FLOOD RISK ASSESSMENT & DRAINAGE STRATEGY REPORT FOR "JOYCE", CHORLTON STREET, MANCHESTER, M1 3HY.

DOCUMENT NUMBER: C3516-R1-REV-C

PREPARED BY

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1. SITE DETAILS

Site Name	Joyce by the James
Site Address	Boulton House, 17 Chorlton Street, Manchester, M1 3HY
Purpose of Development	Coversion of the existing office building to serviced apartments with a new build wing on the car park
Existing Land Use	Brownfield
County	Greater Manchester
Country	England
Local Planning Authority	Manchester City Council

1.1. Site Location

The location of the project site is shown within the location plan, provided in Appendix A.

1.2. Existing Site Description and Topography

The existing site is brownfield, and shown on the 'Pre-development Impermeable Area Exceedance Routes Plan', drawing number C3516-01, provided in Appendix A.

1.3. Geology of The Area

According to the British geological survey, The superficial deposit at the area is Till as shown in Figure 1 below. The bedrock at the area is part of the Chester Formation; consisting of Sandstone as shown in Figure 2 overleaf.

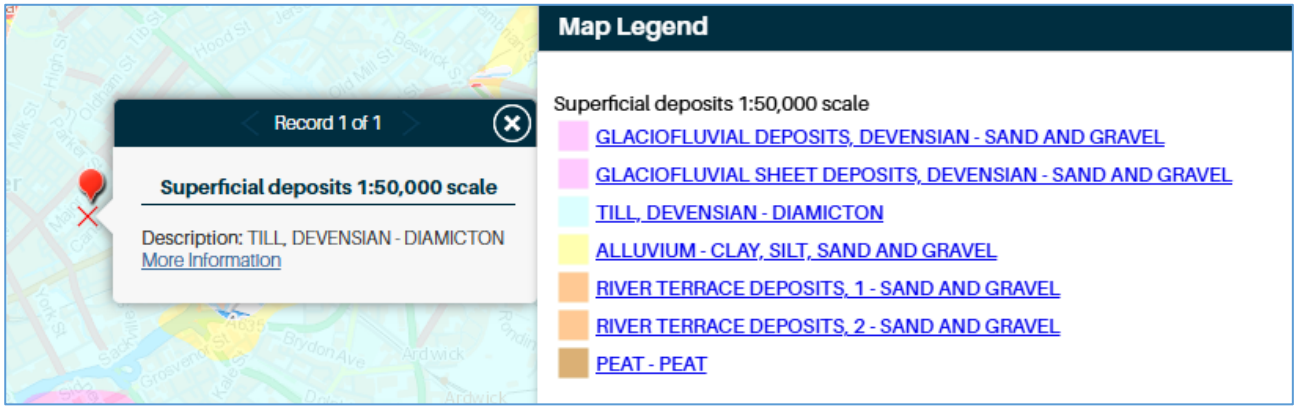


Figure 1 - Superficial Deposits at the site. (Source: British Geological Survey website (contains British Geological Survey materials © NERC2025)).

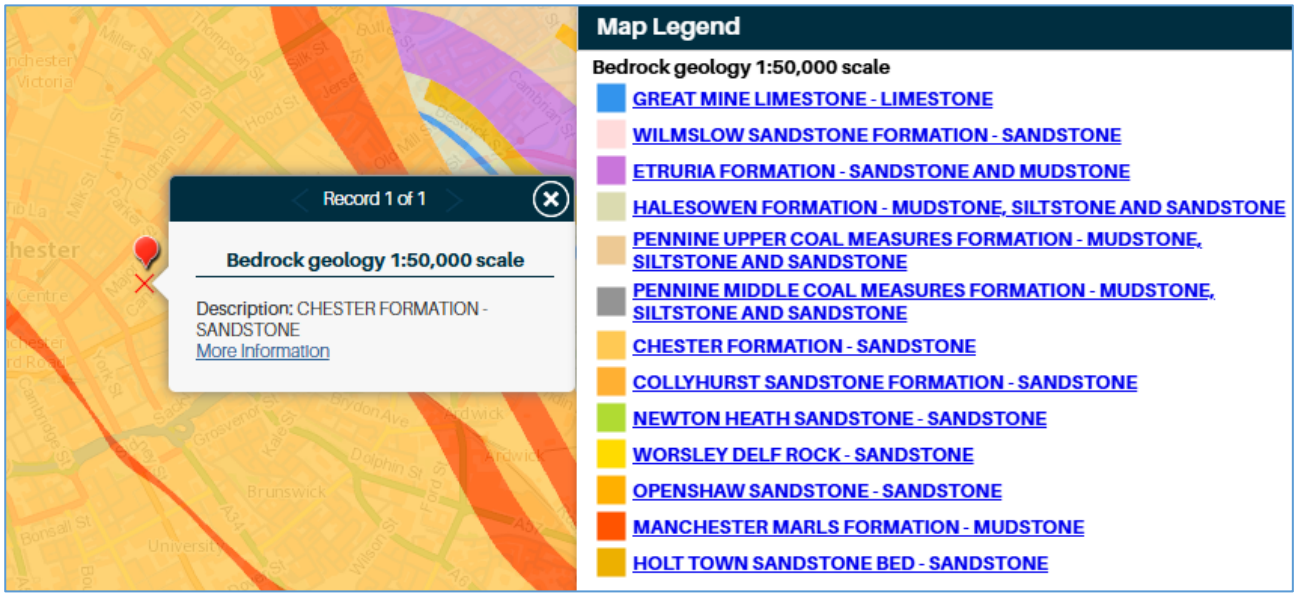


Figure 2 - Bedrock at the site. (Source: British Geological Society Website (contains British Geological Survey materials © NERC2025)).

1.4. Proposed Development

The proposals involve the conversion of the existing office building to serviced apartments with a new build wing on the car park. The proposed site plans, and a 'Post Development Impermeable Area and Exceedance Flow Route plan', drawing number C3516-02, can be found in Appendix A.

2. PLANNING POLICIES

2.1. National Planning Policy

- National Planning Policy Framework (December 2024)
- National Planning Practive Guidance Suite (August 2022)
- CIRIA SUDS manual (C753)

2.2. Local Planning Policy

This report has been written in conjunction with the following local planning policies:

- Level 1 Greater Manchester Strategic Flood Risk Management;
- Greater Manchester Strategic Flood Risk Management Framework
- Manchester, Salford and Trafford Strategic Flood Risk Assessment;

3. FLOOD RISK

The possible causes of flooding set out in NPPF are considered in this section in relation to flood risk to the site itself and the effects of the development of the site on the flood risk elsewhere.

3.1. Flood Zones

The Environment Agency has developed a flood risk map which shows the relative risk of flooding for different return periods. Flood zones assume that no defences are present and so where these do exist, they are only indicative of the potential for flooding.

The development lies within Flood Zone 1 of the Environment Agency's Flood risk map, as shown in Figure 3 overleaf. Land located within Flood Zone 1 is at low risk of flooding, having an associated annual probability of less 1 in 1000.

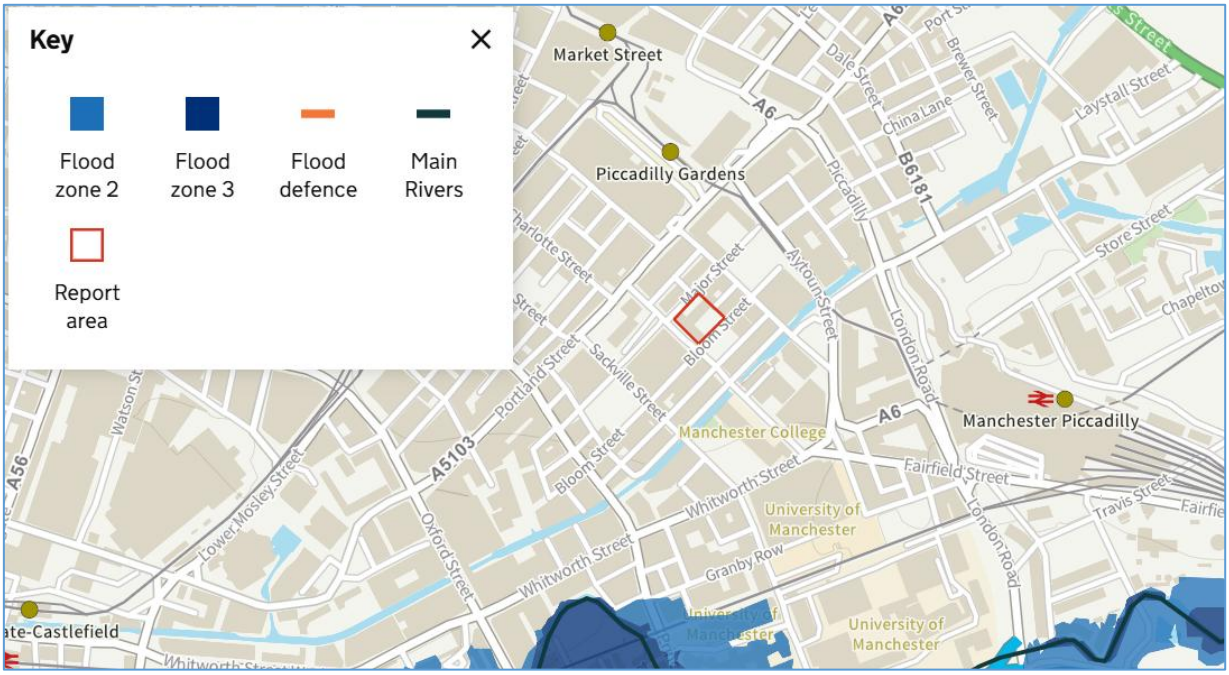


Figure 3 – Environment Agency Flood Map for flooding extent from rivers and sea for the proposed development.

As seen, the site is located within Flood zone 1, and in accordance with Table 1 from the NPPF's technical guidance, land within Flood zone 1 is suitable for any use.

Assessment of this site has been based upon the Environment Agency's flood map, the topographical site survey, and the architect's proposed development layout.

Table 1: NPPF Flood Zone Guidance

Flood Zone Classification	Definition of Zone	Appropriate uses	FRA Requirements	Policy Aims
Zone 1 Low Probability	This zone compromises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (0.1%<).	All uses of land are appropriate in this zone.	For development proposals on sites compromising one hectare or above the vulnerability to flooding from other sources as well as from river and sea flooding, and the potential to increase flood risk elsewhere through addition of hard surfaces and the effect of new development on surface water run-off should be incorporated in a FRA. This need only be brief unless the factors above or other considerations require particular attention. See Annex E for minimum requirements.	In this zone, developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of development, and the appropriate application sustainable drainage techniques.
Zone 2 Medium Probability	This zone compromises land assessed as having between a 1 in 1000 annual probability	The water-compatible less vulnerable and more vulnerable uses of land and essential infrastructure in	All development proposals should be accompanied by a	In this zone developers and local authorities should seek opportunities to reduce the overall level of flood risk in the

Flood Zone Classification	Definition of Zone	Appropriate uses	FRA Requirements	Policy Aims
	of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5%-0.1%) in any year	Table D 2 are appropriate in this zone. Infrastructure in Table D.2 are appropriate in this zone. Subject to the sequential Test being applied the highly vulnerable uses in Table D.2 are only appropriate in this zone if the exception Test (see para. D.9) is passed.	FRA. See Annex E for minimum requirements.	area through the layout of form and development, and the appropriate application of sustainable drainage techniques.
Zone 3a High Probability	This zone compromises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 greater annual probability of flooding from sea (>0.5%) in any year.	The water compatible and less vulnerable uses of land in Table D.2 are appropriate in this Zone. The highly vulnerable uses in Table D.2 should not be permitted in this zone. The more vulnerable and essential infrastructure uses in D.2 should only be permitted in this zone if the Exception Test (see para.	All development proposals in this zone should be accompanied by a FRA. See Annex E for minimum requirements.	In this zone, developers and local authorities should seek opportunities to: i. reduce the overall level of flood risk in the area through the layout and form of the development and appropriate application of sustainable drainage techniques. ii. relocate existing development to land in zones with a lower probability of flooding; and iii. create space for flooding to occur by restoring functional

Flood Zone Classification	Definition of Zone	Appropriate uses	FRA Requirements	Policy Aims
		D.9) is passed Essential Infrastructure permitted in this zone should be designed and constructed to remain operational and safe for users in times of flood.		floodplain and flood pathways and by identifying, allocating and safeguarding open space for flood storage.
Zone 3b The Functional Floor Plan	This zone compromises land where water has to flow or be stored in times of flood. Local planning authorities should identify in their SFRAs areas of functional floodplain and its boundaries accordingly, in agreement with the Environment Agency. The identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters. But land which would flood with an annual	Only the water-compatible uses and the essential infrastructure listed in Table D.2 that has to be there should be permitted on this zone. It 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 • Essential infrastructure in this zone should pass the Exception Test.	All development proposals in this zone should be accompanied by an FRA. See Annex E for minimum requirements.	In this zone, developers and local authorities should seek opportunities to: i. reduce the overall level of flood risk area through the layout and form of the development and appropriate application of sustainable drainage techniques; and ii. relocate existing development to land with a lower probability of flooding.

