

Flood Risk Assessment

Erection of single storey front porch extension and single storey rear extension for dining area

Extension floor level no lower than existing.

At:

12 Shireoak Road

Manchester

M20 4NY

OCTOBER 2024

Flood Risk Assessment completed on 22nd October 2024 by Antoni Mulet Gonzalez (NEBOSH Certified) and Designed by Harry Vann.

Contents

Contents	2
1.0 Scope	3
2.0 Executive summary	3
3.0 Introduction	4
4.0 Purpose of this report	4
4.1 Survey of British legislation	4
4.2 Local policy	4
5.0 References	5
6.0 The Site Description	5
6.1 Site location	5
6.2 Site geology	5
6.3 Site Details and Flood Risks	5
7.0 Assessment of Proposed Development	15
7.1 Assessment and Mitigation of Flood Risk	15
7.1.1 Fluvial Flood Risk Assessment	15
7.1.2 Fluvial Flood Risk - Flood Levels	15
7.1.3 Flood Resilience Strategy	18
7.1.4 Fluvial Flood Risk – Access and Evacuation	21
7.1.5 Surface Water Overland Flows Flood Risks	21
7.1.6 Flooding from drainage system in adjacent areas	23
7.1.7 Reservoir Risks	23
7.1.8 Groundwater flood risk	23
8.0 Occupants and users of the development	23
9.0 Conclusion	24
9.1 Recommendations	24

1.0 Scope

This report presents the findings of a Flood Risk Assessment conducted for 12 Shireoak Road, Manchester M20 4NY, hereafter referred to as “the site.” It has been prepared by the property owners, Mr. Mulet and Mr Vann.

The report does not constitute legal advice and cannot guarantee that the site will never experience flooding in the future.

The Executive Summary provides a brief overview of the key findings and conclusions. However, it should not be considered in isolation, as the full report contains additional context that may affect the interpretation of the summary.

2.0 Executive summary

This Flood Risk Assessment (FRA) has been conducted in line with the National Planning Policy Framework (NPPF) and Planning Policy Guidance (PPG). It is intended to support the Local Planning Authority (LPA) and the Environmental Agency (EA) in assessing the flood risks associated with the proposed development as part of the planning application process.

The proposed development involves a ground floor front porch extension, a ground floor rear extension, and internal alterations to increase living space. There will be no changes to the site’s operation or sensitivity.

Classified as "More Vulnerable" land use under NPPF guidelines, the site is located in Flood Zone 3 (EA FZ3). As a result, the development is considered appropriate under the NPPF but requires the Exception Test. However, because the project involves a minor extension of less than 250 square meters and the further risk assessment demonstrates compliance, it is expected to pass the Exception Test.

The site is in an area identified by the council and EA as having surface water risk. However, objections based on surface water hazards are not applicable as the development concerns an existing dwelling, and the proposed changes would lead to overall improvement.

The scheme has followed the appropriate measures, including:

- Ensuring the extension’s ground floor level is no lower than the existing level, with no need to raise floor levels further.
- Implementing modern flood resilience measures for the ground floor extension, based on expected surface water depths, which will provide better protection and future-proof the property.
- No additional formal Sustainable Drainage Systems (SuDS) are required for policy compliance.

Considering the residual flood risk, the flood levels, extent, and depth at the site can be managed to ensure ongoing refuge for all occupants throughout the development’s lifespan. Given the anticipated flood risk, the development can be safely constructed and operated without increasing flood risk elsewhere, making it appropriate in line with the NPPF.

3.0 Introduction

This Flood Risk Assessment (FRA) has been conducted following NPPF guidelines and includes a desktop study.

Appropriate flood mitigation measures were considered, either already integrated into the proposed scheme or recommended for incorporation during the detailed design stage. The suitability of the development was also assessed in line with the NPPF and its accompanying technical guidance.

4.0 Purpose of this report

This Flood Risk Assessment (FRA) has been conducted in line with the National Planning Policy Framework (NPPF) and is intended to support the Local Planning Authority (LPA) and the Environment Agency (EA) in evaluating flood risks related to the proposed development as part of the planning application.

The report includes the following:

- An assessment of the flood risks affecting the site, based on data and mapping from the EA and the Strategic Flood Risk Assessment (SFRA);
- An evaluation of surface water run-off from the proposed development;
- Recommendations for flood risk mitigation measures to address risks both to and from the development, where applicable.
- Local authorities assess flood risks through environmental and climate change policies that uphold the NPPF's requirements. The SFRA is a key resource for local flood risk information, offering detailed analysis and guidance to ensure developments are built and operated safely in accordance with the NPPF. Further details on the SFRA can be found in the report, including references to policy CS26 and the Flood Risk Supplementary Planning Document (SPD), dated April 2007.

4.1 Survey of British legislation

The National Planning Policy Framework (NPPF) and Planning Policy Guidance (PPG) have replaced all previous Planning Policy Statements (PPSs), while retaining flood risk as a key consideration in development planning.

The Sequential and Exception Tests remain part of the NPPF, with supporting Technical Guidance that includes Tables 2 and 3, which help classify flood risk vulnerabilities and assess development suitability. This report provides the flood risk assessment necessary for both tests, where applicable. However, it is ultimately the planning authority's decision whether the tests are fully met.

Additionally, the report considers the Sustainable Drainage Systems (SuDS) requirements of the Manchester County Council Lead Local Flood Authority (LLFA).

4.2 Local policy

Local authorities assess flood risk through environmental and climate change policies that align with the requirements of the NPPF. A key resource for understanding flood risks in the area is the Strategic Flood Risk Assessment (SFRA), which offers a detailed analysis of local flood risks and provides recommendations to ensure developments are designed and operated safely in compliance with the NPPF. Further details on the SFRA are included in this report.

5.0 References

The information source used to undertake this FRA has been sourced from the following:

- EA Website and Data
- The National Planning Policy Framework (NPPF)
- CIRIA C753 document The SuDS Manual, 2015
- Local Flood Risk Management Strategy (LFRMS), March 2014
- Level 1 Strategic Flood Risk Assessment (SFRA)
- Topographic Survey of the Site.
- British Geological Society Records.
- The CIRIA publication, 'C635 Designing for exceedance in urban drainage – Good Practice', 2006.
- Internet mapping and searches.
- Environmental Agency – Improving the flood performance of new buildings – Flood resilient construction. CIRIA May 2007

6.0 The Site Description

6.1 Site location

The site comprises an existing dwelling, a three-bed semi-detached house situated at 393101N and 385633E in accordance ordinance survey map. The site is associated with part concrete slab part soft landscape front garden. The rear patio area is also built with similar impermeable make-up of imprinted concrete grade slab. A major part of the rear garden is soft landscaping. The site is in EA FZ3.

6.2 Site geology

Bedrock

The British Geological Society records of the site show that it is located within Chester Formation – Sandstone. Sedimentary bedrock formed between 250 and 247.1 million years ago during the Triassic period.

