# FLOOD RISK ASSESSMENT

172-XOS-XX-XX-RP-C-5000 RevP2

Plymouth Grove, Manchester

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27 June 2023

# DOCUMENT ISSUE RECORD

| **Document Number** | | **172-XOS-XX-XX-RP-C-5000** | | | |
|---|---|---|---|---|---|
| **Document Title** | | **Flood Risk Assessment** | | | |
| **Status** | **Revision** | **Date of Issue** | **Author** | **Checked** | **Reviewed** |
| Preliminary | P1 | 03.05.2023 | KS | UM | EDP |
| Planning | P2 | 27.062023 | KS | UM | EDP |
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Report Limitation

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## 1 SYNOPSIS

The site would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this Flood Risk Assessment (FRA) are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable, and the development would be in accordance with the requirements of the National Planning Policy Framework (NPPF).

This FRA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk.

## 2 BRIEF

This report has been prepared by XOsquare Limited on behalf of WUKPG to support a full planning application for a purpose-built student accommodation (PBSA) development (hereafter referred to as the 'Proposed Development') at Plymouth Grove, Manchester (hereafter referred to as 'the Site'). WUKPG are Manchester based property developer and investor with a strong track record of delivery across the PBSA, industrial, affordable housing and specialist healthcare sectors. They possess 23 years experience in developing complex projects in locations across the UK, having delivered over £100m of real estate to date. WUKPG's proposed 239-bed development at Plymouth Grove will comprise a ground plus seven storey building incorporating the highest standard of amenity quality, with residents having safe access to a gym, games room, private study rooms, outdoor rooftop terrace and large open plan social space.

This FRA has been carried out in accordance with guidance contained in the National Planning Policy Framework (NPPF)[1], associated National Planning Practice Guidance (PPG)[2] and the PPG 'Site-specific flood risk assessment checklist.

### 2.1 Scope of Works

This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will be managed so that the development remains safe throughout the lifetime, taking climate change into account.

### 2.2 National Planning Policy Framework (NPPF)

One of the key aims of the NPPF is to ensure that flood risk is taken into account at all stages of the planning process; to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk. It advises that where new development is exceptionally necessary in areas of higher risk, this should be safe, without increasing flood risk elsewhere, and where possible, reduce flood risk overall.

A risk-based approach is adopted at stages of the planning process, applying a source pathway receptor model to planning and flood risk. To demonstrate this, an FRA is required and should include:

- whether a proposed development is likely to be affected by current or future flooding from all sources;
- whether it will increase flood risk elsewhere;
- whether the measures proposed to deal with these effects and risks are appropriate;
- if necessary, provide the evidence to the Local Planning Authority (LPA) that the Sequential Test can be applied; and
- whether the development will be safe and pass part c) of the Exception Test if this is appropriate.

### 2.3 Report Structure

This FRA has the following report structure:

- Section 2 describes the location area and the existing and proposed development;
- Section 3 outlines the flood risk to the existing and proposed development;

[1] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf
[2] Communities and Local Government (2022) Planning Practice Guidance - Flood Risk and Coastal Change: https://www.gov.uk/guidance/flood-risk-and-coastal-change

- Section 4 details the Sequential and Exception Tests;
- Section 5 describes the risk management methods used to mitigate all sources of flood risk; and
- Section 6 presents a summary and conclusions.

# 3 LOCATION & DESCRIPTION

## 3.1 Site Location

The site is located on land at the junction of Plymouth Grove and Dryden Street, Manchester (see Figure 1). The National Grid Reference (NGR) of the site is 385109, 396540.




Figure 1 – Site Location

## 3.2 Existing Development

The existing site is currently previously developed vacant land (see Appendix A).

## 3.3 Proposed Development

The proposals are for the development of residential apartments (see Appendix A).

## 3.4 Ground Levels

A topographical survey of the site has recently been completed (see Appendix B). The maximum ground level of the site is 40.99 metres Above Ordnance Datum (mAOD) and minimum ground level of the site is 38.69mAOD.

## 3.5 Catchment Hydrology / Drainage

The River Medlock is located approximately 980m to the north of the site. Appendix C contains the public sewer plan and confirms that there are public sewers immediately within the vicinity of the site.

## 3.6 Ground Conditions

The British Geological Survey (BGS) Map[3] shows that the bedrock deposits underneath the site consist of the Chester Formation - sandstone. The superficial deposits consist of Till, Devensian - diamicton. Information from the National Soil Resources Institute[4] details the site area as being situated on slowly permeable seasonally wet

[3] https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.41604902.543517422.1681983105-2011341896.1681983105
[4] http://www.landis.org.uk/soilscapes/

acid loamy and clayey soils with impeded drainage. The soil classification for WRAP is type 4: Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

# 4 FLOOD RISK

## 4.1 Sources of Flooding

All sources of flooding have been considered, these are; fluvial (river) flooding, tidal (coastal) flooding, groundwater flooding, surface water (pluvial) flooding, sewer flooding and flooding from artificial drainage systems/infrastructure failure.