Flood Zone Classification	Definition of Zone	Appropriate uses	FRA Requirements	Policy Aims
	probability of 1 in 20 (5%) or greater in any year, or is designed to flood in an extreme (0.1%) flood should provide a starting point for consideration and discussions to identify the functional floodplain.			

3.2. Flood Vulnerability

Table 2 below, which has been extracted from NPPF's technical guidance, highlights the flood risk vulnerability of various developments. This information is based partly on DEFRA/Environment Agency research and 'Flood Risks to People' (FD2321/Tr2) and also on the need of some uses to keep functioning during flooding.

Buildings that combine a mixture of uses should be places into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.

The impact of a flood on a particular use identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and risk mitigation measures needed ensure the development may differ between uses within a particular vulnerability classification.

Table 2: NPPF's Flood Risk Vulnerability Classification

Essential Infrastructure	• Essential transport infrastructure and strategic utility infrastructure, including electricity generating stations and grinds and primary substations.
Highly Vulnerable	• Police, Ambulance and Fire stations and command centres, and telecommunications installations and emergency disposal points. • Basement Dwellings, caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substance consent.
More Vulnerable	• Hospitals, residential institutions such as care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling house, student halls of residence, drinking establishments, nightclubs, hotels and sites used for holiday or short-let caravans and camping.

	• Non-residential uses for health service, nurseries and educations. • Landfill and waste management facilities for hazardous waste.
Less Vulnerable	• Buildings used for shops, financial, professional and other services, restaurants and cafes, offices, industry, storage and distribution and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities), mineral workings and processing (except for sand and gravel). • Water treatment plants and sewerage treatment plans (if adequate pollution control measures are in place.)
Water-compatible Development	• Flood control infrastructure, water transmission infrastructure and pumping stations. • Sewerage transmission infrastructure and pumping stations. • Sand and Gravel workings. • Docks, marinas and wharves, navigational facilities. • MOD defence installations • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterslide location. • Water-based recreation (excluding sleeping accommodation) • Lifeguard and coastguard stations • Amenity open space, nature conservation and sports recreation. • Essential sleeping or residential accommodation for staff required by users in this category, subject to a warning and evacuation plan.

Based on the Environmental Agencies flood map, the development site is located within Flood Zone 1 and in accordance with table 3, overleaf, is therefore suitable for any development. Furthermore, neither a sequential nor exception test is required as a part of this Flood Risk Assessment.

Table 3: NPPF's Flood Risk Vulnerability and Flood Zone Compatibility

Vulnerability Classification	Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone 1	✓	✓	✓	✓	✓
Flood Zone 2	✓	✓	Exception Test	✓	✓
Flood Zone 3a	Exception Test	✓	**X**	Exception Test	✓
Flood Zone 3b	Exception Test	✓	**X**	**X**	**X**

Key: ✓ Development is appropriate
X Development should not be permitted.

4. FLOOD RISK ASSESMENT

The possible causes of flooding set out in NPPF's technical guidance are considered in this section in relation to the flood risk to the site itself and the effects of the development of the site on flood risk elsewhere.

4.1. Fluvial or Tidal Flooding

The River Medlock is located to the south-east of the proposed development site. However, does not cause any flood risk to this site. Therefore, there is no risk of flooding to the proposed development site from fluvial flooding.

The site is also not at risk of tidal flooding, this can also be confirmed by the Environment Agency's Flood map in Figure 3, see Section 3.1.

4.2. Flooding from Land (Overland Flow)

The majority of the proposed development site is at a very low risk of surface water flooding. However, there is an area within the existing car park at a low risk (1:1000), and the entirety of the paving/car parking area adjacent to Major Street, which is at a high risk (1:30) of surface water flooding. This can be seen in Figures 4 & 5, overleaf.



Figure 4– Environment Agency 1:1000 Surface Water Flood Map for the proposed development.

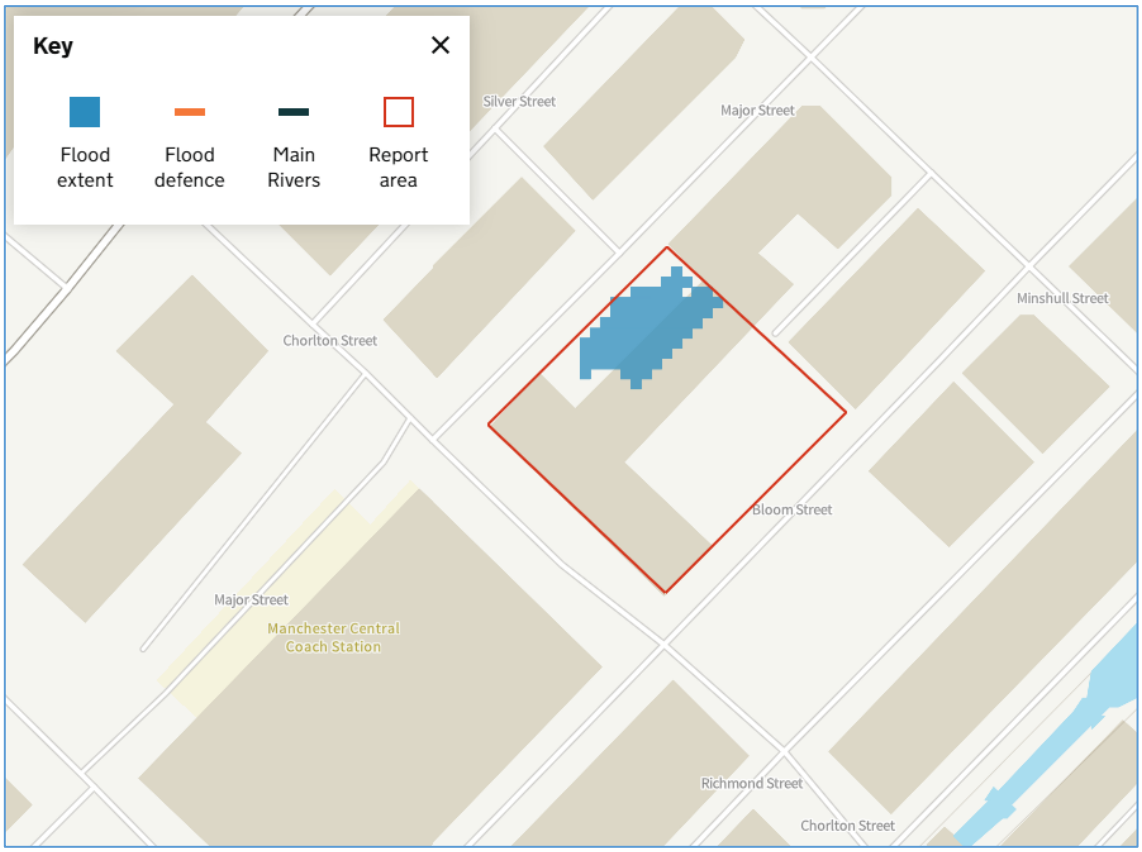


Figure 5– Environment Agency 1:30 Surface Water Flood Map for the proposed development.

Consultation of these areas with the 'Pre-development Impermeable Area and Exceedance Flow Route plan', provided in Appendix A, and Lidar data extracted confirms that this is due to ponding in naturally low lying areas of the site, which will not be the case after the proposed development.

The surface water runoff that will be produced as a result of this development will be dealt with through the use of Sustainable urban Drainage Systems (SuDS), and therefore reduce the peak rate of flow leaving the site. This SuDS solution will be discussed in greater detail further on in this report.

4.3. Flooding from Groundwater

The Environment Agency's website has confirmed that flooding from groundwater is unlikely in this area.

4.4. Flooding from Sewers

The Greater Manchester SFRA confirms that sewer flooding incidents are unlikely within the central area of Manchester, with only a few recorded events. Figure 6 below shows this, and also confirms there have been no occurrences of sewer flooding at the proposed development site.

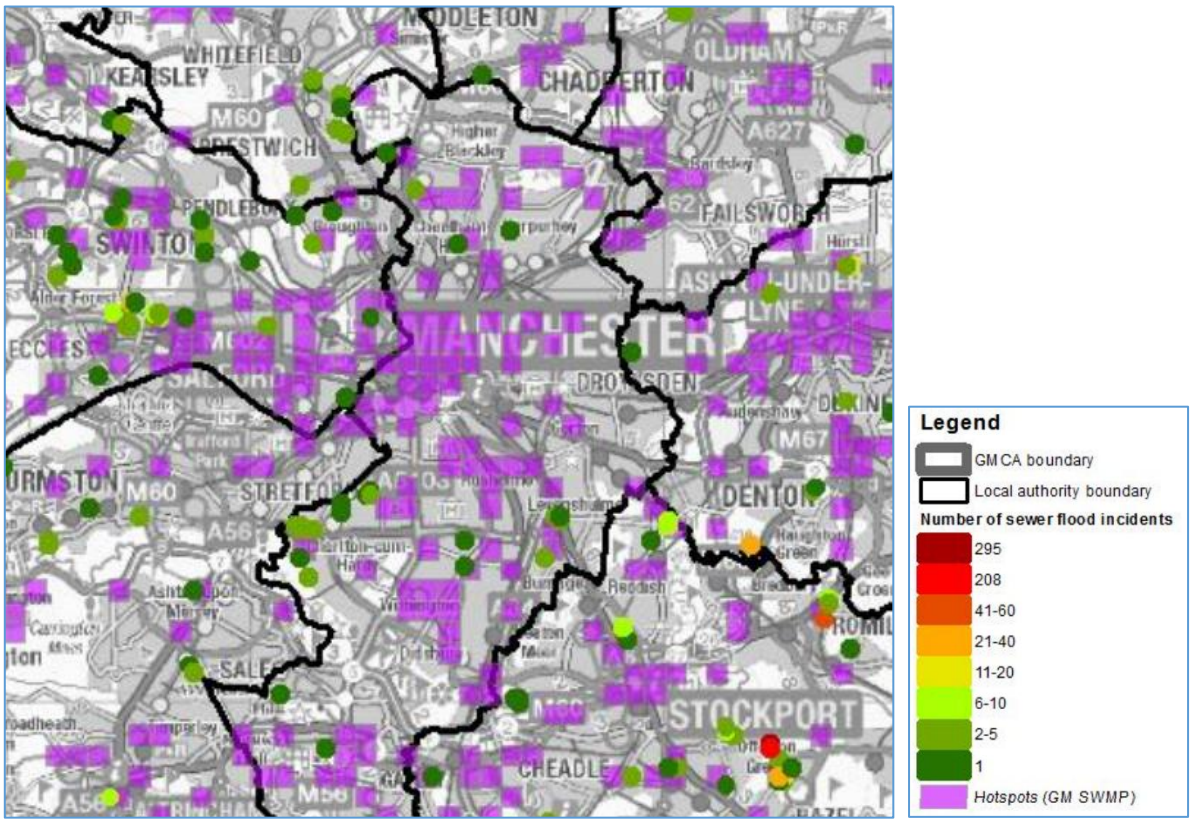


Figure 6 –Historic Sewer Flooding Incidents, extracted from the Greater Manchester Strategic Flood Risk Assessment (SFRA) Report.

4.5. Flooding from Reservoirs or other artificial sources

There is no risk of flooding to this site from reservoirs or any other artificial sources.

This can also be confirmed by the Environment Agency's website.

5. SUSTAINABLE URBAN DRAINAGE SYSTEMS

The total site area is 2,495m^2, and the impermeable areas of the site prior to development are 2,434m^2. Following the development at this site, the impermeable areas will have decreased to 2,386m^2. These areas consist of, the roof areas of the proposed buildings, as well as the hard standing areas, prior to any mitigation by using Sustainable Urban Drainage Systems.