Superficial Deposits

Till, Devensian – Diamicton. Sedimentary superficial deposit formed between 116 and 11.8 thousand years ago during the Quaternary period.

Contaminated Land

The Homescreen report survey reference – 22333216 (Grid reference – 385633 393101) specify no significant concerns have been identified as a result of the contaminated land searches. The Contaminated Land Liability, Past Land Use, Waste and Landfill, Current and Recent Industrial tests has been deemed as passed.

6.3 Site Details and Flood Risks

The flood risk in the area connected to the dwelling is summarised in Table 1. The flood risks map are shown from Figure 1 to Figure 5.

TABLE 1: FLOOD RISK CENTRED ON SHIREOAK ROAD, WITHINGTON, M20 4NY

Flood sources	Site Status	Comment on flood risk posed to / from the development
Fluvial / Tidal	Site is in FZ3 fluvial; undefended or defended. Cringle Brook is c. 800m to the North of the site Immediate access to FZ1 to the east in lowest hazard flood extents which is c.275m from the site.	No highly vulnerable uses No change to site operations or sensitivity No flood compensation required for FZ3 All site users continue to have access to upper floors above the extreme event for the lifetime of the scheme
Groundwater	SFRA indicates site is not in an area of groundwater flooding / incidents.	Low Risk The proposed development will not increase the risk of groundwater flooding.
Artificial Sources	Site is within extensive general EA Reservoir Flood Warning area that would otherwise result from river flooding: managed and maintained to appropriate standards. No other artificial sources with likely flood flow paths that could reach the site.	Low Risk Not relevant to the scheme as residential use at the site is not in question
Surface Water / Sewer Flooding	Site is not located in a Critical Drainage Area but within surface water flood extents from the council and the EA Condition, depth and location of surrounding infrastructure uncertain.	Low Risk No increase in impermeable areas Scheme in fact reduces impermeable areas overall No additional drainage assessment required Results in better protected and flood future- proofed property than existing.
Climate Change: new allowances	Included in the flood modelling extents.	Development will not increase the peak flow and volume of discharge from the site Climate change incorporated in the EA / SFRA modelling Low risk posed to and from the development
Historic Flooding	Included in the EA / council data where appropriate	Site is not in an area of historic flooding based on available data

The defended and undefended flood levels as obtained from EA are illustrated in Table 2 to Table 8.

The predicted flood level at various stages and the finished ground floor level of dwelling are described in Table 8.

