



Egbert Street, Moston

DRAINAGE STRATEGY REPORT



5th May 2023

Egbert Street, Moston

Drainage Strategy Report

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PREPARED BY JAMES ROGERS



Egbert Street, Moston

Drainage Strategy Report

One Manchester - Egbert Street, Moston



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Alan Johnston Partnership Ltd.

Company No. 13204766

Egbert Street, Moston

Drainage Strategy Report

1.0 INTRODUCTION

This drainage strategy report has been prepared on behalf of One Manchester in connection with a planning application for the construction of 2 properties along Egbert Street as part of a larger residential development throughout Moston.

The purpose of this report is to present the surface water and foul water outline drainage strategies for the site which have been developed by the Alan Johnston Partnership. To demonstrate how the specific drainage requirements are to be met, the report should be read in conjunction with the relevant drawings and supporting information, included within the appendices.

The drainage strategies outlined within this report, have been prepared in accordance with BS EN 752:2017 (Drain and sewer systems outside buildings), Sewers for Adoption, Building Regulations Approved Document H (Drainage and waste disposal), the Planning Practice Guidance and the National Planning Policy Framework document (Department for Communities and Local Government, March 2014).

The site is located within Flood Zone 1, with a total site area under 1.0ha. Therefore, in accordance with DEFRA guidance, a Flood Risk Assessment (FRA) is not required.



2.0 SITE DESCRIPTION

The site is situated on a plot of greenfield land on the east end of Egbert Street in Moston, Manchester and is located at National Grid reference SD 87563 01156. The site location is illustrated in Appendix A and the extent of the area to which the application relates is shown on the enclosed aerial photo, attached in Appendix B.

The existing site covers a total area of 0.039ha with the proposed development area covering the entire site. The site currently comprises of open green space and a scattered few boulders.

The site generally falls from north to south, with levels falling from approximately 81.90mAOD in the north of the site to approximately 81.00mAOD on the south of the site. An aerial photo is included in Appendix B to illustrate the site at the present day and the existing topography is indicated on the drainage record information attached in Appendix C.

3.0 PROPOSED DEVELOPMENT

The proposed development is to construct 2 properties along with associated gardens and parking bays.

To enable a viable scheme, the proposed site levels are constrained by surrounding properties and highways. The proposed site plan indicating the proposed building extension is attached in Appendix D.

4.0 ASSESSMENT OF FLOOD RISK

Even though a Flood Risk Assessment is not required under the Planning Practice Guidance and National Planning Policy Framework, a small site-specific flood risk assessment has been completed below.

4.1 Flooding from Rivers

The Flood Risk map is included as Appendix E. As can be seen from the Flood Risk map, all three sites are located within Flood Zone 1 and therefore, the sites are all located in Flood Zone 1 with a chance of flooding of less than 0.1% (or 1 in 1000).

The nearest watercourse is the Moston Brook, which is located approximately 390m east of the site. As such, the risk of flooding to the new development from rivers is considered to be low.

4.2 Flooding from the Sea

The sites are not at risk of flooding from the sea. The lowest level across the site is approximately 81.00mAOD, i.e. well above tidal flood levels.

4.3 Flooding from Land

Intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems can run quickly off land and result in local flooding.

The Surface Water Flooding map is included in Appendix E. It can be seen from the map that the site is classified as having a very low risk of surface water flooding. Therefore, the risk of flooding from overland flows due to surface water flooding is considered to be low.

4.4 Flooding from Groundwater

As can be seen on the hydrogeological maps from the British Geological Survey, the site is located in an area classified as having medium-low risk from groundwater flooding. There is also no indication as to historic flooding within the site boundary as shown on the Environment Agency Historic Flood Map.

As such, it is envisaged that the proposed site has a low risk of flooding from groundwater but this should be confirmed via an intrusive site investigation.

4.5 Flooding from Sewers

A record of public sewers surrounding and serving the development site is included in Appendix F. As can be seen from the public sewer map there are no public sewers within the proposed site boundary. Public sewers are present due south and west of the development with 300mm combined water sewers running north along Faversham Street and west along Egbert Street. There is also a 225mm public surface water sewer beneath Egbert Street just south of the proposed site. There is currently no indication that there are any private sewers within the site boundary.

Therefore, as the proposed drainage networks for the proposed site will be suitably designed and the fact that the surrounding public sewers are all located within the surrounding highways and are maintained by United Utilities, leads to the conclusion that the site itself is considered to have a low risk of flooding from sewers.

4.6 Flooding from Reservoirs, Canals and Other Artificial Sources

The Reservoir Flood Risk map is included in Appendix E. It can be seen from the map that the site is not at risk of flooding from reservoirs. The closest open waterbody is the Boggart Hole Boating Lake which is located approximately 1.42km north of the site and the nearest reservoir is Gorton Upper Reservoir which is located approximately 5.02km south of the site.

Therefore, the site is considered to be at low risk of flooding from reservoirs, canals and other artificial sources.



5.0 PROPOSED DEVELOPMENT

5.1 Effect of Proposed Development

As previously outlined in Section 2.0, the existing site covers a total area of 0.039ha. The pre and post development impermeable areas for the 0.140ha development area have been assessed and are indicated on the attached drawing in Appendix G. The comparison between the pre and post development impermeable areas is also summarised below;

Total Development Area (ha)	Pre-Development Impermeable Area (ha)	Post Development Impermeable Area (ha)
0.039	0.001	0.021

As can be seen the proposed development will increase the overall impermeable areas across the site and therefore will result in an increase in the;

- ◆ Volume of surface water ponding on the site
- ◆ Volume of surface water runoff leaving the site or discharging into surrounding areas
- ◆ Peak discharge rate from the site

As such, drainage systems will need to be redesigned to sufficiently drain the foul and surface water flows arising from the proposed development. Where possible, any existing drainage networks should be utilised. Appropriate design and construction of these systems as set out in Section 5.3 should ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

5.2 Existing Drainage Systems

As can be seen from the Public Sewer Map, attached in Appendix F, there are no public sewers located within the proposed site. Due north along Faversham Street and due west along Egbert Street are 300mm public combined water sewers as well as a 225mm public surface water sewer on Egbert Street which carries flow south of the proposed site.

Current available information indicate that there are no private sewers within the proposed site boundary. This should be confirmed via a CCTV survey prior to the commencement of works. Should any private sewers be discovered is it likely that they are to be abandoned.

As all of the public sewers are located outside of the site and are not being affected by the proposed works, it is envisaged that no public sewer diversions or reduced easement agreements will be required with United Utilities.

5.3 Proposed Drainage Strategy

As outlined above in Section 5.1, site-wide drainage systems are required to drain the foul and surface water flows arising from the proposed development. The proposed drainage systems must ensure that there is no increase in offsite flood risk that would otherwise impact downstream areas.

5.3.1 Surface Water Drainage

The Planning Policy Guidance and the CIRIA SuDS Manual detail that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonably practicable:

- ◆ into the ground (infiltration);
- ◆ to a surface water body;
- ◆ to a surface water sewer, highway drain, or another drainage system;
- ◆ to a combined sewer.

Considering the hierarchy above, the surface water network for the 0.119ha developed area of the site should infiltrate where possible. Although there has not been a full site investigation, the British Geological Records indicate that the superficial deposits on site are that of Devensian Till. This would indicate that the ground is made up of a mixture of sand, boulders and an abundance of clay.

Also given the fact that the site doesn't contain any communal spaces, with land either being building footprint, private garden or private driveways, there is no space to put in

any soakaways. From both these points it can be concluded that infiltration will not be suitable for the proposed development.

As the possibility of infiltration has been ruled out, the intention for the development would be to discharge to watercourse/surface water body. As indicated in Section 4.1, the nearest watercourse is the Moston Brook, which is located approximately 390m east of the site. Given the distance across various plots of developed third party land, it has been deemed impractical to discharge to watercourse.

As such, the only practical solution for discharge of the surface water is to discharge to a public sewer. As indicated within Section 5.2, there are no private sewers within the site boundary connected to the public sewers. It is envisioned that a new connection to the public surface water sewer to the south will be used as the proposed outfall for the development.

While every effort to use the existing systems should be made, the drainage systems should be designed to suit the proposed site layout and topography which aims to provide an efficient design.

In line with Sewers for Adoption (7th Edition), the requirements for the design of a new surface water drainage systems are as follows:

- ◆ Below ground piped drainage to be sized to accommodate the 1 in 2-year (50% AEP) design storm without surcharge.
- ◆ System to be designed not to flood any part of the site in a 1 in 30-year (3% AEP) design storm.
- ◆ For events in exceedance of the 1 in 30-year design storm and up to and including the 1 in 100-year event, site drainage and topography should be designed where practicable to route surface water run-off away from buildings to safe above-ground storage areas on site, thereby preventing this run-off from leaving the site and increasing flood risk elsewhere.