## 4.2 Historic Flooding

There are no records of anecdotal information of flooding at the site including within the British Hydrological Society "Chronology of British Hydrological Events[5]". No other historical records of flooding for the site have been recorded.

## 4.3 Existing and Planned Flood Defence Measures

It is understood that there are no defences in this area. Further risk management measures will be used to protect the site from flooding these are discussed in Section 6.0.

## 4.4 Environment Agency Flood Zones

A review of the Environment Agency's flood map indicates that the site is located within Flood Zone 1 and therefore has a 'low probability' of fluvial/tidal flooding as shown in see Figure 2. Flood Zone 1 has less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%).

The Flood Zones are the current best information on the extent of the extremes of flooding from rivers or the sea that would occur without the presence of flood defences, because these can be breached, overtopped and may not be in existence for the lifetime of the development. The Environment Agency Flood Zones and acceptable development types are explained in Table 1. Table 1 shows that all development types are generally acceptable in Flood Zone 1.

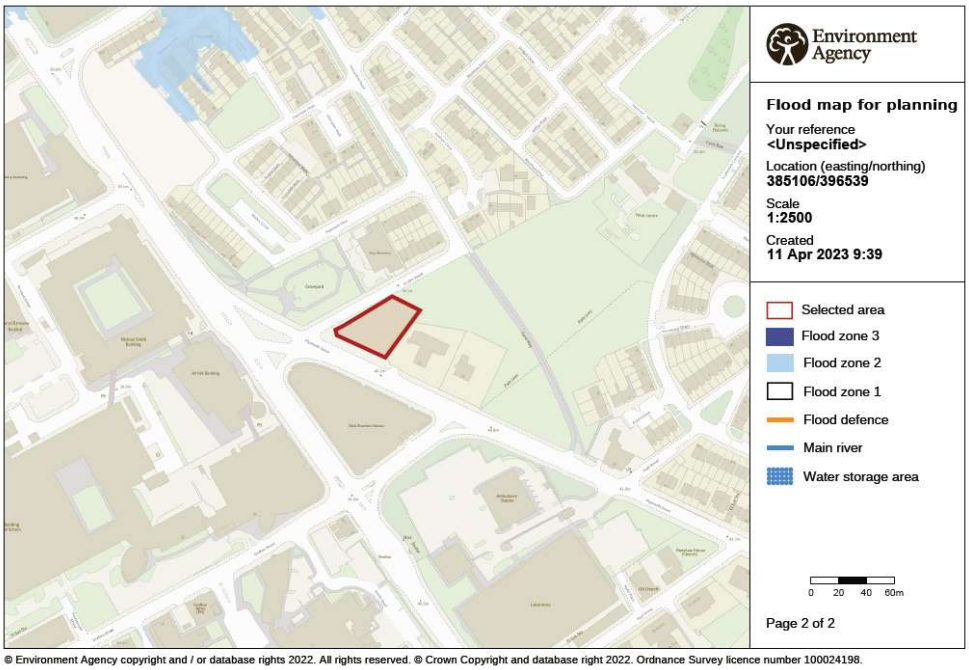



Figure 2 – Environment Agency Flood Zones

[5] https://cbhe.hydrology.org.uk/

Table 1 – Environment Agency Flood Zones and Appropriate Land Use

| Flood Zone | Probability | Explanation | Appropriate Land Use |
|---|---|---|---|
| Zone 1 | Low | Less than a 1 in 1000 annual probability of river or sea flooding in any year (<0.1%) | All development types generally acceptable |
| Zone 2 | Medium | Between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% 0.1%) in any year | Most development type are generally acceptable |
| Zone 3a | High | A 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year | Some development types not acceptable |
| Zone 3b | 'Functional Floodplain' | This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. Functional floodplain will normally comprise:<br>• land having a 3.3% or greater annual probability of flooding, with any existing flood risk management infrastructure operating effectively; or<br>• land that is designed to flood (such as a flood attenuation scheme), even if it would only flood in more extreme events (such as 0.1% annual probability of flooding).<br>Local planning authorities should identify in their Strategic Flood Risk Assessments areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. (Not separately distinguished from Zone 3a on the Flood Map) | Some development types not acceptable |

### 4.5 Flood Vulnerability

In the Planning Practice Guidance to the NPPF (Table 1) appropriate uses have been identified for the Flood Zones. Applying the Flood Risk Vulnerability Classification in Table 2 and 3 of the PPG, the proposed development is classified as 'more vulnerable'. Table 2 of this report and Table 3 of the PPG states that 'more vulnerable' uses are appropriate within Flood Zone 1.