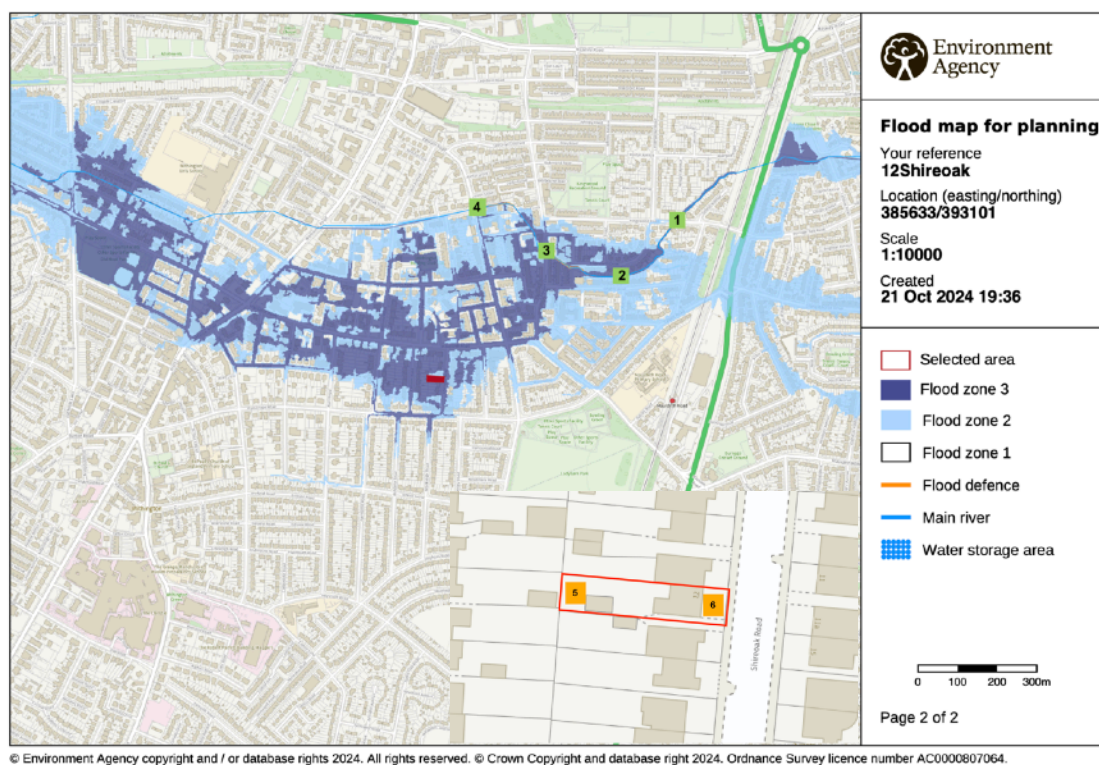


FIGURE 1: DETAILED FLOOD PAY CENTRED ON SHIREOAK ROAD, WITHINGTON, M20 4NY

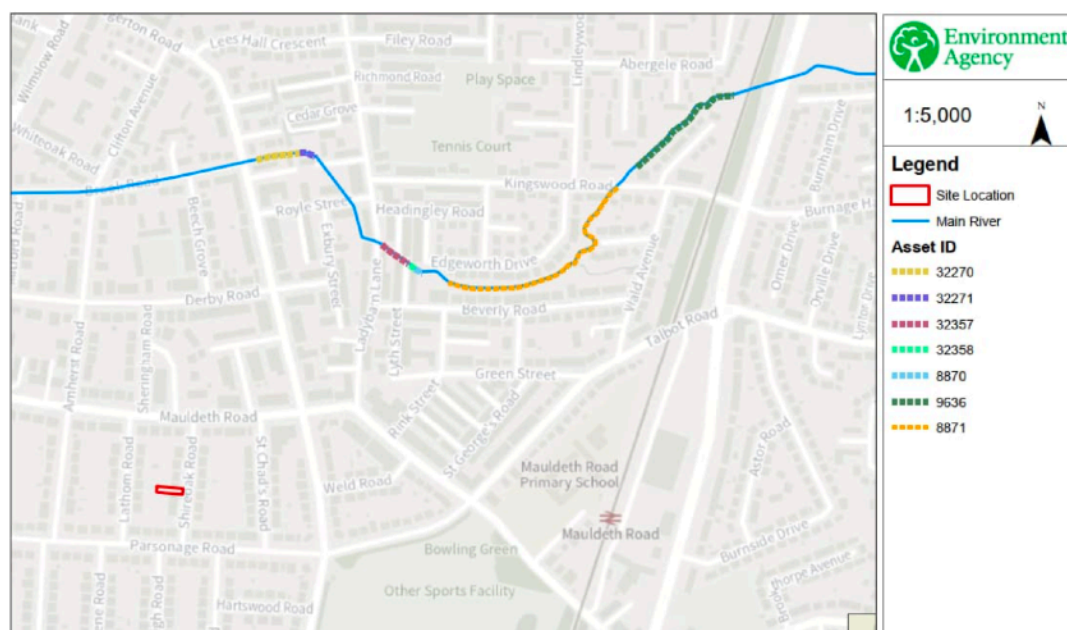


FIGURE 2: FLOOD DEFENCES MAP CENTRED ON SHIREOAK ROAD, WITHINGTON, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	Data	Undefended				
					50% AEP (1 in 2 year)	20% AEP (1 in 5 year)	10% AEP (1 in 10 year)	5% AEP (1 in 20 year)	5% AEP (1 in 25 year)
1	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN)	40.27	40.40	40.56	40.63	40.64
				Modelled Flow (cumecs)	2.15	2.72	3.47	3.80	3.86
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN)	39.77	39.87	39.99	40.04	40.05
				Modelled Flow (cumecs)	3.03	3.70	4.57	5.07	5.17
3	ea013_0238_CRIN01_1791u	385915	393422	Modelled Water Level (maodN)	38.46	38.77	39.31	39.33	39.34
				Modelled Flow (cumecs)	3.03	3.69	4.28	4.39	4.38
4	ea013_0238_CRIN01_1551u	385747	393525	Modelled Water Level (maodN)	37.83	38.02	38.43	38.45	38.45
				Modelled Flow (cumecs)	3.03	3.69	4.27	4.37	4.38
Map Ref.	Model Node Reference	Easting	Northing	Data	Undefended				
					5% AEP (1in 20 year)	2% AEP (1in 50 year)	1.33% AEP (1in 75 year)	1% AEP (1in 100 year)	1% AEP (1in 100 year) + 30% increase in flow
5	2D Levels	385618	393086		37.01	37.20	37.24	37.26	37.29
6		385647	393084		37.50	37.52	37.53	37.53	37.54

Table 2: Defended and Undefended Flood Levels in Withington, Manchester and Modelled Flood Levels at 12 Shireoak Road, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	Data	Undefended				
					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	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.68	40.70	40.71	40.75	40.76
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN) Modelled Flow (cumecs)	4.11	4.29	4.37	4.73	4.79
3	ea013_0238_CRIN01_1791 _u	385915	393422	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.09	40.11	40.12	40.17	40.18
4	ea013_0238_CRIN01_1551 _u	385747	393525	Modelled Water Level (maodN) Modelled Flow (cumecs)	5.54	5.71	5.81	6.37	6.46
					39.35	39.36	39.36	39.37	39.38
					4.40	4.41	4.42	4.44	4.44
					38.47	38.47	38.47	38.49	38.50
					4.40	4.41	4.42	4.44	4.44
Map Ref.	Model Node Reference	Easting	Northing	Data	Undefended				
					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
5	2D Levels	385618	393086		37.30	37.32	37.28	37.39	37.44
6		385647	393084		37.54	37.54	37.53	37.58	37.62

TABLE 3: DEFENDED AND UNDEFENDED FLOOD LEVELS IN WITHINGTON, MANCHESTER AND MODELLED FLOOD LEVELS AT 12 SHIREOAK ROAD, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	Data	Undefended			
					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	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN)	40.79	40.74	40.84	40.88
				Modelled Flow (cumecs)	5.06	4.57	5.54	5.78
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN)	40.23	40.16	40.29	40.31
				Modelled Flow (cumecs)	7.27	6.16	9.19	10.58
3	ea013_0238_CRIN01_1791 u	385915	393422	Modelled Water Level (maodN)	39.39	39.37	39.43	39.46
				Modelled Flow (cumecs)	4.49	4.44	4.48	4.51
4	ea013_0238_CRIN01_1551 u	385747	393525	Modelled Water Level (maodN)	38.53	38.48	38.56	38.61
				Modelled Flow (cumecs)	4.44	4.43	4.47	4.49
Map Ref.	Model Node Reference	Easting	Northing	Data				
5	2D Levels	385618	393086					
6		385647	393084					

TABLE 4: DEFENDED AND UNDEFENDED FLOOD LEVELS IN WITHINGTON, MANCHESTER AND MODELLED FLOOD LEVELS AT 12 SHIREOAK ROAD, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	37.18Data	Defended				
					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)
1	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.27	40.40	40.56	40.63	40.64
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN) Modelled Flow (cumecs)	39.77	39.87	39.99	40.04	40.05
3	ea013_0238_CRIN01_1791 u	385915	393422	Modelled Water Level (maodN) Modelled Flow (cumecs)	38.46	38.77	39.31	39.33	39.34
4	ea013_0238_CRIN01_1551 u	385747	393525	Modelled Water Level (maodN) Modelled Flow (cumecs)	37.83	38.02	38.43	38.45	38.45
					3.03	3.69	4.27	4.37	4.38
Map Ref.	Model Node Reference	Easting	Northing	Data	Defended				
					5% AEP (1 in 20 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
5	2D Levels	385618	393086		36.99	37..1	37.18	37.22	37.27
6		385647	393084		37.47	37.51	37.52	37.52	37.53

TABLE 5: DEFENDED AND UNDEFENDED FLOOD LEVELS IN WITHINGTON, MANCHESTER AND MODELLED FLOOD LEVELS AT 12 SHIREOAK ROAD, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	37.18Data	Defended				
					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	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.68	40.70	40.56	40.71	40.75
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN) Modelled Flow (cumecs)	4.11	4.29	4.37	4.73	4.79
3	ea013_0238_CRIN01_1791_u	385915	393422	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.09	40.11	40.12	40.17	40.18
4	ea013_0238_CRIN01_1551_u	385747	393525	Modelled Water Level (maodN) Modelled Flow (cumecs)	5.54	5.71	5.81	6.37	6.46
					39.35	39.36	39.36	39.37	39.38
					4.40	4.41	4.42	4.44	4.44
					38.47	38.47	38.47	38.49	38.50
					4.40	4.41	4.42	4.44	4.44
Map Ref.	Model Node Reference	Easting	Northing	Data	Defended				
					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
5	2D Levels	385618	393086		37.28	37.30	37.26	37.38	36.43
6		385647	393084		37.53	37.54	37.53	37.58	37.61

TABLE 6: DEFENDED AND UNDEFENDED FLOOD LEVELS IN WITHINGTON, MANCHESTER AND MODELLED FLOOD LEVELS AT 12 SHIREOAK ROAD, M20 4NY

Map Ref.	Model Node Reference	Easting	Northing	37.18Data	61fended			
					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	Ea13_0238_CRIN01_2210d	386228	393488	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.79	40.74	40.84	40.88
2	ea013_0238_CRIN01_1991	386097	393344	Modelled Water Level (maodN) Modelled Flow (cumecs)	5.06	4.57	5.54	5.78
3	ea013_0238_CRIN01_1791 u	385915	393422	Modelled Water Level (maodN) Modelled Flow (cumecs)	40.23	40.16	40.29	40.31
4	ea013_0238_CRIN01_1551 u	385747	393525	Modelled Water Level (maodN) Modelled Flow (cumecs)	7.27	6.16	9.19	10.58
					39.39	39.37	39.43	39.46
					4.49	4.44	4.48	4.51
					38.53	38.48	38.56	38.61
					4.44	4.43	4.47	4.49
Legends	Model data taken from Cringle Brook 2017 AEP – Annual Exceedance 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 and flood risk assessment.							