For each design case described above, the design storm is the critical storm duration for the site conditions. In the case of the 1 in 100-year design storm, a 45% increase in the peak rainfall intensity is applied to allow for the estimated worst-case impacts of climate change. This is in accordance with advice, issued by the Environment Agency, which updates previous climate change allowances outlined in the National Planning Policy Framework.

Suitable systems of below ground drainage will be required to contain as a minimum requirement, the 1 in 30-year event. Additionally, any surface water run-off from events that exceed the design capacity of the new drainage system, up to and including the 1 in 100-year (+45%) event, will be retained on-site in safe storage areas.

In compliance with Section 3.4.1 of the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA User Guide, it is envisaged that as the existing site is greenfield, Domett Street, Moston Manchester City Council will require the proposed surface water runoff rates to be restricted to achieve the same greenfield run off rates.

Given the size of the proposed site, an assessment of the existing greenfield surface water run off rate is not required as the existing run off rate will be well below 5.0 L/s including for the 1-in-100 year storm event.

The 5.0 L/s discharge restriction is generally accepted as the minimum discharge rate to avoid the need for very small orifices, which due to their minimal size are prone to blockage. The 5.0 L/s discharge rate is in compliance with the Environment Agency document; ‘Rainfall runoff management for developers’, Report SC030219.

This is further supported by United Utilities, as the guidance notes within the United Utilities Section 104 adoption agreement states that for any flow control device, “The minimum acceptable orifice size is 100mm.” and to achieve this minimum orifice diameter a maximum discharge rate of 5.0 L/s is required.

Given the compliance with both Manchester City Council and United Utilities guidelines, it is anticipated that the proposed drainage strategy will be accepted.

As seen in from the Outline Drainage Strategy Drawing attached in Appendix H, it is anticipated that the attenuation storage will be provided within the surface water drainage network itself and porosity within the porous parking bays sub base, with a vortex flow control device used to restrict the discharge rate to the required 5.0 L/s discharge rate, as indicated above.

The surface water drainage calculations have also been included within Appendix H and as can be seen the proposed surface water drainage and attenuation storage prevent any flooding for all rainfall events up to and including the 1 in 100 year + 45% climate change event and also meet the required 5.0 L/s discharge restriction. This is summarised in the table below.

Rainfall Return Period (years)	Discharge Rate (L/s)
1 Year	2.2
2 Year (Qbar)	3.0
30 Year	4.9
100 Year	5.0

As can be seen from the Outline Drainage Strategy Drawing attached in Appendix J, the surface water drainage collects the runoff from the site area via areas of porous paving and rainwater downpipes and conveys the surface water runoff to the south of the proposed site.

Here, the surface water runoff is restricted via a vortex flow control prior to discharging into the existing public surface water sewer along Egbert Street. The current proposed connection point is into United Utilities manhole UUMH5106. The vortex flow control

device restricts the runoff to the required 5.0 L/s discharge rate, for all rainfall events up to and including the 1 in 100 year +45% climate change event.

It should be noted that the proposed surface water drainage network provides sufficient storage to prevent any flooding for all rainfall events up to and including the 1 in 100 year +45% climate change event and therefore the exceedance flow paths are for use in exceptional circumstances only.

The surface water drainage strategy and discharge rate should be confirmed via more detailed discussions with Manchester City Council and United Utilities prior to the commencement of any works.

5.3.2 SuDS Summary

As outlined below, all other SuDS techniques have been considered for this development;

SuDS Technique	Suitable for This Development?	Reasoning
Green Roof	✗	Not suitable due to minimal roof area available due to plant and equipment on roof.
Rainwater Harvesting	✓	Water butts added to RWP on each plot
Basins & Ponds	✗	Unsuitable due to lack of available space.
Filter Strips & Swales	✗	Unsuitable due to lack of available space.
Bio-retention Areas	✗	Unsuitable due to lack of available space.
Infiltration Techniques	✗	Unsuitable due existing impermeable strata and lack of space for a soakaway.
Permeable Surfaces	✓	Suitable given available car parking spaces and appropriate substitute for an attenuation tank.
Tanked/Piped Systems	✗	Not required

Green roof areas have been considered but due to the minimal roof area available the use of a green roof has been discounted. Rainwater harvesting was also considered but due to a lack of greywater demand it has been deemed as impractical to include a rainwater harvesting system.

Due to the lack of available space across the site, the use of detention basins and/or ponds has also been discounted. Filter drains/strips, swales and bio-retention areas have also been deemed as impractical due to the lack of available space within the site.

As previously discussed in Section 5.3.1 infiltration is deemed as not feasible across the site and therefore the use of infiltration SuDS techniques is not possible. Non-infiltration (tanked) permeable surfaces such as permeable paving have also been considered and have been included. This provides the added benefit of providing the appropriate attenuation storage for the 1-in-100 year storm event without needing to include an attenuation tank. As such oversized pipes/an attenuation tank are not required.

The use of specific SuDS techniques across the site will be confirmed during the later stages of the design process but where possible, the above SuDS summary should be adhered to as close as reasonably possible.

5.3.4 Foul Water Drainage

Foul water drainage disposal is set out in Part H of the Building Regulations in order of priority the preferred methods are;

1. Public sewer
2. Septic tank
3. Cesspool

The foul water system shall be designed in accordance with;

- ◆ BS EN 752:2017 (Drain and sewer systems outside buildings)
- ◆ Sewers for Adoption (7th Edition)
- ◆ National Planning Policy Framework document (Department for Communities and Local Government, March 2012).
- ◆ Planning Practice Guidance
- ◆ BS EN 12056-2:2000 (Drainage systems inside buildings)
- ◆ Building Regulations Approved Document H, Drainage and waste disposal. (Office of the Deputy Prime Minister, December 2015).

As can be seen from the Outline Drainage Strategy Drawing attached in Appendix J, the proposed foul water drainage will collect the runoff from the new proposed building extension and conveys the foul water to the west of the proposed site.

Here the foul water runoff will discharge via gravity into the existing public combined water sewer along Faversham Street. The current proposed connection point is at United Utilities Manhole UUMH5103. It is anticipated that the foul water can discharge into the existing private sewer at unrestricted rates.

The foul water drainage strategy and unrestricted discharge rate should be confirmed via more detailed discussions with Manchester City Council and United Utilities prior to the commencement of any works.



6.0 FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SUDS techniques in accordance with the CIRIA SUDS Manual C753. The surface water run-off from the proposed development is restricted using a vortex flow control device and the attenuated run-off is stored using a below ground cellular attenuation tank.

It is envisaged that the following components have been or will be included within the drainage strategy for the proposed development:

- ◆ Inspection chambers, manholes and catchpits.
- ◆ Pipes.
- ◆ Drainage channels and gullies.
- ◆ Vortex flow control device.
- ◆ Porous/permeable paving.

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

It is assumed that the proposed drainage will remain private and therefore maintenance of the surface and foul water drainage systems will be the responsibility of One Manchester or an on-site facilities management team and therefore a copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

6.1 General Maintenance & Inspection Requirements

- ◆ No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.
- ◆ Maintenance/inspection work shall be carried out in a safe/planned manner.
- ◆ All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.
- ◆ Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped persons working in accordance with current statutory safe working policies.
- ◆ Drainage systems shall be inspected on a regular basis or should any problems be suspected. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.
- ◆ It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.
- ◆ Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;
 - Rodding - Manual/Mechanical with flexible rods.
 - Jetting - High pressure water jetting.
 - Plunging.

6.2 Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually.

- ◆ Covers of inspection chambers and manholes shall be removed and the sides, benchings and channels cleared.
- ◆ Accumulated deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall.
- ◆ Main and branch drains shall be cleared as required and flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- ◆ Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable grease or other sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

6.3 Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, as failure to do so would expose the development to a greater level of flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, where used the manufacturer's recommendations should be followed. Access for maintenance of the pipes is provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required take remedial action.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

6.4 Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullies components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal.	Monthly or as required.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial Inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six-monthly intervals. Also, 48 hours after large storms.

6.5 Vortex Flow Control Device

Regular inspection and maintenance is important to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, where used the manufacturer's recommendations should be followed.

- ◆ Normally, little maintenance is required as there are generally a vortex flow control device has no moving parts.
- ◆ If blockages occur they tend to do so at the intake of the vortex flow control device.
- ◆ Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.
- ◆ The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

- ◆ Following installation of the vortex flow control device it is vitally important that any extraneous material i.e. Building materials are removed from the unit and the chamber.
- ◆ After the system is made live, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

It should be noted that the Main Contractor should provide a Verification Report, including photographic evidence, to demonstrate that the drainage has been constructed as per the design drawings. As-built drawings should be supplied by the Main Contractor, where the construction of the drainage varies from the design construction status drawings.