Table 2 – Flood Risk Vulnerability and Flood Zone 'Compatibility' as identified in Table 3 of the PPG

| Flood Risk Vulnerability Classification | Essential Infrastructure | Water Compatible | Highly Vulnerable | More Vulnerable | Less Vulnerable |
|---|---|---|---|---|---|
| Zone 1 | ✓ | ✓ | ✓ | ✓ | ✓ |
| Zone 2 | ✓ | ✓ | Exception test required | ✓ | ✓ |
| Zone 3a | Exception test required | ✓ | × | Exception test required | ✓ |
| Zone 3b 'Functional Floodplain' | Exception test required | ✓ | × | × | × |

Key: ✓: Development is appropriate, ×: Development should not be permitted.

### 4.6 Climate Change

Projections of future climate change, in the UK, indicate more frequent, short-duration, high intensity rainfall and more frequent periods of long duration rainfall. Guidance included within the NPPF recommends that the effects of climate change are incorporated into FRA. Recommended precautionary sensitivity ranges for peak rainfall intensities and peak river flows are outlined in the associated Planning Practice Guidance to the NPPF[6].

Table 3 shows peak river flow climate change allowances by river basin district. The flood risk assessments: climate change allowances guidance recommends that for 'less vulnerable' uses in Flood Zone 1 that the central allowances are used. Therefore, the design flood level for the site is the 1 in 100 year (+35%) event.

Table 3 – Peak River Flow Allowances by River Catchment

| River Catchment | Allowance Category | 2020s | 2050s | 2080s |
|---|---|---|---|---|
| Irwell Management Catchment | Upper | +24% | +43% | +75% |
| | Higher | +15% | +26% | +46% |
| | Central | +12% | +19% | +35% |

### 4.7 Fluvial (river) Flooding

The site is not located within the vicinity of fluvial flooding sources and the risk of fluvial flooding is considered to be not significant.

### 4.8 Tidal (coastal) Flooding

The site is not located within the vicinity of tidal flooding sources and the risk of tidal flooding is considered to be not significant.

### 4.9 Groundwater Flooding

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded. Groundwater flooding tends to occur sporadically in both location and time. When groundwater flooding does occur, it tends to mostly affect low-lying areas, below surface infrastructure and buildings (for example, tunnels, basements and car parks) underlain by permeable rocks (aquifers).

The susceptibility of the site to groundwater flooding, based on the underlying geological conditions, is low. There are no records of groundwater flooding at or near to the site. It can therefore be concluded that the risk of groundwater flooding is not significant.

### 4.10 Surface Water (pluvial) Flooding

The soil condition at the site and within the vicinity of the site and the topography of the site suggest that the site is relatively well drained and surface water flooding would not be expected to accumulate to any significant depths. Surface water flooding tends to occur sporadically in both location and time such surface water would tend to be confined to the streets around the development.

Figure 3 confirms that the site has a very low risk of surface water flooding with a chance of flooding of less than 1 in 1000 years (0.1%). Small areas within the vicinity of the site have a low risk of surface water flooding with a chance of flooding of 1 in 1000 (0.1%) to 1 in 100 (1%) years. This may result in water depths of less than 300mm and velocities of less than 0.25m/s. It can therefore be concluded that the risk of surface water flooding is of not significant.