Pre and post development surface water runoff calculations showing the peak flow rate leaving the site can be found in Appendix B, and the pre and post impermeable areas drawings are located within Appendix A.

Surface water arising from a developed site should, as far as practicable, be managed in a sustainable manner to mimic the surface water flows arising from the site prior to the proposed development, while reducing the flood risk to the site itself and elsewhere, taking climate change into account.

Reducing the rate of surface water discharge from Urban Sites is one of the most effective ways of reducing and managing flood risk.

Traditional piped surface water systems work by removing the surface water from our developments as quickly as possible, however this can cause various adverse impacts:

- Increased downstream flooding, and sudden rises in flow rates and water levels in local water courses.

- Reduction in groundwater levels dry weather flows in watercourses.

- Reduce amenity and adversely affect biodiversity due to the surface water run-off containing contaminants such as oil, organic matter and toxic materials.

SuDS are defined as a sequence of management principles and control structures designed to drain surface water in a more sustainable fashion than conventional piped drainage techniques. SuDS should utilise the environmental, ecological and social benefits.

These include:

- Protection and enhancement of water quality – As well as providing on-site attenuation, SuDS treat the water, resulting in an improved quality of water leaving the site. This is achieved when the water passes through the fine soils and the roots of specially selected plants, pollutants washed of the hard landscaping by rainfall will be safely removed before the water reaches the natural water course.

- A sympathetic approach to the environmental setting by providing the opportunities to create habitats for flora and fauna in urban watercourses and open spaces.

- Meeting the amenity and social needs of the local community and residents in the creation of attractive green spaces.

The various types of SuDS include:

Permeable paving	
Soakaways;	
Swales and basins;	
Bioretention/ rain gardens;	
Green roofs and rainwater re-use;	
Infiltration trenches and filter drains	
Ponds and wetlands	

Preferably a combination of these techniques should be used as part of the surface water management train, and it is important for all stakeholders, such as developers, architects, landscape architects and engineers to work together at the planning stage in order to determine a feasible solution.

The SuDS management train is shown below, and this has been followed when proposing the proposed Sustainable Urban Drainage Systems for this site.

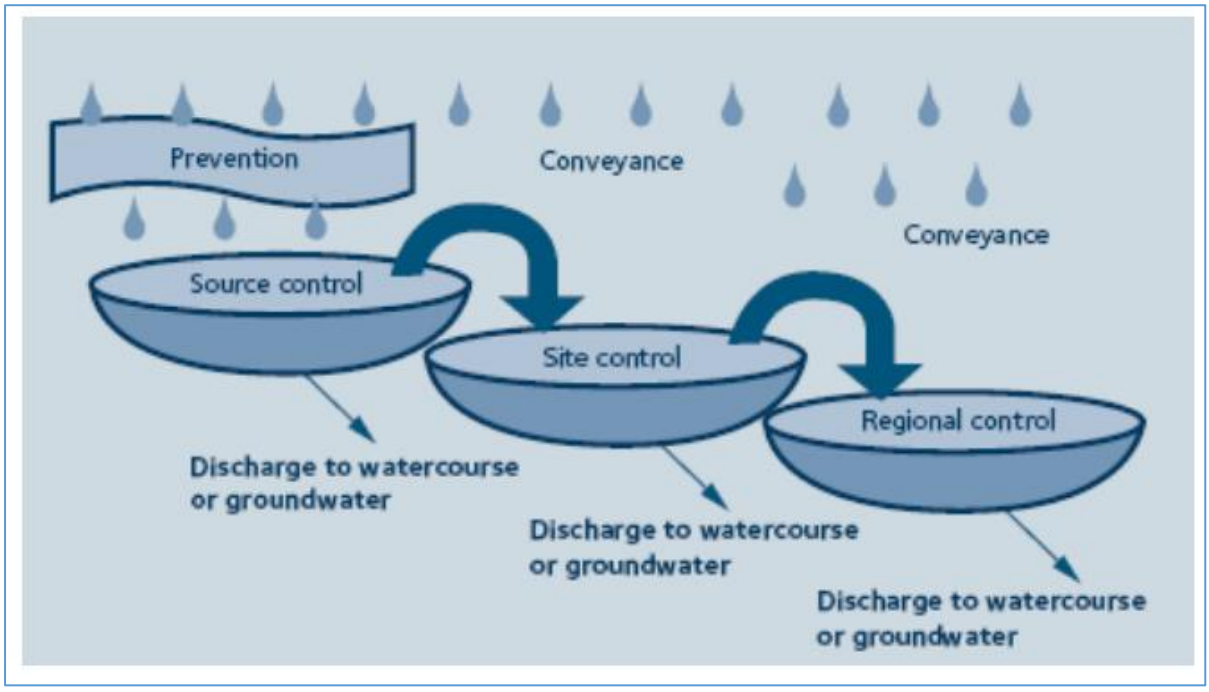


Figure 7 – SuDS Management Train

6. SuDS PROPOSALS FOR DEVELOPMENT

In accordance with the CIRIA SuDS Manual C753 and Policy SI 13 of the London Plan, the SuDS hierarchy has been considered in relation to the site-specific constraints and its surroundings. Table 4 below outlines the hierarchical approach considered for the development at Boulton House.

Sustainable Drainage Proposal	Description	Constraints/Comments	Appropriate
Rainwater Use as a Resource	Use of rainwater runoff for reuse, e.g. Rainwater harvesting tanks, Blue Roofs for irrigation	Wall mounted rainwater harvesting tanks will be provided where suitable	Yes
Rainwater Full Infiltration to Ground (Source Control)	Infiltration devices and/or soakaways. Surface water runoff stored on site and gradually percolating into receiving ground	There is no suitable space to implement full infiltration due to the existing conditions and the proposed development.	No
Rainwater Partial Infiltration to Ground (Source Control)	Installation of permeable/porous surfacing	Permeable Paving is proposed on all new hardstanding areas	Yes
Rainwater attenuation in green infrastructure features for gradual release	The onsite storage of all surface water runoff which can then be gradually conveyed to a nearby watercourse, sewer or infiltration into the ground. Forms of green infrastructure features: Green Roofs, Raingardens, Ponds, Swales, Detention basins, Infiltration Trenches and Raingarden Planters	Areas of green & blue roofing have been proposed where feasible	Yes

Rainwater discharge direct to a watercourse	All surface water runoff on site discharged at a restricted rate to a nearby watercourse	Consultation of EA Maps and survey information shows no nearby watercourses to site	N/A
Controlled rainwater discharge to a surface water sewer or drain	All surface water runoff on site is discharged at a restricted rate to a nearby surface water sewer or drain, all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	N/A	N/A
Controlled rainwater discharge to a combined sewer	All surface water runoff on site discharged at a restricted rate to a nearby combined sewer all rainwater runoff stored in below ground attenuation features. E.g. oversized pipes or geo-cellular tanks	All remaining surface water runoff will discharge into a below ground attenuation tank, as seen in Appendix A, sized for a 1 in 100 year +45% CC storm event, using FEH data. This will then discharge into an existing surface water sewer, at a reduced rate of 4.5 l/s.	Yes

Table 4: SuDS Hierarchy

7. PROPOSED SuDS SOLUTION

In order to ensure that the SuDS management train has been considered fully, both green and blue roofs are proposed. Furthermore, wall mounted rainwater harvesting tanks will be implemented, where feasible, in order to promote rainwater re-use. All hardstanding areas will also be formed of a permeable surfacing in order to deal with as much of the surface water at the source, with the surface water runoff from all sloped areas to be caught by slot drains.

Due to the existing hardstanding areas as well as the limited space to install a soakaway away from any habitable areas, infiltration forms of SuDS were deemed unsuitable. Therefore, all surface water run off had to be attenuated and discharged at a rate of 4.5 l/s.

The remaining surface water runoff will be collected in an underground attenuation tank before discharging at a controlled rate to the nearby Combined Water Sewer. A detailed hydraulic model was built, using Infodrainage, to simulate rainfall events for a 1 in 100 year storm event, with a 45% allowance for climate change using FEH Rainfall data, with a restricted flow discharging at a rate of 4.5 l/s. The results of the hydraulic model can be found in Appendix B.

We believe the Sustainable Urban Drainage System hierarchy has been considered fully with respect to the type of development, the proposals will reduce flood risk at the site and elsewhere. The proposed SuDS strategy is shown on drawing number C3268-03 in Appendix A.

8. FOUL WATER DRAINAGE STRATEGY

The foul drainage from the site will be discharged via gravity to an existing Combined Water Sewer within the site boundary.

The proposed foul drainage strategy has been provided on drawing number C3536-05, provided in Appendix A.

9. TIMESCALE AND MAINTENANCE OF DRAINAGE WORKS

All drainage works shall be completed prior to first occupation and there shall be no adoption of any of the drainage works within the site, and the managers of the site will be responsible to oversee the long-term maintenance of the communal drains.

The following outline maintenance strategy sets out recommended timescales for maintenance of the proposed drainage works, in line with CIRIA SuDS Design Guide:

- Regular inspection will comprise the inspection and cleaning of catchment, gutters, filters and tanks to reduce the likelihood of contamination, this is recommended to be carried out every 3 to 6 months.

- Any flow control device should be checked every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

- The catchpit chamber and flow control to the attenuation tank should be checked and cleaned every 3 months for the accumulation of debris/ silt, in order to ensure that there are no blockages.

The following table outlines the maintenance requirements for the porous paving:

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 or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is the most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required
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, 48hr after large storms in six months
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 5: Operation and maintenance requirements for pervious pavements.

The following table outlines the maintenance requirements for the attenuation tank:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment pre-treatment structures and/or internal forebays.	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required
	Inspect slit accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Table 6: Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	**Required action**	**Typical Frequency**
Regular maintenance	Inspection of the tank for debris and sediment build-up, inlets/outlets/withdraw devices, overflow areas, pumps, filters	Annually (and following poor performance)
	Cleaning of tank, inlets, outlets, gutters. Withdrawal devices and roof drain filters of silts and other debris	Annually (and following poor performance)
Occasional maintenance	Cleaning and/ or replacement of any filters	Three monthly (or as required)
Remedial actions	Repair of overflow erosion damage or damage to tank	As required
	Pump repairs	As required

Table7: Operation and maintenance requirement for RWH systems

The following table outlines the maintenance requirements for green roofs:

Maintenance schedule	Required action	Typical Frequency
Regular Inspections	Inspect all components including soil substrate vegetation, drains irrigation systems (if applicable), membranes and roof structure for proper operation integrity of waterproofing and structural stability	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment (ie year one) replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where > 5% of coverage)	Annually (in autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required- clippings should be removed and not allowed to accumulate	Six monthly or as required
Remedial Actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

Table 8: Operation and maintenance requirement for green roofs

The following table outlines the maintenance requirements for the flow control chambers:

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect from surface and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then 6 monthly intervals
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Orifice plates within plastic chambers or vortex controls to be jetted from the surface after heavy rainfall events to remove any debris or silt	As required
	Empty catchpits upstream of SuDS features to ensure no debris is passed downstream	3 months or as required
Remedial actions*	In the event of a blockage, a vortex flow control can be removed from the chamber via the lifting cabled located at the access, this will be cleaned at surface level and reinstalled into its original location	As required
	In the event of a blockage, the orifice plate should be jetted from surface, and if blockage is not cleared the orifice plate can be removed by removing fixing bolts. These fixing bolts should be checked and replaced if needed.	As required
Monitoring	Following installation it is important that any extraneous materials i.e. building materials: granular backfill, in-situ pour concrete etc are removed from the unit and the new flow control chamber is fully jetted down	Upon installation
	Inspect/check chamber channel for any debris or silt build-up. Upstream chambers should be checked at the same time as these monitoring works to ensure network is operating at full capacity.	Annually

Table 9: Operation and maintenance requirement for flow control chambers

*All Remedial Works should be carried out by a competent and certified contractor, with no entry or removal of parts to be undertaken by landowner.

If upstream network of flow control chamber is regularly maintained, little maintenance is required within the chamber as there are no moving parts.