6.6 Porous/Permeable Paving

The maintenance requirements for permeable/porous paving is covered under the previous pavements section within the CIRIA SUDS Manual C753. As such, the maintenance requirements for permeable/porous tarmac are outlined within Table 20.15 of the CIRIA SUDS Manual C753. An extract of that table is given below to set out the maintenance schedule for the permeable/porous tarmac component of the proposed drainage systems.

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50 mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three-monthly, 48 h after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

It should be noted that the Main Contractor should provide a Verification Report, including photographic evidence, to demonstrate that the drainage has been constructed as per the design drawings. As-built drawings should be supplied by the Main Contractor, where the construction of the drainage varies from the design construction status drawings.

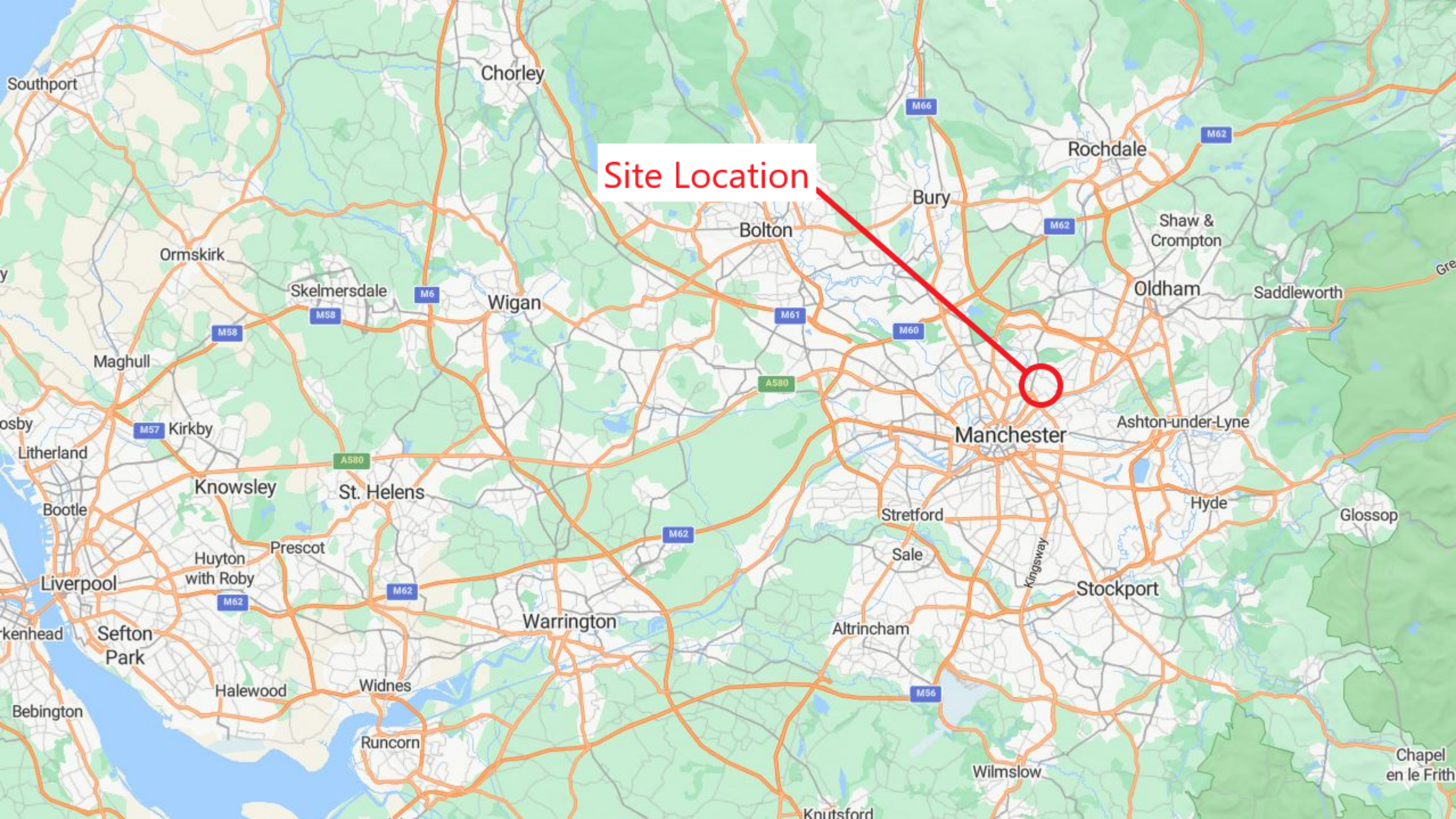
7.0 CONCLUSIONS

- ◆ The site is located within Flood Zone 1 with a low probability of flooding from all sources.
- ◆ Information from the British Geological Surveys and the proposed site layout indicates that infiltration is not suitable.
- ◆ Due to the distance across developed third-party land, discharging the surface water from the site to the nearest watercourse has been deemed as impractical. As such the proposed site is to discharge into the public surface water due south of the site boundary. A new proposed connection to an existing United Utilities surface water manhole (UUMH5106) is to be proposed under a Section 106 agreement.
- ◆ The surface water discharge rate is to be restricted to 5.0 L/s to comply with LLFA requirements and United Utilities guidelines. The proposed surface water drainage design meets these criteria and also ensures there is no flooding for all rainfall events up to and including the 1 in 100 year +45% climate change design storm.
- ◆ The runoff is to be restricted using a vortex flow control device and the surcharged runoff is attenuated using the proposed permeable paving and surface water drainage network itself.
- ◆ The foul water drainage is to discharge into the existing public combined water sewer via the existing United Utilities manhole (UUMH5103) due west of site under a Section 106 agreement via gravity. It is anticipated that the foul water can discharge into the public sewer at unrestricted rates.

8.0 RECOMMENDATIONS

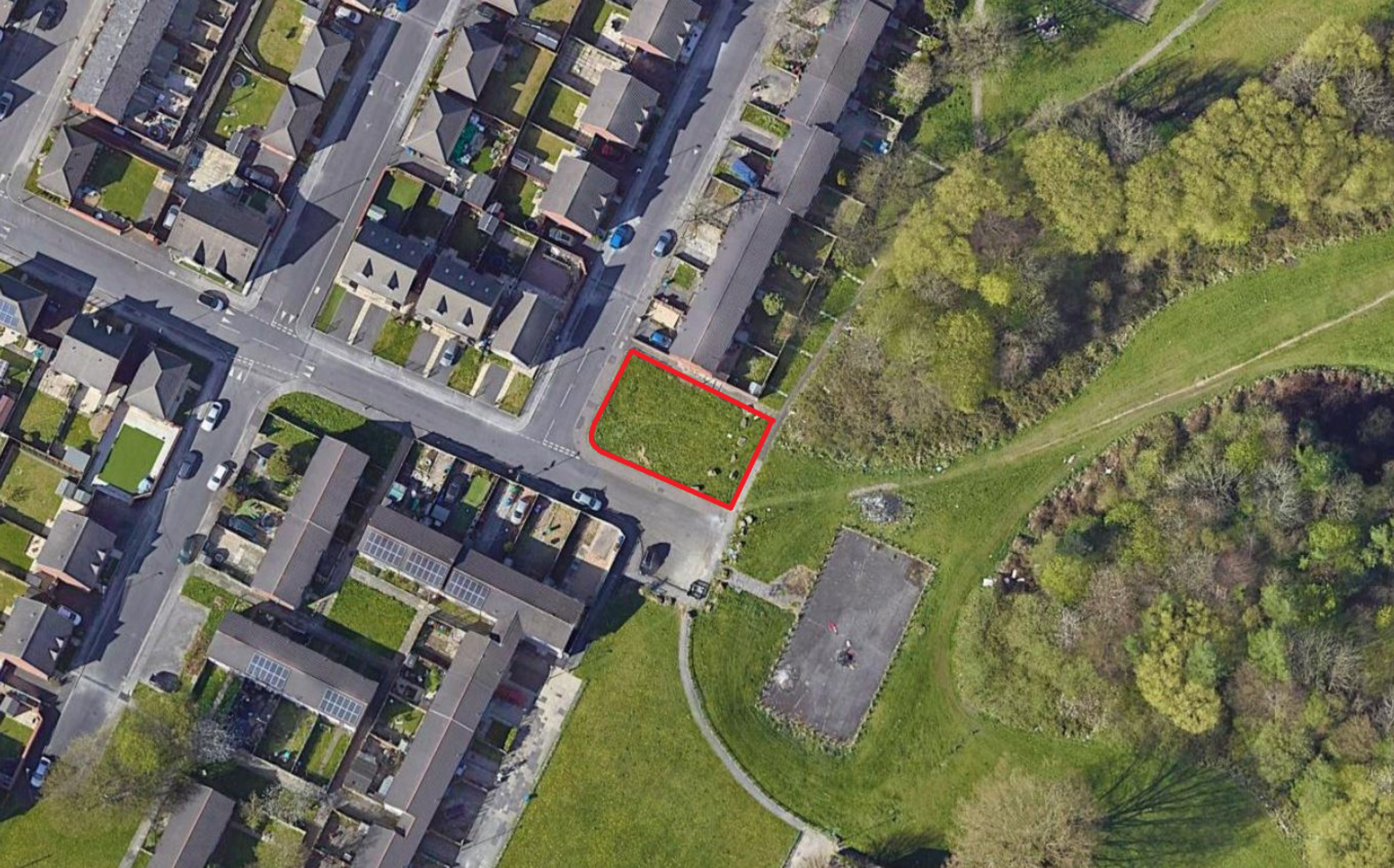
- ◆ An intrusive site investigation should be conducted to confirm the possibility of discharging surface water via infiltration can be fully ruled out.
- ◆ The surface water drainage strategy and discharge rates should be confirmed via more detailed discussions with Manchester City Council and United Utilities prior to the commencement of any works.
- ◆ The foul water drainage strategy and unrestricted discharge rate should be confirmed via more detailed discussions with Manchester City Council and United Utilities prior to the commencement of any works.
- ◆ The invert level of the existing public water outfall manholes (UUMH5106 and UUMH5103) should be confirmed via a CCTV survey prior to construction.