[6] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#high-allowances

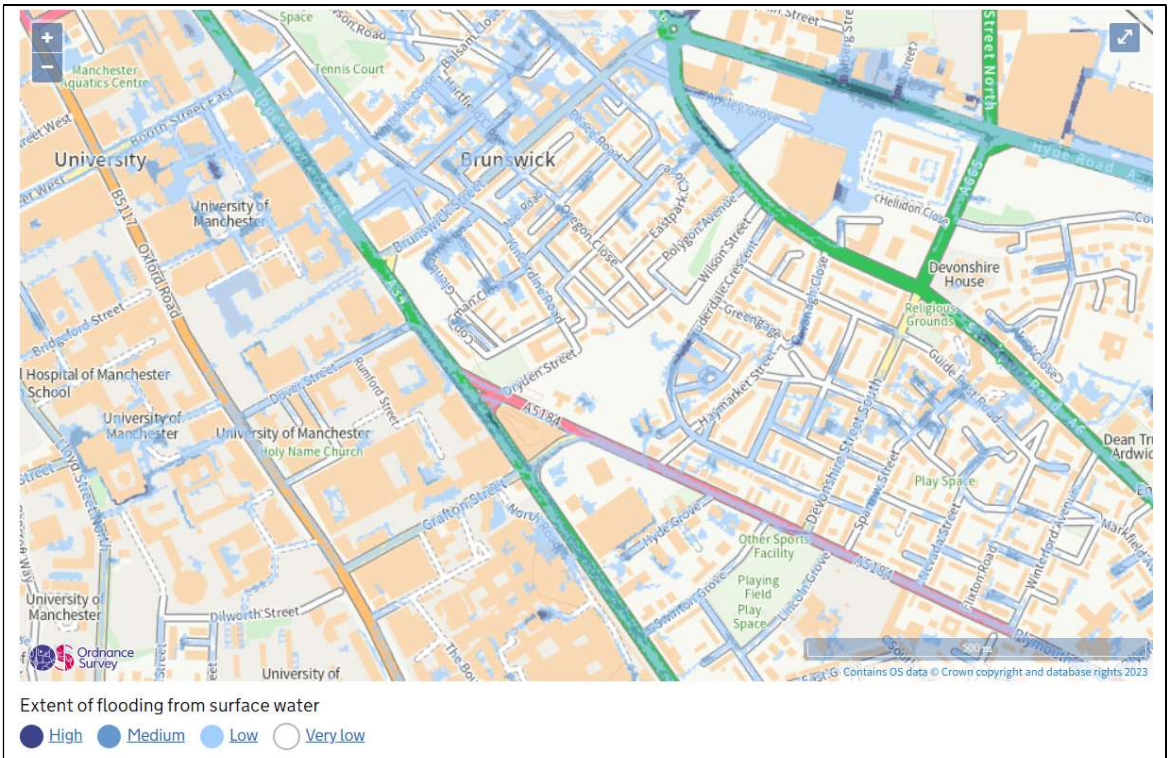



Figure 3 – Environment Agency Surface Water Flood Map

### 4.11 Sewer Flooding

Sewer flooding occurs when urban drainage networks become overwhelmed and maximum capacity is reached. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time such flood flows would tend to be confined to the streets around the development.

There are existing public sewers within roads adjacent to the site these will inevitably have a limited capacity so in extreme conditions there would be surcharges, which may in turn cause flooding. Flood flows could also be generated by burst water mains, but these would tend to be of a restricted and much lower volume than weather generated events and so can be discounted for the purposes of this assessment. Given the design parameters normally used for drainage design in recent times and allowing for some deterioration in the performance of the installed systems, which are likely to have been in place for many years, an appropriate flood risk probability from this source could be assumed to have a return period in the order of 1 in 10 to 1 in 30 years.

The provision of adequate level difference between the ground floors and adjacent ground level would reduce the annual probability of damage to property from this source to 1 in 100 years or less. Therefore, sewer flooding poses a low flood risk to the site. It can therefore be concluded that the risk of sewer flooding is of low significance. The risk from this source will be further managed and mitigated by using a number of risk management measures (see Section 6.0).

### 4.12 Flooding from Artificial Drainage Systems/Infrastructure Failure

Reservoirs are located within the vicinity of the site. The Environment Agency Reservoir flood map shows that the site is at risk of reservoir flooding (see Figure 4). This map shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The Environment Agency Reservoir flood map has been prepared for emergency planning purposes and for this reason they reflect a worst-case scenario. Since this is a prediction of a worst-case scenario, it is unlikely that any actual flood would be this large.

Reservoir flooding is extremely unlikely; reservoirs in the UK have a very good safety record. There has been no loss of life in the UK from reservoir flooding since 1925. Since then reservoir safety legislation has been introduced to make sure reservoirs are well maintained.

The hazard is well managed through effective legislation and it is unlikely that the impact zone downstream of these reservoirs should not allow the proposed development. The risk of flooding from flooding from artificial drainage systems/infrastructure failure is considered to be not significant.

