



## Flood Risk Assessment and Drainage Strategy

Paradise Mews, Manchester,  
M1 2DE.

Ref: 1-21074-FRA&DS

14<sup>th</sup> December 2021

Prepared on Behalf of:

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**FLOOD RISK ASSESSMENT AND DRAINAGE STRATEGY**  
**Proposed Residential Block, Paradise Mews, Manchester, M1 2DE.**

*Report Reference:* 1-21074 – FRA&DS

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**Revision List**

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# **1. INTRODUCTION**

## **1.1 Project Background**

- 1.1.1. Clancy Consulting Limited have been commissioned by Victor (M1) Limited to produce a Flood Risk Assessment and Drainage Strategy in support of a planning application to Manchester City Council for the construction of a new residential building off Ducie Street in Manchester.
- 1.1.2. The local planning authority, local highway authority and lead local flood authority (LLFA) is Manchester City Council. The water authority responsible for the sewers in the area is United Utilities (UU).
- 1.1.3. The report provides information on the nature of flood risk at the site and follows Government guidance regarding development and flood risk.
- 1.1.4. The report is based on currently available information and preliminary discussions.
- 1.1.5. This report sets out the results of a flood risk assessment and drainage strategy (FRA&DS) required by the Local Planning Authority in support of the planning application for this development. The assessment has been carried out in accordance with the general principals set out in National Planning Policy Framework published in March 2018 and Technical Guidance to the National Planning Policy Framework.
- 1.1.6. Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.
- 1.1.7. Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Clancy Consulting Ltd shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Clancy Consulting Ltd.
- 1.1.8. This report is prepared solely for the benefit of the Client. This report may not be assigned without prior written permission from Clancy Consulting Ltd.

## 1.2 Scope of Assessment

1.2.1. The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency (EA) for Flood Risk Assessments as outlined in the Communities and Local Governments Planning Policy Guidance to the National Planning Policy Framework (NPPF).

1.2.2. The assessment will:

- Investigate all potential risks of flooding to the site,
- Consider the impact the development may have elsewhere with regards to flooding,
- Consider design proposals to mitigate any potential risk of flooding determined to be present; and
- Consider foul & surface water drainage proposals for the proposed development.

1.2.3. The total site area is approximately 0.036 hectares and following scrutiny of the Environment Agency flood maps it has been identified that site lies within Flood Zone 1. According to local council Strategic Flood Risk Assessment, the site lies within the Conurbation Core Critical Drainage Area (CCFDA). A Flood Risk Assessment is therefore required to support a planning application.

1.2.4. In April 2015, the Government made changes to the National Planning Policy Framework which made Sustainable Urban Drainage Systems (SuDS) a material consideration in the determination of planning applications for 'major' developments.

1.2.5. A Drainage Strategy will therefore be required as part of the Planning Application for the development, as the site is considered to be 'major' development by the Town and Country Planning Order 2015.

1.2.6. This Flood Risk Assessment and Drainage Strategy reviews the following information:

- Environment Agency flood maps for rivers and sea flooding.
- UK Government Flood Warning Information Service maps for surface water flooding and reservoir flooding.
- Manchester City, Salford City and Trafford Councils Level 1 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, User Guide, Final, dated May 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid Strategic Flood Risk Assessment (SFRA) published in March 2011.
- United Utilities Public Sewer Records Extract
- Topographical Survey completed in September 2020 by Malcolm Hughes Chartered Land Surveyors

## 2. EXISTING SITE DESCRIPTION

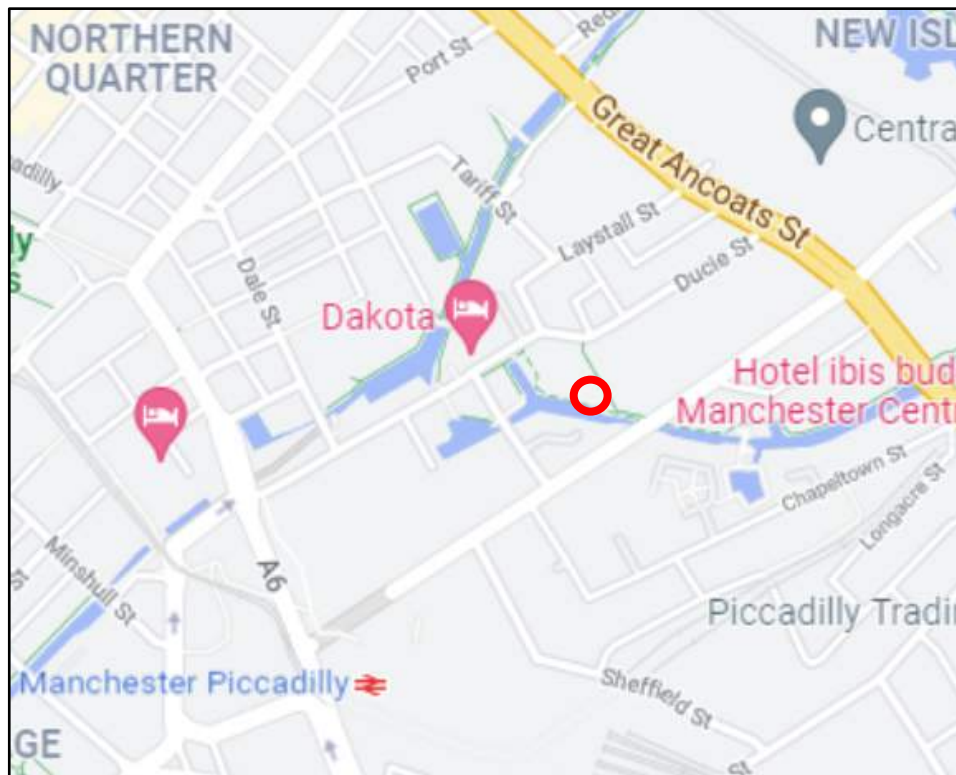
### 2.1 Site Location

2.1.1. The site is located as detailed below.

*Table 1 - Site Location*

|                   |            |
|-------------------|------------|
| OS X (Eastings)   | 384964.338 |
| OS Y (Northings)  | 398138.062 |
| Nearest Post Code | M1 2ED     |

*Figure 1 - Site Location Plan*

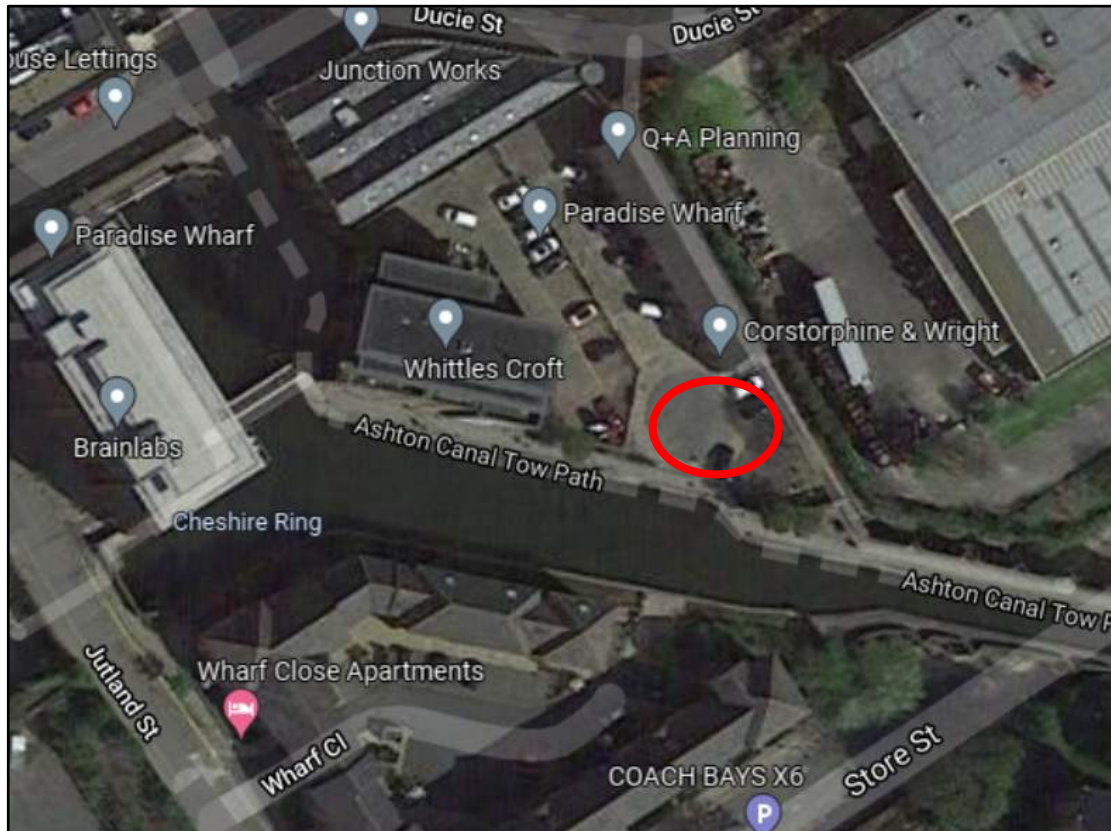


2.1.2. The overall site is approximately 0.036 ha, with an impermeable area of 0.036ha which equates to 100% of the total site area.

2.1.3. The site currently consists of a car parking area of the adjacent buildings.

2.1.4. The site is bounded by Aston Canal to the south, Paradise Walk and warehouse building to the east, apartment buildings and office building to the west and north respectively.

*Figure 2 - Existing Site - Extract from Google Maps*



2.1.5. The topographical survey shows the site falling from a level of c.45.5m AOD in the southeast corner to a level of c.45.3m AOD in the northeast corner. From the western part of the site to the north and north-eastern part of the site, levels vary by c.50-100mm. A copy of the Topographical survey is included within Appendix A.

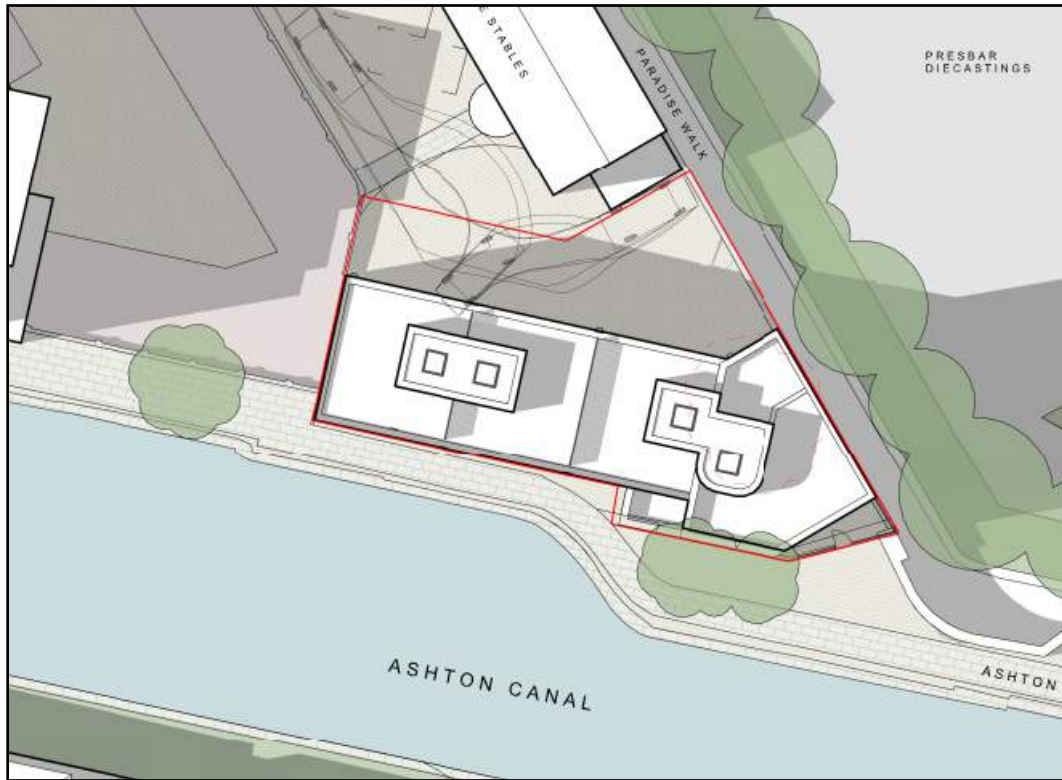
2.1.6. The topographical survey has recorded existing drainage gullies to the north-eastern part of the site.

## **2.2 Development Proposals**

2.2.1. The proposed development is expected to comprise of a full planning application for a new residential block. The proposed building spans the full width of the site to the southern boundary, with the northern part of the site being used for access and parking.

2.2.2. An extract of the proposed site plan is shown in Figure 3 below and included within Appendix A for further reference.

*Figure 3 - Proposed Site Plan by Corstorphine & Wright Architects*

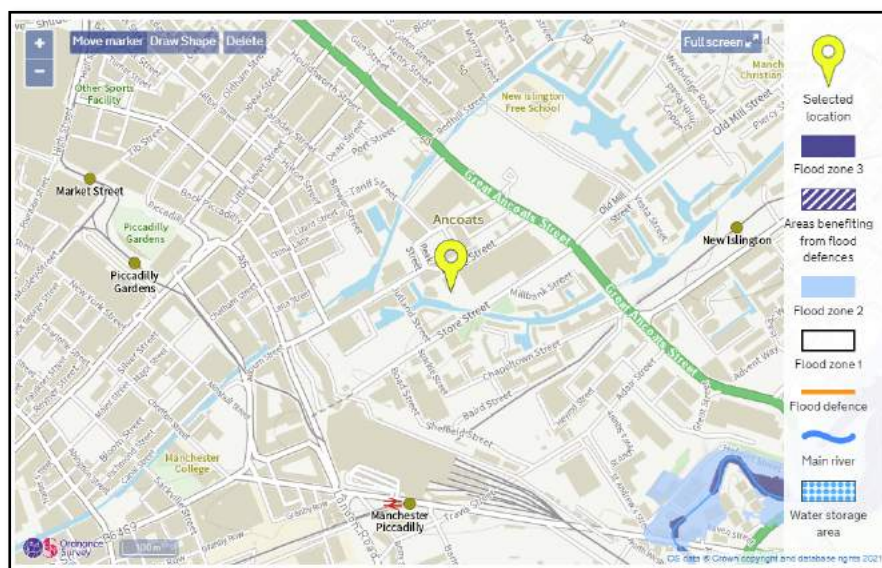


### 3. FLOOD POTENTIAL

#### 3.1 Potential for Flooding

3.1.1 The EA Flood Map for Planning from Rivers and Seas for the area of the proposed development indicates that the site lies fully in Flood Risk Zone 1.

*Figure 4 - EA Flood Mapping for Planning*



3.1.2 The Local Flood Risk Management Strategy for Manchester has been reviewed and referenced within this report when required.