Appendix A – Site Location Plan

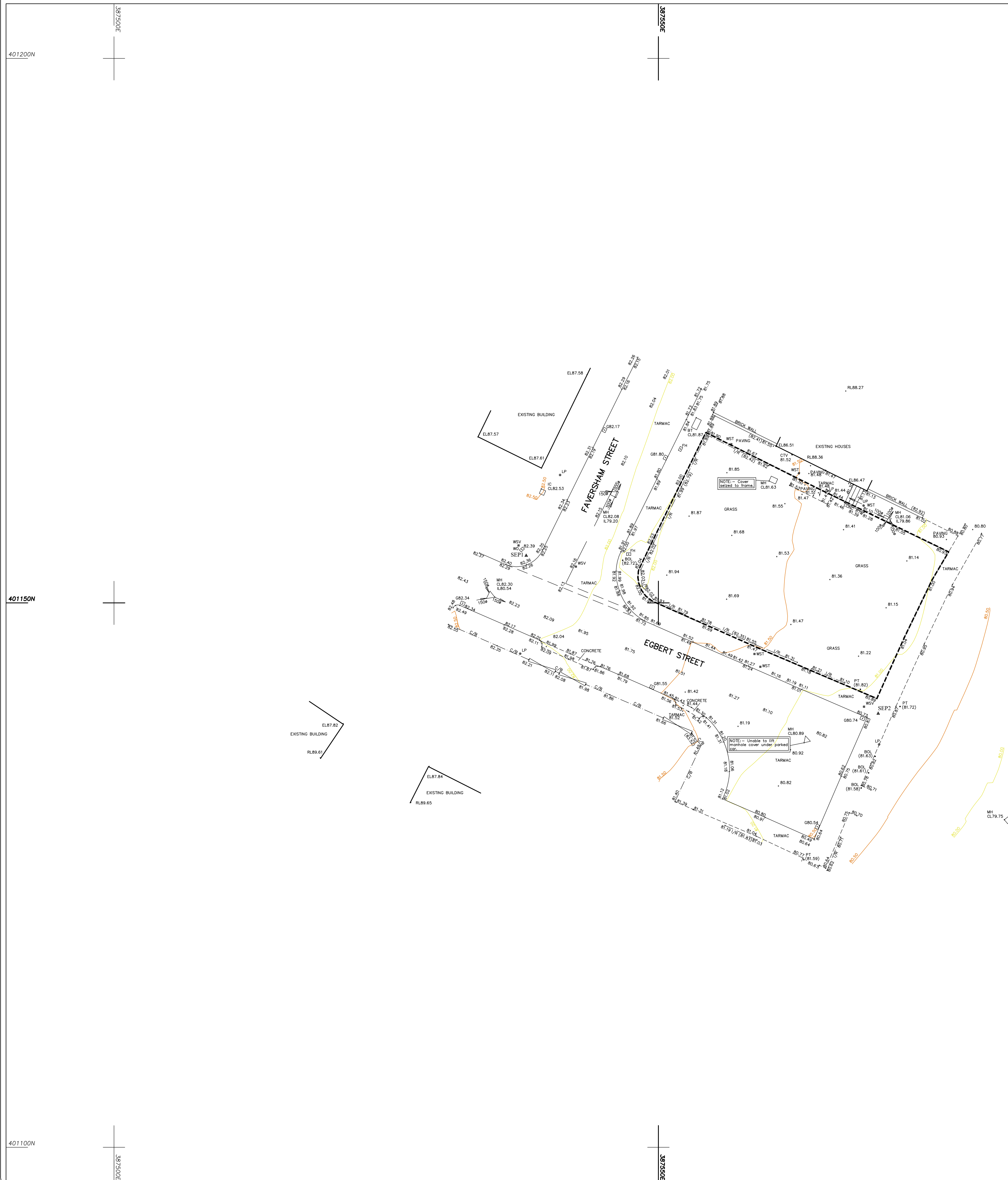


Site Location

Appendix B – Aerial Photo



Appendix C – Existing Drainage Information with Topography



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PLAN GRID NORTH

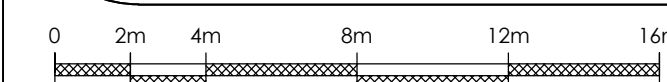
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NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS			
Name	Easting	Northing	Height
SEP1	387537.859	401154.337	82.387
SEP2	387570.185	401139.833	80.872

SHEET LAYOUT



SCALE BAR

REV	DATE	DESCRIPTION
A	02/23	Drawing updated to reflect current site conditions.