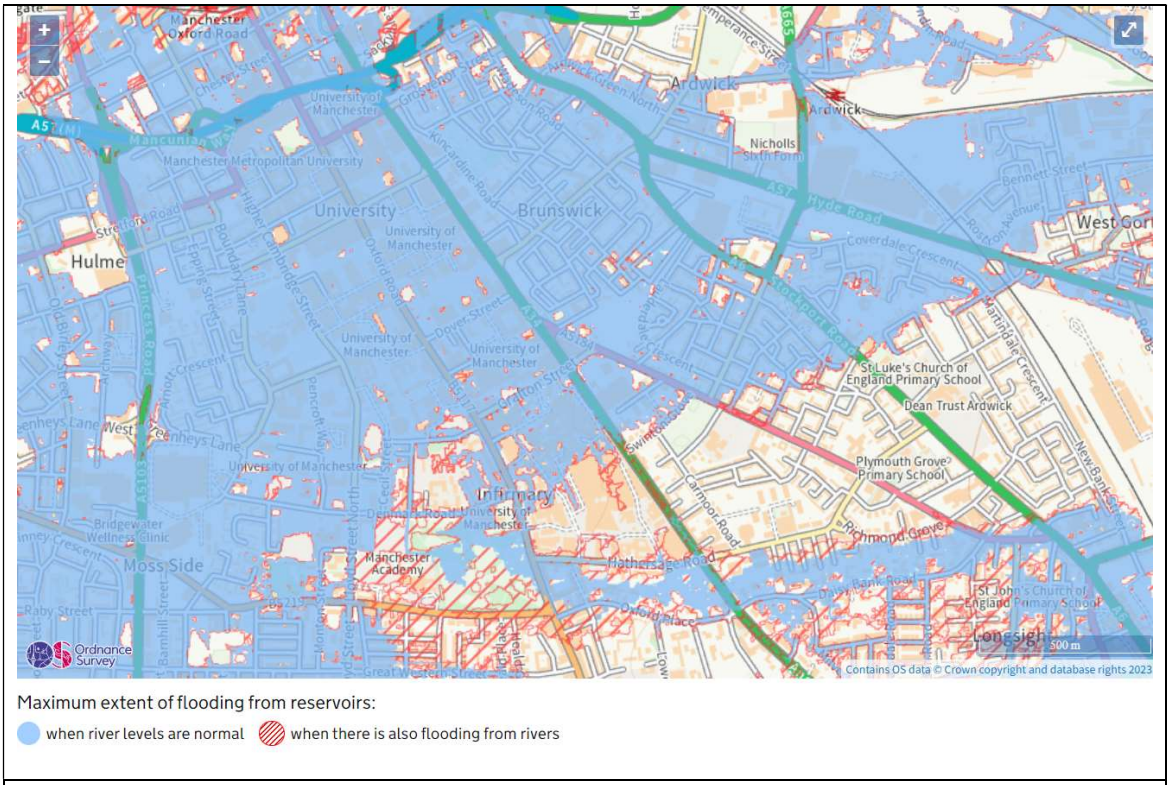



Figure 4 – Environment Agency Reservoir Flood Map

### 4.13 Effects of the Development on Flood Risk

Based on the available information, the site is currently not at risk from fluvial flooding. There is therefore currently no presence of flood flow routes or floodplain storage on site. The proposed development would therefore not result in any impedance of flood flows or displacement of existing floodplain.

### 4.14 Summary of Site-Specific Flood Risk

A summary of the sources of flooding and a review of the risk posed by each source at the site is shown in Table 4.

Table 4 – Risk Posed by Flooding Sources

| Sources of Flooding | Potential Flood Risk | Potential Source | Probability/Significance |
|---|---|---|---|
| Fluvial (river) Flooding | No | None Reported | Not significant |
| Tidal (coastal) Flooding | No | None Reported | Not significant |
| Groundwater Flooding | No | None Reported | Not significant |
| Surface Water (pluvial) Flooding | No | None Reported | Not significant |
| Sewer Flooding | Yes | Local Sewers | Low |

| Sources of Flooding | Potential Flood Risk | Potential Source | Probability/Significance |
|---|---|---|---|
| Flooding from Artificial Drainage Systems/Infrastructure Failure | Yes | Reservoirs | None |

The site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The site has a 'low probability' of fluvial/tidal flooding as the site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river/tidal flooding in any year (<0.1%). A secondary flooding source has been identified which may pose a low risk to the site. This is:

- Sewer flooding

The risk of flooding from all sources is considered to be low or not significant. The flooding sources will only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site.

The proposed development is classified as 'more vulnerable', 'more vulnerable' uses are appropriate within Flood Zone 1 after the completion of a satisfactory FRA. The flood risk at the site, will be further managed and mitigated by using a number of risk management techniques, and mitigation strategies to manage and reduce the overall flood risk at the site.

In conclusion, the flood risk to the site can be considered to be limited; the site is situated in Flood Zone 1, with a low or less annual probability of flooding and from all sources. The site is unlikely to flood except in very extreme conditions.

# 5 SEQUENTIAL AND EXCEPTION TESTS

## 5.1 Sequential / Exception Tests

The risk-based Sequential Test in accordance with the NPPF aims to steer new development to areas at the lowest probability of flooding (i.e. Flood Zone 1). The flood risk to the site can be considered to be limited; the site is situated in Flood Zone 1, with a low or less annual probability of flooding and from all sources. The site is unlikely to flood except in very extreme conditions. Therefore, the proposed development is not subject to the Sequential and/or Exception Tests. The development proposals should therefore be considered by the LPA to satisfy the Sequential and Exception Tests as set out in the NPPF.

# 6 RISK MANAGEMENT

## 6.1 Introduction

In this flood zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area through the layout, form of the development and the use of flood mitigation measures including SuDS techniques. The flooding sources will have to mitigated on the site by using a number of techniques, and mitigation strategies to manage and reduce the overall flood risk at the site. These will be used to ensure the development will be safe and there is:

- Minimal risk to life;
- Minimal disruption to people living and working in the area;
- Minimal potential damage to property;
- Minimal impact of the proposed development on flood risk generally; and;
- Minimal disruption to natural heritage.

## 6.2 Minimum Floor Level

The finished floor levels will be maintained at existing levels.

## 6.3 Flood Resilience and Resistance

The development of the layout should always consider that the site is potentially at risk from an extreme event and as such the implementation of flood resilience and resistance methods should be assessed. Relatively simple measures such as raising utility entry points, using first floor or ceiling down electrical circuits and sloping landscaping away from properties can be easily and economically incorporated into the development of the site.