TABLE 7: DEFENDED AND UNDEFENDED FLOOD LEVELS IN WITHINGTON, MANCHESTER AND MODELLED FLOOD LEVELS AT 12 SHIREOAK ROAD, M20 4NY

7.0 Assessment of Proposed Development

7.1 Assessment and Mitigation of Flood Risk

The flood risks were determined by identifying the sources of flooding and assessing their possible impact and likelihood to the development.

7.1.1 Fluvial Flood Risk Assessment

The assessment of fluvial flood risk was conducted using the Environmental Agency Flood Zone Maps, following the standing advice approach outlined in the NPPF guidelines. This approach considers both the scale of the development and the vulnerability of land uses to flood risks.

Standing Advice Applicability

Development Size

The proposed development falls within the remit of the standing advice as it is a minor extension of a household with a floor space of no more than 250 m²

Sequential Test

The proposed development does not require a sequential test. The site is not in an area with increased flood risk as a result of multiple minor extensions.

7.1.2 Fluvial Flood Risk - Flood Levels

The Fluvial flood risk from rivers or sea is medium in accordance with SFRA guideline and as shown in Figure 3

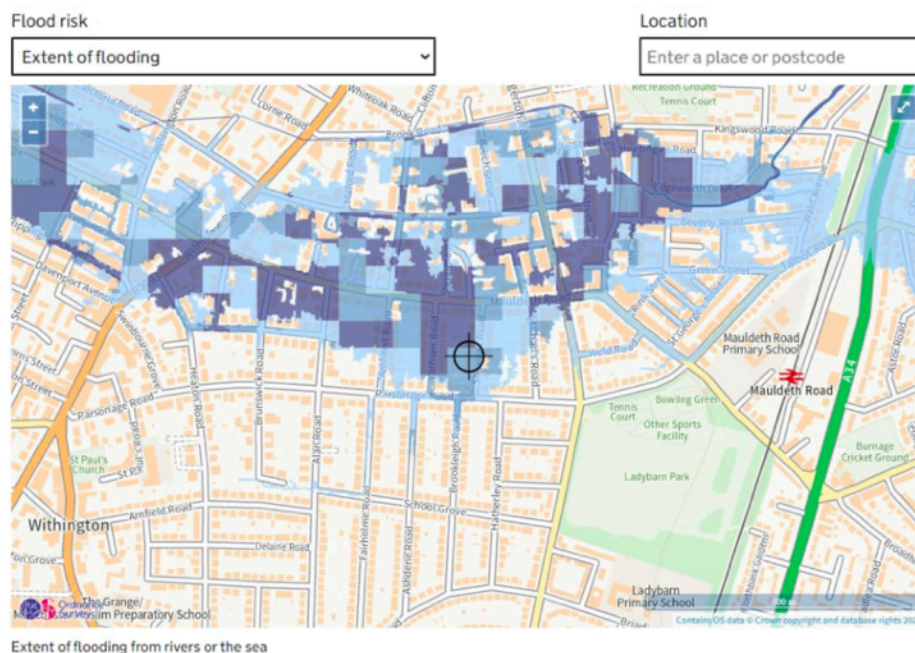


FIGURE 3: EXTENT OF FLOODING RISK FROM RIVERS AND SEA ON 12 SHIREOAK ROAD, WITHINGTON, M20 4NY

The Fluvial flood risk from surface water flood is low as shown in **Figure 3** and the water depth at medium risk scenario is below 300mm as per **Figure 4**.

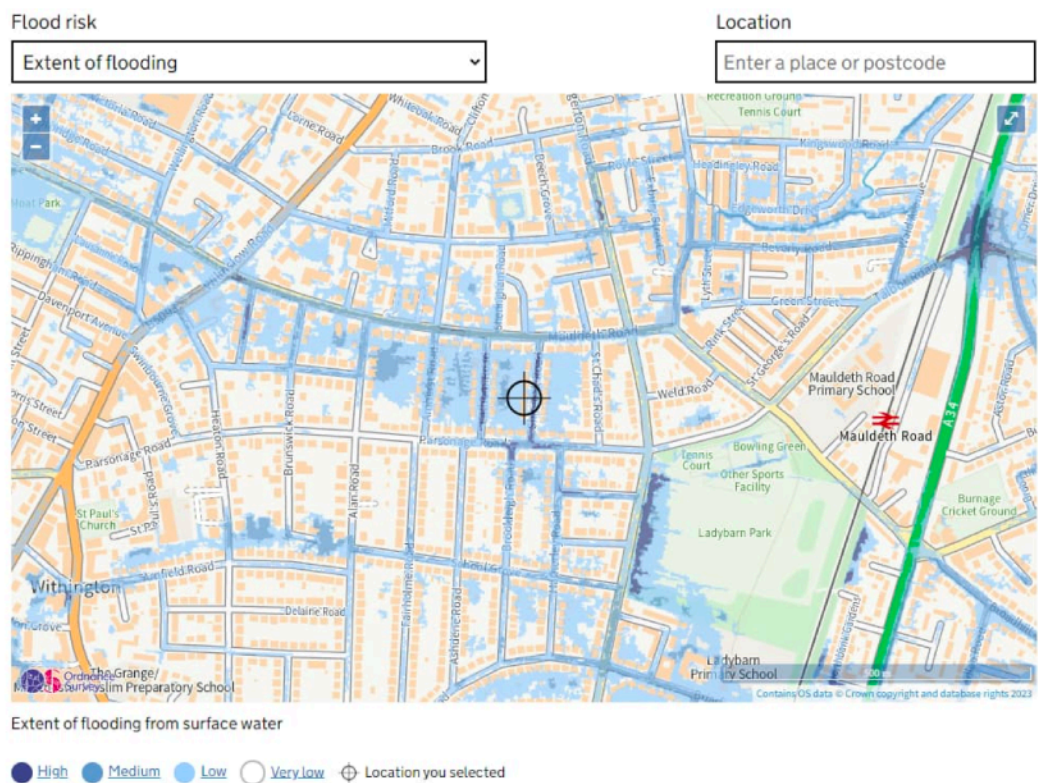


FIGURE 4: EXTENT OF FLOODING RISK FROM SURFACE WATER ON 12 SHIREOAK ROAD, WITHINGTON, M20 4NY



FIGURE 5: EXTENT OF FLOODING RISK FROM SURFACE WATER ON 12 SHIREOAK ROAD, WITHINGTON, M20 4NY

Although the flood defences are provided on Cringle Brook the site does not benefit as per Environmental Agency records (See Table 2 to Table 7). The average ground level at the approach of the dwelling in the front, finished ground floor level and the flood levels at various scenarios is summarised in **Table 8**.