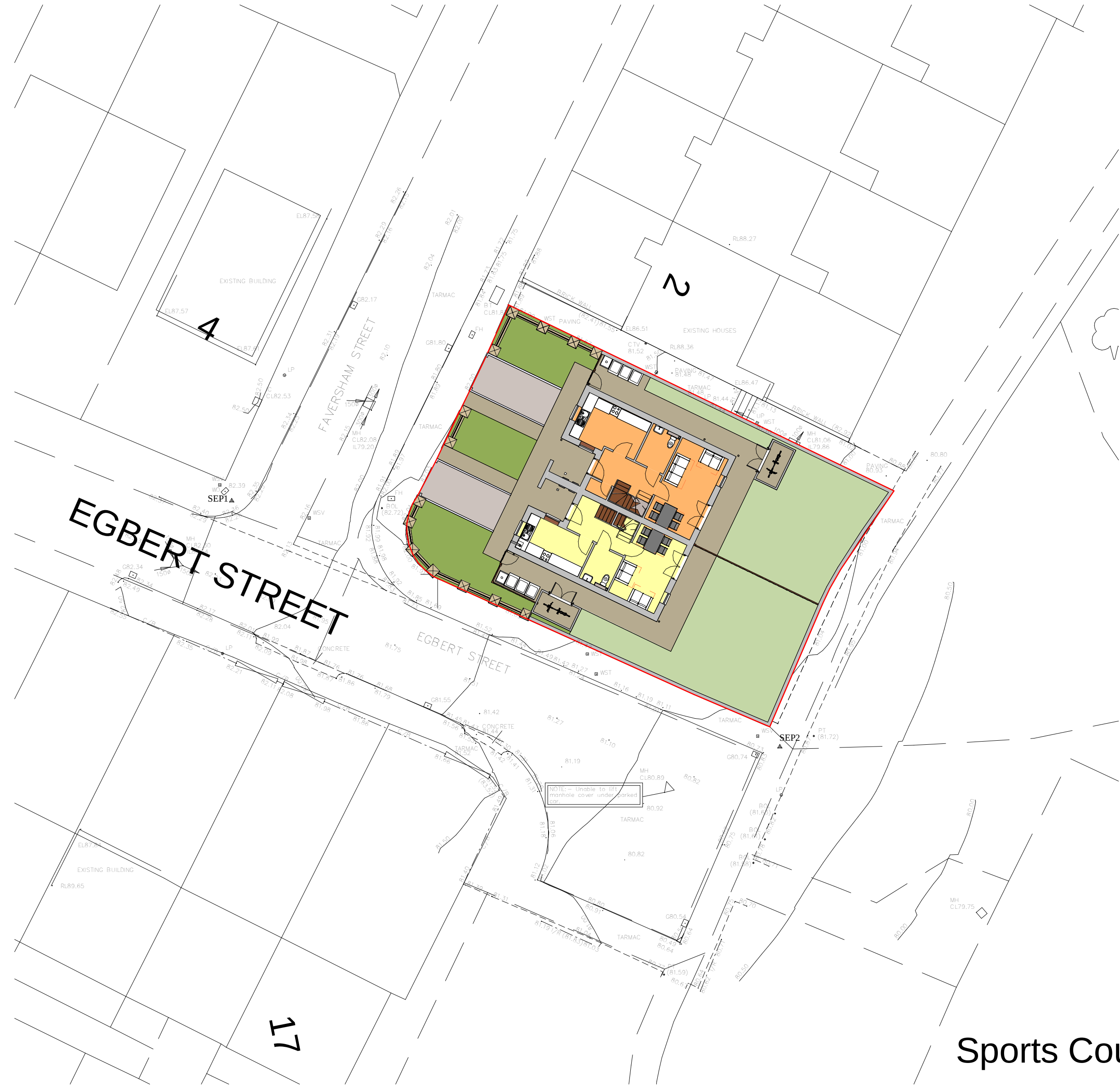


Client
Curtins Consulting Limited
Rose Wharf
78-80 East Street
Leeds
LS9 8EE

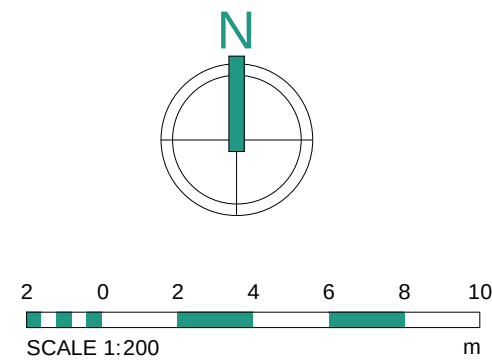
Project Title
Topographical Survey of Land at:
Egbert Street - Faversham Street
Manchester
M40 5EL

Surveyed A.Nesbitt		Drawn B.Foy		Checked R.Critchley	
Scale 1:200	Date Feb` 23	Drawing Ref. S21519-T-A		No. 01	Size A1

Appendix D – Proposed Site Plan



Proposed Site Plan
1 : 200



This drawing is copyright Bernard Taylor Partnership Ltd and must not be copied or disclosed by or to any unauthorised persons without the prior written consent of Bernard Taylor Partnership Ltd

Do not scale from this drawing. Do not take measurements from the CAD base. Any discrepancies are to be reported to the architect for clarification.

All dimensions are to be checked on site prior to construction, manufacture of any components and ordering of materials and equipment.

All materials and workmanship to be in accordance with the current British Standards and codes of practice.

Layout subject to confirmation of red line boundary, all statutory approvals including highways, planning and building regulations, relevant surveys and reports such as topographical, ecology, trees, ground investigation and flood risk.

Schedule of Accommodation		
3B5P Houses	1no.	102m2
2B3P Houses	1no.	70m2
TOTAL	2no	

9	26.05.23	JW	Proposed boundary treatment revised following client comments to show brick wall with railings
8	27.03.23	JW	Drawing pack updated to show timber bike storage following client feedback
7	15.03.23	JW	Planning package amended following DTMO5
6	21.02.23	HG	Schedules added in line with client comments
5	06.02.23	RA	Site layouts and schedules amended in line with clients comments on 31.02.23
4	16.08.21	JP	Layout amended to position bin stores within rear gardens.
3	04.06.21	AP	GIA amended to correspond with the Manchester's emerging space standards
2	10.12.20	JP	Drawing revised following meeting with LPA
1	30.11.20	ED	Drawing revised following pre-application advice from MCC.
Rev	Date	Int	Description

btp
ARCHITECTS

RIBA
Chartered Practice

CLIENT:
One Manchester

PROJECT:
P500 - Egbert Street, Moston

DESCRIPTION:
Proposed Site Plan

PURPOSE OF ISSUE:
Planning

DRAWN BY:	CHECKED	DATE:	SCALE @ A2:
HP	VS	11/11/20	1 : 200

JOB NO:	STATUS CODE:	DRAWING NO:	REV
3813	S0	105	9

FILE IDENTIFIER:
ES-BTP-00-SP-DR-A-3813_105.9

Elizabeth House 486 Didsbury Road Heaton Mersey Stockport SK4 3BS
0161 443 1221 info@bernardtaylor.co.uk www.btparchitects.co.uk

Appendix E – Flood Risk Maps

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
387562/401153

Created
26 Jun 2023 15:50

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

You will need to do a flood risk assessment if your site is **any of the following:**

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

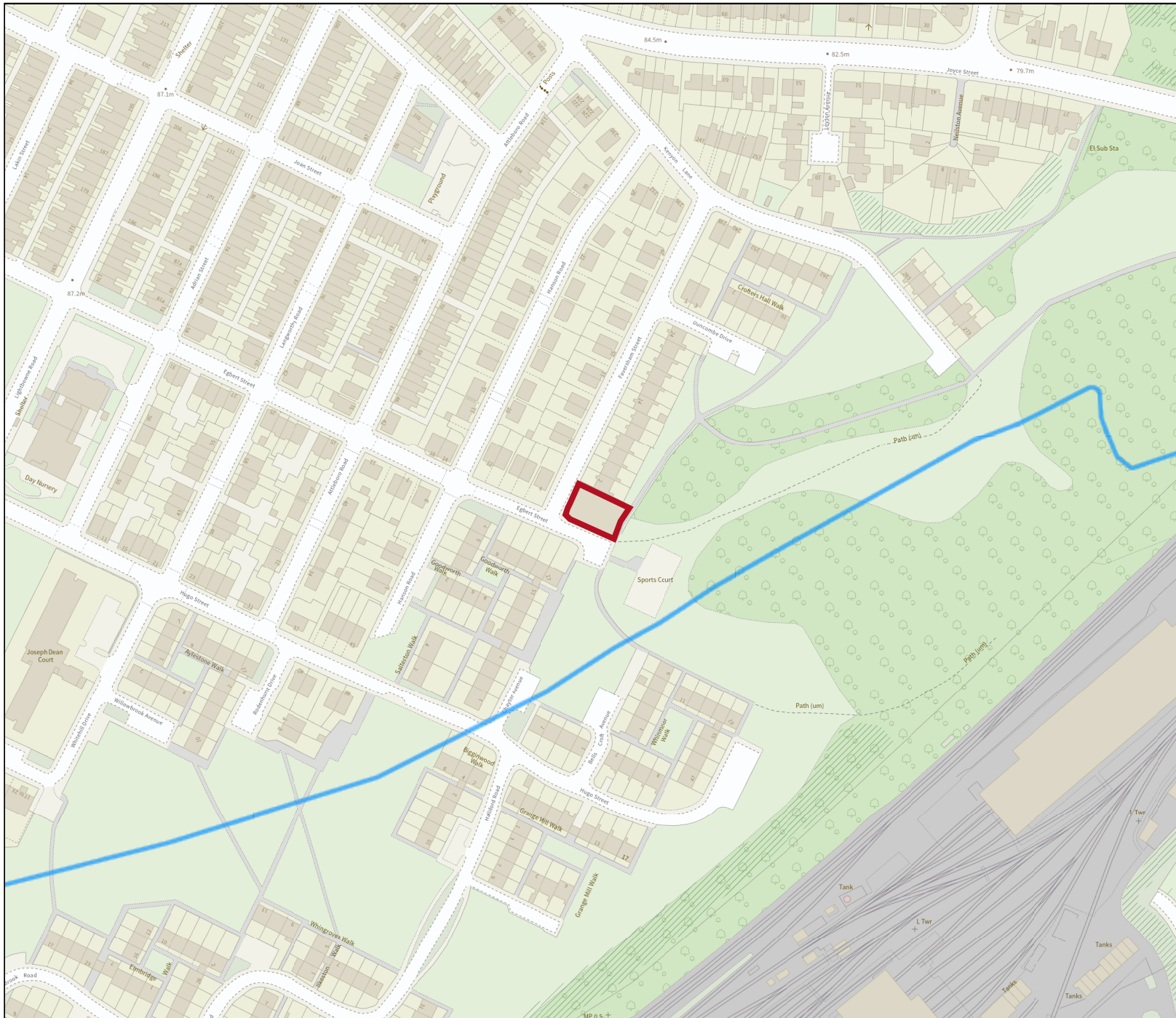
Notes

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 2022 OS 100024198. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference
<Unspecified>