## 6.4 Access and Egress

The site and surrounding area is located within Flood Zone 1 therefore a permanently safe and dry access can be maintained.

## 6.5 Flooding Consequences

The mitigation measures detailed above show that the flood risk can be effectively managed and therefore the consequences of flooding are acceptable. In conclusion, the flood risk to the site can be considered to be limited; the site is situated in Flood Zone 1, with a low annual probability of flooding and from all sources.

# 7 SUMMARY AND CONCLUSION

## 7.1 Introduction

This report presents an FRA in accordance with the NPPF for the proposed development at Plymouth Grove, Manchester This FRA identifies and assesses the risks of all forms of flooding to and from the development and demonstrates how these flood risks will need to be managed so that the development remains safe throughout the lifetime, taking climate change into account.

## 7.2 Flood Risk

The site is not at risk of flooding from a major source (e.g. fluvial and/or tidal). The site has a 'low probability' of fluvial/tidal flooding as the site is located within Flood Zone 1 with less than a 1 in 1000 annual probability of river/tidal flooding in any year (<0.1%). A secondary flooding source has been identified which may pose a low risk to the site. This is:

- Sewer flooding

The risk of flooding from all sources is considered to be low or not significant. The flooding sources will only inundate the site to a relatively low water depth and water velocity, will only last a short period of time, in very extreme cases and will not have an impact on the whole of the proposed development site.

The proposed development is classified as 'more vulnerable', 'more vulnerable' uses are appropriate within Flood Zone 1 after the completion of a satisfactory FRA. The flood risk at the site, will be further managed and mitigated by using a number of risk management techniques, and mitigation strategies to manage and reduce the overall flood risk at the site.

In conclusion, the flood risk to the site can be considered to be limited; the site is situated in Flood Zone 1, with a low or less annual probability of flooding and from all sources. The site is unlikely to flood except in very extreme conditions.

## 7.3 Sequential and Exception Tests

The development proposals should be considered by the LPA to satisfy the Sequential and Exception Tests as set out in the NPPF.

## 7.4 Risk Management

The flooding sources will be managed on the site by using a number of mitigation strategies to manage and reduce the overall flood risk at the site and will ensure the development will be safe. Measures used:

**Minimum Floor Level** - The finished floor levels will be maintained at existing levels.

**Flood Resilience and Resistance** - The development of the layout should always consider that the site is potentially at risk from an extreme event and as such the implementation of flood resilience and resistance methods should be assessed.

**Access and Egress** - The site and surrounding area is located within Flood Zone 1 therefore a permanently safe and dry access can be maintained.

## 7.5 Conclusion

In conclusion, the site would be expected to remain dry in all but the most extreme conditions. Providing the recommendations made in this FRA are instigated, flood risk from all sources would be minimised, the consequences of flooding are acceptable, and the development would be in accordance with the requirements of the NPPF.

This FRA demonstrates that the proposed development would be operated with minimal risk from flooding, would not increase flood risk elsewhere and is compliant with the requirements of the NPPF. The development should not therefore be precluded on the grounds of flood risk.

# **APPENDIX A** – Site Masterplan

| Drawing/ Document | Link |
|---|---|
| Site Masterplan | |




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|---|---|---|---|---|
| E | SCHEME UPDATED | 02.05.23 | JRB | NOO |
| D | SCHEME UPDATED | 19.04.23 | JRB | NOO |
| C | RED LINE BOUNDARY AND LAYOUT REVISIONS | 29.03.23 | JRB | GH |
| B | RED LINE BOUNDARY UPDATED | 23.03.23 | JRB | GH |
| A | ISSUED FOR INFORMATION | 20.02.23 | JRB | NOO |
| - | ISSUED FOR INFORMATION | 31.10.22 | IM | MH |

