1% AEP
1.33% AEP
2% AEP
5% AEP
Flood extents may not be visible where they overlap other return periods
0 100 200 300 400 500
metres
N
Levenshulme
Mauldeth Road
Fallowfield Brook
Shaw Brook
Birchfields Primary School
Alma Park Primary School
St Mary's Roman Catholic Primary School
Acacias Community Primary School
Mauldeth Road Primary School
Ladybarn Primary School
Green End Primary School
Ladybarn Road
Braemar Road
Whitby Road
Filey Road
Lindleywood Road
Kingsway
Slade Lane
Albert Road
Osborne Road
Grange Avenue
Burnage Hall Road
Avon Road
Shawbrook Road
School Grove
Stephens Road
Heyscroft Road
Egerton Road
B5093
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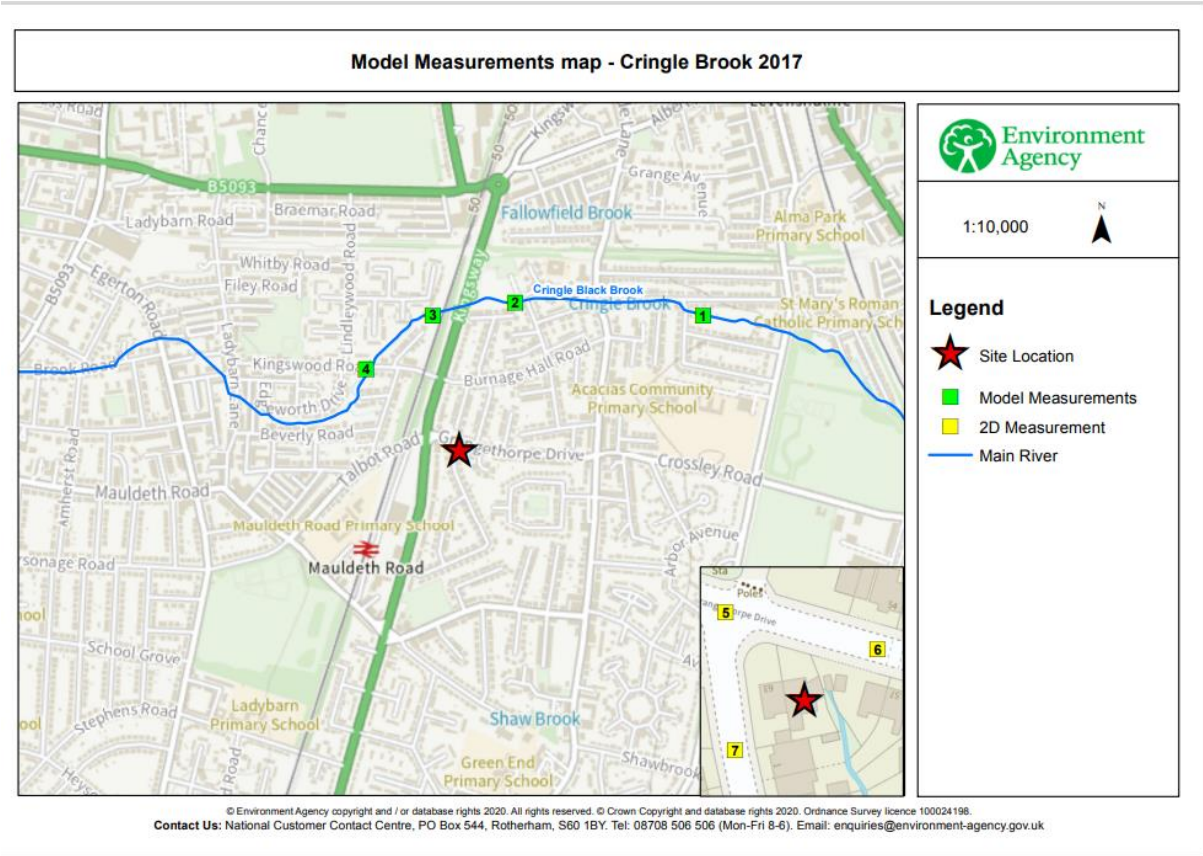
Fig-9



9. Conclusion:

The information provided by the Environment Agency demonstrates that whilst the site is at low risk of flooding from surface water, river or the sea, see figures 2 and 3 above. However, the computer modelling shows that Annual Exeedence probability of 0.1%, i.e. in 1000 years would impact the site.

As it is considered to be a minor development, according to the Environment Agency's guidelines, where the existing floor level can't be raised. Also as 1 in 1000 years is a rare occurrence, it is recommended that flood resilience measure up to 300mm from the floor with flood resistance doors be adopted to minimise impact of flooding.