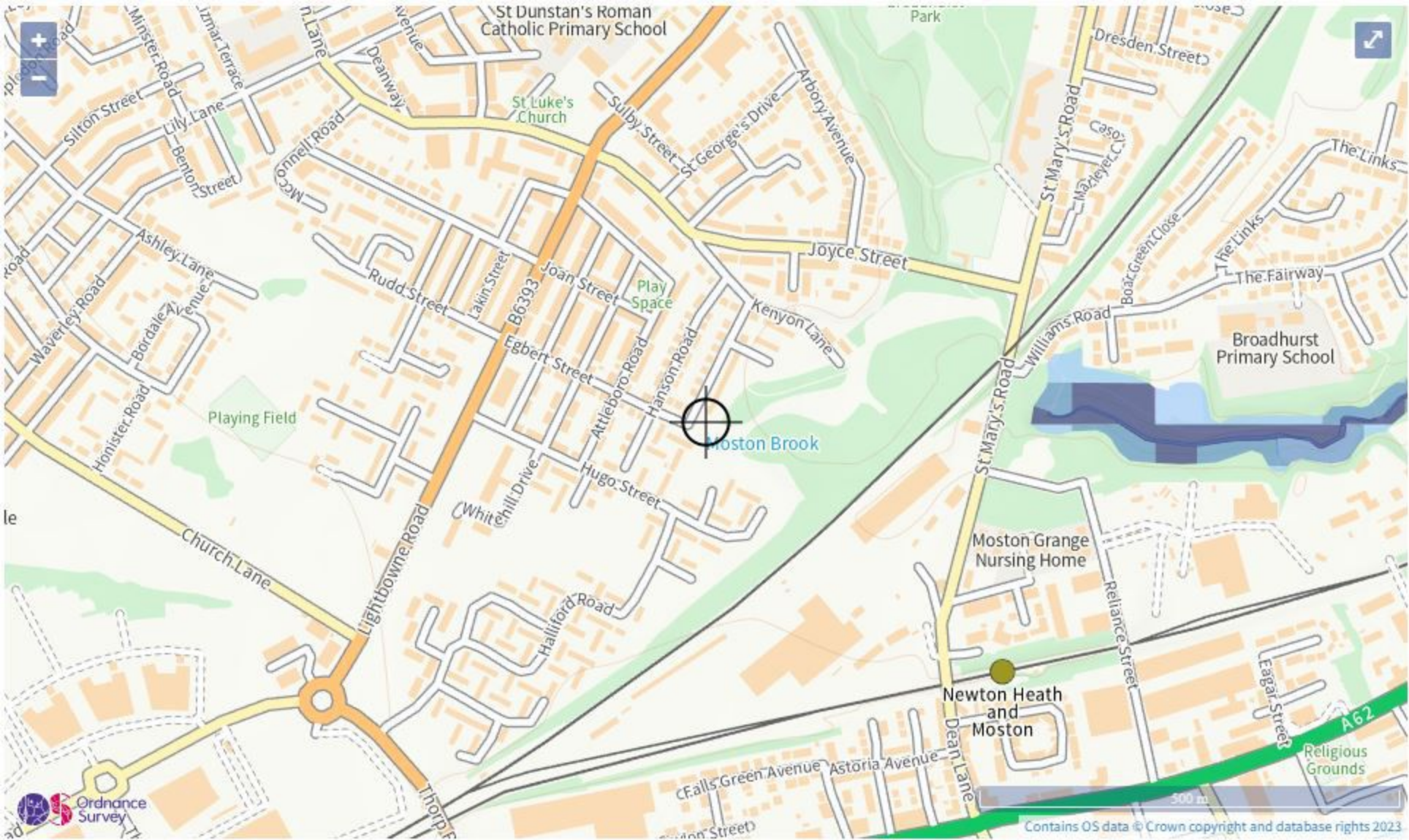
Location (easting/northing)
387562/401153