3.1.3 The main sources of flooding at the site, which are addressed in more detail in the following chapters, are the following:

- *Flooding from rivers or fluvial flooding*
- *Tidal Flooding (Coastal or Estuarine)*
- *Reservoir Flooding*
- *Canal Flooding*
- *Groundwater Flooding*
- *Public Sewers or Highway Drainage Flooding (Infrastructure Failure)*
- *Surface Water Flooding to the Site.*
- *Surface Water Flooding from the Site.*

## 3.2 Existing Historical Flooding Information

3.2.1 Manchester LLFA Data Screening searches have provided no evidence of historical flooding to this site.

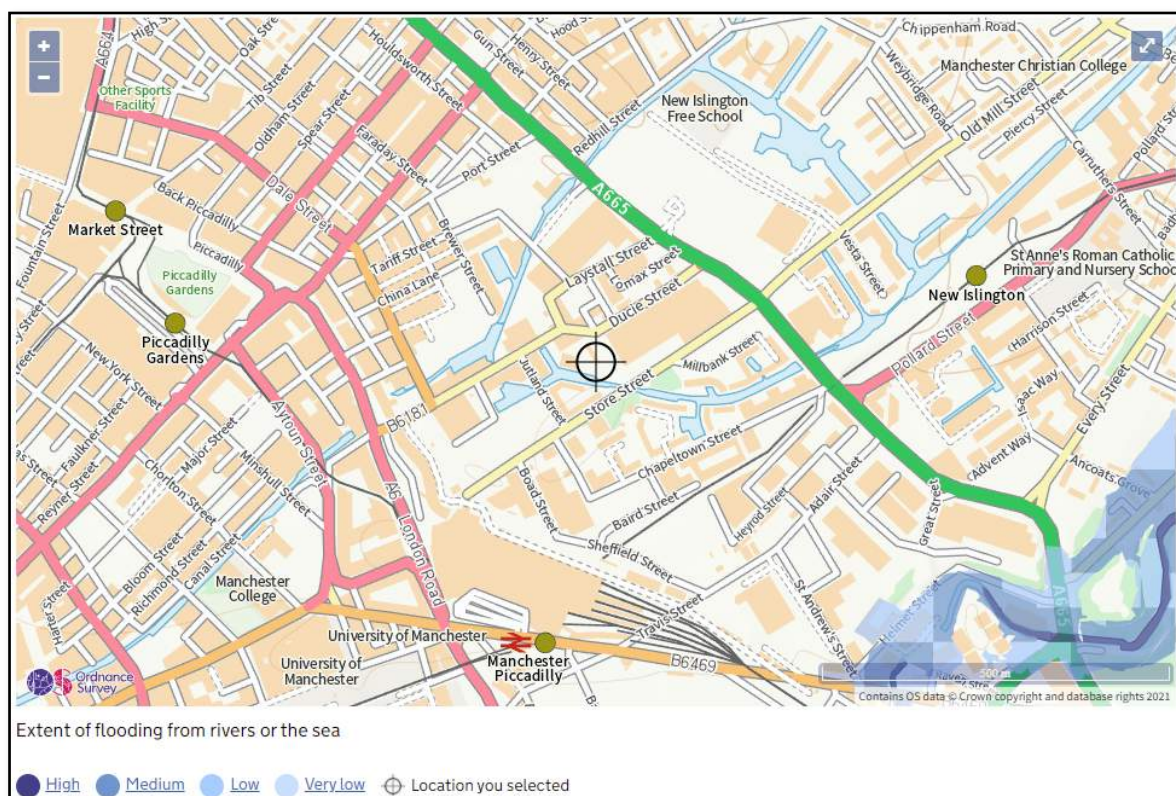
## 3.3 Flood Risk Probabilities

3.1.1. This study assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change, as well as how flood risks should be managed. The approach to assessing flood risk at the development site was informed by the requirements of NPPF in conjunction with the client and Environment Agency requirements.

### ***Flooding from rivers or fluvial flooding***

3.1.2. Flooding to the site from rivers and sea is indicated below in Figure 5, taken from the UK Governments Long-Term Flood Risk Information.

***Figure 5: Long Term Flood Risk Map – Flood Risk from Rivers or the Sea for this Site***



3.1.3. The whole of the site can be seen to be within 'Very low' risk Flood Zone 1 (No shading) which has less than a 0.1% chance of fluvial flooding each year. Therefore, regarded to be low risk from fluvial flooding.

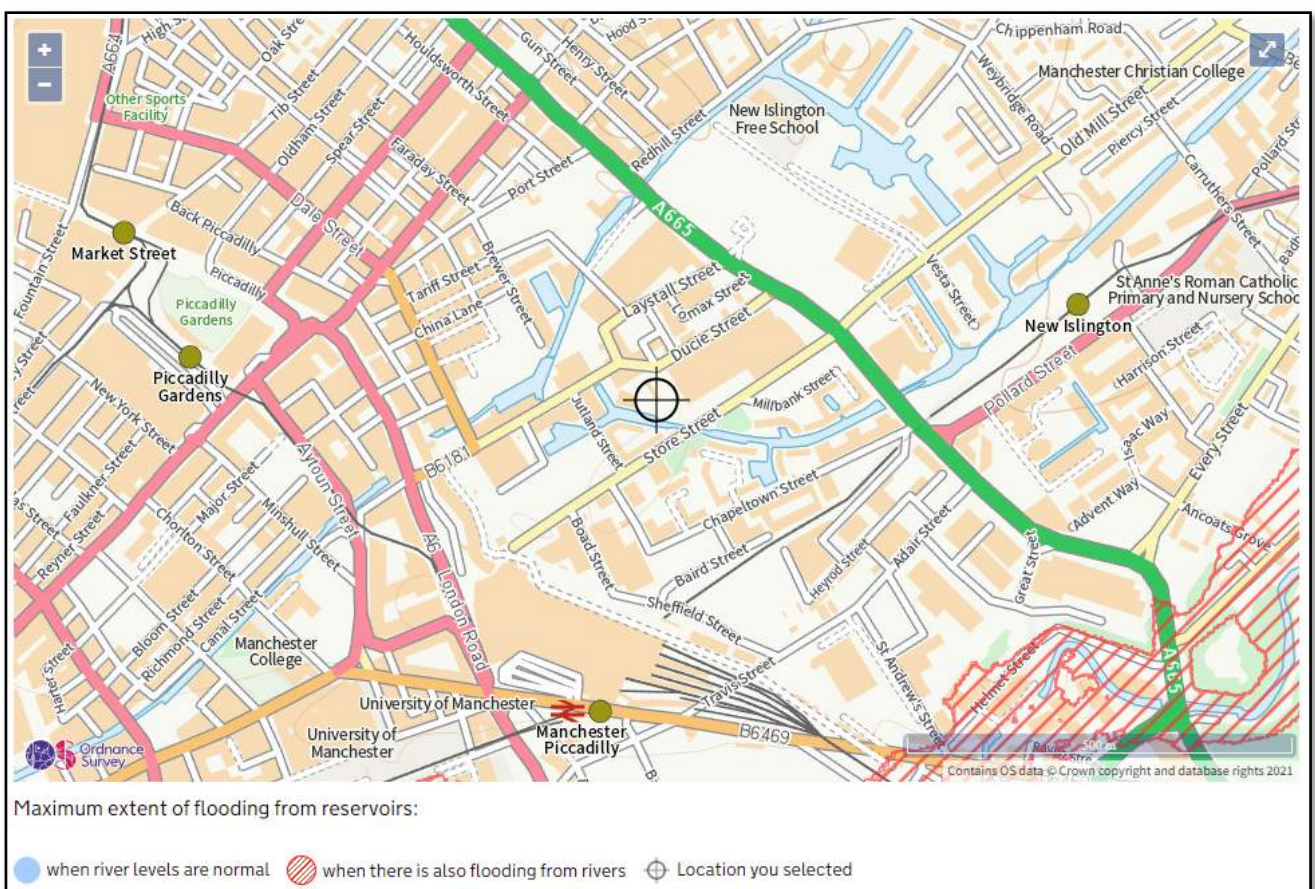
### ***Tidal Flooding (Coastal or Estuarine)***

- 3.1.4 There is currently no flood risk identified on the Environment Agency flood maps for the site and it is therefore regarded to be at low risk from tidal flooding.

### ***Reservoir Flooding***

- 3.1.5 Reservoir flooding is extremely unlikely to happen and there has been no loss of life in the UK from reservoir flooding since 1925. The Environment Agency is the enforcement authority and ensures that reservoirs are inspected regularly, and essential safety work is carried out.

***Figure 6: Long Term Flood Risk Map – Flood Risk from Reservoirs***



- 3.1.6 The extent of flooding from a reservoir breach map shows no water would encroach on the site and therefore, the site is regarded to be at low risk from reservoir flooding.

### ***Canal Flooding***

- 3.1.7 The nearest canal to the site is Aston Canal and is situated to the south bounding the site, being separated only by the canal tow path. Aston canal standing water level is below the lowest site level. Rochdale Canal is also located to the north c.150m from the centroid of the site. The canals are identified in the SFRA as not generally posing a direct flood risk as they are a

controlled water body. Therefore, the residual risk of canal flooding is usually associated with lower probability events such as overtopping and/or the breaching of embankments.

- 3.1.8 The Manchester SFRA identifies areas within the Canal Hazard Breach zones. The site is not located within the extent of the breach therefore based on the above information; it is considered that there is low risk of canal flooding to the site.

#### ***Groundwater Flooding***

- 3.1.9 Groundwater flooding tends to be more persistent than other sources of flooding, typically lasting for weeks or months rather than hours or days. Groundwater flooding does not generally pose a significant risk to life due to the slow rate at which the water level rises; however, it can cause significant risk to property.
- 3.1.10 According to the Manchester, Salford and Trafford SFRA, there are no known reports of groundwater flooding in the Manchester, Trafford and Salford authorities.
- 3.1.11 The site is not shown to be within an area at risk of groundwater flooding according to the groundwater flooding map shown within the Manchester, Salford and Trafford SFRA.
- 3.1.12 It is assumed based on the information available that there is no significant risk of groundwater flooding to the site, however there may be a potential risk where this has not been recorded.

#### ***Public Sewers or Highway Drainage Flooding (Infrastructure Failure)***

- 3.1.13 There are no highway drains recorded within the site. It is likely that there will be localised highway drainage surrounding the site (such as gullies and connections). However, the adjacent footways fall away from the site to the public highway.
- 3.1.14 United Utilities have not provided any records of flooding to the site or in the vicinity at the time of writing this report. This may be provided following their response to our pre-development enquiry. Should records of flooding be provided this section of the report should be updated accordingly.
- 3.1.15 Providing United Utilities and Salford City Council maintain their drainage assets within and in the vicinity of the site, the risk of flooding to the proposed development site from public sewers or highway drainage is considered as low.

#### ***Surface Water Flooding to the Site.***

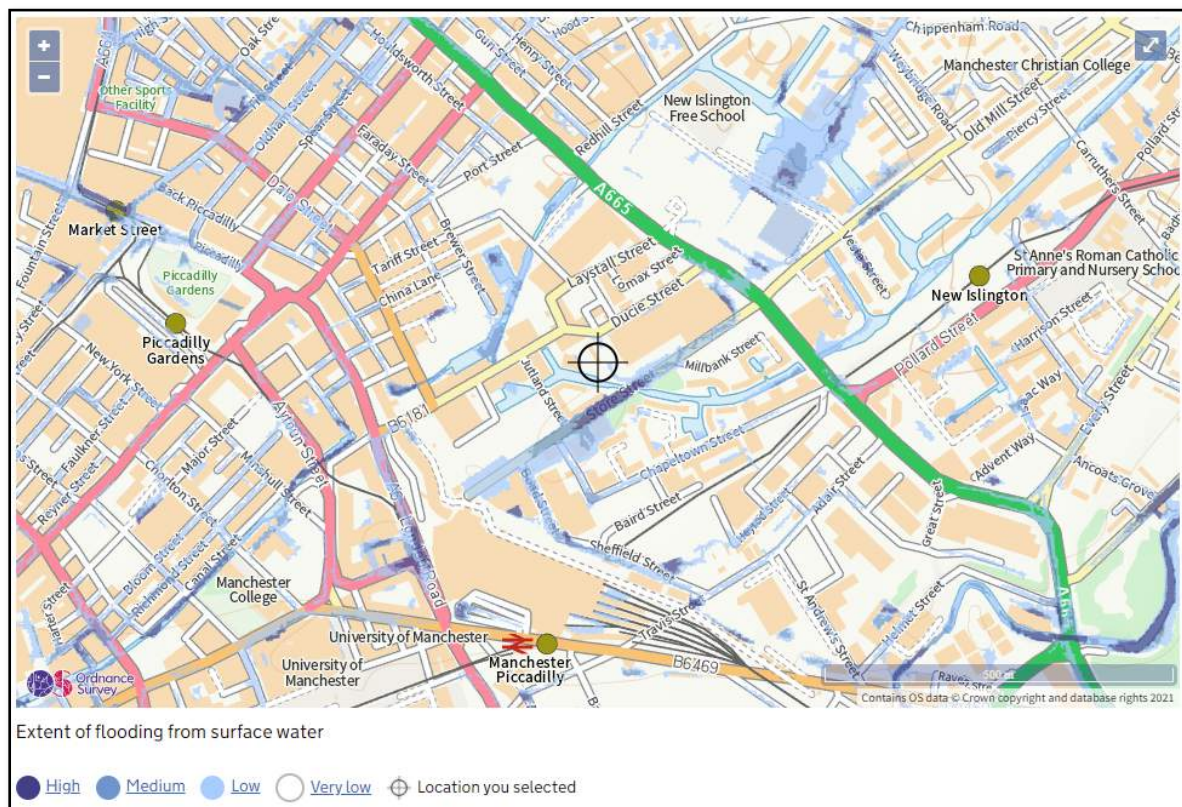
- 3.1.16 Surface water flooding can be caused when rainwater during extreme rainfall events does not drain away through the normal drainage system or soak into the ground with flooding occurring, principally from manholes and gullies. Surcharging sewers can result in overland flows which if originating at a higher elevation than a development site can potentially pose a flood risk.

3.1.17 From the UK Government's Flood Risk from Surface Water (extent of flooding) map;

- Where a site is located in a dark blue shaded zone, this indicates that the site is at high risk of flooding, where flooding occurs as a result of rainfall with a greater than 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a mid-blue shaded zone, this indicates that the site is at medium risk of flooding, where flooding occurs as a result of rainfall of between 1 in 100 (1%) and 1 in 30 (3.3%) chance in any given year.
- Where a site is located in a light blue shaded zone, this indicates that the site is at low risk of flooding, where flooding occurs as a result of rainfall of between 1 in 1000 (0.1%) and 1 in 100 (1%) chance in any given year.
- Where a site is located in a clear (unshaded) area; this indicates that the site is at very low risk of flooding, where flooding occurs as a result of rainfall with less than 1 in 1000 (0.1%) chance in any given year.

3.1.18 The extent of flooding to the site from surface water is indicated in Figure 7 and it can be seen that the site has areas identified as being at a 'very low' risk of flooding from surface water.

*Figure 7: Risk of Flooding from Surface Water – Extent of Flooding*



### ***Surface Water Flooding to the Site.***

- 3.1.19 Developers are responsible for ensuring that new developments do not increase the flood risk elsewhere. Where new development is proposed, the proposed surface water drainage network shall be designed to not flood for the critical 1 in 30-year storm event and flood water generated up to the critical 1 in 100-year plus climate change storm event shall be constrained within areas on site so as not to cause damage to buildings, essential services or adjoining developments and services.
- 3.1.20 The development has the potential to increase flood risk where additional run-off from proposed roads, paved areas and building roofs are discharged freely into the downstream drainage network. It is therefore encouraged to propose permeable areas, landscaping areas and incorporate sustainable drainage features utilising infiltration or attenuation where possible.
- 3.1.21 An assessment of the proposed surface flows is carried out within the drainage strategy section of this report.