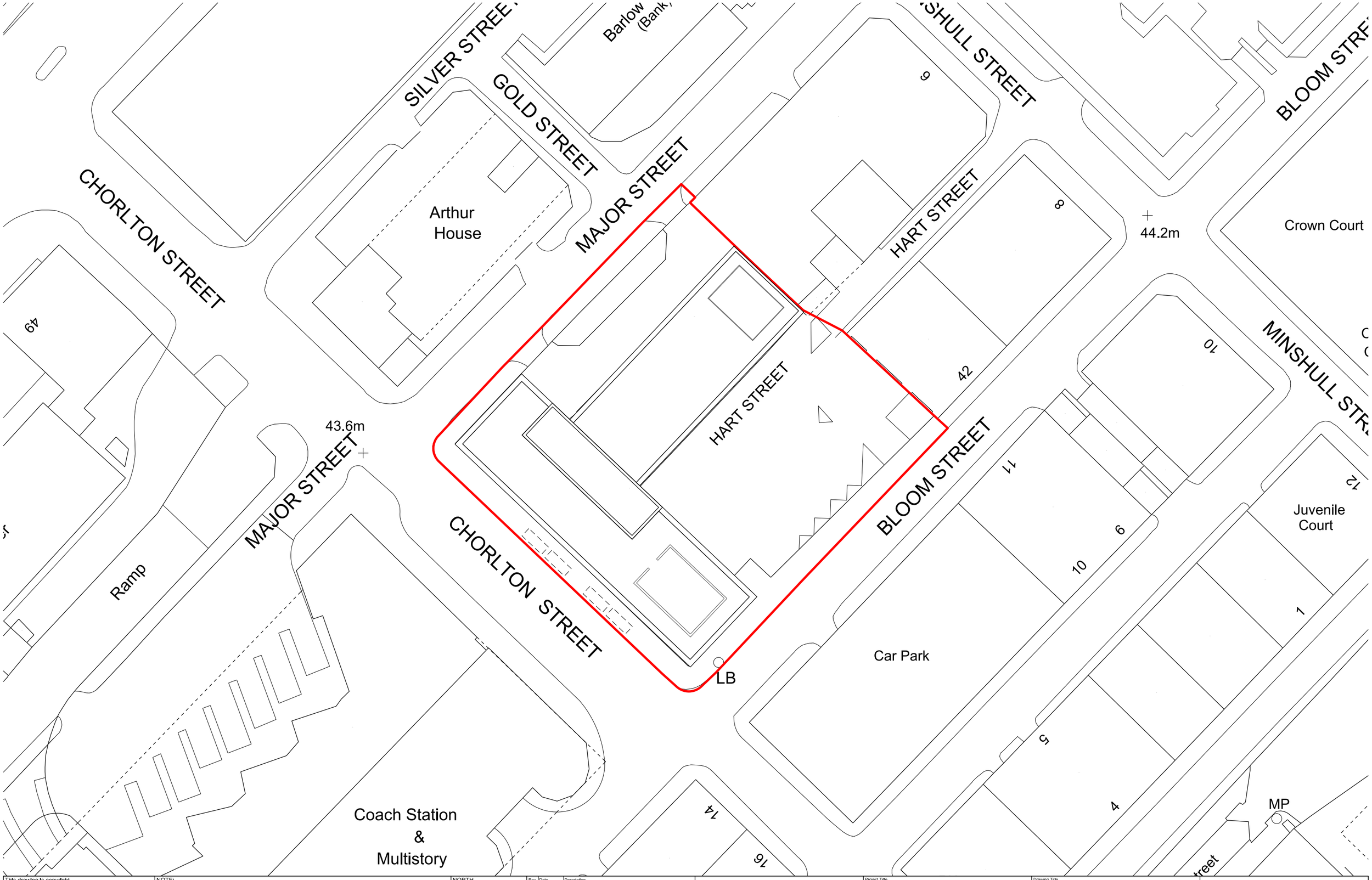
10. CONCLUSIONS

The purpose of this report is to satisfy the local planning authority that the proposed development is not a risk of flooding and will not increase flood risk at the site or elsewhere.

The flood risk from all sources has been assessed and the proposed development will incorporate a suitable SuDS solution to ensure that the proposals do not increase flood risk.

A proposed Foul Drainage Strategy has also been provided in the drawings provided in Appendix A.

APPENDIX A - DRAWINGS



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Contractor to report any dimensional discrepancies, errors or omissions prior to commencing on site.

NOTE:

NORTH

Rev	Date	Description
P01	28 - 05 - 2025	Planning Submission

Project Title
Joyce,
17 Chorlton Street,
Manchester

Drawing Title
Existing Site Plan
Roof Level

Job No
10531

Scale
1:500 @ A3

Status
PLANNING

Drawing No
10531-SHA-ZZ-A-B5D9-G100-XP-RF-002

Revision
P01

simpsonhaugh

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NOTE:

NORTH

Rev	Date	Description
P01	28 - 05 - 2025	Planning Submission

Project Title
Joyce,
17 Chorlton Street,
Manchester

Drawing Title
General Arrangement
Proposed Plan
Level 00

Job No
10531

Scale
1:250 @ A3

Status
PLANNING

Drawing No
10531-SHA-ZZ-A-B5D9-G200-PL-00-001

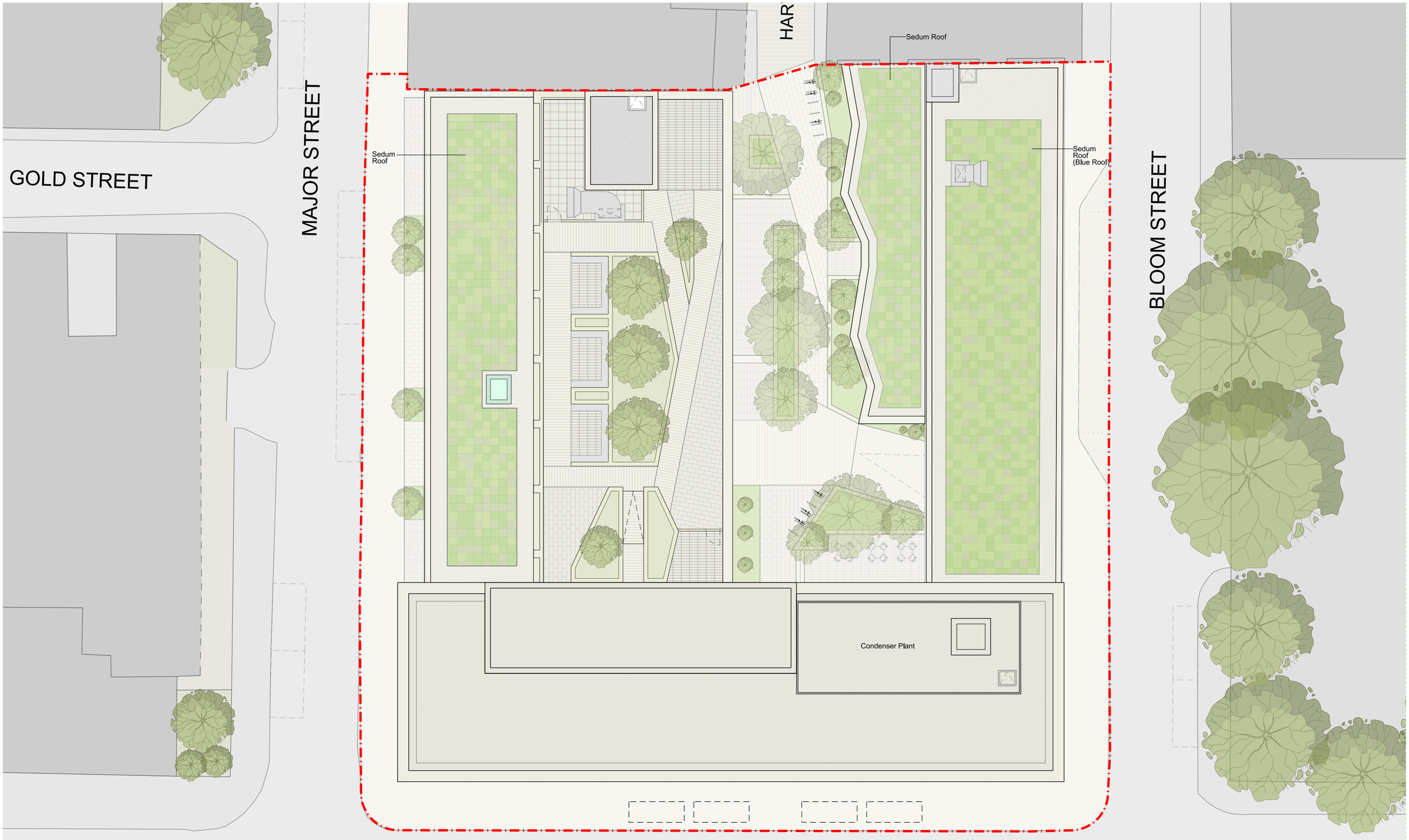
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NOTE:

NORTH

Rev	Date	Description
P01	28 - 05 - 2025	Planning Submission

Project Title
Joyce,
17 Chorlton Street,
Manchester

Drawing Title
General Arrangement
Proposed Plan
Roof Level

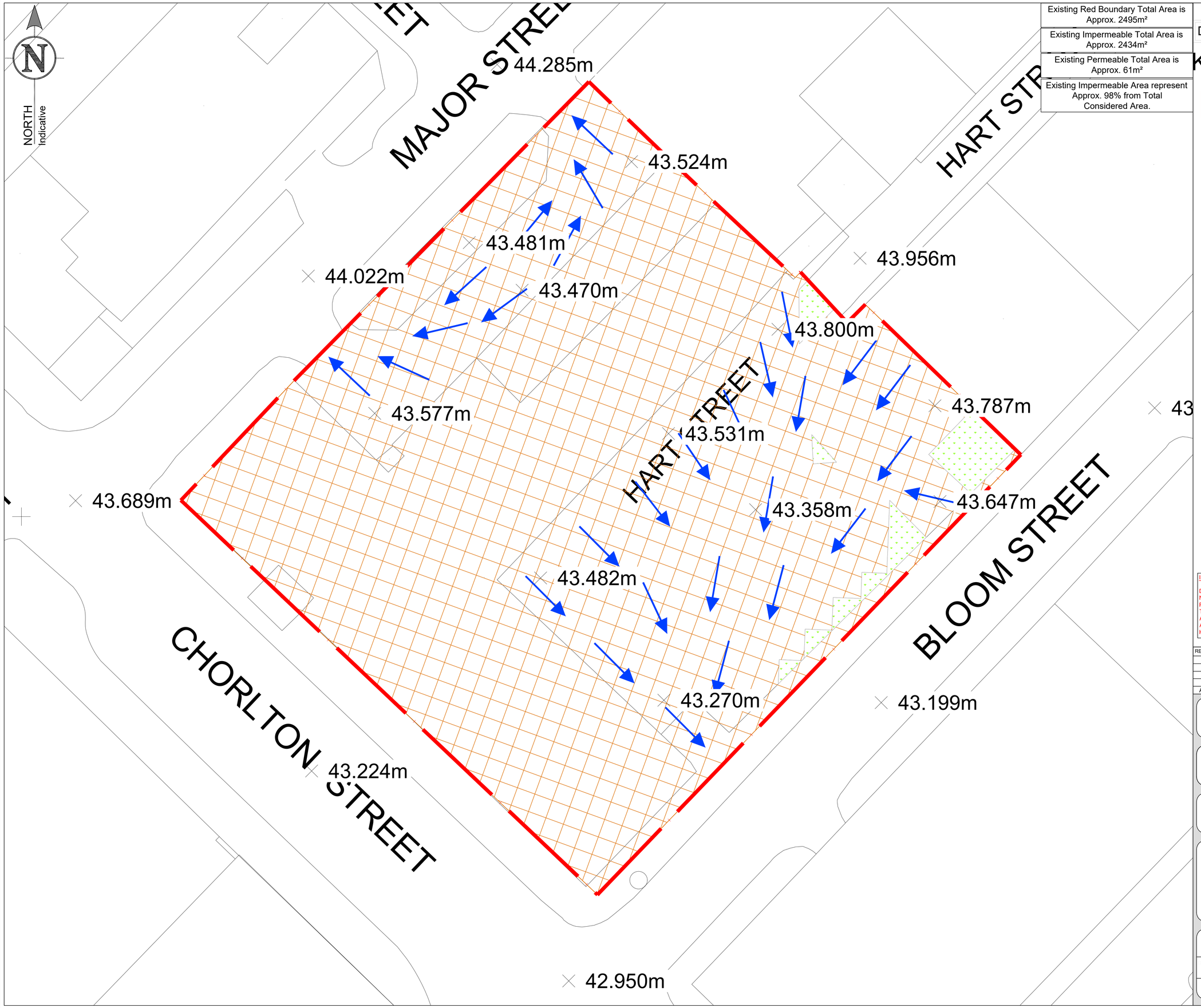
Job No: 10531
Scale: 1:250 @ A3
Status: PLANNING
Drawing No: 10531-SHA-ZZ-A-B5D9-G200-PL-RF-001
Revision: P01