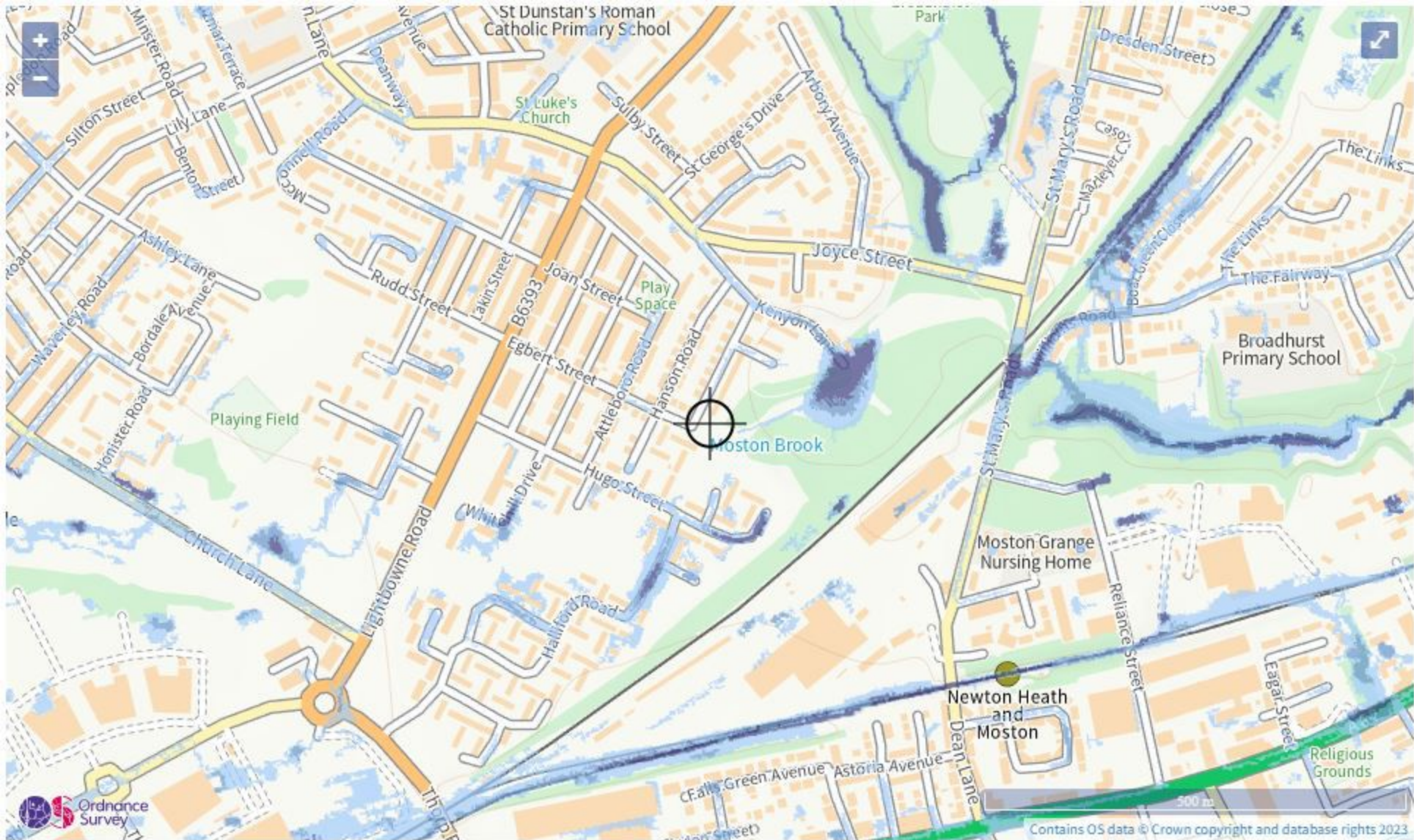
Scale
1:2500

Created
26 Jun 2023 15:50

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

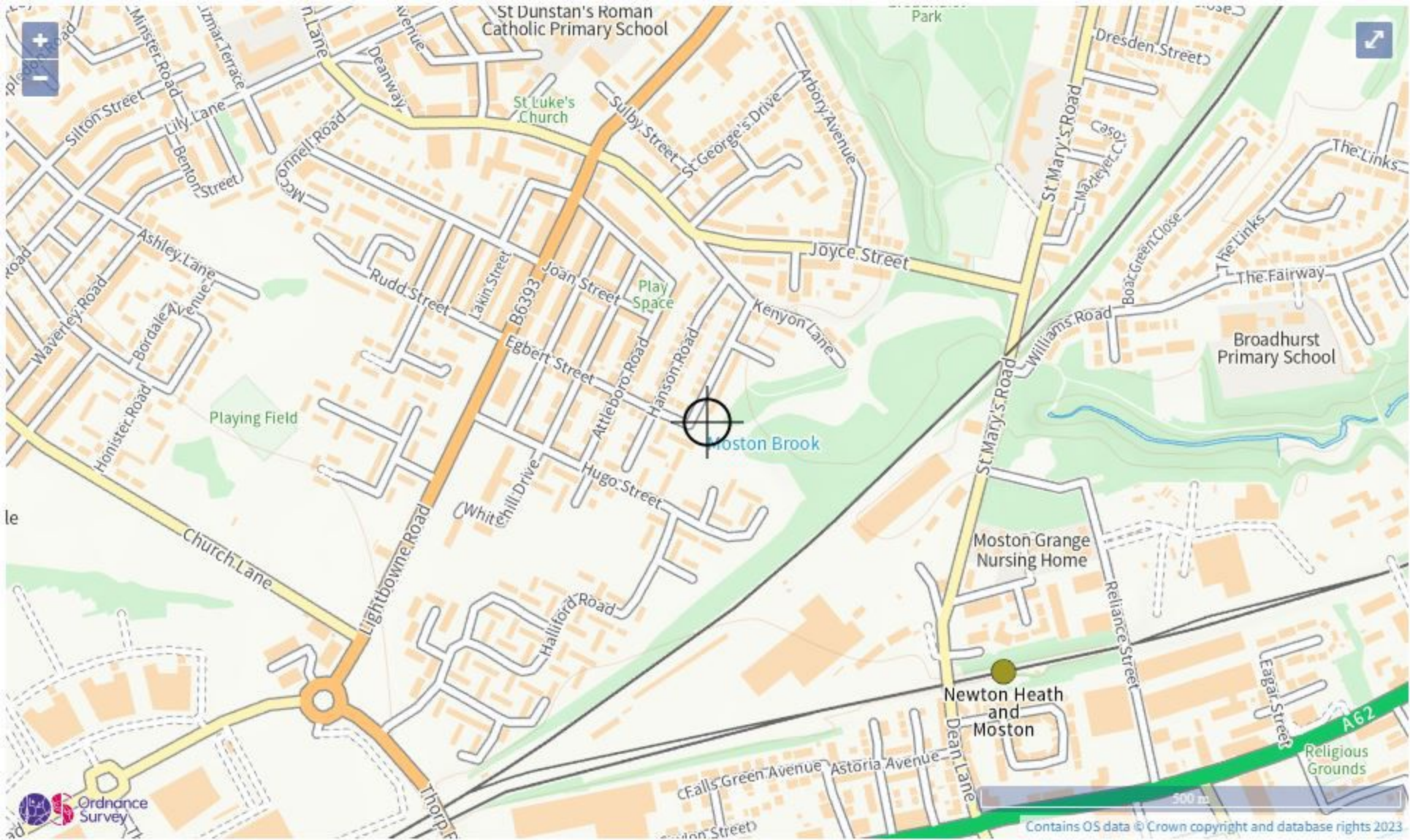
0 20 40 60m





Extent of flooding from surface water

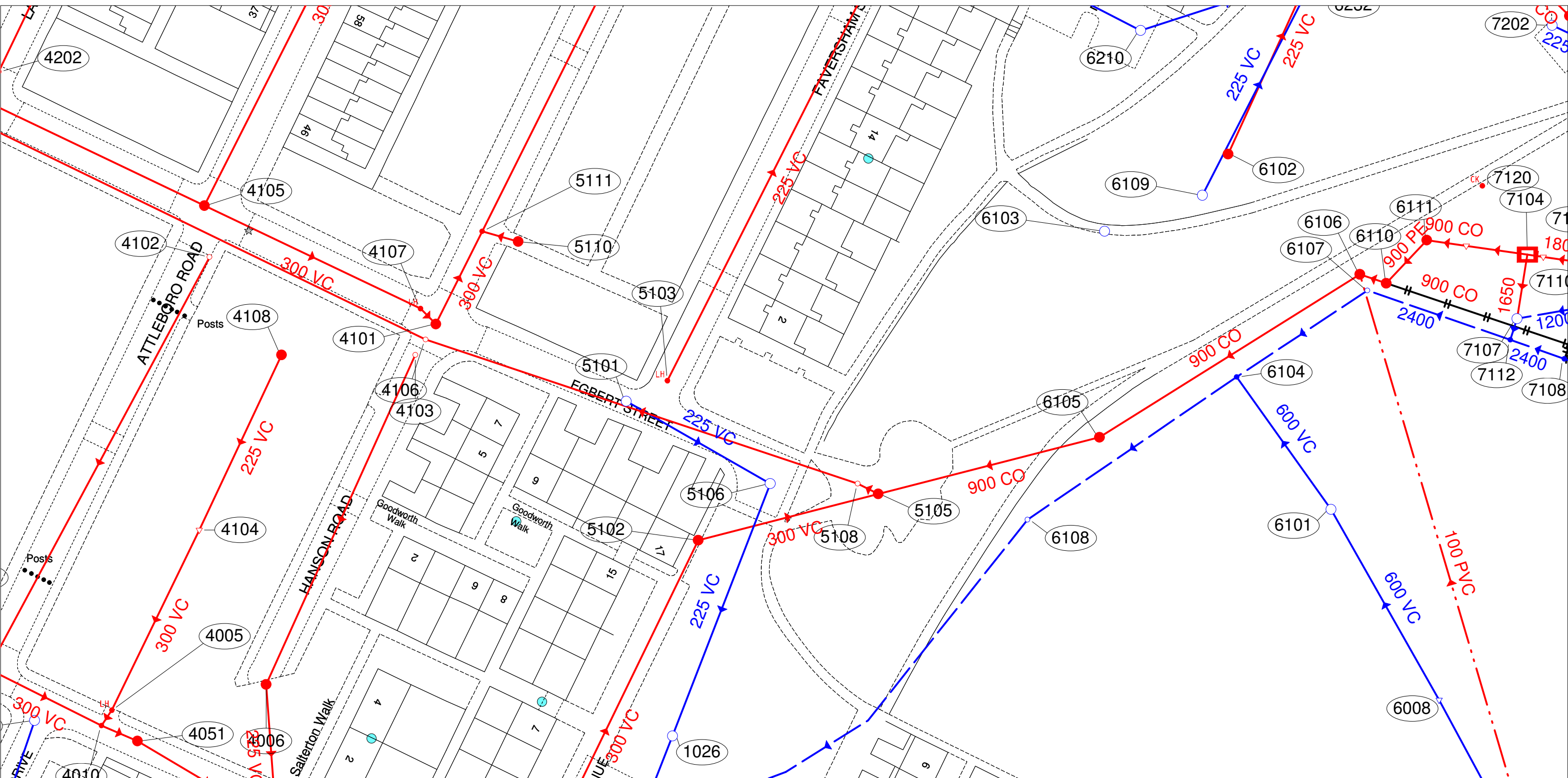
High Medium Low Very low Location you selected



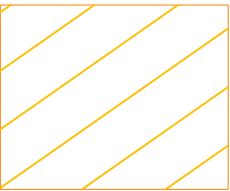
Maximum extent of flooding from reservoirs:

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

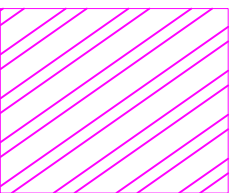
Appendix F – Public Sewer Map & CCTV Survey



Appendix G – Pre & Post Development Impermeable Areas Drawing



PRE DEVELOPMENT
IMPERMEABLE AREAS = 11m²



POST DEVELOPMENT
IMPERMEABLE AREAS = 210m²

SITE BOUNDARY

P01	08.09.2023	PRELIMINARY ISSUE	JJR	JP	KOB
REV	DATE	DESCRIPTION	BY	CHK	APP
DRAWING STATUS:					
PRELIMINARY					
CLIENT:					
ONE MANCHESTER					
ARCHITECT:					
BTP ARCHITECTS					
PROJECT:					
P500 - EGBERT STREET, MOSTON					
TITLE:					
PRE & POST DEVELOPMENT IMPERMEABLE AREAS					
STATUS:	PROJECT No.	PROJECT	ORIGINATOR	VOL/SYS	LEVEL
S2	222-100	ES - AJP - ZZ - 00 -SK - C - 0001			
			TYPE	ROLE	DRAWING No.
SCALE @ A1:	DESIGNED:	DRAWN:	CHECKED:	APPROVED:	DATE:
1:100	JJR	JJR	JP	KOB	SEP 2023

Appendix H – Outline Drainage Strategy Drawing & SW Calcs

The Alan Johnston Partnership		Page 1
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.017	4-8	0.004