### ***Summary of Flood Risk***

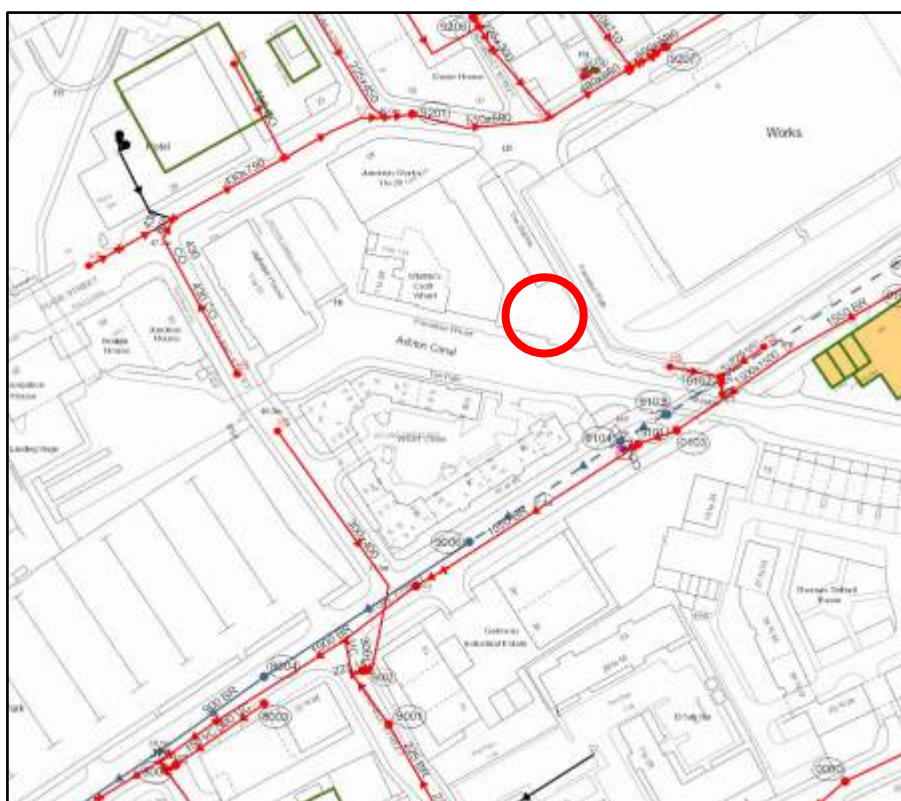
- 3.1.22 From the evidence collated and subsequent negotiations the main types of flooding that may apply to the proposed development site are as follows:
- *Flooding from rivers or fluvial flooding – Very Low*
  - *Tidal Flooding (Coastal or Estuarine) – Very Low*
  - *Reservoir Flooding – Very Low*
  - *Canal Flooding – Very Low*
  - *Groundwater Flooding – Very Low*
  - *Public Sewers or Highway Drainage Flooding (Infrastructure Failure) - Low*
  - *Surface Water Flooding to the Site – Very Low*
  - *Surface Water Flooding from the Site – Very Low*
- 3.1.23 Considering the above information, the risk of flooding to the site is generally considered 'Very low'.

## 4. DRAINAGE STRATEGY

### 4.1 Existing Public Sewers

- 4.1.4 There are existing public sewers within the vicinity of the site. See below Figure 8, extract from United Utilities maps, also included in Appendix B.

*Figure 8: United Utilities Public Sewer Records*



- 4.1.5 To the north of the site in Ducie Street, an existing brick 510x680 combined water sewer falls in an easterly direction. This is located c.25m from the site.
- 4.1.6 To the south of the site in Store Street, there are two live systems. A 1500 brick combined water sewer and a 900mm culverted watercourse known as 'Shooters Brook'. The culverted watercourse connects to a public surface water sewer downstream, c.10m east of Store Street junction with Jutland Street. There is also two 225mm diameter combined sewers to the southern end of Paradise Walk connecting to the main combined sewer.
- 4.1.7 To the west of the site in Jutland Street, c.60m from the site, a 450mm concrete combined water sewer heads north toward Ducie Street public sewer and a 300x400 brick combined water sewer heads south towards Store Street and connects to public combined water sewer.

## **4.2 Existing Site Drainage**

- 4.2.1 The topographical survey has identified positive drainage within the site in the form of gullies. The gullies are located to the north-eastern part of the site. A CCTV survey has confirmed the gullies to be live.
- 4.2.2 Dye testing has been carried out during the survey works and connectivity has been proven to the 900mm culverted watercourse within Store Street.
- 4.2.3 To the east of the site within Paradise Walk, the client has confirmed a 450mm drain which heads in a southerly direction towards Store Street, below the Ashton Canal. It is therefore a reasonable assumption that surface water discharges from the site to Store Street culverted watercourse via the 450mm diameter pipe.

## **4.3 Existing Surface Water Runoff Assessment**

- 4.3.1 The existing impermeable area has been determined as 100% of the total site area, which equates to 0.036 ha.
- 4.3.2 The current site plan shows the proposed development will include an impermeable area of approximately 0.036 ha.
- 4.3.3 The existing surface water runoff from the site for the 1 in 1 year return period has been calculated using the following equation:

$$Q = 2.78 C_v C_R i A$$

Where:

Q = Flow Rate (l/s),  $C_v$  &  $C_R$  = Run-off and Routing coefficient ~ 1.0, A = Impermeable Area (Ha) = 0.036 ha,  $i$  = Design Rainfall Intensity (mm/hr) = 50mm/hr

$$\text{Therefore } Q = 5 \text{ l/s}$$

## **4.4 Existing Foul Drainage**

- 4.4.1 There is no evidence of foul water drainage discharging from the existing site, however adjacent properties are known to be connected to the public sewer.

## **4.5 Proposed Drainage (Foul)**

- 4.5.1 A separate foul and surface water system is proposed.
- 4.5.2 United Utilities have been consulted with regards to discharge of foul and surface water. At the time of writing this report we have not received a response. Correspondence included with Appendix C.
- 4.5.3 Foul drainage within the development site will be collected in a traditional below ground gravity system.

- 4.5.4 It is assumed at this stage that United Utilities will allow Foul Water to discharge to the nearest and most convenient combined public sewer at an unrestricted rate.
- 4.5.5 The foul drainage is proposed to connect to the combined 225mm diameter sewer to the south of Paradise Walk. A detailed survey should be carried out of the receiving network to confirm location, level and condition.
- 4.5.6 It is assumed that all drainage will be privately maintained and therefore connection to the public sewer network will be subject to a Section 106 Agreement with United Utilities.

#### **4.6 Proposed Drainage (Surface)**

- 4.6.1 A separate foul and surface water system is proposed.
- 4.6.2 United Utilities have been consulted with regards to discharge of foul and surface water. At the time of writing this report we have not received a response. Correspondence included with Appendix C.
- 4.6.3 Manchester LLFA have been consulted with regards to discharge of surface water. At the time of writing this report we have not received a response. Correspondence included with Appendix C.
- 4.6.4 Canals and Rivers Trust have been consulted to confirm if surface water can be discharged to the Aston canal and at this time permission to discharge has been rejected. See correspondence within Appendix C.
- 4.6.5 It is assumed that all drainage will remain privately maintained. Where drainage remains private, connection to the public sewer network will be subject to Agreement with MCC LLFA and United Utilities.
- 4.6.6 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity not to flood for the critical 1 in 30-year storm event and flood water generated for up to the critical 1 in 100-year plus climate change storm event shall be constrained within the areas on site so not to cause damage to buildings, essential services or adjoining developments and services.
- 4.6.7 In February 2016, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Table 4 demonstrates the climate change allowances with central and upper end allowances being considered.
- 4.6.8 Based on the nature of the development, a lifespan in excess of 60 years is anticipated. Therefore, the potential climate change allowance for 2070-2115 ranges between 20% for the central allowance and 40% for the upper end allowance. As such, an allowance of 40% for climate change on peak rainfall intensity will be included in calculations.

*Table 2: (Extract Environment Agency Guidance) Peak Rainfall Intensity Allowance in small and urban catchments*

| Applies across all of England | Total potential change anticipated for the '2020s' (2015 to 2039) | Total potential change anticipated for the '2050s' (2040 to 2069) | Total potential change anticipated for the '2080s' (2070 to 2115) |
|-------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|
| Upper end                     | 10%                                                               | 20%                                                               | 40%                                                               |
| Central                       | 5%                                                                | 10%                                                               | 20%                                                               |

4.6.9 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration.

#### ***Infiltration***

4.6.10 The nature of the development and building footprint doesn't allow for any soakaway features to be installed >5m away from existing and proposed buildings. Therefore, infiltration has been discounted to prevent risk to properties. The site is also elevated behind significant retaining structures, therefore infiltration could pose risk to lower levels.

#### ***Watercourse***

4.6.11 The site is located adjacent to the Ashton canal. As mentioned above, Canals and Rivers Trust have been consulted to confirm if surface water can be discharged to the Ashton canal and at this time permission to discharge has been rejected.

4.6.12 Following review of United Utilities Sewer maps and Manchester LLFA data screening information, a 900mm Culverted Watercourse is located within Store Street to the south of the site, which then connects to a Surface Water Public sewer further downstream. This is approximately 50m from the centroid of the site and set c.10m lower. Adjacent to the development site in Paradise Walk, is a 450mm diameter drain which dye testing confirms is connected to the watercourse in Store Street. Therefore, we propose to discharge surface water flows to the watercourse via the 450mm existing drain.

#### ***Public Surface Water Sewer***

4.6.13 There are no public surface water sewers within the immediate vicinity of the site. The culverted watercourse in Store Street connects to the surface water public sewer further downstream however given its distance from the site, it is considered not a viable option.

#### ***Public Combined Water Sewer***

4.6.14 There are several public combined sewers within the vicinity of the site which could potentially be used to receive Surface Water flows from the development. This option maybe explored should the proposed connection to the culverted watercourse in Store Street become a non-viable option.

4.6.15 Table 3 summarises the options for surface water disposal.

Table 3: Surface Water Disposal.

| Surface Water Disposal     | Potential | Description                                                                                                                                                                                                                                                                                                                                              |
|----------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infiltration               | X         | It is assumed that the site will not be suitable for infiltration SuDS.                                                                                                                                                                                                                                                                                  |
| Watercourse                | ✓         | <p>A 900mm Culverted Watercourse is located within Store Street to the south of the site.</p> <p>This is approximately 50m from the centroid of the site.</p> <p>An existing 450mm diameter pipe within Paradise Walk connects to the culverted watercourse therefore we propose to discharge surface water flows to the watercourse via this route.</p> |
| Surface Water Public Sewer | X         | There are no public surface water sewers within the immediate vicinity of the site. The culverted watercourse in Store Street connects to the surface water public sewer further downstream however given its distance from the site, it is considered not a viable option.                                                                              |
| Combined Public Sewer      | X         | Any new outfall is preferred to a surface water system in accordance with UU/LLFA requirements.                                                                                                                                                                                                                                                          |

### ***Proposed Surface Water Discharge Rates***

- 4.6.16 Applying a 50% reduction on existing flows in line with existing planning policies set out in Manchester, Salford and Trafford SFRA, the proposed discharge rate for the redeveloped areas would be 2.5l/s. To restrict flows to 2.5l/s, an orifice size of <75mm would be required. This would increase the risk of blockages quite considerably, potentially increasing the risk of flooding. With the above in mind, we propose a discharge rate of 5l/s for storms up to 1 in 100 year including 40% for climate change, this will reduce the risk of blockage and subsequently flooding to the proposed development, due to the larger orifice size required to limit blockage. Although 5l/s will not result in improvement of the frequent 1 year rainfall events, it will provide significant improvement in higher order events.
- 4.6.17 Surface water flows will be restricted at the most downstream chamber prior to discharging off site using a flow control device.

### ***Storm Water Attenuation***

- 4.6.18 It is proposed to attenuate surface water flows up to and including 1 in 100 year plus 40% climate change within the site boundary.
- 4.6.19 A quick storage estimate has been carried out for the aforementioned storm event, restricting flows to 5 l/s and the volume required is calculated at a maximum of 10m<sup>3</sup>. Refer to Appendix D for calculations.

### ***Sustainable Drainage***

- 4.6.20 For all new development Sustainable Drainage techniques (SuDS) should be considered.
- 4.6.21 Due to the size, location and layout of the site, use of SuDS is quite challenging. Green SuDS i.e. attenuate ponds, swales etc are not practical for this development site.
- 4.6.22 Other SuDS features such as Green, Blue or Brown roofs should be considered however may not be suitable for the building due to roof layout, roof pitch or building plant equipment etc at roof level.
- 4.6.23 The most appropriate SuDS features for this site given the nature of the layout is permeable surfacing. The area fronting the building used and required for access could be used as a lined permeable system. Storage could also be provided within the sub-base material to attenuate surface water flows.
- 4.6.24 Permeable systems also offer water quality treatment process as the water percolates through the stone layers. Additional membranes can also be included within the system to trap any hydrocarbons that may be present due to the use of the site.
- 4.6.25 Providing storage within the development and restricting flows is also a good technique of sustainable drainage as this slows down the speed of surface water discharge at source, prior to passing flows forward to its designed location.

- 4.6.26 A traditional piped network will be provided beneath the building to convey flows from the building.
- 4.6.27 It is assumed that all drainage will be privately maintained and therefore connection to the culverted watercourse will be subject to agreement with the relevant authorities.
- 4.6.28 The Proposed Foul and Surface Water Drainage Layout is included within Appendix E.

## **5. DRAINAGE MAINTENANCE STRATEGY**

- 5.1 A suitable drainage maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented, and this should form part of the Operations and Maintenance Manual.
- 5.2 It will be necessary at detailed design stage to prepare a schedule of maintenance requirements for the ongoing operation of the development.

## **6. SUDS VERIFICATION**

- 6.1 The Verification section has been developed with reference to the drainage design details and philosophy provided in section 4 of this report.
- 6.2 The contractor is responsible for the installation of SuDS features installed as part of this scheme. The contractor is to confirm by Photographic record that SuDS have been installed as per the design.
- 6.2 It will be necessary for a competent person to verify the installation of SuDS features recorded by the contractor.

## 7. NPPF AND LOCAL POLICY

### 7.1 National Planning Policy Framework (NPPF) and Planning Practice Guidance

7.7.1 In February 2019, the Department of Communities and Local Government published the National Planning Policy Framework document (NPPF) and the Planning Practice Guidance was published in March 2014 which provides guidance on how flood risk should be assessed during the planning and development process.