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Existing Red Boundary Total Area is Approx. 2495m²
Existing Impermeable Total Area is Approx. 2434m²
Existing Permeable Total Area is Approx. 61m²
Existing Impermeable Area represent Approx. 98% from Total Considered Area.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Existing Hardstanding Area
- Existing Permeable Area
- Proposed Site Boundary
- Exceedance Route Arrow
- × 66.688m — Spot Levels as per Lidar

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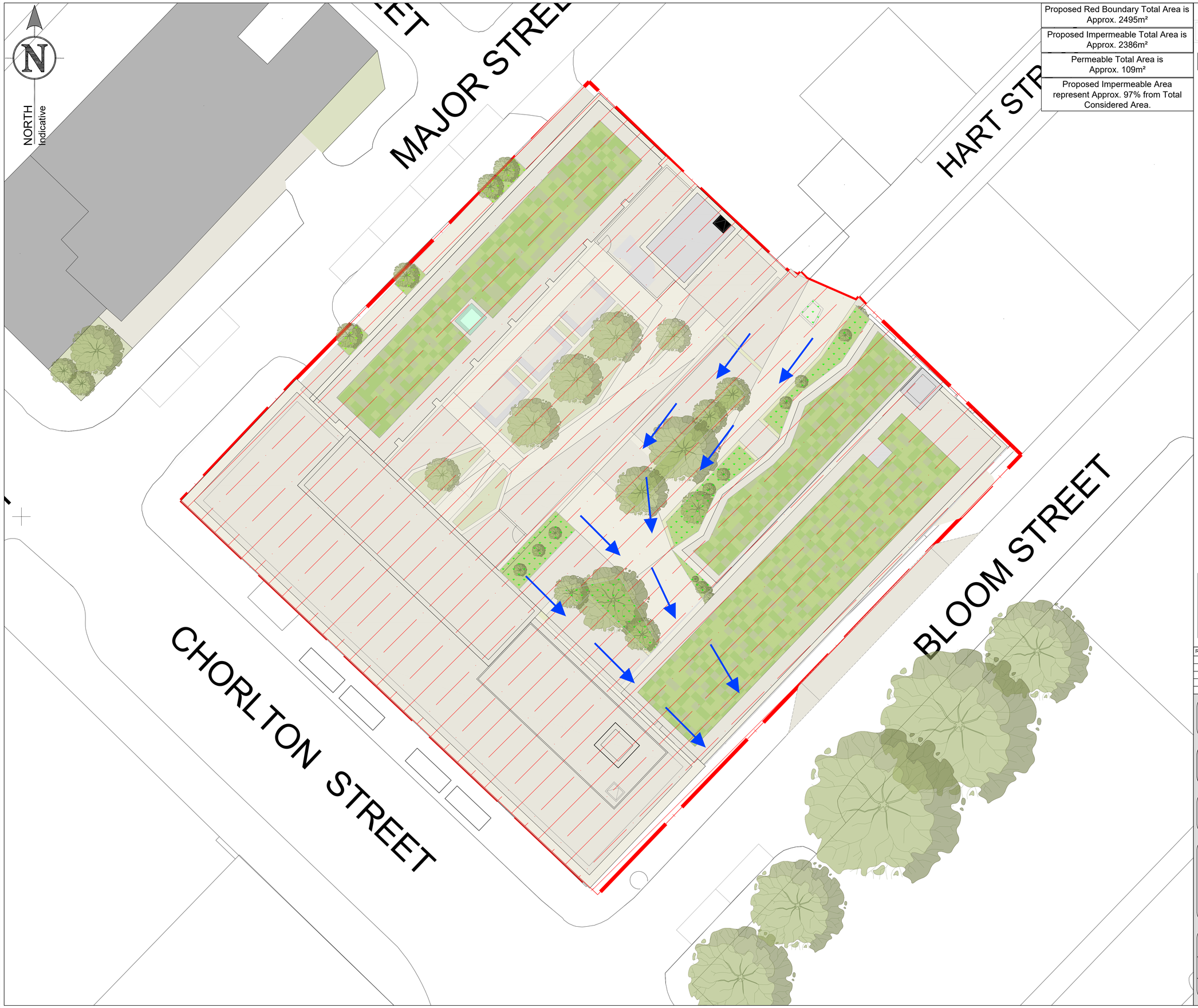
Boulton House, 17 Chorlton Street, Manchester, M1 3HY

Pre-Development Impermeable Areas & Exceedance Routes Plan

The James (M1 Living) Ltd

Nimbus ENGINEERING CONSULTANTS

S.L	23-04-25	S.L	23-04-25
M.HAM	1:150	C3516-01	A
23-04-25	A1		



Proposed Red Boundary Total Area is Approx. 2495m²
Proposed Impermeable Total Area is Approx. 2386m²
Permeable Total Area is Approx. 109m²
Proposed Impermeable Area represent Approx. 97% from Total Considered Area.

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Roof & Hardstanding Areas
- Proposed Permeable Area
- Proposed Site Boundary
- Exceedance Route Arrow

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A	23-04-25	M.HAM	For Information.	S.L	S.L

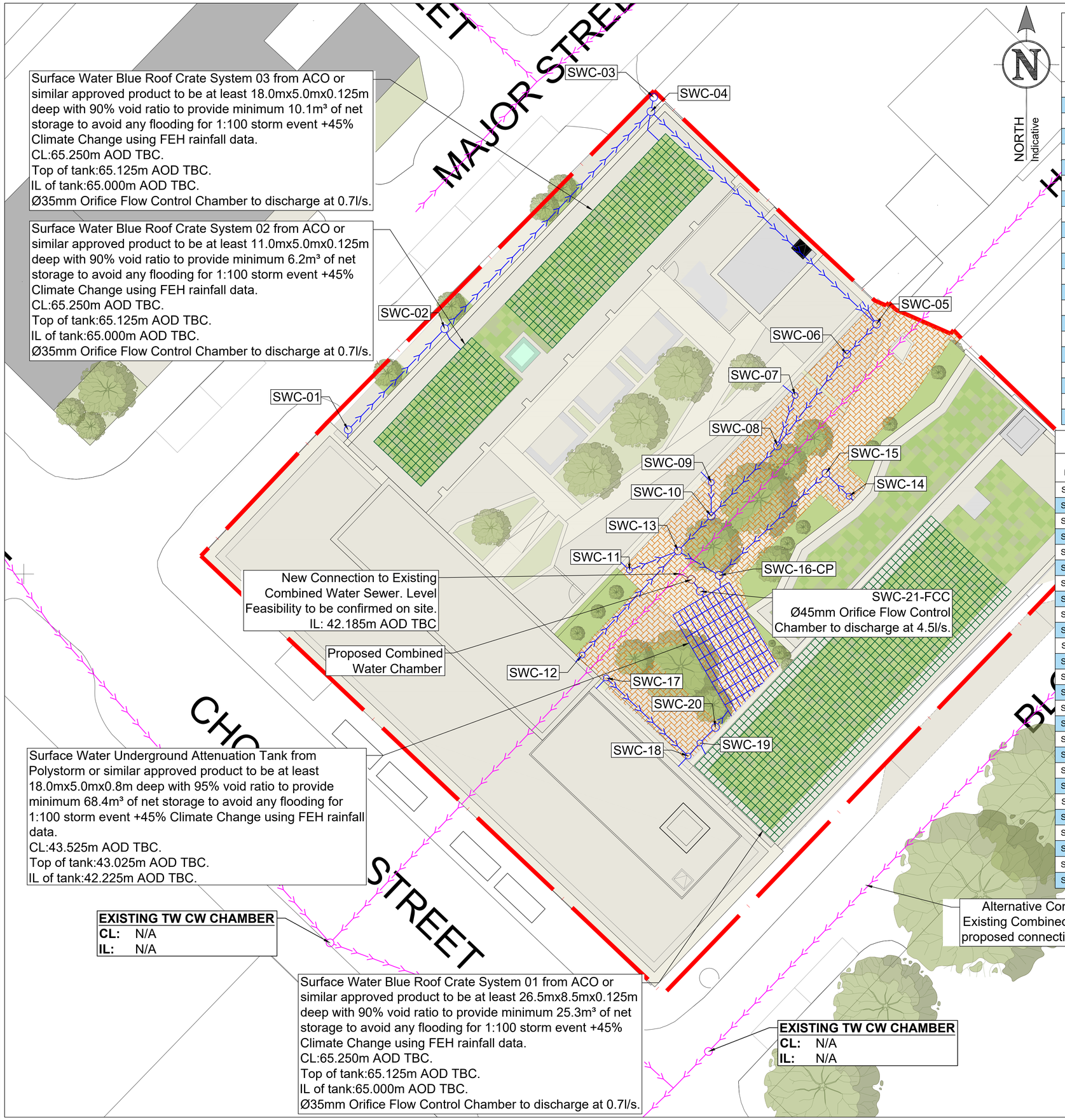
Boulton House, 17 Chorlton Street, Manchester, M1 3HY

Post-Development Impermeable Areas & Exceedance Routes Plan

The James (M1 Living) Ltd

Nimbus ENGINEERING CONSULTANTS

S.L	17-05-25	S.L	17-05-25
M.HAM	1:150	C3516-02	B
23-04-25	A1		



SCHEDULE OF SURFACE WATER CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

NAME	TYPE	DIAMETER (m)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)
SWC-01	IC	0.600	44.200	43.180	1.020
SWC-02	IC	0.600	44.100	43.050	1.050
SWC-03	IC	0.600	44.000	42.840	1.160
SWC-04	IC	0.600	44.000	42.825	1.175
SWC-05	IC	0.600	43.800	42.591	1.209
SWC-06	IC	0.600	43.700	42.525	1.175
SWC-07	IC	0.450	43.550	42.475	1.075
SWC-08	IC	0.600	43.535	42.410	1.125
SWC-09	IC	0.450	43.525	42.375	1.150
SWC-10	IC	0.600	43.500	42.320	1.180
SWC-11	IC	0.450	43.500	42.350	1.150
SWC-12	IC	0.450	43.500	42.420	1.080
SWC-13	IC	0.600	43.500	42.290	1.210
SWC-14	IC	0.450	43.550	42.385	1.165
SWC-15	IC	0.600	43.550	42.360	1.190
SWC-16	CP	0.600	43.525	42.245	1.280
SWC-17	CP	0.450	43.500	42.400	1.100
SWC-18	IC	0.450	43.500	42.282	1.218
SWC-19	IC	0.450	43.450	42.267	1.183
SWC-20	CP	0.600	43.450	42.250	1.200
SWC-21	FCC	0.600	43.525	42.213	1.312
CWC-01	IC	0.600	43.512	42.202	1.310

SCHEDULE OF SURFACE WATER PIPES

PIPE NAME	START AND END STRUCTURE	DIAMETER (m)	LENGTH (m)	GRADIENT
SWP-01	SWC-01 to SWC-02	0.150	12.776	1:98
SWP-02	SWC-02 to SWC-03	0.150	20.861	1:93
SWP-03	SWC-03 to SWC-04	0.150	1.275	1:85
SWP-04	SWC-04 to SWC-05	0.150	24.048	1:103
SWP-05	SWC-05 to SWC-06	0.150	3.695	1:56
SWP-06	SWC-06 to SWC-08	0.150	9.607	1:84
SWP-07	SWC-07 to SWC-08	0.150	5.271	1:81
SWP-08	SWC-08 to SWC-10	0.150	7.279	1:81
SWP-09	SWC-09 to SWC-10	0.150	3.725	1:68
SWP-10	SWC-10 to SWC-13	0.150	2.866	1:96
SWP-11	SWC-11 to SWC-13	0.150	3.474	1:58
SWP-12	SWC-12 to SWC-13	0.150	11.052	1:85
SWP-13	SWC-13 to SWC-16	0.150	3.787	1:84
SWP-14	SWC-14 to SWC-15	0.150	2.358	1:94
SWP-15	SWC-15 to SWC-16	0.150	11.163	1:97
SWP-16	SWC-16 to Att. Tank	0.150	1.251	1:63
SWP-17	SWC-17 to SWC-19	0.150	8.660	1:73
SWP-18	SWC-18 to SWC-19	0.150	1.440	1:96
SWP-19	SWC-19 to SWC-20	0.150	1.522	1:90
SWP-20	SWC-20 to Att. Tank	0.150	1.761	1:70
SWP-21	Att. Tank to SWC-21	0.150	1.011	1:84
SWP-22	SWC-21 to CWC-01	0.150	1.144	1:102
SWP-23	CWC-01 to Existing	0.150	1.845	1:110
SWP-24	Blue Roof 01 to SWC-19	TBD	TBD	TBD
SWP-25	Blue Roof 02 to SWC-02	TBD	TBD	TBD
SWP-26	Blue Roof 03 to SWC-04	TBD	TBD	TBD