Description	Level in meters above Ordnance Datum	Protection
Ground Level	+37.68	-
Finished Level at Ground Floor of the Dwelling	+37.92	-
Water Level at 5% AEP (1 in 20 year)	+37.50	UNDEFENDED
Water Level at 2% AEP (1 in 50 year)	+37.52	
Water Level at 1% AEP (1 in 100 year)	+37.53	
Water Level at 1% AEP + 70% increase in flow (1 in 100 year)	+37.54	
Water Level at 2% AEP (1 in 50 year)	+37.51	DEFENDED
Water Level at 1% AEP (1 in 100 year)	+37.52	
Water Level at 1% AEP + 70% increase in flow (1 in 100 year)	+37.54	

TABLE 8 : DESIGN DATA AND FLOOD LEVELS AT DWELLING NO. 12 SHIREOAK ROAD

The predicted flood level at 1% AEP level for this site is +37.53m above ordnance datum and at 1% AEP level plus 70% increase in flow for this site is +37.54m when the floods are undefended. There is not much difference in the predicted flood levels when they are defended.\

The existing finished ground level is approximately 240mm from the ground level at the approach at the front of the property. The finished ground floor level is calculated as + 37.92. The ground floor is 380mm above the worst predicted flood level.

The final floor level of the new extension has been set as per the existing building's ground levels. This level is no lower than existing levels and therefore the following flood proofing has been incorporated.

7.1.3 Flood Resilience Strategy

The flood resilience strategy for the development has been based on the CLG2007 Improving the Flood Performance of New Buildings. See Figure 6 below. The strategy is based on the water level within the proximity of the building.

Since the water depth is below 300mm risk from surface water. However, considering the medium risk of flooding from river and sea, it has been assumed that the water entry strategy approach used with a water exclusion strategy for up to 300mm depth flows.

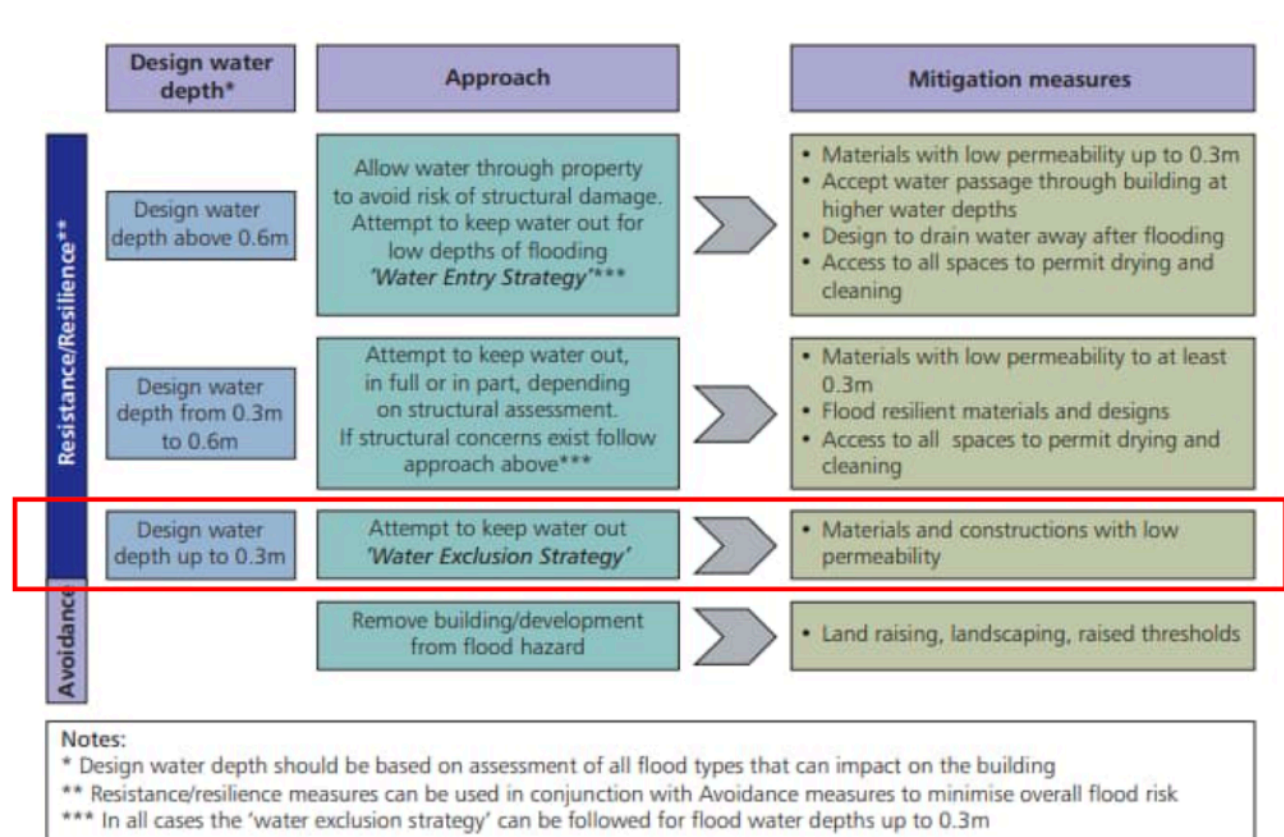


FIGURE 6: RATIONALE FOR FLOOD RESILIENT AND/ OR RESISTANT DESIGN STRATEGIES

The building should utilise building materials that are suitable for a 'water exclusion strategy'. Materials classified as "Good" (highlighted in red) in Figure 7 shall be used for construction of the new extension.

Material	Resilience characteristics*		
	Water penetration	Drying ability	Retention of pre-flood dimensions, integrity
Bricks			
Engineering bricks (Classes A and B)	Good	Good	Good
Facing bricks (pressed)	Medium	Medium	Good
Facing bricks (handmade)	Poor	Poor	Poor
Blocks			
Concrete (3.5N, 7N)	Poor	Medium	Good
Aircrete	Medium	Poor	Good
Timber board			
OSB2, 11 mm thick	Medium	Poor	Poor
OSB3, 18mm thick	Medium	Poor	Poor
Gypsum plasterboard			
Gypsum Plasterboard, 9mm thick	Poor	Not assessed	Poor
Mortars			
Below d.p.c. 1:3(cement:sand)	Good	Good	Good
Above d.p.c. 1:6(cement:sand)	Good	Good	Good

* Resilience characteristics are related to the testing carried out and exclude aspects such as ability to withstand freeze/thaw cycles, cleanability and mould growth

FIGURE 7: FLOOD RESILIENCE CHARACTERISTICS OF BUILDING MATERIALS

Foundations: Suspended reinforced concrete floor slabs is the preferred option. However, a ground bearing slab with limiting crack width to prevent the ingress of water could also be used for the site. There should be a minimum space of 150mm ventilated void between the ground level and the bottom of the floor slab. Damp proof membranes should be included in the design. Floor insulation should be of the closed-cell type. Under floor services using ferrous materials should be avoided.