Total Area Contributing (ha) = 0.021

Total Pipe Volume (m³) = 0.780

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	11.411	0.120	95.1	0.006	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	12.613	0.130	97.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	11.076	0.110	100.7	0.005	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	9.036	0.090	100.4	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.18	80.700	0.006	0.0	0.0	0.0	1.03	18.2	0.8
S1.001	50.00	5.39	80.580	0.006	0.0	0.0	0.0	1.02	18.0	0.8
S2.000	50.00	5.18	80.560	0.005	0.0	0.0	0.0	1.00	17.7	0.7
S1.002	50.00	5.54	80.450	0.021	0.0	0.0	0.0	1.00	17.7	2.8

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SSW01	81.500	0.800	Open Manhole	600	S1.000	80.700	150				
SSW02	81.500	0.920	Open Manhole	600	S1.001	80.580	150	S1.000	80.580	150	
SSW03	81.500	0.940	Open Manhole	600	S2.000	80.560	150				
SSW04	81.500	1.050	Open Manhole	1200	S1.002	80.450	150	S1.001	80.450	150	
								S2.000	80.450	150	
SUU5106	80.810	0.450	Open Manhole	1200		OUTFALL		S1.002	80.360	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SSW01	387556.987	401162.147	387556.987	401162.147	Required	
SSW02	387552.038	401151.865	387552.038	401151.865	Required	
SSW03	387568.206	401156.375	387568.206	401156.375	Required	
SSW04	387563.403	401146.395	387563.403	401146.395	Required	
SUU5106	387563.688	401137.363			No Entry	



The Alan Johnston Partnership		Page 3
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19 File SW + FW NETWORK.MDX	Designed by JJR Checked by JP	
Micro Drainage	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	150	SSW01	81.500	80.700	0.650	Open Manhole	600
S1.001	o	150	SSW02	81.500	80.580	0.770	Open Manhole	600
S2.000	o	150	SSW03	81.500	80.560	0.790	Open Manhole	600
S1.002	o	150	SSW04	81.500	80.450	0.900	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	11.411	95.1	SSW02	81.500	80.580	0.770	Open Manhole	600
S1.001	12.613	97.0	SSW04	81.500	80.450	0.900	Open Manhole	1200
S2.000	11.076	100.7	SSW04	81.500	80.450	0.900	Open Manhole	1200
S1.002	9.036	100.4	SUU5106	80.810	80.360	0.300	Open Manhole	1200

The Alan Johnston Partnership		Page 4
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19 File SW + FW NETWORK.MDX	Designed by JJR Checked by JP	
Micro Drainage	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.006	0.006	0.006
1.001	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.005	0.005	0.005
1.002	-	-	100	0.010	0.010	0.010
				Total	Total	Total
				0.021	0.021	0.021

The Alan Johnston Partnership		Page 5
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19 File SW + FW NETWORK.MDX	Designed by JJR Checked by JP	
Micro Drainage	Network 2019.1	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	SSW01	150	0.650	0.770	Unclassified	600	0	0.650	Unclassified
S1.001	SSW02	150	0.770	0.900	Unclassified	600	0	0.770	Unclassified
S2.000	SSW03	150	0.790	0.900	Unclassified	600	0	0.790	Unclassified
S1.002	SSW04	150	0.300	0.900	Unclassified	1200	0	0.900	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
------------------------	-----------------	-----------------	-----------------	------------------------	-------------	-----------

S1.002 SUU5106 80.810 80.360 79.710 1200 0

Simulation Criteria for Storm

Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000
 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000
 Hot Start (mins) 0 Inlet Coefficient 0.800
 Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000
 Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 60
 Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 1

 Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Profile Type Summer
 Return Period (years) 2 Cv (Summer) 0.750
 Region England and Wales Cv (Winter) 0.840
 M5-60 (mm) 18.300 Storm Duration (mins) 30
 Ratio R 0.360

The Alan Johnston Partnership		Page 6
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: SSW04, DS/PN: S1.002, Volume (m³): 1.6

Unit Reference	MD-SHE-0109-5000-0800-5000
Design Head (m)	0.800
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	109
Invert Level (m)	80.450
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points			Control Points		
	Head (m)	Flow (l/s)		Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	5.0	Kick-Flo®	0.537	4.2
Flush-Flo™	0.241	5.0	Mean Flow over Head Range	-	4.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.7	0.800	5.0	2.000	7.7	4.000	10.6	7.000	13.9
0.200	5.0	1.000	5.5	2.200	8.0	4.500	11.3	7.500	14.4
0.300	5.0	1.200	6.0	2.400	8.4	5.000	11.8	8.000	14.8
0.400	4.8	1.400	6.5	2.600	8.7	5.500	12.4	8.500	15.2
0.500	4.5	1.600	6.9	3.000	9.3	6.000	12.9	9.000	15.7
0.600	4.4	1.800	7.3	3.500	10.0	6.500	13.4	9.500	16.1

The Alan Johnston Partnership		Page 7
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.360 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 45

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)	
S1.000	SSW01	15 Winter	1	+0%	100/15 Summer				80.720	-0.130	0.000	
S1.001	SSW02	15 Winter	1	+0%	100/15 Summer				80.600	-0.130	0.000	
S2.000	SSW03	15 Winter	1	+0%	100/15 Summer				80.579	-0.131	0.000	
S1.002	SSW04	15 Winter	1	+0%	30/15 Summer				80.520	-0.080	0.000	

				Pipe			
PN	US/MH Name	Flow Cap.	Flow (l/s)	Flow (l/s)	Status	Level Exceeded	
S1.000	SSW01	0.04		0.7	OK		
S1.001	SSW02	0.04		0.7	OK		
S2.000	SSW03	0.04		0.6	OK		
S1.002	SSW04	0.15		2.3	OK		

The Alan Johnston Partnership		Page 8
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.360 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 45

									Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m³)
S1.000	SSW01	15 Winter	2	+0%	100/15 Summer				80.723	-0.127	0.000
S1.001	SSW02	15 Winter	2	+0%	100/15 Summer				80.603	-0.127	0.000
S2.000	SSW03	15 Winter	2	+0%	100/15 Summer				80.581	-0.129	0.000
S1.002	SSW04	15 Winter	2	+0%	30/15 Summer				80.534	-0.066	0.000

		Pipe			
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Level Status Exceeded
S1.000	SSW01	0.06		0.9	OK
S1.001	SSW02	0.06		0.9	OK
S2.000	SSW03	0.05		0.8	OK
S1.002	SSW04	0.19		3.0	OK

The Alan Johnston Partnership		Page 9
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.360 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 45

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) SurchARGE	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m ³)	
S1.000	SSW01	15 Winter	30	+0%	100/15 Summer				80.733	-0.117	0.000	
S1.001	SSW02	15 Winter	30	+0%	100/15 Summer				80.628	-0.102	0.000	
S2.000	SSW03	15 Winter	30	+0%	100/15 Summer				80.627	-0.083	0.000	
S1.002	SSW04	15 Winter	30	+0%	30/15 Summer				80.622	0.022	0.000	

				Pipe		
	US/MH	Flow /	Overflow	Flow		Level
PN	Name	Cap.	(l/s)	(l/s)	Status	Exceeded
S1.000	SSW01	0.11		1.8	OK	
S1.001	SSW02	0.10		1.7	OK	
S2.000	SSW03	0.09		1.4	OK	
S1.002	SSW04	0.31		4.9	SURCHARGED	

The Alan Johnston Partnership		Page 10
1 Dale Street Liverpool L2 2ET	222-100 Moston P500 - Egbert Street SW Network	
Date 24/08/2023 14:19	Designed by JJR	
File SW + FW NETWORK.MDX	Checked by JP	
Micro Drainage	Network 2019.1	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 18.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.360 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
 Return Period(s) (years) 1, 2, 30, 100
 Climate Change (%) 0, 0, 0, 45

										Water	Surcharged	Flooded
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)	Depth (m)	Volume (m ³)	
S1.000	SSW01	15 Winter	100	+45%	100/15 Summer				81.211	0.361	0.000	
S1.001	SSW02	15 Winter	100	+45%	100/15 Summer				81.205	0.475	0.000	
S2.000	SSW03	15 Winter	100	+45%	100/15 Summer				81.204	0.494	0.000	
S1.002	SSW04	15 Winter	100	+45%	30/15 Summer				81.199	0.599	0.000	

							Pipe
PN	US/MH Name	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded	
S1.000	SSW01	0.18		2.9	FLOOD RISK		
S1.001	SSW02	0.13		2.1	FLOOD RISK		
S2.000	SSW03	0.11		1.8	FLOOD RISK		
S1.002	SSW04	0.32		5.0	SURCHARGED		