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Permeable Paving
- Proposed Site Boundary
- Surface Water UPVC Pipes
- Existing Combined Water Pipes
- Proposed Combined Water Pipes

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A	01-05-25	M.HAM	For Information.	S.L	S.L

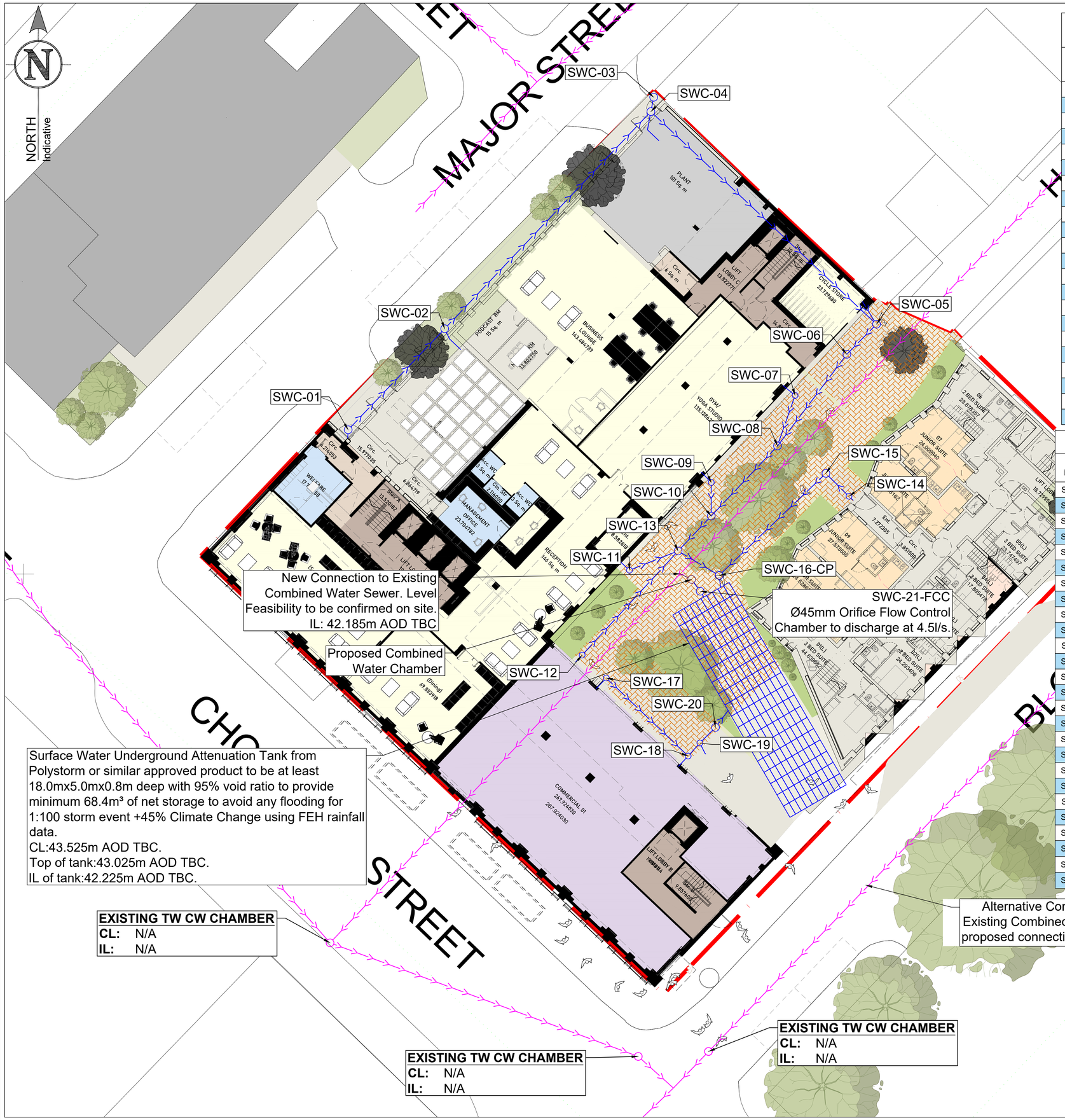
Boulton House, 17 Chorlton Street, Manchester, M1 3HY

SuDS Layout & Location Plan on Roof Plan

The James (M1 Living) Ltd

Nimbus ENGINEERING CONSULTANTS

S.L	17-06-25	S.L	17-06-25
M.HAM	1:150	C3516-03	B
01-05-25	A1		



SCHEDULE OF SURFACE WATER CHAMBERS
*COVER LEVELS TO BE CONFIRMED ON SITE PRIOR TO CONSTRUCTION

NAME	TYPE	DIAMETER (m)	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH (m)
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SWC-09	IC	0.450	43.525	42.375	1.150
SWC-10	IC	0.600	43.500	42.320	1.180
SWC-11	IC	0.450	43.500	42.350	1.150
SWC-12	IC	0.450	43.500	42.420	1.080
SWC-13	IC	0.600	43.500	42.290	1.210
SWC-14	IC	0.450	43.550	42.385	1.165
SWC-15	IC	0.600	43.550	42.360	1.190
SWC-16	CP	0.600	43.525	42.245	1.280
SWC-17	CP	0.450	43.500	42.400	1.100
SWC-18	IC	0.450	43.500	42.282	1.218
SWC-19	IC	0.450	43.450	42.267	1.183
SWC-20	CP	0.600	43.450	42.250	1.200
SWC-21	FCC	0.600	43.525	42.213	1.312
CWC-01	IC	0.600	43.512	42.202	1.310

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SWP-04	SWC-04 to SWC-05	0.150	24.048	1:103
SWP-05	SWC-05 to SWC-06	0.150	3.695	1:56
SWP-06	SWC-06 to SWC-08	0.150	9.607	1:84
SWP-07	SWC-07 to SWC-08	0.150	5.271	1:81
SWP-08	SWC-08 to SWC-10	0.150	7.279	1:81
SWP-09	SWC-09 to SWC-10	0.150	3.725	1:68
SWP-10	SWC-10 to SWC-13	0.150	2.866	1:96
SWP-11	SWC-11 to SWC-13	0.150	3.474	1:58
SWP-12	SWC-12 to SWC-13	0.150	11.052	1:85
SWP-13	SWC-13 to SWC-16	0.150	3.787	1:84
SWP-14	SWC-14 to SWC-15	0.150	2.358	1:94
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SWP-18	SWC-18 to SWC-19	0.150	1.440	1:96
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SWP-24	Blue Roof 01 to SWC-19	TBD	TBD	TBD
SWP-25	Blue Roof 02 to SWC-02	TBD	TBD	TBD
SWP-26	Blue Roof 03 to SWC-04	TBD	TBD	TBD

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Permeable Paving
- Proposed Site Boundary
- Surface Water UPVC Pipes
- Existing Combined Water Pipes
- Proposed Combined Water Pipes

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A	01-05-25	M.HAM	For Information.	S.L	S.L

Boulton House, 17 Chorlton Street, Manchester, M1 3HY

SuDS Layout & Location Plan on GF Plan

The James (M1 Living) Ltd

Nimbus ENGINEERING CONSULTANTS

S.L	17-06-25	S.L	17-06-25
M.HAM	1:150	C3516-04	B
01-05-25	A1		

FOUL WATER LEVELS TO BE DETERMINED AT DESIGN STAGE
TO ENSURE NO CLASHING WITH SURFACE WATER PIPES

NORTH
Indicative

MAJOR STREET

HART STREET

BLOOM STREET

CHORLTON STREET

SVP-01
SVP-02
SVP-03
SVP-04
SVP-05
SVP-06
SVP-07
SVP-08
SVP-09
SVP-10
SVP-11
SVP-12
SVP-13
SVP-14
SVP-15
SVP-16
SVP-17
SVP-18
SVP-19

FWC-01
FWC-02
FWC-03
FWC-04
FWC-05
FWC-06
FWC-07
FWC-08
FWC-09
FWC-10
FWC-11

New Connection to Existing Combined Water Sewer. Level Feasibility to be confirmed on site.
IL: 42.185m AOD TBC

Proposed Combined Water Chamber

Alternative Connection Point to Existing Combined Water Sewer if proposed connection is unfeasible.

EXISTING TW CW CHAMBER
CL: N/A
IL: N/A

EXISTING TW CW CHAMBER
CL: N/A
IL: N/A

EXISTING TW CW CHAMBER
CL: N/A
IL: N/A

DRAWING TO BE PRINTED IN COLOUR.

KEY:

- Proposed Permeable Paving
- Proposed Site Boundary
- Surface Water UPVC Pipes
- Existing Combined Water Pipes
- Proposed Combined Water Pipes
- Proposed Foul Water Pipes

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A	01-05-25	M.HAM	For Information.	S.L	S.L

Boulton House, 17 Chorlton Street, Manchester, M1 3HY

Foul Water Drainage Plan on GF Plan

The James (M1 Living) Ltd

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S.L	17-06-25	S.L	17-06-25
M.HAM	1:150	C3516-05	B
01-05-25	A1		

APPENDIX B – SURFACE WATER RUNOFF CALCULATIONS & HYDRAULIC MODELLING REPORTS

Nimbus Engineering Consultants Ltd
www.nimbusengineering.co.uk

Kemp House,
152 City Road,
London, EC1V 2NX
Mob:0772 339 3155
email: info@nimbusengineering.co.uk

Job No.	C3516
Sheet no.	1
Date	25/04/25

MasterDrain
HY 10.01

Project: Boulton House, 17 Chorlton Street, Manchester, M1 3HY

Title: Pre & Post Development Surface Water Runoff Calcs

By	Checked	Reviewed
M.HAM		

Data:-

Hydrology (FSR):-

Location = MANCHESTER (CENTRAL)		WRAP	= 4
Long reference = 383397		Grid reference	= SJ8397
M5-60 (mm)	= 17.8	SAAR (mm/yr)	= 900
r	= 0.36	Soil	=0.47
Hyd. area	= 10	Hyd. zone	= 5
Hydrograph	= Winter	Area = England & Wales	

Site values used in design:-

Total site area	= 0.2495 ha	Climate change factor	= 45%
Pre-dev area drained	= 0.2435 ha	Post-dev area drained	= 0.2386 ha
Imperm runoff factor	= 100%	Perm runoff factor	= 20%

Pre-development

Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Pre-dev flow to drain	= 0.00 l/s

Post-development

Area to soakaways	= 0.0000 ha	Area to other SUDS	= 0.0000 ha
Perv. area to SUDS	= 0.0000 ha	Post-dev flow to drain	= 0.00 l/s

Calculations:-

Revised Post-dev Imperm. area = 0.239 ha
Equiv. Post-dev Imperm. area = 0.239 ha
Equiv. Post-dev Perm. area = 0.002 ha
Total Pre-dev equiv. area ha = 0.245 ha
Total Post-dev equiv. area ha = 0.241 ha
100 yr 6 hour mean intensity = 9.82mm/hr

Results:-

Pre-dev peakflow runoff (l/s) (m³/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	45.7	29.8	19.4	12.3	7.7	5.8	4.8	4.1	45.7	N/A	45.7	1
30	110.2	73.1	46.5	28.7	17.4	12.8	10.3	8.7	110.2	N/A	110.2	30
100	142.2	95.2	61.0	37.8	22.8	16.7	13.4	11.3	142.2	N/A	142.2	100

Post-dev peakflow runoff (l/s)

R.P.	15	30	60	120	240	360	480	600	Max	CCF	Final	R.P.
1	44.9	29.3	19.0	12.1	7.6	5.7	4.7	4.0	44.9	45	65.2	1
30	108.4	71.9	45.7	28.3	17.1	12.6	10.2	8.6	108.4	45	157.2	30
100	139.9	93.7	60.0	37.2	22.4	16.4	13.2	11.1	139.9	45	202.9	100

100 year 6 hour (x Climate Change Factor) storm gives:-
Pre-dev runoff volume m³ = 144.2m³
Post-dev rainfall volume = 205.7m³
Post-dev volume m³ (excess above SUDS) = 205.7m³
100 yr 6 hour mean intensity = 9.82mm/hr
Pre-dev volume to drain at 0 l/s = 0.0 m³
Post-dev volume to drain at 0 l/s = 0.0 m³
Post-dev storage volume = 205.7m³
Post-dev 5mm imperm volume = 11.9 m³
Post-dev 5mm perm volume = 0.5 m³

$Q_{BAR(rural)}$ = 1.616 l/s or 6.478 l/s/ha or 0.002 cumecs - from IoH 124.