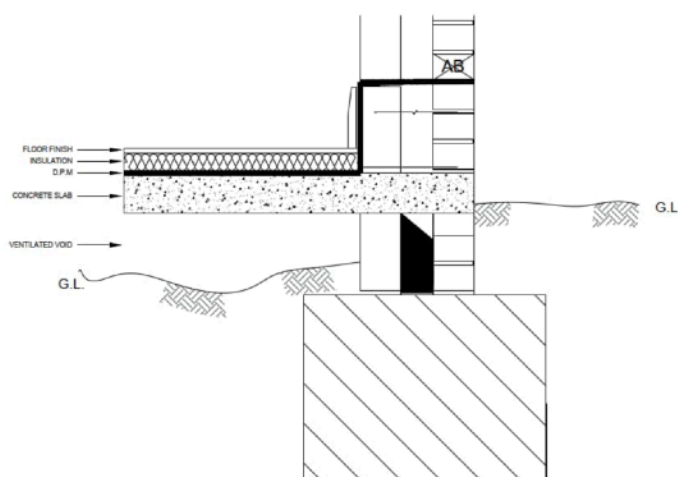


FIGURE 8: FLOOD RESILIENCE CHARACTERISTICS OF BUILDING MATERIALS

Concrete blocks used in foundations should be sealed with an impermeable material or encased in concrete to prevent water movement from the ground to the wall construction.

External Walls: Class B engineering bricks can be used for external face at lower ground level up to damp proof membrane. External wall can also be built as per options shown in Figure 9 and above the brick line.

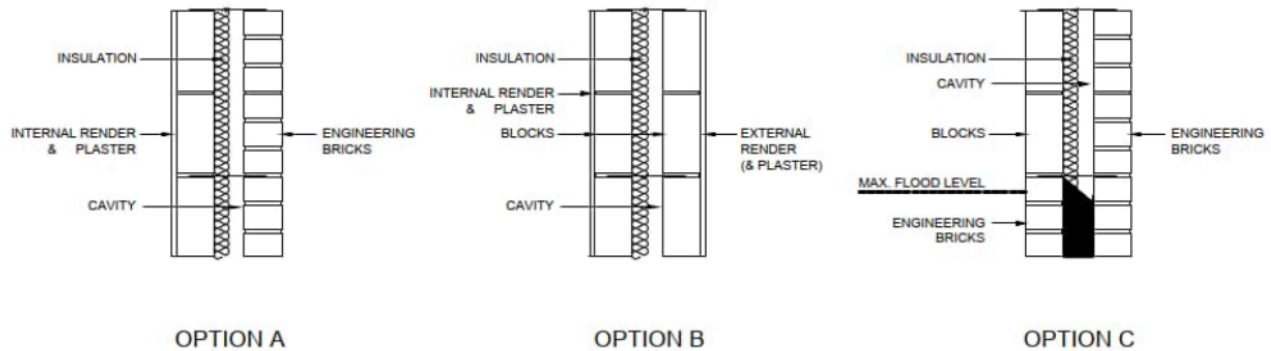


FIGURE 9: FLOOD RESILIENCE CHARACTERISTICS OF BUILDING MATERIALS

Part filled cavity – Option A

- External face consisting of engineering bricks up to required level for flood protection (up to 0.30m maximum above floor level plus one course). Other external facing materials can be used above this level, but ensure interface is watertight.
- Rigid insulation
- Internal face consisting of blocks
- Internal cement-based render, preferably with lime content. Composition depends on masonry: the following mix is effective for flood resilience.
 - 1 cement : 6 sand : 1 lime on aircrete.
- Ensure stainless steel wall ties are used to minimize corrosion and consequent staining.
- Sacrificial plasterboard can be used but it needs to be removed between ground floor and flood level. The board should be fitted horizontally to make removal easier in some cases a dado rail can be used to cover the joints.

Part filled cavity – Option B

- External cement based render, preferably with lime content. Composition depends on masonry, the following mixes are effective.
 - 1 Cement : 4 sand : ½ lime on concrete blockwork
 - 1 Cement : 6 sand : 1 lime on aircrete
- External face consisting of blocks
- Rigid insulation
- Internal face consisting of blocks
- Internal cement-based render, preferably with lime content. Composition depends on masonry: the following mix is effective for flood resilience.
 - 1 cement : 6 sand : 1 lime on aircrete.
- Ensure stainless steel wall ties are used to minimize corrosion and consequent staining.

Part filled cavity – Option C

Same as Option A but the internal wall can also be built with engineering bricks and the cavity upto flood level filled with impermeable material such as lean concrete GEN 1 mix.

Services and fittings (communications wiring, hearing systems, electrical services, water, electricity and gas meters) should be placed at above the flood level. Where possible, all service entries should be sealed (e.g. with expanding foam or similar closed cell material). Closed cell insulation should be used for pipes which are below the predicted flood level.

Fittings should be designed to be replaced after a flood, it is advisable to specify durable fittings that are not appreciably affected by water and can easily cleaned (e.g. use of plastic materials or stainless steel). The cost of these units may need to be balanced against the frequency of flooding. Avoid wood fibre based carcasses and use easily removable solid wood doors and drawers.

7.1.4 Fluvial Flood Risk – Access and Evacuation

Safe egress is achievable by following Shireoak road south towards Parsonage road at approximately 75 metres and further following East to reach Parrswood Road at approximately 200 metres. See figure below for details.