CLIENT: WUKPG

PROJECT: Plymouth Grove

DRAWING: Proposed Site Plan

SCALE: 1:500 @A4

DATE ISSUED: 31.10.22

| PROJECT | DRAWN BY | CHECKED BY |
|---|---|---|
| 1441+21 | IM | MH |

| ORIGIN | VOLUME | LEVEL | TYPE | ROLE | NUMBER | REVISION |
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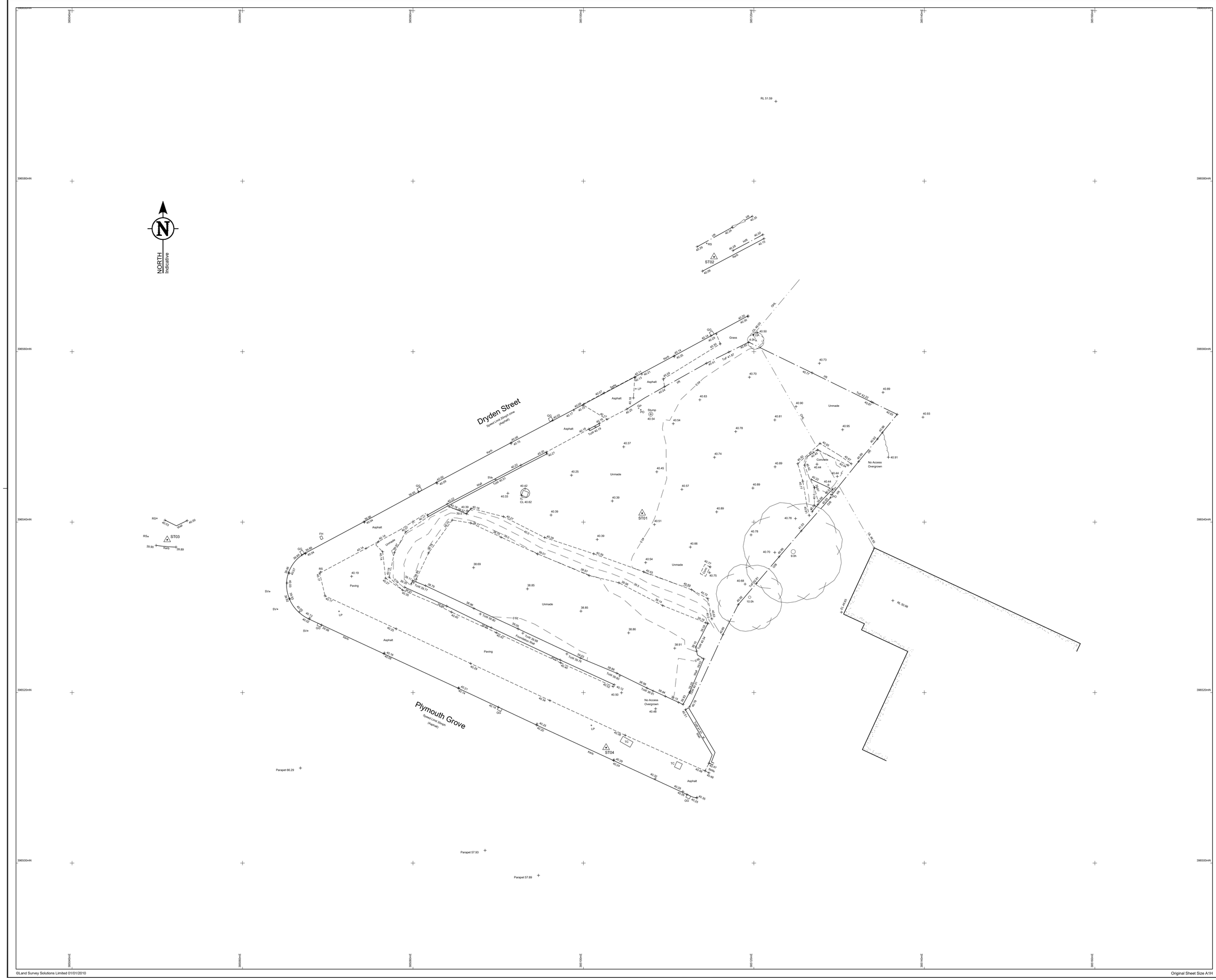
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# **APPENDIX B** – Topographical Survey

| Drawing/ Document | Link |
|---|---|
| Topographical Survey | |




## TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

### ABBREVIATIONS & SYMBOLS

| | | | | | |
|---|---|---|---|---|---|
| AH | Arch Head Height | ER | Earth Rod | RSD | Roller Shutter Door |
| A/B | Air Brick | ET | EP+Transformer | RSJ | Rolled Steel Joist |
| AR | Assumed Route | FB | Flower Bed | SI | Sign Post |
| AV | Air Valve | FBD | Floor Board Direction | SP | Arch Spring Point Height |
| BB | Bellsha Beacon | FH | Fire Hydrant | SV | Stop Valve |
| BH | Bore Hole | FL | Floor Level | SW | Surface Water |
| BL | Bed Level | FP | Flag Pole | SY | Cable Stay |
| BO | Bollard | FW | Foul Water | Tac | Tactile Paving |
| B/P | Brace Post | GG | Gully Grate | TC | Telecom Cover |
| BS | Bus Stop | GV | Gas Valve | TH | Trial Pit |
| BU | Bush | HH | Head Height | THL | Threshold Level |
| B/W | Barbed Wire Fence | IC | Inspection Cover | TL | Traffic Light |
| BX | Box (Utilities) | IL | Invert Level | ToW | Top of Wall |
| C/B | Close Board Fence | I/R | Iron Railings | TP | Telegraph Pole |
| CH | Cill Height | KO | Kerb Outlet | TS | Traffic Signal Cover |
| CL | Cover Level | LP | Lamp Post | TV | Cable TV Cover |
| C/L | Chain Link Fence | MH | Manhole | UB | Universal Beam |
| C-Lev | Ceiling Level | MP | Marker Post | UC | Unknown Cover |
| Col | Column | NB | Name Board | UK | Unknown Tree |
| C/P | Chestnut Paling Fence | OHL | Overhead Line (approx) | UMG | Unmade Ground |
| CR | Cable Riser | Pan | Panel Fence | USB | Under Side Beam |
| C/W | Chicken Wire | PB | Post Box | UTL | Unable To Lift |
| DC | Drainage Channel | PM | Parking Meter | UTS | Unable To Survey |
| DH | Door Head Height | PO | Post | VP | Vent Pipe |
| Dil. | Dilapidated | P/R | Post & Rail Fence | WB | Waste Bin |
| DP | Down Pipe | P/W | Post & Wire Fence | WH | Weep Hole |
| DR | Drain | P/Wall | Partition Wall | WL | Water Level |
| EBx | Electric Box | RE | Rodding Eye | WM | Water Meter |
| EC | Electric Supply Cover | RL | Ridge Level | WO | Wash Out |
| EL | Eaves Level | RP | Reflector Post | CH | Floor to Ceiling Height |
| EP | Electric Pole | RS | Road Sign | FC | Floor to False Ceiling Ht |
| | | | | | Survey Control Station |