The rainfall rates are calculated using the location specific values above in accordance with the Wallingford procedure.

Nimbus Engineering Consultants Ltd
www.nimbusengineering.co.uk

Kemp House,
152 City Road,
London, EC1V 2NX
Mob:0772 339 3155
email: info@nimbusengineering.co.uk

Job No.	C3516
Sheet no.	2
Date	25/04/25
Project	Boulton House, 17 Chorlton Street, Manchester, M1 3HY
Title	Pre & Post Development Surface Water Runoff Calcs
By	M.HAM
Checked	
Reviewed	

MasterDrain
HY 10.01

Data summary.

Use the data below for the SUR1 form

Site areas:-

Total site area	=	0.2495 ha ;2495.0 m² [3A]
Pre-development impermeable area	=	0.2435 ha [3B]
Pre-development permeable area	=	0.0060 ha
Post-development impermeable area	=	0.2386 ha [3C]
Post-development permeable area	=	0.0109 ha

Peak runoff:-

Pre-development 1 year storm (15min) =	45.7 l/s [6A]
Pre-development 100 year storm (15min) =	142.2 l/s [6C]
Post-development 1 year storm (15min) =	44.9 l/s [6B]
Post-development 100 year storm (15min)=	139.94 l/s [6D]

Greenfield runoff:-

$Q_{BAR(rural)}$ = 1.616 l/s or 6.478 l/s/ha or 0.002 cumecs - from IoH 124.

Climate change factor:-
CCF = 45%

Volumes:-
Pre-development 100 yr/6hr storm [12A]= 209.0m³
Post-development 100 yr/6hr storm (add. volume with no SUDS) [12B]= 205.7m³
Post-development 100 yr/6hr storm (add. volume with SUDS) = 205.7m³
Post-development add. predicted volume (No SUDS) [12C] = -3.3m³

You may also require
Data relating to the infiltration test calculations (if applicable)
Evidence to show runoff reduction (if applicable)
Information on calculation methods (if applicable see next sheet)

Note
Numbers in square brackets relate to the
Nov. 2010 v1.1 / issued 11/02/10 copy of SUR1

Nimbus Engineering Consultants Ltd
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Job No.	C3516
Sheet no.	3
Date	25/04/25

MasterDrain
HY 10.01

Project	Boulton House, 17 Chorlton Street, Manchester, M1 3HY	By	Checked	Reviewed
Title	Pre & Post Development Surface Water Runoff Calcs	M.HAM		

Definitions and methods

Hydrology

The hydrological constants are derived from the Wallingford maps. They are used to calculate location specific rainfall figures.

Site values and factors

Areas of the site should be entered in hectares (10000 m²). If the Pre-development site is a green field, this box is blank.
Climate Change Factor is initially set at 20% - this may be changed as required.
Greenfield runoff is calculated using the method described in IoH 124.
Runoff factors

The impermeable runoff factor is initially set at 98%
The permeable runoff factor is initially set at 20%

Note: the CCF and the runoff factors may be changed by the user to suit the development
The areas draining to soakaways and other SUDS are entered in the appropriate box (in hectares)

Calculations

The post-development area is reduced by subtracting the areas that drain to soakaways or other SUDS, to give a revised figure.
All areas are then multiplied by the appropriate runoff factor to give an equivalent area with 100% runoff.
These are then summated.
This gives a total pre-development equivalent area, and a similar figure for the post-development area.
The 'Post-dev volume to drain (no SUDS)' gives the total runoff to drain if no SUDS were used.

Results

The pre- and post-development areas are subjected to 1,30 and 100 year return period storms with a duration of 15 to 600 minutes.
The Revised Post-dev Imperm. area is the area (in ha) that is not going to SUDS x impervious runoff factor.
The runoff rates are calculated for the chosen hydrograph (Summer or Winter) as l/s. Figures in red indicate m³/s
The peak value is measured, multiplied by the CCF and the total maximum rate is shown.
The pre- and post-development volumes for a 100 year / 6 hour storm are calculated from the area under the hydrograph curve.
Post-dev volume (i.e. excess above SUDS) is that volume produced by the drained area that does not go to SUDS.
Qbar(rural) is calculated in accordance with the procedure laid down in IoH 124

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Job No.	C3516
Sheet no.	1
Date	25/04/25
Project	Boulton House, 17 Chorlton Street, Manchester, M1 3HY
Title	IoH 124 (Qbar(urban))Runoff Calcs
By	M.HAM
Checked	
Reviewed	

MasterDrain
HY 10.01

Hydrological Data:-

FSR Hydrology:-

Location = MANCHESTER (CENTRAL) Grid reference = SJ8397
M5-60 (mm) = 17.8 r = 0.36
Soil runoff = 0.45 SAAR (mm/yr) = 900
WRAP = 4 Area = England & Wales
Hydrological area = 10 Hydrological zone = 5

Soil classification for WRAP type 4
Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Design data:-

Area = 0.002495 Km² - 0.25 Ha - 2495 m² % Urbanisation = 98.00%

Calculation method:-

Runoff is calculated from:-

$$Q_{BAR(urban);} = Q_{BAR(rural)} (1 + URBAN)^{2NC}[1 + URBAN\{(21/CIND) - 0.3\}]$$

where:-

NC varies with the value of SAAR:-
for 500<SAAR<1100 mm then NC = 0.92 - 0.00024SAAR
for 1100<SAAR<3000 mm then NC = 0.74 - 0.000082SAAR

CIND = 102.4SOIL + 0.28(CWI - 125) CWI = Catchment Wetness Index

so

CIND =38.002 CWI =96.151 NC =0.704

For areas less than 50Ha, a modified calculation which multiplies the 50Ha runoff value by the ratio of the site area to 50Ha is used
Reducing factor used for these calculations is 0.005

$Q_{BAR(rural)}$ = 1.471 (l/s)

$Q_{BAR(urban)}$ = 4.801 (l/s)

$Q_{BAR(urban)}$ is then multiplied by a growth factor - GC(T) - for different storm return periods derived from EA publication W5-074/A.

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Job No.	C3516
Sheet no.	2
Date	25/04/25
Project	Boulton House, 17 Chorlton Street, Manchester, M1 3HY
Title	IoH 124 (Qbar(urban))Runoff Calcs
By	M.HAM
Checked	
Reviewed	

MasterDrain
HY 10.01

Calculated data:-

Mean Annual Peak Flow $Q_{BAR(urban)}$ = 4.80 l/s

Values for $Q_{BAR(urban)}$

Ret. per.	m³/hr	l/s	l/s/ha	Ret. per.	m³/hr	l/s	l/s/ha
1yr	0.004	4.081	16.355	100yr	0.010	10.081	40.407
2yr	0.004	4.465	17.894	100yr+20%	0.012	12.098	48.488
5yr	0.006	5.809	23.282	100yr+30%	0.013	13.106	52.529
10yr	0.007	6.625	26.553	200yr	0.012	11.522	46.179
30yr	0.008	8.065	32.325	200yr + 30%	0.015	14.978	60.033
50yr	0.009	8.881	35.596	500yr	0.013	13.106	52.529
				1000yr	0.015	14.594	58.493

Growth factors -

1yr	2yr	5yr	10yr	30yr	50yr	100yr	200yr	500yr	1000yr
0.85	0.93	1.21	1.38	1.68	1.85	2.10	2.40	2.73	3.04

The above is based on the Institute of Hydrology Report 124 to which you are referred for further details (see Sect 7). Note that the 200 year growth curve was taken from W5-074/A.

For WRAP type 1 soils, CIND can become negative for lower values of SAAR. In this case the CIND value is multiplied by -1 to return a positive value (CIND is very small at this point).

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:100 Year Storm Event + 45% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			



Blue Roof 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	50
Number of Crates Wide	18
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	25.438

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	R11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (15)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Att. Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.525
Depth (m)	0.800
Base Level (m)	42.225
Number of Crates Long	18
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	68.900

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (16)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (17)
Outlet Type	Free Discharge



Blue Roof 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	22
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	6.313

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (22)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Blue Roof 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	62.250
Depth (m)	0.125
Base Level (m)	62.000
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	10.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7) Catchment Area (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	R3 (Green Roof)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	R1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	62.000