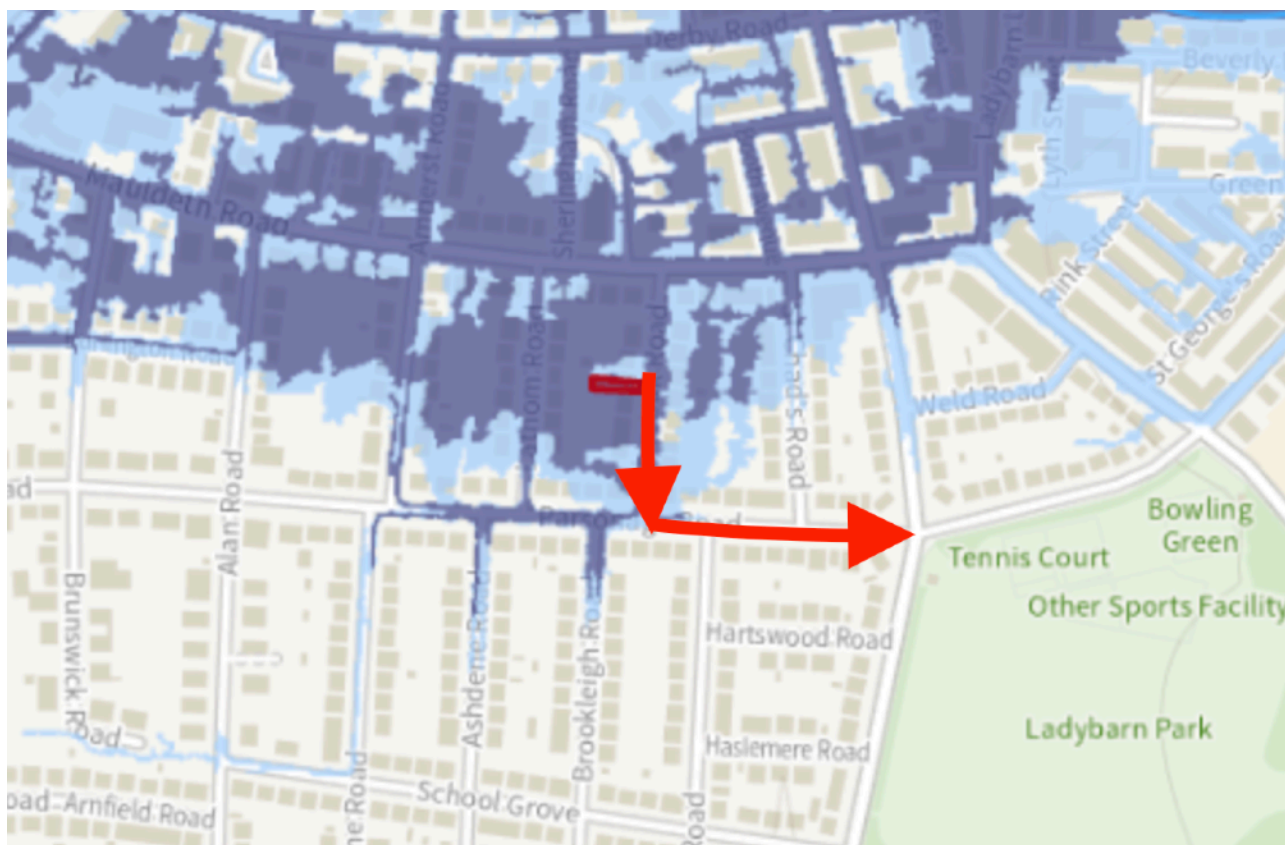


FIGURE 10: GENERAL EVACUATION ROUTE

7.1.5 Surface Water Overland Flows Flood Risks

The site has no SuDS; the site currently drains 100% of roof and hardstanding to sewer. A site of this size would have a Greenfield equivalent average discharge rate (QBAR) of no greater than 0.10l/s. It is also not possible to restrict to 3 times the QBAR of ~0.30l/s.

This low figure is a simple function of the fact that the site is very small. It is not possible to restrict discharge to this low rate.

The Environmental Agency maps (See Figure 4) show that the flood risk from surface water is low. However, a residual risk of localised shallow ponding remains likely. The development has already higher FFL compared to likely flooding due to surface water and accommodates areas for free flow of runoff at either side of the new building.

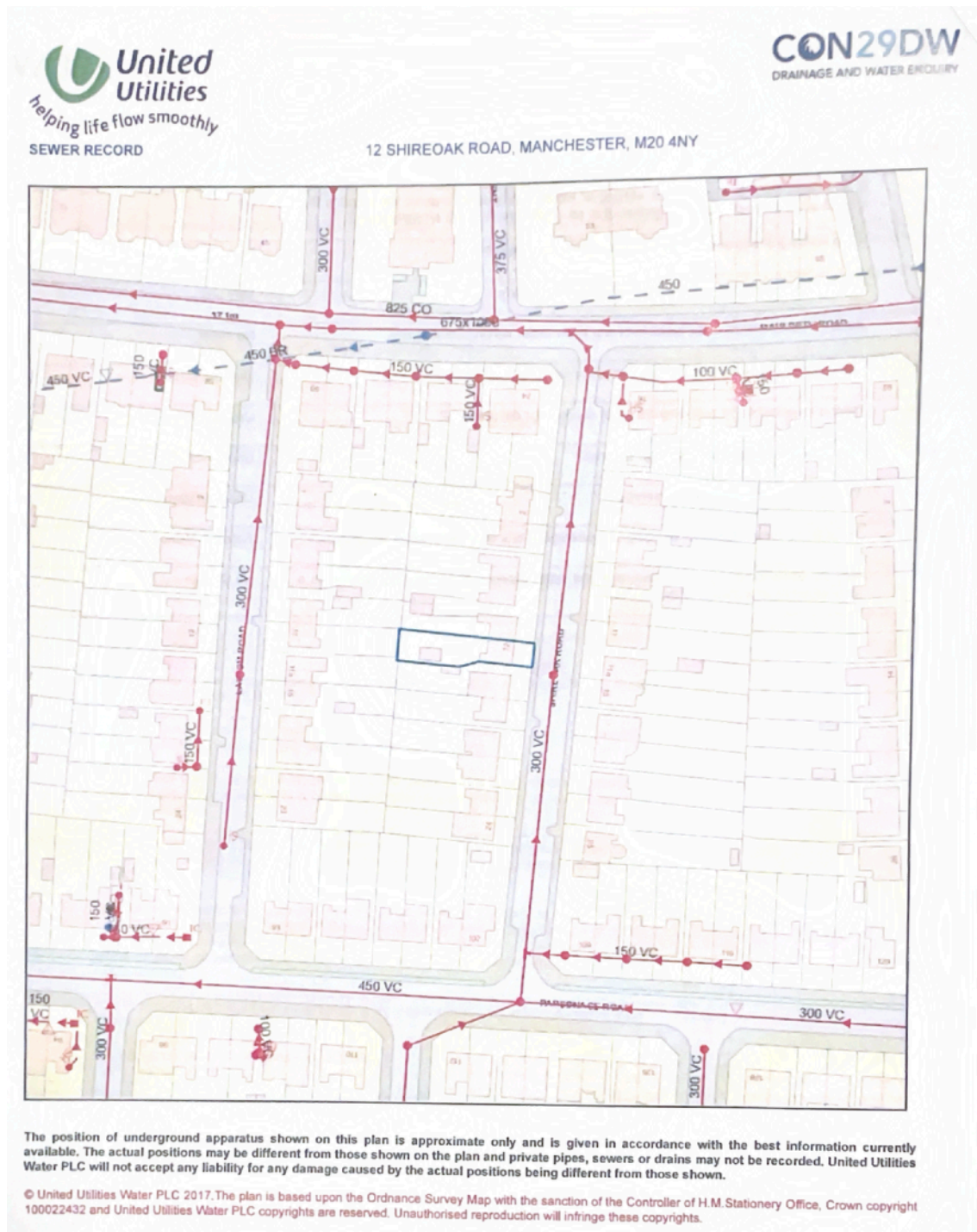


FIGURE 11: LAYOUT OF PUBLIC SEWER IN THE AREA

7.1.6 Flooding from drainage system in adjacent areas

There are no records of sewer flooding within the site.