### DRAWING NOTES

**Topographical Surveys**

Trees are drawn to scale showing the average canopy spread. Descriptions and heights should be used as a guide only.

All building names, descriptions, number of storeys, construction type including roof line details are indicative only and taken externally from ground level.

All below ground details including drainage, voids and services have been identified from above ground and therefore all details relating to these features including; sizes, depth, description etc will be approximate only. All critical dimensions and connections should be checked and verified prior to starting work.

Detail, services and features may not have been surveyed if obstructed or not reasonably visible at the time of the survey.

Surveyed physical features may not necessarily represent the legal boundary line.

**Measured Building Surveys**

Measurements to internal walls are taken to the wall finishes at approx 1m above the floor level and the wall assumed to be vertical.

Cill heights are measured as floor to the cill and head heights are measured from cill to the top of window.

**General**

The contractor must check and verify all site and building dimensions, levels, utilities and drainage details and connections prior to commencing work. Any errors or discrepancies must be notified to Survey Solutions immediately.

The accuracy of the digital data is the same as the plotting scale implies. All dimensions are in metres unless otherwise stated.

The survey control listed is only to be used for topographical surveys at the stated scale. All control must be checked and verified prior to use.

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Do not scale from this drawing.

### SURVEY CONTROL CO-ORDINATES

| STATIONS | EASTINGS | NORTHINGS | LEVEL |
|---|---|---|---|
| ST02 | 385115.325 | 396571.111 | 40.258 |
| ST03 | 385051.166 | 396537.923 | 39.981 |
| ST01 | 385106.887 | 396541.046 | 40.613 |
| ST04 | 385102.660 | 396513.547 | 40.333 |

SURVEY GRID AND LEVEL DATUM

The coordinate system established for this survey is related to Ordnance Survey (OS) national grid at a single point using Smartnet, then orientated to grid north with a scale factor of 1.000.

The level datum established for this survey is related to Ordnance Survey (OS) using GPS Smartnet.

To avoid discrepancies any coordinated data used in conjunction with this survey must be derived directly from this control data.

| REV | DESCRIPTION | DRAWN | APPR | DATE |
|---|---|---|---|---|

SURVEY SOLUTIONS

LAND SURVEYING
BUILDING SURVEYING
UNDERGROUND SURVEYING
SITE ENGINEERING
MONITORING

0845 040 5969
survey-solutions.co.uk

IPSWICH BEDFORD COVENTRY GLASGOW LONDON MANCHESTER NORWICH NOTTINGHAM YEOVIL

PROJECT TITLE
3 PLYMOUTH GROVE, MANCHESTER M13 9PZ

DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 1 of 1

| CLIENT | | | | SCALE |
|---|---|---|---|---|
| RECOM SOLUTIONS LTD | | | | 1:200 |
| SURVEYOR | SURVEY DATE | CHECKED BY | APPROVED BY | DWG STATUS |
| JC TH | 20/03/23 | AG | AG | FINAL |
| DRAWING NUMBER | | | REVISION | ISSUE DATE |
| 47361MCLS-01 | | | | 23/03/23 |

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Original Sheet Size A1H

# **APPENDIX C** – Public Sewer Plan

| Drawing/ Document | Link |
|---|---|
| Public Sewer Plan | |

# United Utilities Maps for SafeDig

| | |
|---|---|
| **Date :** | 22/03/2023 10:12:51 |
| **Centre X:** | 385145 |
| **Centre Y:** | 396516 |
| **Scale :** | 1000 |
| **UserName:** | GMPTMT |

**Extract from maps of United Utilities' Underground Assets**

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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United Utilities
Water for the North West