Table 4: (Extract from Planning Practice Guidance) Flood Zone Classifications

These Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. They are shown on the Environment Agency's [Flood Map for Planning \(Rivers and Sea !\[\]\(8a290070f8f4fe66461b1fbc567fb9b1\_img.jpg\)](#)), available on the Environment Agency's web site, as indicated in the table below.

| Flood Zone                                 | Definition                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zone 1<br>Low<br>Probability               | Land having a less than 1 in 1,000 annual probability of river or sea flooding.<br>(Shown as 'clear' on the Flood Map – all land outside Zones 2 and 3)                                                                                                                                                                                                  |
| Zone 2<br>Medium<br>Probability            | Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or<br>Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.<br>(Land shown in light blue on the Flood Map)                                                                                                                               |
| Zone 3a<br>High<br>Probability             | Land having a 1 in 100 or greater annual probability of river flooding; or<br>Land having a 1 in 200 or greater annual probability of sea flooding.<br>(Land shown in dark blue on the Flood Map)                                                                                                                                                        |
| Zone 3b<br>The<br>Functional<br>Floodplain | <b>This zone comprises land where water has to flow or be stored in times of flood.</b><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.<br>(Not separately distinguished from Zone 3a on the Flood Map) |

Table 5: (Extract from Planning Practice Guidance) Flood Risk Vulnerability Classification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Essential Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk.</li> <li>• Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood.</li> <li>• Wind turbines.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Highly Vulnerable</b></p> <ul style="list-style-type: none"> <li>• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding.</li> <li>• Emergency dispersal points.</li> <li>• Basement dwellings.</li> <li>• Caravans, mobile homes and park homes intended for permanent residential use.</li> <li>• Installations requiring <b>hazardous substances consent</b>. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure').</li> </ul> |
| <p><b>More Vulnerable</b></p> <ul style="list-style-type: none"> <li>• Hospitals</li> <li>• Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels.</li> <li>• Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.</li> <li>• Non-residential uses for health services, nurseries and educational establishments.</li> <li>• Landfill* and sites used for waste management facilities for hazardous waste.</li> <li>• Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.</li> </ul>                                                                                                                                                                                                                                 |

**Less Vulnerable**

- Police, ambulance and fire stations which are **not** required to be operational during flooding.
- Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure.
- Land and buildings used for agriculture and forestry.
- Waste treatment (except landfill\* and hazardous waste facilities).
- Minerals working and processing (except for sand and gravel working).
- Water treatment works which do not need to remain operational during times of flood.
- Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.

**Water-Compatible Development**

- Flood control infrastructure.
- Water transmission infrastructure and pumping stations.
- Sewage transmission infrastructure and pumping stations.
- Sand and gravel working.
- Docks, marinas and wharves.
- Navigation facilities.
- Ministry of Defence defence installations.
- Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location.
- Water-based recreation (excluding sleeping accommodation).
- Lifeguard and coastguard stations.
- Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms.
- Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 6: (Extract from Planning Practice Guidance) Flood Risk Vulnerability and Flood Zone Compatibility

| Flood Zones | Flood Risk Vulnerability Classification |                         |                         |                 |                  |
|-------------|-----------------------------------------|-------------------------|-------------------------|-----------------|------------------|
|             | Essential infrastructure                | Highly vulnerable       | More vulnerable         | Less vulnerable | Water compatible |
| Zone 1      | ✓                                       | ✓                       | ✓                       | ✓               | ✓                |
| Zone 2      | ✓                                       | Exception Test required | ✓                       | ✓               | ✓                |
| Zone 3a †   | Exception Test required †               | ✗                       | Exception Test required | ✓               | ✓                |
| Zone 3b *   | Exception Test required *               | ✗                       | ✗                       | ✗               | ✓*               |

**Key:**

✓ Development is appropriate

✗ Development should not be permitted.

Notes to table 3:

- This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea;
- The Sequential and Exception Tests do not need to be applied to minor developments and changes of use, except for a change of use to a caravan, camping or chalet site, or to a mobile home or park home site;
- Some developments may contain different elements of vulnerability and the highest vulnerability category should be used, unless the development is considered in its component parts.

† 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 to be there and 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.

## **7.2 Site Specific NPPF Flood Risk Categorisation**

- 7.2.1 To assess the NPPF flood risk classification for the site, the first step was to inspect the UK Government web based 'Flood Map for Planning' which is used to inform planning of a site's Flood Zone(s) and the probability of flooding from rivers or sea (not taking into account the presence of flood defences or climate change). However, the web based 'Long Term Flood Risk Assessment for Locations in England' should also be used to identify the long-term flood risks from rivers and seas, surface water and reservoirs.
- 7.2.2 The Flood Map for Planning report is enclosed in Appendix F, and it can be seen that the site is classified as entirely within Flood Zone 1.
- 7.2.3 Further site-specific review of the flood risk to the site is provided in the Flood Potential section.

## **7.3 Site Specific Flood Zone Compatibility**

- 7.3.1 The proposals for the development site are likely to fall within the following category:
- Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- 7.3.2 Buildings used for education are classed as 'More Vulnerable' development in the Flood Risk Vulnerability Classification (table 5).

## **7.4 Sequential Test**

- 7.4.1 The site is categorised as a 'More Vulnerable' development (shown in table 5) and is within Flood Zone 1 and therefore the sequential test is not required to be applied (see table 6).

## **8. CONCLUSIONS AND RECOMMENDATIONS**

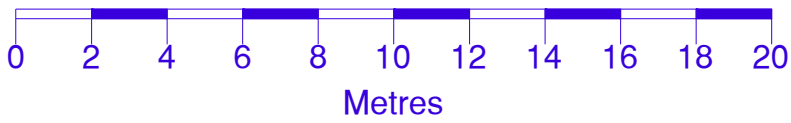
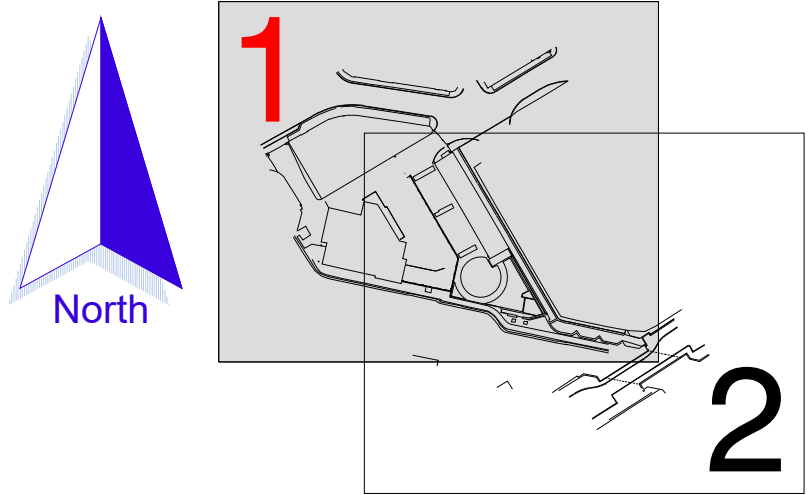
- 8.1 This report gives details of flood risk assessment and drainage strategy, which has been carried out in relation to the new residential development, Paradise Mews, Manchester.
- 8.2 The EA Flood Map for Planning from Rivers and Seas for the area of proposed development indicates that the site fully lies within Flood Zone 1.
- 8.3 The site has been categorised as 'More Vulnerable' - Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels.
- 8.4 The assessment of flood risk to the site detailed in the flood potential section has been determined as 'Very low'.
- 8.5 Infiltration has been considered however determined not a viable option for this site.
- 8.6 Surface water is proposed to discharge to the culverted watercourse within Store Street south of the site.
- 8.7 The proposed discharge rate for this development is 5 l/s. Subject to approval with Manchester LLFA and United Utilities.
- 8.8 Foul water to discharge to combined sewer in Store Street. Subject to a section 106 Agreement with United Utilities.
- 8.9 Flow restrictions and attenuation will be provided for storms up to and including 1 in 100 year plus 40% for climate change in accordance with EA guidance.
- 8.10 Sustainable drainage features are to be considered used where possible.
- 8.11 A detailed CCTV drainage survey is to be carried out to confirm all existing drainage to be reused is in good condition.
- 8.12 All below ground drainage designed, should be approved and accepted by Building Control, Manchester LLFA and United Utilities prior to commencement of works.

## **APPENDIX A – PROPOSED SITE PLAN & TOPOGRAPHICAL SURVEY**



Notes

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

- BOL Bollard
- BT BT Cover
- CATV Cable TV Cover
- CB Control Box
- CL Cover Level
- DK Drop Kerb
- EH Eaves Height
- ER Earth Rod
- FH Fire Hydrant
- GP Gate Post
- GV Gas Valve
- GU Gully
- IC Inspection Cover
- LC Lighting Cover
- LP Lamp Post
- MH Man Hole
- PH Parapet Height
- RE Rodding Eye
- RH Ridge/Roof Height
- RWP Rain Water Pipe
- SP Sign Post
- TC TriCAD Control
- TF Top of Fence
- TL Threshold Level
- TV Top of Wall
- U/S Under Side
- WB Waste Bin
- WL Water Level
- WP Water Pipe
- WV Water Valve

NOTE

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

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

Rev.0 Description. Issued



2 Berkshire Close | Wilpshire | Blackburn | Lancashire | BB1 9NG  
tel 01254 614055 fax 01254 209754 e-mail sales@tricadsolutions.co.uk

Site Address

The Stables  
Paradise Wharf  
Manchester

Project Description

Site Survey

Drawing Title

Existing Site Layout

| Scale    | Date       | Drawn By |
|----------|------------|----------|
| 1:200@A1 | 14/05/2020 | AD       |

Drawing Number

TRI-2997-01

**APPENDIX B – UNITED UTILITIES SEWER RECORDS AND  
MANCHESTER LLFA DATA SCREENING SEARCHES.**

Clancy Consulting Ltd

2  
Dunham Road, Clancy Consulting  
Altrincham, Manchester, Greater Manchester  
WA14 4NX

FAO:

**How to contact us:**

**United Utilities Water Limited  
Property Searches  
Haweswater House  
Lingley Mere Business Park  
Great Sankey  
Warrington  
WA5 3LP**

**Telephone: 0370 7510101**

**E-mail: [propertysearches@uuplc.co.uk](mailto:propertysearches@uuplc.co.uk)**

**Your Ref: 10956120  
Our Ref: UUPS-ORD-351023  
Date: 09/12/2021**

**Dear Sirs**

**Location: Paradise Wharf**

I acknowledge with thanks your request dated 08/12/2021 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



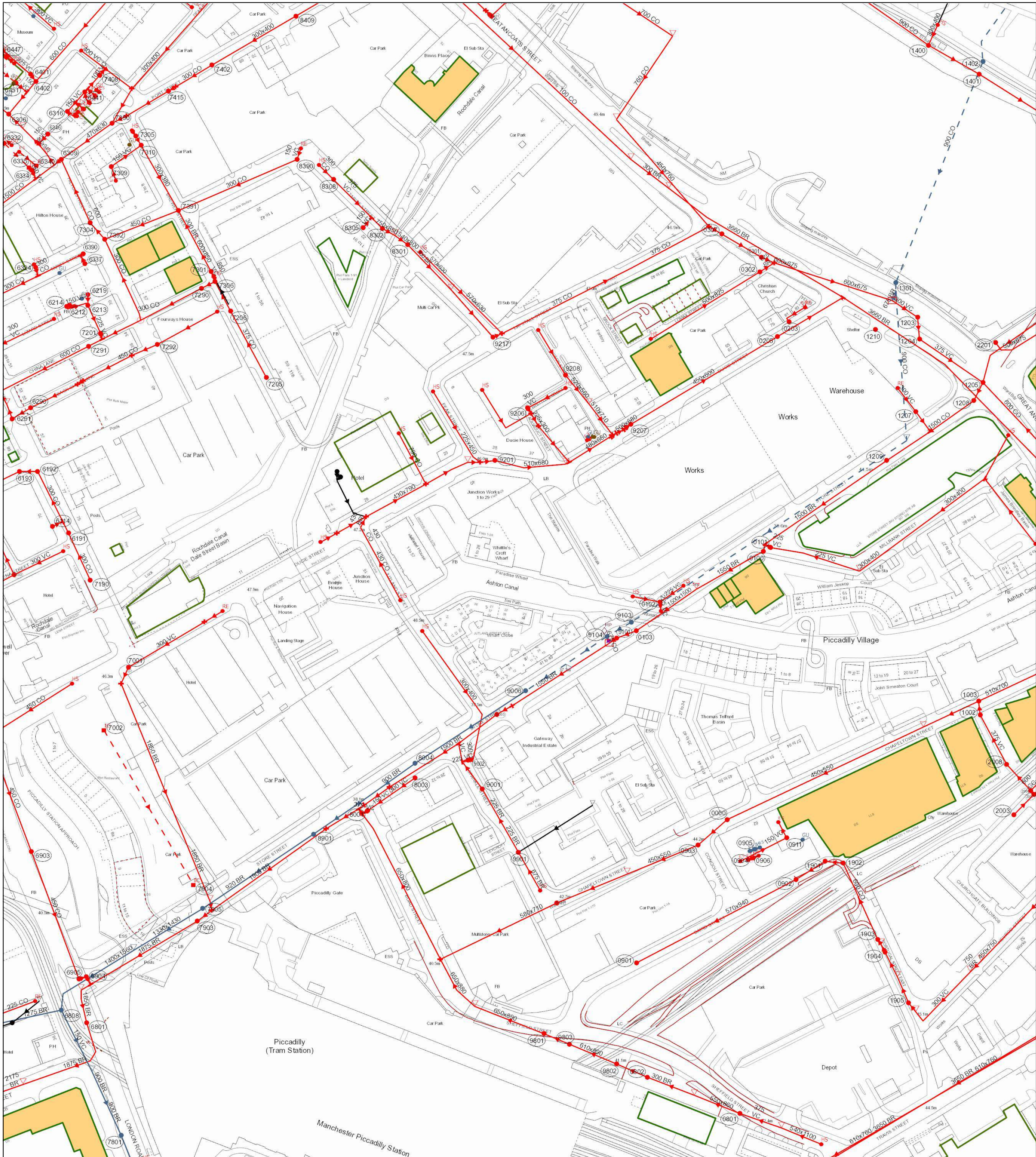
Karen McCormack  
Property Searches Manager

## TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

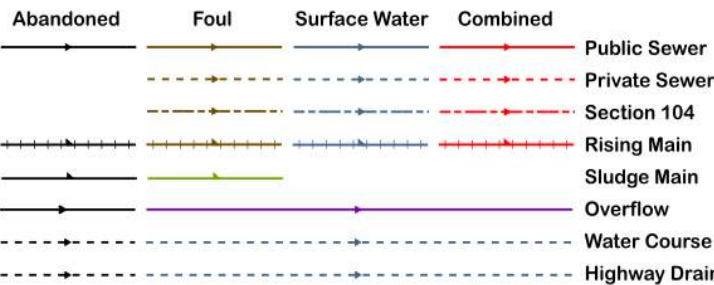
### TERMS AND CONDITIONS:

- This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position and depth of any UUWL apparatus shown on the Map are approximate only. UUWL strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUWL apparatus. The exact location, positions and depths should be obtained by excavation trial holes.
- The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.
- The position and depth of UUWL apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.
- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



| Refo | Cover | Func | Invert | Size x | Size y | Shape | Matl | Length   | Grad            |
|------|-------|------|--------|--------|--------|-------|------|----------|-----------------|
| 0903 | 46.26 | CO   | 41.44  | 375    |        |       | VC   | 42.15445 | 1 in 113        |
| 2003 | 46.26 | CO   | 41.44  | 375    |        |       | VC   | 15.76138 |                 |
| 0307 | 46.64 | CO   | 39.59  | 600    |        |       | BR   | 25.45544 | 1 in 367        |
| 7205 | 46.33 | CO   | 43.93  | 375    |        |       | CO   | 18.37468 |                 |
| 2000 | 46.48 | CO   | 41.22  | 375    |        |       | VC   | 2.803735 |                 |
| 1002 |       |      |        |        |        |       | VC   | 2.552588 |                 |
| 0301 | 45.79 | CO   | 0      | 600    |        |       | BR   | 7.615773 |                 |
| 7408 |       |      |        |        |        |       | VC   | 1.125611 |                 |
| 9206 |       |      |        |        |        |       | CO   | 3.605551 |                 |
| 9802 |       |      |        |        |        |       | VC   | 29.21111 | 1 in 66         |
| 1402 | 45.86 | SW   | 37.14  | 600    |        |       | CO   | 13.1103  |                 |
| 6316 |       |      |        |        |        |       | VC   | 14.20068 |                 |
| 7205 | 45.73 | CO   | 44.04  | 375    |        |       | CO   | 41.58894 | 1 in 416        |
| 1003 |       |      |        |        |        |       | BR   | 33.77514 | 1 in 10         |
| 0911 |       |      |        |        |        |       | VC   | 9.059594 |                 |
| 6324 |       |      |        |        |        |       | VC   | 4.940213 |                 |
| 6200 | 46.48 | CO   | 41.22  | 375    |        |       | VC   | 19.62488 |                 |
| 6451 |       |      |        |        |        |       | VC   | 7.79177  |                 |
| 9902 | 42.3  | CO   | 36.35  | 580    |        |       | BR   | 71.11299 |                 |
| 6214 |       |      |        |        |        |       | VC   | 13.83322 |                 |
| 6337 |       |      |        |        |        |       | VC   | 5.335555 |                 |
| 2000 | 46.48 | CO   | 41.22  | 375    |        |       | VC   | 38.92028 | 1 in 419        |
| 7306 | 47.19 | CO   | 43.87  | 375    |        |       | CO   | 8.376329 |                 |
| 6441 |       |      |        |        |        |       | VC   | 12.46028 |                 |
| 9217 |       |      |        |        |        |       | CO   | 5.385165 |                 |
| 6219 |       |      |        |        |        |       | VC   | 5.942734 |                 |
| 6103 | 45.93 | CO   | 0      | 300    |        |       | VC   | 18.78259 | 1 in 26         |
| 6402 | 48.47 | CO   | 44.19  | 600    |        |       | CO   | 23.43075 |                 |
| 8003 | 37.56 | CO   | 33.99  | 300    |        |       | VC   | 15.81155 |                 |
| 9409 |       |      |        |        |        |       | CO   | 53.82443 |                 |
| 7402 | 48.83 | CO   | 44.58  | 300    |        |       | VC   | 23.32381 |                 |
| 7801 | 39.93 | SW   | 29     | 900    |        |       | BR   | 79.84986 | 1 in 639        |
| 6309 |       |      |        |        |        |       | CO   | 4.95997  |                 |
| 6306 | 48.41 | CO   | 42.97  | 1600   |        |       | CO   | 25.54511 |                 |
| 9201 | 45.67 | CO   | 41.97  | 510    |        |       | BR   | 39.57922 |                 |
| 8302 | 48.56 | CO   | 41.09  | 750    |        |       | BR   | 41.05258 | 1 in 119        |
| 9901 | 38.41 | SW   | 32.05  | 920    |        |       | BR   | 73.4983  | 1 in 4          |
| 1205 | 44.33 | CO   | 35.03  | 1500   |        |       | VC   | 11.18034 |                 |
| 9101 | 36.79 | CO   | 32.65  | 1550   |        |       | BR   | 4.895671 | 1 in 16         |
| 9901 | 42.96 | CO   | 37.53  | 225    |        |       | VC   | 46.31129 |                 |
| 8801 | 39.58 | CO   | 31.14  | 1875   |        |       | BR   | 61.81135 |                 |
| 9002 | 38.03 | CO   | 33.32  | 225    |        |       | VC   | 4.123106 |                 |
| 0100 | 39.21 | CO   | 33.63  | 1550   |        |       | VC   | 42.54499 | 1 in 10         |
| 7415 |       |      |        |        |        |       | VC   | 28.86701 |                 |
| 0103 | 36.75 | CO   | 33.87  | 470    |        |       | BR   | 11.68867 |                 |
| 0102 | 37.18 | CO   | 33.72  | 225    |        |       | VC   | 5.099003 |                 |
| 9301 | 48.37 | CO   | 41.16  | 300    |        |       | BR   | 4.65545  | 1 in 112        |
| 6291 | 46.98 | CO   | 42.51  | 450    |        |       | CO   | 8.544003 |                 |
| 9801 | 42.32 | CO   | 37.99  | 550    |        |       | BR   | 29.92562 |                 |
| 9801 | 36.05 | CO   | 33.64  | 375    |        |       | VC   | 3.605551 |                 |
| 0101 | 39.24 | CO   | 35.25  | 225    |        |       | VC   | 4.932576 | 1 in 52         |
| 6334 |       |      |        |        |        |       | CO   | 4.358779 |                 |
| 6905 |       |      |        |        |        |       | BR   | 122.1995 |                 |
| 6905 | 39.59 | SW   | 29.25  | 1275   |        |       | VC   | 99.29753 | 1 in 138        |
| 0902 | 45.18 | CO   | 0      | 570    |        |       | BR   | 38.01516 | 1 in 44         |
| 8004 | 37.76 | SW   | 32.63  | 600    |        |       | CO   | 15.23155 |                 |
| 7202 | 47.35 | CO   | 43.5   | 450    |        |       | VC   | 15.23155 | 1 in 171        |
| 1905 | 45.1  | CO   | 40.67  | 370    |        |       | VC   | 15.23155 | 1 in 270        |
| 1204 | 43.57 | CO   | 38     | 375    |        |       | VC   | 4.472135 | 1 in 50         |
| 7301 | 47.3  | CO   | 45.5   | 600    |        |       | BR   | 18.76307 | 1 in 145        |
| 9401 | 50.56 | CO   | 45.66  | 900    |        |       | VC   | 4.24094  | 1 in 67         |
| 1901 | 45.22 | CO   | 39.58  | 600    |        |       | BR   | 18.86795 | 1 in 97         |
| 1904 | 45.31 | CO   | 40.45  | 350    |        |       | VC   | 4.472135 | 1 in 52         |
| 1209 | 42.01 | CO   | 34.42  | 1500   |        |       | BR   | 85.35426 |                 |
| 6182 | 46.83 | CO   | 43.2   | 300    |        |       | CO   | 10       |                 |
| 6290 | 47    | CO   | 42.64  | 450    |        |       | CO   | 11.6919  |                 |
| 6193 | 46.78 | CO   | 43.03  | 300    |        |       | CO   | 32.20248 |                 |
| 6213 |       |      |        |        |        |       | VC   | 16.86002 |                 |
| 7503 | 38.9  | CO   | 31.44  | 1875   |        |       | BR   | 74.43118 |                 |
| 9801 | 40.8  | CO   | 36.49  | 650    |        |       | BR   | 40.8534  |                 |
| 9207 | 45.26 | CO   | 41.04  | 450    |        |       | BR   | 94.06869 |                 |
| 9001 | 39.49 | CO   | 34.98  | 300    |        |       | VC   | 28.73911 |                 |
| 6903 |       |      |        |        |        |       | VC   | 75.14354 |                 |
| 1301 |       | SW   |        |        |        |       | CO   | 67.22192 |                 |
| 9208 | 46.97 | CO   | 43.22  | 520    |        |       | BR   | 28.61553 | 1 in 85         |
| 7291 | 47.3  | CO   | 42.94  | 600    |        |       | CO   | 55.00909 | 1 in 110        |
| 6390 | 47.88 | CO   | 45.75  | 300    |        |       | VC   | 71.22428 | 1 in 20         |
| 8305 | 45.88 | CO   | 42.74  | 150    |        |       | VC   | 7.301441 | 1 in 31         |
| 9401 | 48.44 | CO   | 44.49  | 225    |        |       | VC   | 5        | 1 in 109        |
| 7392 | 47.97 | CO   | 43.52  | 600    |        |       | CO   | 12.04159 |                 |
| 1401 | 45.7  | CO   | 38.09  | 900    |        |       | CO   | 54.3783  | 1 in 54         |
| 6103 | 45.93 | CO   | 43.09  | 370    |        |       | BR   | 56.20773 |                 |
| 1207 | 42.92 | CO   | 36.89  | 300    |        |       | VC   | 13.60147 | 1 in 0.98677615 |
| 7390 | 46.46 | CO   | 43.3   | 470    |        |       | CO   | 34.40931 |                 |
| 9006 | 37.22 | SW   | 33.22  | 900    |        |       | BR   | 72.94518 | 1 in 130        |
| 7305 |       |      |        |        |        |       | VC   | 6.013783 |                 |
| 6808 | 39.59 | SW   | 29.25  | 150    |        |       | VC   | 38.01316 | 1 in 422        |
| 7201 |       |      |        |        |        |       | VC   | 3.358119 |                 |
| 7304 | 48.07 | CO   | 43.39  | 600    |        |       | VC   | 38.46376 |                 |
| 7310 |       |      |        |        |        |       | VC   | 41.44429 |                 |
| 0802 | 41.7  | CO   | 37.47  | 300    |        |       | BR   | 18.36787 | 1 in 37         |
| 6191 | 46.88 | CO   | 43.75  | 300    |        |       | CO   | 38.01316 | 1 in 70         |
| 6390 | 47.87 | CO   | 45.6   | 300    |        |       | CO   | 74.68601 | 1 in 65         |
| 1400 | 47    | CO   | 38.81  | 900    |        |       | CO   | 32.24903 | 1 in 47         |
| 1203 | 43.94 | CO   | 38.16  | 375    |        |       | VC   | 12.04159 | 1 in 75         |
| 0302 | 45.94 | CO   | 41.45  | 825    |        |       | BR   | 9.433981 |                 |
| 1903 | 45.32 | CO   | 40.27  | 600    |        |       | CO   | 46.09772 | 1 in 105        |
| 8308 |       |      |        |        |        |       | VC   | 38.18377 |                 |
| 7190 | 46.86 | CO   | 44.65  | 300    |        |       | CO   | 28.63564 | 1 in 33         |
| 9104 |       | SW   | 33.72  | 900    |        |       | BR   | 27.13569 | 1 in 113        |
| 7905 | 38.95 | SW   | 31.17  | 1330   |        |       | BR   | 44.41846 |                 |
| 7001 | 46.21 | CO   | 44.06  | 300    |        |       | VC   | 9.948558 |                 |
| 9103 |       | SW   |        |        |        |       | BR   | 15.61097 |                 |
| 0000 | 44.45 | CO   | 37.64  | 450    |        |       | VC   | 21.25029 |                 |
| 7209 |       |      |        |        |        |       | VC   | 20.12815 |                 |
| 6904 |       |      |        |        |        |       | CO   | 4.97611  |                 |
| 9005 | 37.34 | CO   | 32.29  | 1900   |        |       | BR   | 71.34517 | 1 in 50         |
| 7391 | 48.03 | CO   | 45.04  | 450    |        |       | CO   | 43.56176 | 1 in 158        |
| 7290 | 47.22 | CO   | 43.94  | 300    |        |       | CO   | 37.81025 |                 |
| 0205 |       |      |        |        |        |       | BR   | 42.18551 |                 |
| 1902 | 45.39 | CO   | 39.76  | 600    |        |       | CO   | 10.04988 | 1 in 77         |
| 6346 |       |      |        |        |        |       | VC   | 7.530991 |                 |
| 9803 | 41.09 | CO   | 36.87  | 610    |        |       | BR   | 15.24851 | 1 in 32         |
| 1208 | 44.2  | CO   | 32.45  | 1500   |        |       | CO   | 58.25029 |                 |

## LEGEND



All point assets follow the standard colour convention:  
red - combined  
brown - foul  
blue - surface water  
purple - overflow

- Manhole
- Head of System
- Extent of Survey
- Rodding Eye
- Inlet
- Discharge Point
- Vortex
- Penstock
- Washout Chamber
- Valve
- Air Valve
- Non Return Valve
- Soakaway
- Gully
- Cascade
- Flow Meter
- Hatch Box
- Oil Interceptor
- Summit
- Drop Shaft
- Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- Inspection Chamber
- Bifurcation Chamber
- Lamp Hole
- T Junction / Saddle
- Catchpit
- Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- Network Storage Tank
- Sewer Overflow
- Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- Control Kiosk
- Change of Characteristic

## MANHOLE FUNCTION

- FO Foul
- SW Surface Water
- CO Combined
- OV Overflow

## SEWER SHAPE

- CI Circular
- EG Egg
- OV Oval
- FT Flat Top
- RE Rectangular
- SQ Square
- TR Trapezoidal
- AR Arch
- BA Barrel
- HO HorseShoe
- UN Unspecified

## SEWER MATERIAL

- AC Asbestos Cement
- BR Brick
- PE Polyethylene
- RP Reinforced Plastic Matrix
- CO Concrete
- CSB Concrete Segment Bolted
- CSU Concrete Segment Unbolted
- CC Concrete Box Culverted
- PSC Plastic / Steel Composite
- GRC Glass Reinforced Plastic
- DI Ductile Iron
- PVC Polyvinyl Chloride
- CI Cast Iron
- SI Spun Iron
- ST Steel
- VC Vitrified Clay
- PP Polypropylene
- PF Pitch Fibre
- MAC Masonry, Coursed
- MAR Masonry, Random
- U Unspecified

## Address or Site Reference:

Paradise Wharf,

Scale: 1:1250

Date: 09/12/2021

Sheet: 1 of 1

Printed by: Property Searches

SEWER  
RECORDS

United  
Utilities  
Water for the North West

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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**Lead Local Flood Authority**

Highways Service  
Growth and Neighbourhoods Directorate  
Manchester City Council  
PO Box 532  
Town Hall  
Manchester  
M60 2LA

Email: [floodriskmanagement@manchester.gov.uk](mailto:floodriskmanagement@manchester.gov.uk)

**DATE:09/12/2021**

Dear Sir or Madam,

**RE: Our Ref: MCC008/12/2021**

We acknowledge with thanks your payment for our LLFA data screen service.

Please find enclosed plan showing the results of the data screen. The position of features shown on this plan is approximate only and is given in accordance with the best information currently available.

The enclosed plan cannot be used to substitute a competent site investigation.

The enclosed plan is being provided to you subject to Manchester City Council's terms and conditions which are shown attached.

I trust the above meets your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter, please do not hesitate to contact us.

Yours Faithfully,



**Neil Bayliss-Rowe, Highways Development Control & Flood Risk Manager, Lead Local Flood Authority**

### **TERMS AND CONDITIONS – LLFA DATA SCREEN**

These provisions apply to LLFA data supplied by Manchester City Council (“MCC”).

#### **TERMS AND CONDITIONS:**

- This data Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.
- MCC has taken all reasonable care to compile this data Map. This data Map and any information supplied with it is provided for general guidance only and MCC makes no representation, undertaking or warranty of any kind as to its accuracy, completeness or being up to date is given or implied.
- In particular, the position of any culverted assets shown on the data Map are approximate only. MCC strongly recommends that a comprehensive site investigation is undertaken in addition to reviewing this data Map to determine and ensure the precise location of any assets. The exact location, positions and depths should be obtained by an appropriate survey which may include but shall not be limited to GPR and CCTV.
- The data screened may be modified over time without notice and therefore this data Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the data Map have been made subsequent to issue and prior to any works being carried out.
- This data Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) or for the purpose of determining the suitability of a point of connection to discharge.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising from damages of any kind caused to assets by reason of the actual position and/or existence of assets being different from those shown on the data Map and any information supplied with it.
- If any provision contained herein is or becomes legally invalid or unenforceable, it will be taken to be severed from the remaining provisions which shall be unaffected and continue in full force and affect.
- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent MCC from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.