7.1.7 Reservoir Risks

The Reservoir Flood Map (RFM) produced by the EA do not show the risk to individual properties of dam breach flooding. The map shows flooding in the area due flooding from rivers which is explained in Section. 6.4.2.

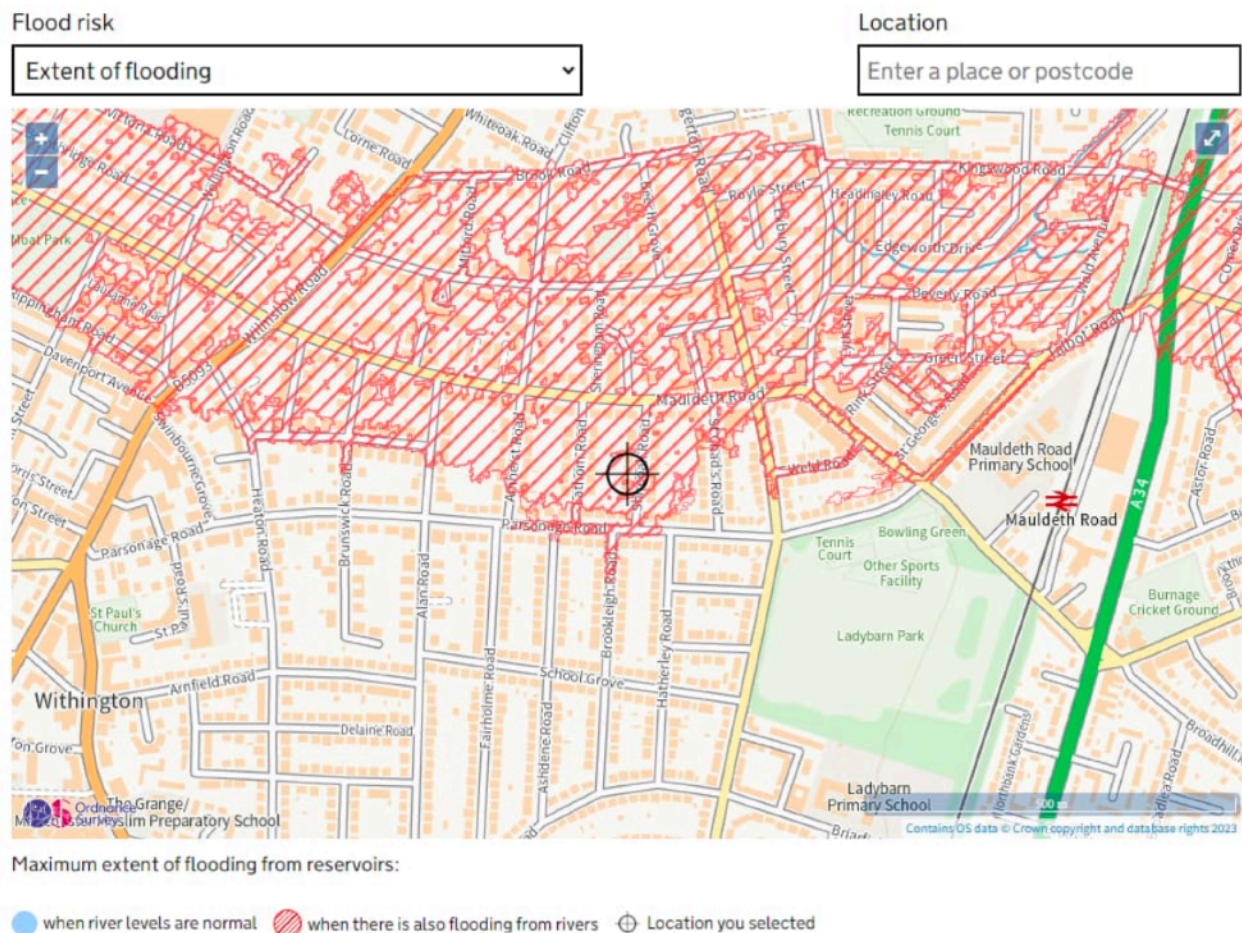


FIGURE 12: FLOOD RISKS FROM RESERVOIRS (WHEN THERE IS FLOODING FROM RIVERS)

7.1.8 Groundwater flood risk

SFRA indicates site is not in an area of groundwater flooding/ incidents. No mitigation is required.

8.0 Occupants and users of the development

The development proposals will not increase the overall number of occupants or users compared to the current use. The building's purpose, capacity, and function remain consistent with its existing state. The nature or times of occupation or use will not change. The proposed development is intended to maintain the same pattern of usage as the current situation, without any changes that would affect flood risk. Appropriate flood mitigation measures have been considered to protect vulnerable occupants. The building design ensures that any areas at lower risk of flooding are prioritised for use by individuals who may be more vulnerable, such as those with mobility or health concerns.

9.0 Conclusion

The scheme comprises extension for an existing dwelling to increase the existing living space, no change to site operation or sensitivity.

The site is considered to be generally in FZ3 and according to the NPPF retained Flood Risk Vulnerability Classification, the proposed residential land use would be classified as “More Vulnerable”. The further risk assessment carried out in accordance with the NPPF guidance suggests that the development fully complies with its recommendations as it has been designed for water entry and be safe for use. The drainage principles should be used in the detailed design of the surface water systems.

This report recommends that the proposal will be safe, in terms of flood risk, for its design life and will not increase the flood risk elsewhere.

The modern methods and new design techniques used for the new construction will also results in better protected and flood future-proofed property than existing.

9.1 Recommendations

- Use EA guidance for constructing any new permeable paving areas.
- Follow recommendations for construction as described in Section 7.1.3.
- No formal evacuation plan is required. All site users can access upper refuge areas above the extreme event for the lifetime of the scheme.

If evacuation is deemed necessary:

1. Take Shireoak road south towards Parsonage Road for approximately 75 metres.
2. Turn left follow East to reach Parrswood Road at approximately 200 metres. See Figure 10 for details.

- With respect to maintenance, the proposed SuDS techniques should be maintained in accordance with appropriate regimes set out within the SuDS manual and will be the responsibility of the owner/ management company.

Given the SuDS required for this site are retaining the grass areas and if the new patio areas are included for them to have an extra subbase of granular material: no further maintenance or management measures are required given these are minimal intervention and no maintenance, for them to still operate as SuDS measures. The following SuDS hierarchy check shall be followed at all times.