10. Guidance for property owner/occupier:

It is proposed that the following flood resistance measure be adopted;

i. Any existing airbricks should be raised to 450mmm above the floor level or fitted with manually operated covers.

ii. Any new airbricks should be anti-flood airbricks

iii. Waterproof coating to be applied to all external walls to a height of 0.60m.

iv. All utility entrance points into the building be sealed to prevent water entry

v. Wiring for services such as TV and internet be protected by suitable insulation to minimise damage.

vi. All external doors to be flood resistance doors.

vii. All windows should have water tight seal at the joints with the walls.

Appendix A:

					Undefended														
Map Reference	Model Node Reference	Easting	Northing	Data	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	3.33 % AEP (1 in 30 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 flow	1 % AEP (1 in 100 year) + 35% Increase flow	1 % AEP (1 in 100 year) + 70% Increase flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% Increase flow
1	ea013_0238_CRN01_3100i	387061	393623	Modelled Water Level (m aodN)	47.56	47.76	47.89	47.92	47.96	48.10	48.24	48.31	48.51	48.53	48.60	48.44	48.70	48.79
				Modelled Flow (cumecs)	2.41	3.02	3.41	3.50	3.57	3.67	3.67	3.69	4.37	4.43	4.46	4.35	4.43	4.52
2	ea013_0238_CRN01_2642i	386596	393653	Modelled Water Level (m aodN)	43.04	43.40	43.62	43.67	43.74	43.93	44.09	44.18	44.59	44.64	44.86	44.41	44.99	45.10
				Modelled Flow (cumecs)	2.41	3.01	3.40	3.49	3.60	3.91	4.18	4.33	4.96	5.13	5.85	4.67	6.39	7.16
3	ea013_0238_CRN01_2431d	386394	393621	Modelled Water Level (m aodN)	41.98	42.09	42.13	42.14	42.15	42.18	42.20	42.21	42.25	42.25	42.27	42.23	42.28	42.29
				Modelled Flow (cumecs)	2.56	3.23	3.54	3.62	3.70	3.91	4.08	4.16	4.53	4.58	4.77	4.37	4.87	4.96
4	ea013_0238_CRN01_2210d	386227	393492	Modelled Water Level (m aodN)	40.40	40.56	40.63	40.64	40.65	40.68	40.70	40.71	40.75	40.76	40.79	40.74	40.84	40.88
				Modelled Flow (cumecs)	2.72	3.47	3.80	3.86	3.93	4.11	4.29	4.37	4.73	4.79	5.06	4.57	5.54	5.78
5	2D Measure	386437	393318	Modelled Water Level (m aodN)									No Data	No Data	42.60			
6	2D Measure	386478	393308	Modelled Water Level (m aodN)									No Data	No Data	42.96			
7	2D Measure	386440	393280	Modelled Water Level (m aodN)									No Data	No Data	42.60			

	Defended															
Map Reference	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	5 % AEP (1 in 20 year)	4 % AEP (1 in 25 year)	3.33 % AEP (1 in 30 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 flow	1 % AEP (1 in 100 year) + 35% Increase flow	1 % AEP (1 in 100 year) + 70% Increase flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	0.1 % AEP (1 in 1000 year) + 30% Increase flow
1	47.56	47.76	47.89	47.92	47.96	48.10	48.24	48.31	48.51	48.53	48.60	48.44	48.70	48.79
	2.41	3.02	3.41	3.50	3.57	3.67	3.67	3.69	4.37	4.43	4.46	4.35	4.43	4.52
2	43.04	43.40	43.62	43.67	43.74	43.93	44.09	44.18	44.59	44.64	44.86	44.41	44.99	45.10
	2.41	3.01	3.40	3.49	3.60	3.91	4.18	4.33	4.96	5.13	5.85	4.67	6.39	7.16
3	41.98	42.09	42.13	42.14	42.15	42.18	42.20	42.21	42.25	42.25	42.27	42.23	42.28	42.29
	2.56	3.23	3.54	3.62	3.70	3.91	4.08	4.16	4.53	4.58	4.77	4.37	4.87	4.96
4	40.40	40.56	40.63	40.64	40.65	40.68	40.70	40.71	40.75	40.76	40.79	40.74	40.84	40.88
	2.72	3.47	3.80	3.86	3.93	4.11	4.29	4.37	4.73	4.79	5.06	4.57	5.54	5.78
5									No Data	No Data	42.60			
6									42.94	42.94	42.95			
7									No Data	No Data	42.60			

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.