## DATA SCREEN SYMBOLOGY

### Bridge

-  Good
-  Fair
-  Poor
-  Very Poor
-  Unknown

### Trash Screen

-  Good
-  Fair
-  Poor
-  Very Poor
-  Unknown

### Culvert Orifice

-  Very Good
-  Good
-  Fair
-  Poor
-  Very Poor
-  Unknown

### Culvert Conduit

-  CCTV surveyed
-  Not CCTV surveyed
-  Ordinary Watercourse Conduit
-  MCC SuDS
-  MCC Flood Incident Points
-  MCC Section 19 Report
-  MCC Flood Incident Polygons
-  MCC Local Authority Boundary



**Supplementary Information where available:**

**Critical Drainage Area** – The site is within the Conurbation Core (CDA)

**Flood Incidents** –

**MCC Flood Incident Polygon:**

-Store Street Aqueduct – Seepage from banks running down highway and footway of Store Street – reported March 2017.

**MCC Flood Incident Points (within close proximity to the site):**

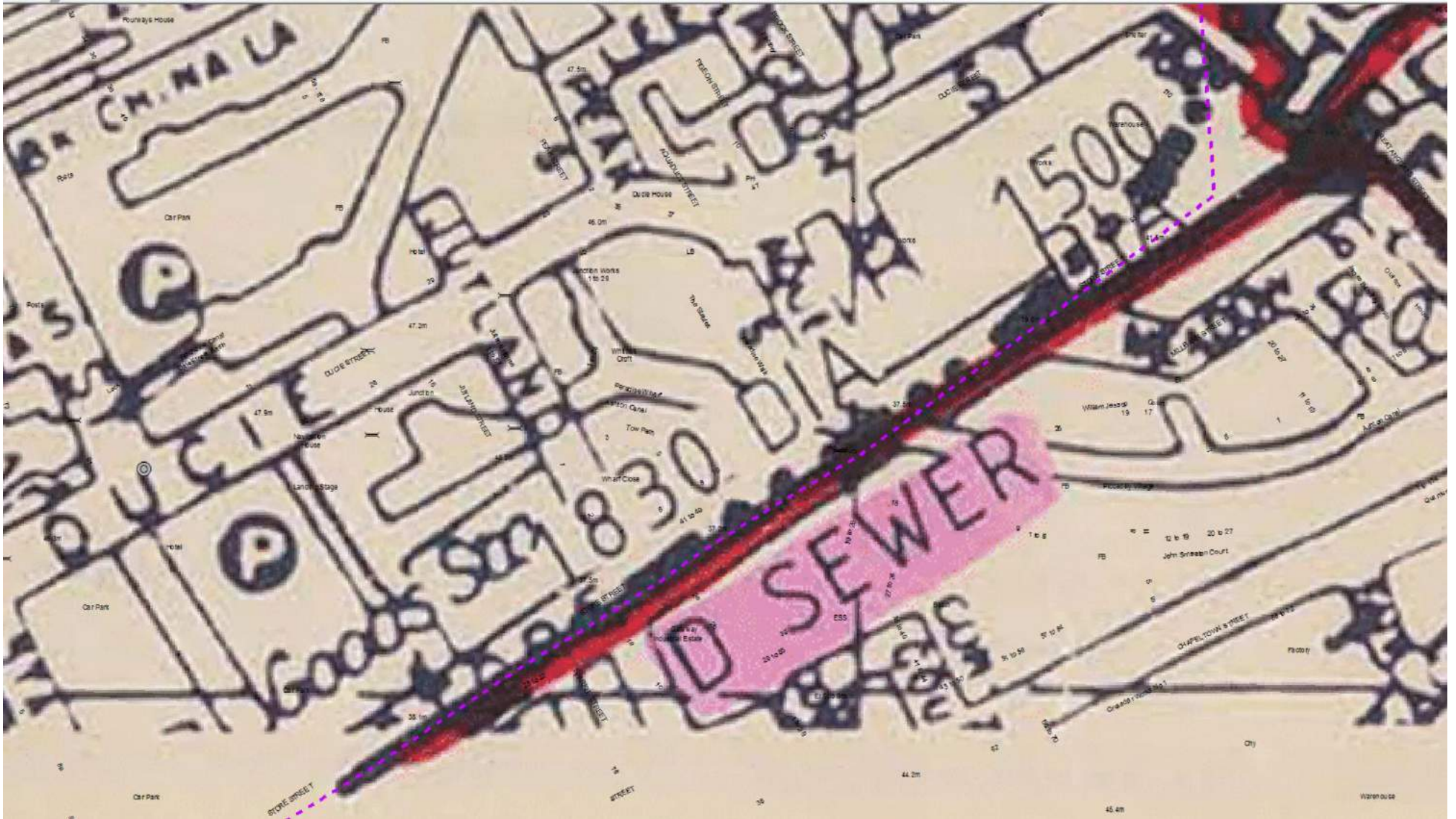
-Points directly beneath canal on Store Street are blocked gullies dated 2019. Point on Store Street South of Canal is recorded as 'flooding on highway' dated October 2020 (source of flooding not specified). Points on Jutland Street and Ducie Street are gully issues (blockage or loose cover) both dated 2019.

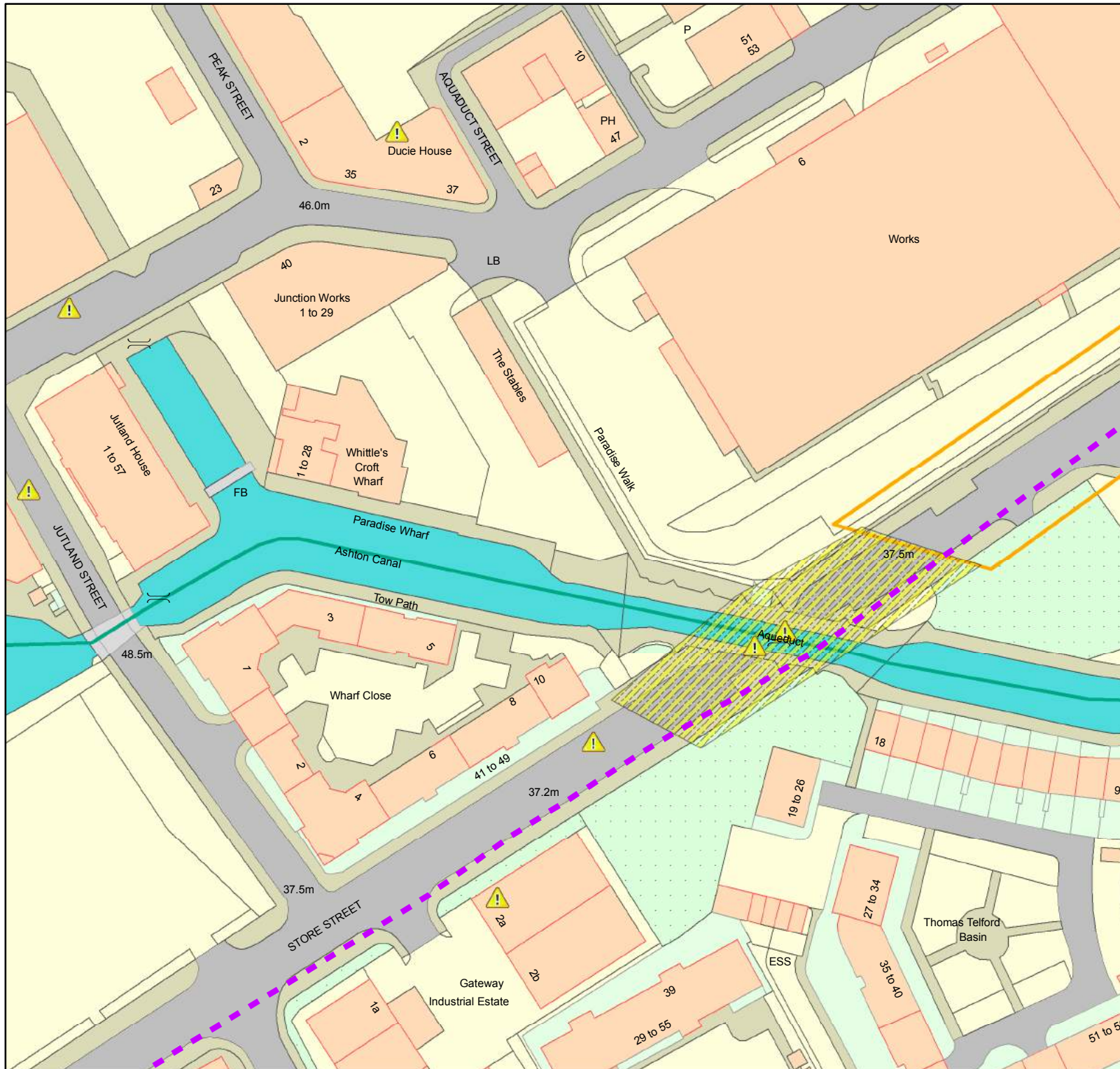
**Culvert Conduits** – The culverted ordinary watercourse called the Shooters Brook is located within Store Street. The culvert is recorded on the United Utilities records as being a 900mm circular brick culvert.

**Survey and Design Archive** – Extract from the 1984 survey of major drainage is included.

**Any other information** – The site would benefit from an assessment of surface water flood risk, main rivers & associated assets (canals), fluvial flood risk, historic events & flood warning areas. We recommend the applicant screens appropriate EA datasets during their investigation.

### Historic 1984 Mapping:





MANCHESTER  
CITY COUNCIL

## LLFA DATA SCREEN

Address/Site Ref:

**Paradise Wharf**

Our Ref: **MCC008/12/2021**

Author: Manchester City Council LLFA

Date: 09/12/2021

Scale: 1:1,051

The position of features shown on this plan is approximate only and is given in accordance with the best information currently available. Manchester City Council will not accept liability for any loss or damage caused by the actual position being different from those shown.

0 5 10 20  
Meters

N



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## **APPENDIX C – CORRESPONDANCE**

## Carl Dawson

---

**From:** Deborah McCormick <Deborah.McCormick@canalrivertrust.org.uk>  
**Sent:** 14 December 2021 16:01  
**To:** Carl Dawson  
**Cc:** Christopher Acton; Gareth Taylor  
**Subject:** RE: [CCL: 1-21074] 1-21074 Paradise Wharf, Manchester

### CAUTION: EXTERNAL EMAIL

Hi Carl,

Thanks for your email.

At the moment we can't accept new applications for SWD into the canal at this location, however, I am expecting the results of a flood model study from our Hydrologists in Late January which will identify potential mitigation measures we can introduce to allow us to accept future SWD to the canal, so it really depends on the timescales for your scheme.

If you wanted to proceed with an application to drain into the canal, in the first instance you would need to sign up to our code of practice and follow the mandatory process, I have copied in our Works Engineer, Gareth Taylor who would deal with your application and can send you all the relevant details, Gareth is currently off but will be able to assist on his return.

Kind regards  
Deborah

#### Deborah McCormick

Utilities Surveyor BSc (Hons)  
Canal & River Trust, North West Region  
M 07768 447444  
My working days are Monday to Thursday



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**Rainbow Ally**

---

**From:** Carl Dawson <carl.dawson@clancy.co.uk>  
**Sent:** 08 December 2021 15:26  
**To:** Deborah McCormick <Deborah.McCormick@canalrivertrust.org.uk>; Joe Hildred <Joe.Hildred@canalrivertrust.org.uk>  
**Cc:** Christopher Acton <chris.acton@clancy.co.uk>  
**Subject:** [CCL: 1-21074] 1-21074 Paradise Wharf, Manchester

You don't often get email from [carl.dawson@clancy.co.uk](mailto:carl.dawson@clancy.co.uk). [Learn why this is important](#)

**CAUTION: This email originated from an external source. DO NOT CLICK/OPEN links or attachments unless you are certain of their origin.**

Hi Deborah/Joe,

We are looking to develop a drainage strategy for a site adjacent to the Ashton Canal in Manchester.

The site boundary is shown on the below and attached a wider site plan FYI.



We are reviewing the hierarchy for discharging surface water for the above site and with the canal being so close to the site, it is likely that the local planning authority may request that Surface Water is discharged here, should infiltration not be feasible.

I am aware of recent developments being rejected permission to discharge to the Rochdale Canal (just north of our site) due to capacity issues therefore we seek your advice for this development.

Its worth noting that the current site discharges SW to public combined sewer in Paradise Walk, to the east/southeast of the site.

Should CRT consider it acceptable to discharge SW to the Ashton Canal, please can you provide your requirements with regards to discharge rates etc.

I would be grateful if you could review and advise at your earliest convenience.

If you require any further information please get in touch.

Kind regards

Carl Dawson



**Carl Dawson**

Senior Civil Engineer



Dunham Court, 2 Dunham Road, Altrincham, Cheshire, WA14 4NX.



[carl.dawson@clancy.co.uk](mailto:carl.dawson@clancy.co.uk)



Tel: 0161 613 6000



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Canal & River Trust is a charitable company limited by guarantee registered in England & Wales with company number 7807276 and charity number 1146792. Registered office address National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

### Cadw mewn cysylltiad

Cofrestrwch i dderbyn e-gylchlythyr Glandŵr Cymru <https://canalrivertrust.org.uk/newsletter>

Cefnogwch ni ar <https://www.facebook.com/canalrivertrust>

Dilynwch ni ar <https://twitter.com/canalrivertrust> ac <https://www.instagram.com/canalrivertrust>

Mae'r e-bost hwn a'i atodiadau ar gyfer defnydd y derbynnydd bwriedig yn unig. Os nad chi yw derbynnydd bwriedig yr e-bost hwn a'i atodiadau, ni ddylech gymryd unrhyw gamau ar sail y cynnwys, ond yn hytrach dylech eu dileu heb eu copïo na'u hanfon ymlaen a rhoi gwybod i'r anfonwr eich bod wedi eu derbyn ar ddamwain. Mae unrhyw farn neu safbwynt a fynegir yn eiddo i'r awdur yn unig ac nid ydynt o reidrwydd yn cynrychioli barn a safbwyntiau Glandŵr Cymru.

Mae Glandŵr Cymru yn gwmni cyfyngedig drwy warant a gofrestrwyd yng Nghymru a Lloegr gyda rhif cwmni 7807276 a rhif elusen gofrestredig 1146792. Swyddfa gofrestredig: National Waterways Museum Ellesmere Port, South Pier Road, Ellesmere Port, Cheshire CH65 4FW.

**From:** Carl Dawson  
**Sent:** 14 December 2021 17:19  
**To:** floodriskmanagement@manchester.gov.uk  
**Subject:** [CCL: 1-21074] Paradise Mews, Manchester.  
**Attachments:** 20005\_0300 - SITE LOCATION PLAN.pdf

Good afternoon,

We are currently producing an FRA and Drainage Strategy for a site located off Ducie Street, Manchester. The site is less than 1ha, in FZ1 however lies within the Conurbation Core CDA, please see location plan attached.

The existing site comprises of 100% hard standing areas. The proposal is to erect a 4-storey residential building with external areas to the north of access.

Following the hierarchy of surface water disposal for new developments, we have followed the order as set out below.

#### **Infiltration**

The nature of the development and building footprint doesn't allow for any soakaway features to be installed >5m away from existing and proposed buildings. Therefore, this has been discounted to prevent risk to properties.

#### **Watercourse**

The site is located adjacent to the Aston canal. Canals and Rivers Trust have been consulted to confirm if surface water can be discharged to the Aston canal and at this time permission to discharge has been rejected.

Following a review of United Utilities Sewer maps and Manchester LLFA data screening information, there is a 900mm Culverted Watercourse within Store Street south of the site, which then connects to a SW Public sewer further downstream. This is approximately 50m from the centroid of the site and set c.10m lower. Adjacent to our site in Paradise Walk is a 450mm diameter drain which connects to the watercourse in Store Street. Therefore, we propose to discharge SW flows to the watercourse via the 450mm existing drain, as per the existing scenario.

#### **Public Surface Water Sewer**

There are no public surface water sewers within the immediate vicinity of the site. The culverted watercourse in Store Street connects to the surface water public sewer further downstream however given its distance from the site, it is considered not a viable option.

#### **Public Combined Water Sewer**

There are several public combined sewers within the vicinity of the site which could potentially be used to receive surface flows from the development. This option maybe explored should the proposed connection to the culverted watercourse in Store Street become a non-viable option.

Following a review of the topographical survey, it is evident that surface water is positively draining from the site via gullies. The gully within the north eastern corner has been dye tested and confirmed to connect to the culverted watercourse via the 450mm diameter pipe in Paradise Walk.

We have calculated existing flows from the sites hardstanding/impermeable area (0.036ha) using the Wallingford Modified rational method ( $Q = 2.78 C_v C_R i A$ ) based on 50mm/hr and the rate is 5 l/s.

Applying a 50% reduction on existing flows in line with existing planning policies, the proposed discharge rate for the redeveloped areas would be c.2.5l/s. We suggest increasing this to 5 l/s for all storms up to and including 40% climate change, to reduce the risk of blockage due to the small orifice size that would be required for flows smaller than this.

In order to achieve the above flow restrictions, a flow control device would be located within the last chamber prior to discharging off site. Attenuation within our site will be provided using appropriate SuDs features.

I would be grateful if MCC can review our proposed surface water discharge rates, location and provide approval in principle.

We have also issued the above to UU for their comment. It is assumed that foul water from the development will be allowed to connect to the surrounding public combined sewers.

If you have any questions please do not hesitate to get in contact.

Kind Regards  
Carl Dawson

**From:** Carl Dawson  
**Sent:** 14 December 2021 17:22  
**To:** WastewaterDeveloperServices@uuplc.co.uk  
**Subject:** [CCL: 1-21074] Paradise Mews, Manchester.  
**Attachments:** 20005\_0300 - SITE LOCATION PLAN.pdf

Good afternoon,

We are currently producing an FRA and Drainage Strategy for a site located off Ducie Street, Manchester. The site is less than 1ha, in FZ1 however lies within the Conurbation Core CDA, please see location plan attached.

The existing site comprises of 100% hard standing areas. The proposal is to erect a 4-storey residential building with external areas to the north of access.

Following the hierarchy of surface water disposal for new developments, we have followed the order as set out below.

### **Infiltration**

The nature of the development and building footprint doesn't allow for any soakaway features to be installed >5m away from existing and proposed buildings. Therefore, this has been discounted to prevent risk to properties.

### **Watercourse**

The site is located adjacent to the Aston canal. Canals and Rivers Trust have been consulted to confirm if surface water can be discharged to the Aston canal and at this time permission to discharge has been rejected.

Following a review of United Utilities Sewer maps and Manchester LLFA data screening information, there is a 900mm Culverted Watercourse within Store Street south of the site, which then connects to a SW Public sewer further downstream. This is approximately 50m from the centroid of the site and set c.10m lower. Adjacent to our site in Paradise Walk is a 450mm diameter drain which connects to the watercourse in Store Street. Therefore, we propose to discharge SW flows to the watercourse via the 450mm existing drain, as per the existing scenario.

### **Public Surface Water Sewer**

There are no public surface water sewers within the immediate vicinity of the site. The culverted watercourse in Store Street connects to the surface water public sewer further downstream however given its distance from the site, it is considered not a viable option.

### **Public Combined Water Sewer**

There are several public combined sewers within the vicinity of the site which could potentially be used to receive surface flows from the development. This option maybe explored should the proposed connection to the culverted watercourse in Store Street become a non-viable option.

Following a review of the topographical survey, it is evident that surface water is positively draining from the site via gullies. The gully within the north eastern corner has been dye tested and confirmed to connect to the culverted watercourse via the 450mm diameter pipe in Paradise Walk.

We have calculated existing flows from the sites hardstanding/impermeable area (0.036ha) using the Wallingford Modified rational method ( $Q = 2.78 C_v CR i A$ ) based on 50mm/hr and the rate is 5 l/s.

Applying a 50% reduction on existing flows in line with existing planning policies, the proposed discharge rate for the redeveloped areas would be c.2.5l/s. We suggest increasing this to 5 l/s for all storms up to and including 40% climate change, to reduce the risk of blockage due to the small orifice size that would be required for flows smaller than this.

In order to achieve the above flow restrictions, a flow control device would be located within the last chamber prior to discharging off site. Attenuation within our site will be provided using appropriate SuDs features.

I would be grateful if UU can review our proposed surface water discharge rates, location and provide approval in principle.

We have also issued the above to Manchester LLAS for their comment.

It is assumed that foul water from the development will be allowed to connect to the surrounding public combined sewers.

If you have any questions please do not hesitate to get in contact.

Kind Regards  
Carl Dawson

## **APPENDIX D – QUICK STORAGE ESTIMATE**

**Quick Storage Estimate**

**Variables**

FSR Rainfall: [v]  
 Return Period (years): 100  
 Region: England and Wales [v]  
 Map: M5-60 (mm): 18.000  
 Ratio R: 0.359  
 Cv (Summer): 0.750  
 Cv (Winter): 0.840  
 Impermeable Area (ha): 0.036  
 Maximum Allowable Discharge (l/s): 5.0  
 Infiltration Coefficient (m/hr): 0.00000  
 Safety Factor: 2.0  
 Climate Change (%): 40

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

**Quick Storage Estimate**

**Results**

Global Variables require approximate storage of between 4.4 m<sup>3</sup> and 10 m<sup>3</sup>.  
 These values are estimates only and should not be used for design purposes.

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

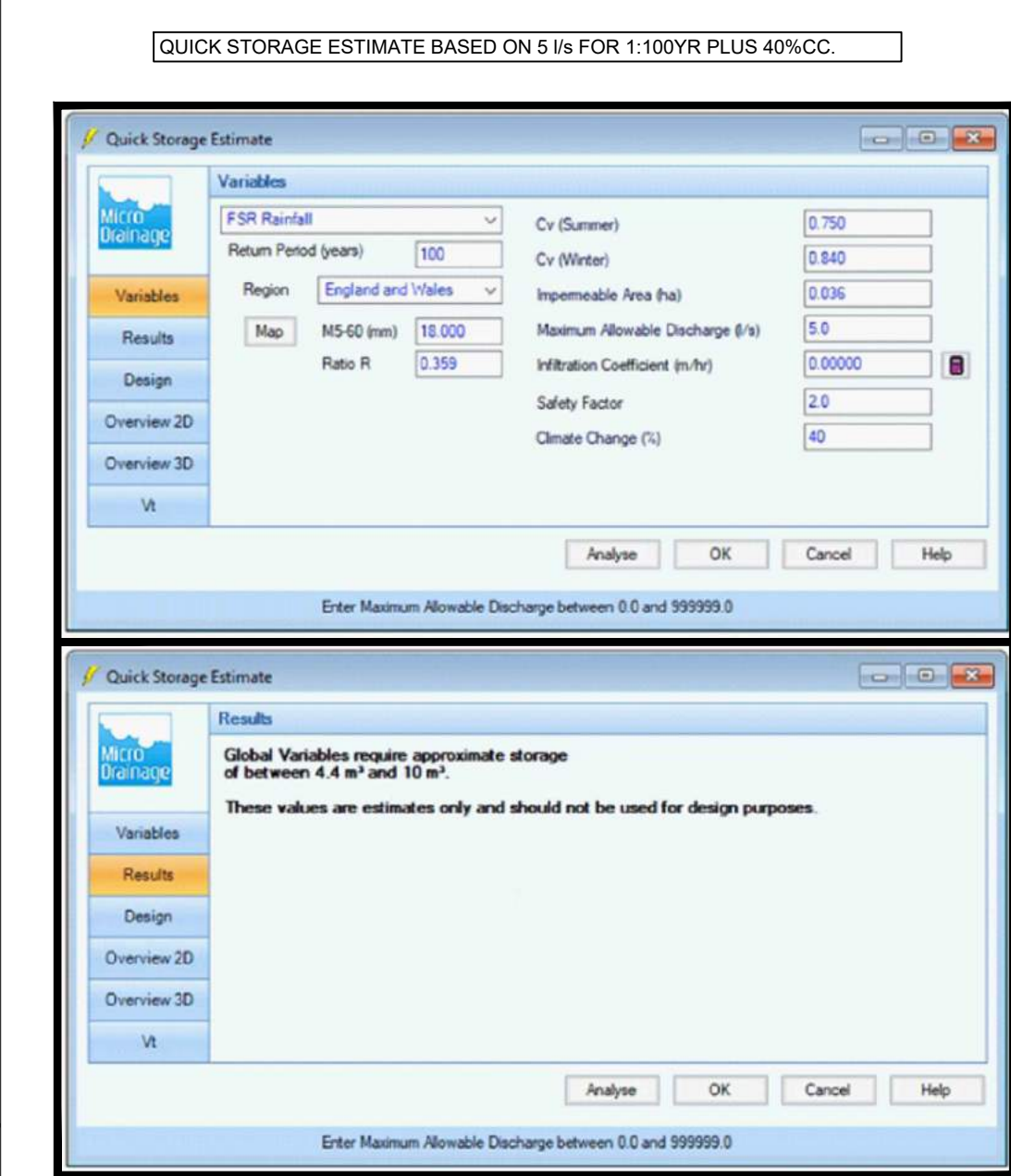
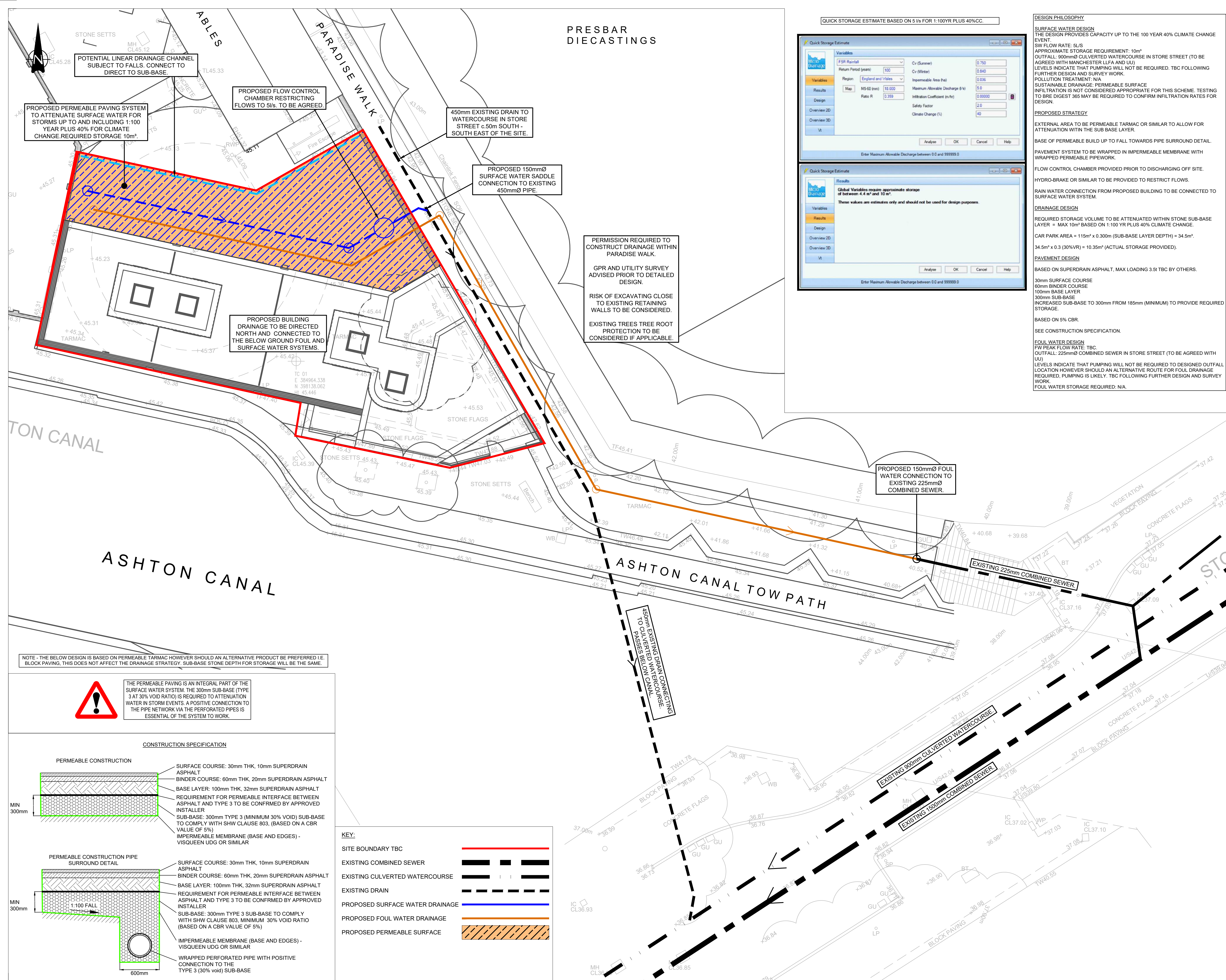
### Quick Storage Estimate using Micro Drainage Software.

Maximum DR = 5l/s

A = 0.036ha

RP = 100yr + 40% CC

## **APPENDIX E – DRAINAGE STRATEGY LAYOUT**



**DESIGN PHILOSOPHY**

**SURFACE WATER DESIGN**  
THE DESIGN PROVIDES CAPACITY UP TO THE 100 YEAR 40% CLIMATE CHANGE EVENT.  
SW FLOW RATE: 5L/S  
APPROXIMATE STORAGE REQUIREMENT: 10m³  
OUTFALL: 900mmØ CULVERTED WATERCOURSE IN STORE STREET (TO BE AGREED WITH MANCHESTER LLFA AND UU)  
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED. TBC FOLLOWING FURTHER DESIGN AND SURVEY WORK.  
POLLUTION TREATMENT: N/A  
SUSTAINABLE DRAINAGE: PERMEABLE SURFACE INFILTRATION IS NOT CONSIDERED APPROPRIATE FOR THIS SCHEME. TESTING TO BRE DIGEST 365 MAY BE REQUIRED TO CONFIRM INFILTRATION RATES FOR DESIGN.

**PROPOSED STRATEGY**

EXTERNAL AREA TO BE PERMEABLE TARMAC OR SIMILAR TO ALLOW FOR ATTENUATION WITHIN THE SUB-BASE LAYER.

PAVEMENT SYSTEM TO BE WRAPPED IN IMPERMEABLE MEMBRANE WITH WRAPPED PERMEABLE PIPEWORK.

FLOW CONTROL CHAMBER PROVIDED PRIOR TO DISCHARGING OFF SITE.

HYDRO-BRAKE OR SIMILAR TO BE PROVIDED TO RESTRICT FLOWS.

RAIN WATER CONNECTION FROM PROPOSED BUILDING TO BE CONNECTED TO SURFACE WATER SYSTEM.

**DRAINAGE DESIGN**

REQUIRED STORAGE VOLUME TO BE ATTENUATED WITHIN STONE SUB-BASE LAYER = MAX 10m³ BASED ON 1:100 YR PLUS 40% CLIMATE CHANGE.

CAR PARK AREA = 115m² x 0.300m (SUB-BASE LAYER DEPTH) = 34.5m³.

34.5m³ x 0.3 (30%VR) = 10.35m³ (ACTUAL STORAGE PROVIDED).

**PAVEMENT DESIGN**

BASED ON SUPERDRAIN ASPHALT, MAX LOADING 3.5t TBC BY OTHERS.

30mm SURFACE COURSE  
60mm BINDER COURSE  
100mm BASE LAYER  
300mm SUB-BASE  
INCREASED SUB-BASE TO 300mm FROM 185mm (MINIMUM) TO PROVIDE REQUIRED STORAGE.

BASED ON 5% CBR.

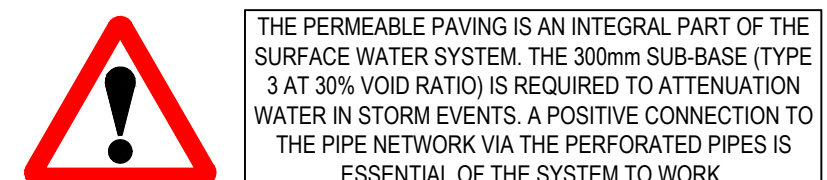
SEE CONSTRUCTION SPECIFICATION.

**FOUL WATER DESIGN**

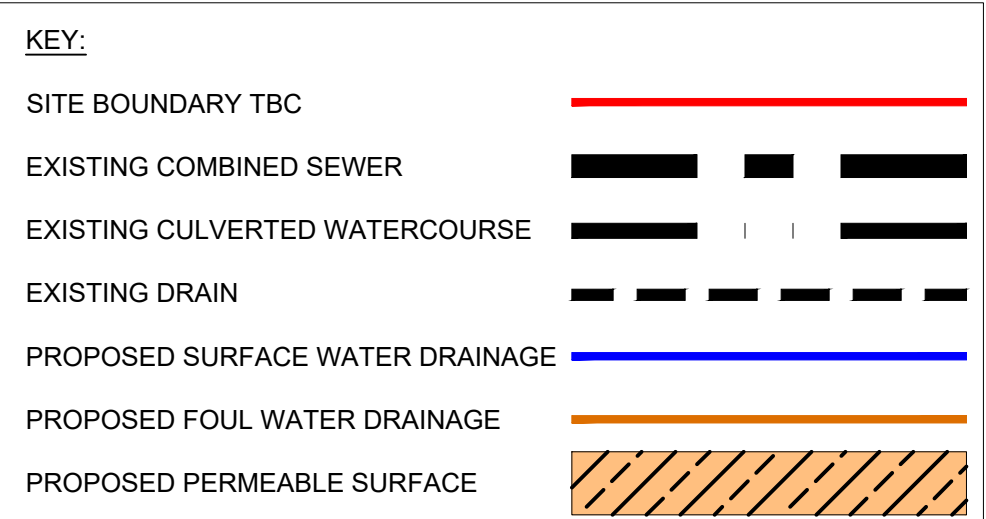
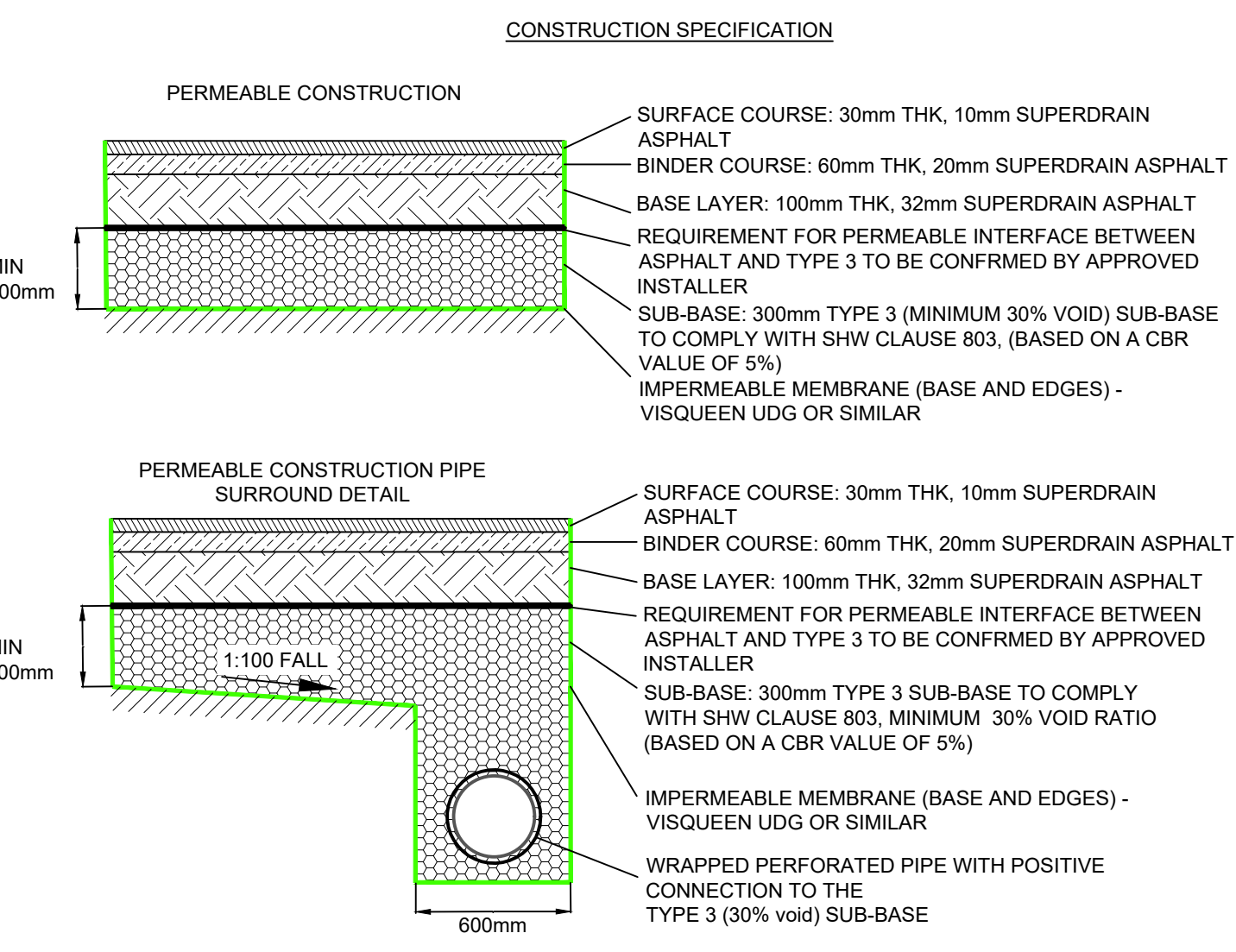
FW PEAK FLOW RATE: TBC.  
OUTFALL: 225mmØ COMBINED SEWER IN STORE STREET (TO BE AGREED WITH UU)  
LEVELS INDICATE THAT PUMPING WILL NOT BE REQUIRED TO DESIGNED OUTFALL LOCATION HOWEVER SHOULD AN ALTERNATIVE ROUTE FOR FOUL DRAINAGE REQUIRED, PUMPING IS LIKELY. TBC FOLLOWING FURTHER DESIGN AND SURVEY WORK.  
FOUL WATER STORAGE REQUIRED: N/A.

- GENERAL NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
  - DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
  - ALL EXISTING SEWERS, CONNECTIONS, PIPE SIZES AND INVERT LEVELS TO BE CONFIRMED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS TO ENSURE CONNECTIVITY. ANY VARIANCE FROM THE INFORMATION SHOWN SHOULD BE REPORTED TO THE ENGINEER FOR REVIEW.
  - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
  - ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
  - WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.
  - ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.
  - ALL RAINWATER AND FOUL POP UPS LOCATIONS TO BE CONFIRMED BY THE ARCHITECT AND MAE ENGINEER.
  - COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT / LANDSCAPE ARCHITECT.
  - ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS. THESE ARE TO BE CONFIRMED ONCE A DETAILED CAPACITY CHECK HAS BEEN UNDERTAKEN AT A LATER DESIGN STAGE.
  - OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

NOTE - THE BELOW DESIGN IS BASED ON PERMEABLE TARMAC HOWEVER SHOULD AN ALTERNATIVE PRODUCT BE PREFERRED I.E. BLOCK PAVING, THIS DOES NOT AFFECT THE DRAINAGE STRATEGY. SUB-BASE STONE DEPTH FOR STORAGE WILL BE THE SAME.



THE PERMEABLE PAVING IS AN INTEGRAL PART OF THE SURFACE WATER SYSTEM. THE 300mm SUB-BASE (TYPE 3 AT 30% VOID RATIO) IS REQUIRED TO ATTENUATE WATER IN STORM EVENTS. A POSITIVE CONNECTION TO THE PIPE NETWORK VIA THE PERFORATED PIPES IS ESSENTIAL OF THE SYSTEM TO WORK.



|                                                                                                                                                                                                                                                                                                                                                                                                            |            |                          |               |             |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------|---------------|-------------|------|
| P01                                                                                                                                                                                                                                                                                                                                                                                                        | 17.12.21   | FOR INFORMATION          | CD            | PM          | PM   |
| Rev                                                                                                                                                                                                                                                                                                                                                                                                        | Date       | Description              | By            | Check       | App. |
| COPYRIGHT: THE COPYRIGHT OF THIS DRAWING IS VESTED IN CLANCY CONSULTING.<br>IT SHALL NOT BE USED WITHOUT PERMISSION BY ANYONE FOR ANY PURPOSE.<br>DO NOT SCALE THIS DRAWING ELECTRONICALLY OR MANUALLY.<br>WORK TO FIGURED DIMENSIONS ONLY.<br>ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.<br>DO NOT TURN ON LAYERS THAT HAVE BEEN TURNED OFF.<br>DO NOT TURN LAYERS THAT HAVE BEEN FROZEN. |            |                          |               |             |      |
| Client                                                                                                                                                                                                                                                                                                                                                                                                     |            | VICTOR (M1) LTD          |               |             |      |
| Project                                                                                                                                                                                                                                                                                                                                                                                                    |            | PARADISE MEWS            |               |             |      |
| Office                                                                                                                                                                                                                                                                                                                                                                                                     |            | MANCHESTER               |               |             |      |
| Discipline                                                                                                                                                                                                                                                                                                                                                                                                 |            | CIVILS                   |               |             |      |
| Title                                                                                                                                                                                                                                                                                                                                                                                                      |            | DRAINAGE STRATEGY LAYOUT |               |             |      |
| Scale @ A1                                                                                                                                                                                                                                                                                                                                                                                                 |            | 1:100                    | Status        | PRELIMINARY |      |
|  <b>clancy</b><br>consulting                                                                                                                                                                                                                                                                                          |            |                          |               |             |      |
| www.clancy.co.uk                                                                                                                                                                                                                                                                                                                                                                                           |            |                          |               |             |      |
| Originator                                                                                                                                                                                                                                                                                                                                                                                                 | Job Number | Discipline               | Building/Zone |             |      |
| CCL                                                                                                                                                                                                                                                                                                                                                                                                        | 1-21074    | C                        | XX            |             |      |
| Type                                                                                                                                                                                                                                                                                                                                                                                                       | Level      | Drawing No.              | Revision      |             |      |
| DR                                                                                                                                                                                                                                                                                                                                                                                                         | XX         | 92500                    | P01           |             |      |

## **APPENDIX F – ENVIRONMENT AGENCY FLOOD MAPS FOR PLANNING**

# Flood map for planning

Your reference  
**Paradise Mews**

Location (easting/northing)  
**384962/398155**

Created  
**7 Dec 2021 14:49**

**Your selected location is in flood zone 1, an area with a low probability of flooding.**

## This means:

- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

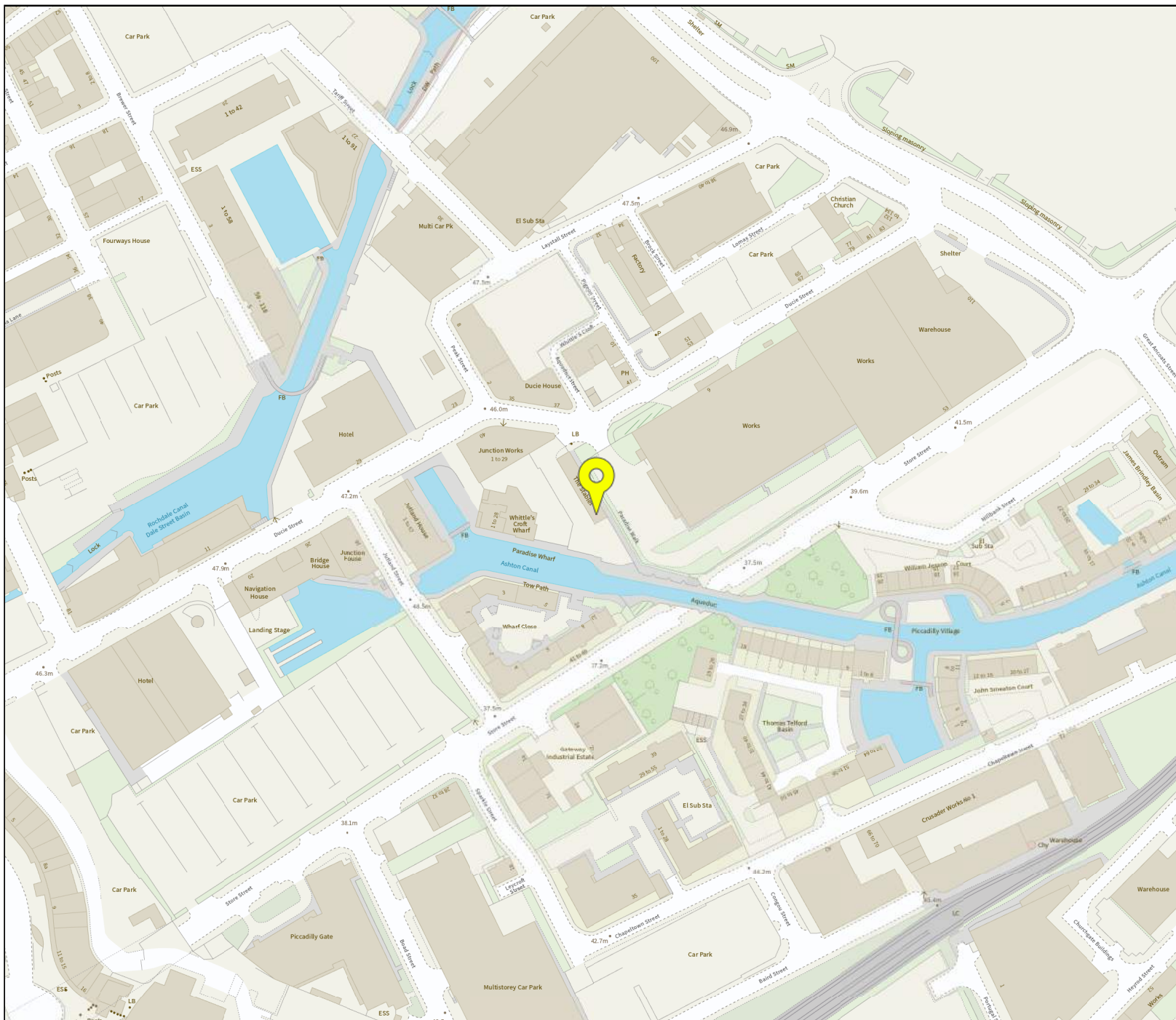
## Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2021 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



## Flood map for planning

Your reference  
**Paradise Mews**

Location (easting/northing)  
**384962/398155**

Scale  
**1:2500**

Created  
**7 Dec 2021 14:49**

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

  
0 20 40 60m