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:100 Year Storm Event + 45% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	43.500 42.350	Diameter / Length: 0.450					Manhole
E:384389.778 N:397979.886	1.150		{a} Pipe (7)	Pipe	42.350	Diam/Width:150	Not Applicable
S7	43.550 42.475	Diameter / Length: 0.450					Manhole
E:384402.334 N:397993.114	1.075		{a} Pipe (6)	Pipe	42.475	Diam/Width:100	Not Applicable
S12	43.500 42.420	Diameter / Length: 0.450					Manhole
E:384385.621 N:397972.695	1.080		{a} Pipe (8)	Pipe	42.420	Diam/Width:150	Not Applicable
S20	43.450 42.250	Diameter / Length: 0.600	{1} Pipe (14) (1)	Pipe	42.250	Diam/Width:150	Manhole
E:384395.728 N:397967.232	1.200		{a} Pipe (16)	Pipe	42.250	Diam/Width:150	Not Applicable
S14	43.550 42.385	Diameter / Length: 0.450					Manhole
E:384406.221 N:397985.162	1.165		{a} Pipe (10)	Pipe	42.385	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S18	43.450 42.282	Diameter / Length: 0.450	{1} Pipe (13)	Pipe	42.282	Diam/Width:150	Manhole
E:384393.728 N:397965.046	1.168		{a} Pipe (14)	Pipe	42.282	Diam/Width:150	Not Applicable
Existing CW Sewer	43.500 42.185	Diameter / Length: 0.600	{1} Pipe (18)	Pipe	42.185	Diam/Width:150	Manhole
E:384392.239 N:397977.387	1.315						Not Applicable
S21	43.525 42.213	Diameter / Length: 0.600	{1} Pipe (17)	Pipe	42.213	Diam/Width:150	Manhole
E:384394.874 N:397977.835	1.312		{a} Pipe (18)	Pipe	42.213	Diam/Width:150	Not Applicable
S15	43.550 42.360	Diameter / Length: 0.600	{1} Pipe (10)	Pipe	42.360	Diam/Width:150	Manhole
E:384404.334 N:397986.575	1.190		{a} Pipe (11)	Pipe	42.360	Diam/Width:150	Not Applicable
S16	43.525 42.245	Diameter / Length: 0.600	{1} Pipe (11) {2} Pipe (9)	Pipe Pipe	42.245 42.245	Diam/Width:150 Diam/Width:150	Manhole
E:384396.334 N:397978.790	1.280		{a} Pipe (12)	Pipe	42.245	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S2	44.100 43.050	Diameter / Length: 0.600	{1} Pipe	Pipe	43.050	Diam/Width:150	Manhole
E:384376.343 N:397999.309	1.050		{2} Pipe (22)	Pipe	43.050	Diam/Width:150	
			{a} Pipe (1)	Pipe	43.050	Diam/Width:150	Not Applicable
S4	44.000 42.825	Diameter / Length: 0.600	{1} Pipe (2)	Pipe	42.825	Diam/Width:150	Manhole
E:384391.819 N:398015.616	1.175		{2} Pipe (1)	Pipe	42.825	Diam/Width:150	
			{3} Pipe (23)	Pipe	42.825	Diam/Width:150	
			{a} Pipe (3)	Pipe	42.825	Diam/Width:150	Not Applicable
S5	43.800 42.591	Diameter / Length: 0.600	{1} Pipe (3)	Pipe	42.591	Diam/Width:150	Manhole
E:384408.413 N:397999.841	1.209		{a} Pipe (4)	Pipe	42.591	Diam/Width:150	Not Applicable
S1	44.200 43.180	Diameter / Length: 0.600					Manhole
E:384367.553 N:397990.036	1.020		{a} Pipe	Pipe	43.180	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S9	43.525 42.375	Diameter / Length: 0.450					Manhole
E:384396.229 N:397986.557	1.150		{a} Pipe (20)	Pipe	42.375	Diam/Width:100	Not Applicable
S17	43.500 42.400	Diameter / Length: 0.450					Manhole
E:384387.427 N:397970.988	1.100		{a} Pipe (13)	Pipe	42.400	Diam/Width:150	Not Applicable
S3	44.000 42.840	Diameter / Length: 0.600					Manhole
E:384390.481 N:398016.049	1.160		{a} Pipe (2)	Pipe	42.840	Diam/Width:150	Not Applicable
S13	43.500 42.290	Diameter / Length: 0.600	{1} Pipe (21) {2} Pipe (7) {3} Pipe (8)	Pipe Pipe Pipe	42.290 42.290 42.290	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384393.128 N:397980.806	1.210		{a} Pipe (9)	Pipe	42.290	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	43.700 42.525	Diameter / Length: 0.600	{1} Pipe (4)	Pipe	42.525	Diam/Width:150	Manhole
E:384405.909 N:397995.858	1.175		{a} Pipe (5)	Pipe	42.525	Diam/Width:150	Not Applicable
S8	43.535 42.410	Diameter / Length: 0.600	{1} Pipe (5) {2} Pipe (6)	Pipe Pipe	42.410 42.410	Diam/Width:150 Diam/Width:100	Manhole
E:384399.623 N:397988.593	1.125		{a} Pipe (19)	Pipe	42.410	Diam/Width:150	Not Applicable
S10	43.500 42.320	Diameter / Length: 0.600	{1} Pipe (19) {2} Pipe (20)	Pipe Pipe	42.320 42.320	Diam/Width:150 Diam/Width:100	Manhole
E:384394.849 N:397983.097	1.180		{a} Pipe (21)	Pipe	42.320	Diam/Width:150	Not Applicable
S19	43.450 42.267	Diameter / Length: 0.450	{1} Pipe (14) {2} Pipe (15)	Pipe Pipe	42.267 42.267	Diam/Width:150 Diam/Width:150	Manhole
E:384394.700 N:397966.109	1.183		{a} Pipe (14) (1)	Pipe	42.267	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:100 Year Storm Event + 45% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Inflow Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Att. Tank		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (1)	S16		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (2)	S15		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (3)	S16		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	S3		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (5)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (6)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	S11		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (10)	S9		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	S7		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	S5		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (13)	S17		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (14)	S18		Time of Concentration	0.014	100	0	100	0.014
R1	Blue Roof 3		Time of Concentration	0.007	100	0	100	0.007
R2	S2		Time of Concentration	0.005	100	0	100	0.005
R3 (Green Roof)	Blue Roof 3		Green Roof	0.016		0		0.016
R4	S1		Time of Concentration	0.027	100	0	100	0.027
R5	S12		Time of Concentration	0.015	100	0	100	0.015
R11	Blue Roof 1		Time of Concentration	0.039	100	0	100	0.039
R12	S14		Time of Concentration	0.002	100	0	100	0.002
R13	S14		Time of Concentration	0.002	100	0	100	0.002
R14 (Green Roof)	S14		Green Roof	0.009		0		0.009
TOTAL		**0.0**		**0.237**				**0.237**

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 384385 397964 SJ 84385 97964
Rainfall Version	2013
Data Type	Point
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:100 Year Storm Event + 45% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Junctions Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Resident Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.350	43.403	1.053	0.9	0.167	0.000	0.7	4.546	Flood Risk
S7	FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.475	43.405	0.930	0.9	0.148	0.000	0.7	4.811	Flood Risk
S12	FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.420	43.403	0.983	2.0	0.156	0.000	1.8	11.004	Flood Risk
S20	FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.250	43.400	1.150	3.8	0.326	0.000	3.6	35.832	Flood Risk
S14	FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.385	43.401	1.016	0.6	0.162	0.000	0.4	2.994	Flood Risk
S18	FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.282	43.401	1.119	3.6	0.178	0.000	3.4	20.505	Flood Risk
Existing CW Sewer	FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.185	42.223	0.038	2.6	0.000	0.000	2.6	3.097	OK
S21	FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.213	43.398	1.185	4.5	0.335	0.000	4.5	89.133	Flood Risk
S15	FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.360	43.401	1.041	1.1	0.295	0.000	0.9	6.457	Flood Risk
S16	FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.245	43.401	1.156	13.1	0.327	0.000	12.9	97.020	Flood Risk
S2	FEH: 100 years: +45 %: 15 mins: Winter	44.100	43.050	43.461	0.411	18.6	0.116	0.000	15.4	10.899	Surcharged
S4	FEH: 100 years: +45 %: 240 mins: Winter	44.000	42.825	43.411	0.586	6.5	0.166	0.000	6.4	52.276	Surcharged
S5	FEH: 100 years: +45 %: 240 mins: Winter	43.800	42.591	43.408	0.817	7.4	0.231	0.000	7.1	57.219	Surcharged
S1	FEH: 100 years: +45 %: 30 mins: Winter	44.200	43.180	43.498	0.318	12.5	0.090	0.000	12.3	11.551	Surcharged
S9	FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.375	43.404	1.029	0.9	0.164	0.000	0.7	4.668	Flood Risk
S17	FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.400	43.401	1.001	1.9	0.159	0.000	1.7	10.321	Flood Risk
S3	FEH: 100 years: +45 %: 240 mins: Winter	44.000	42.840	43.411	0.571	0.9	0.162	0.000	0.9	5.382	Surcharged
S13	FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.290	43.403	1.113	10.4	0.315	0.000	10.2	80.146	Flood Risk
S6	FEH: 100 years: +45 %: 240 mins: Winter	43.700	42.525	43.407	0.882	7.1	0.250	0.000	6.9	56.880	Flood Risk

S8	FEH: 100 years: +45 %: 240 mins: Winter	43.535	42.410	43.405	0.995	7.7	0.282	0.000	7.5	61.177	Flood Risk
S10	FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.320	43.404	1.084	8.2	0.307	0.000	8.0	65.270	Flood Risk
S19	FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.267	43.401	1.134	4.0	0.180	0.000	3.8	36.480	Flood Risk

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:100 Year Storm Event + 45% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025 Designed by: M.HAM Checked by: Approved By:	Nimbus ENGINEERING CONSULTANTS
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX	

Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Blue Roof 1	FEH: 100 years: +45 %: 240 mins: Winter	65.118	65.118	0.118	0.118	5.3	23.933	0.000	0.000	0.8	16.621	302	5.913
Att. Tank	FEH: 100 years: +45 %: 240 mins: Winter	43.400	43.400	1.175	1.175	17.7	68.787	0.000	0.000	4.5	89.843	177	0.163
Blue Roof 2	FEH: 100 years: +45 %: 120 mins: Winter	65.108	65.108	0.108	0.108	2.8	5.352	0.000	0.000	0.8	6.735	78	15.221
Blue Roof 3	FEH: 100 years: +45 %: 180 mins: Winter	62.118	62.118	0.118	0.118	3.2	9.548	0.000	0.000	0.8	11.157	142	6.849

Status
OK
OK
OK
OK

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:100 Year Storm Event + 45% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Stormwater Controls	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		



Blue Roof 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	50
Number of Crates Wide	18
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	25.438

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	R11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (15)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Att. Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.525
Depth (m)	0.800
Base Level (m)	42.225
Number of Crates Long	18
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	68.900

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (16)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (17)
Outlet Type	Free Discharge



Blue Roof 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	22
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	6.313

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (22)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Blue Roof 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	62.250
Depth (m)	0.125
Base Level (m)	62.000
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	10.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7) Catchment Area (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	R3 (Green Roof)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	R1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	62.000

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	43.500 42.350	Diameter / Length: 0.450					Manhole
E:384389.778 N:397979.886	1.150		{a} Pipe (7)	Pipe	42.350	Diam/Width:150	Not Applicable
S7	43.550 42.475	Diameter / Length: 0.450					Manhole
E:384402.334 N:397993.114	1.075		{a} Pipe (6)	Pipe	42.475	Diam/Width:100	Not Applicable
S12	43.500 42.420	Diameter / Length: 0.450					Manhole
E:384385.621 N:397972.695	1.080		{a} Pipe (8)	Pipe	42.420	Diam/Width:150	Not Applicable
S20	43.450 42.250	Diameter / Length: 0.600	{1} Pipe (14) (1)	Pipe	42.250	Diam/Width:150	Manhole
E:384395.728 N:397967.232	1.200		{a} Pipe (16)	Pipe	42.250	Diam/Width:150	Not Applicable
S14	43.550 42.385	Diameter / Length: 0.450					Manhole
E:384406.221 N:397985.162	1.165		{a} Pipe (10)	Pipe	42.385	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S18	43.450 42.282	Diameter / Length: 0.450	{1} Pipe (13)	Pipe	42.282	Diam/Width:150	Manhole
E:384393.728 N:397965.046	1.168		{a} Pipe (14)	Pipe	42.282	Diam/Width:150	Not Applicable
Existing CW Sewer	43.500 42.185	Diameter / Length: 0.600	{1} Pipe (18)	Pipe	42.185	Diam/Width:150	Manhole
E:384392.239 N:397977.387	1.315						Not Applicable
S21	43.525 42.213	Diameter / Length: 0.600	{1} Pipe (17)	Pipe	42.213	Diam/Width:150	Manhole
E:384394.874 N:397977.835	1.312		{a} Pipe (18)	Pipe	42.213	Diam/Width:150	Not Applicable
S15	43.550 42.360	Diameter / Length: 0.600	{1} Pipe (10)	Pipe	42.360	Diam/Width:150	Manhole
E:384404.334 N:397986.575	1.190		{a} Pipe (11)	Pipe	42.360	Diam/Width:150	Not Applicable
S16	43.525 42.245	Diameter / Length: 0.600	{1} Pipe (11) {2} Pipe (9)	Pipe Pipe	42.245 42.245	Diam/Width:150 Diam/Width:150	Manhole
E:384396.334 N:397978.790	1.280		{a} Pipe (12)	Pipe	42.245	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S2	44.100 43.050	Diameter / Length: 0.600	{1} Pipe	Pipe	43.050	Diam/Width:150	Manhole
E:384376.343 N:397999.309	1.050		{2} Pipe (22)	Pipe	43.050	Diam/Width:150	
			{a} Pipe (1)	Pipe	43.050	Diam/Width:150	Not Applicable
S4	44.000 42.825	Diameter / Length: 0.600	{1} Pipe (2)	Pipe	42.825	Diam/Width:150	Manhole
E:384391.819 N:398015.616	1.175		{2} Pipe (1)	Pipe	42.825	Diam/Width:150	
			{3} Pipe (23)	Pipe	42.825	Diam/Width:150	
			{a} Pipe (3)	Pipe	42.825	Diam/Width:150	Not Applicable
S5	43.800 42.591	Diameter / Length: 0.600	{1} Pipe (3)	Pipe	42.591	Diam/Width:150	Manhole
E:384408.413 N:397999.841	1.209		{a} Pipe (4)	Pipe	42.591	Diam/Width:150	Not Applicable
S1	44.200 43.180	Diameter / Length: 0.600					Manhole
E:384367.553 N:397990.036	1.020		{a} Pipe	Pipe	43.180	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S9	43.525 42.375	Diameter / Length: 0.450					Manhole
E:384396.229 N:397986.557	1.150		{a} Pipe (20)	Pipe	42.375	Diam/Width:100	Not Applicable
S17	43.500 42.400	Diameter / Length: 0.450					Manhole
E:384387.427 N:397970.988	1.100		{a} Pipe (13)	Pipe	42.400	Diam/Width:150	Not Applicable
S3	44.000 42.840	Diameter / Length: 0.600					Manhole
E:384390.481 N:398016.049	1.160		{a} Pipe (2)	Pipe	42.840	Diam/Width:150	Not Applicable
S13	43.500 42.290	Diameter / Length: 0.600	{1} Pipe (21) {2} Pipe (7) {3} Pipe (8)	Pipe Pipe Pipe	42.290 42.290 42.290	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384393.128 N:397980.806	1.210		{a} Pipe (9)	Pipe	42.290	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	43.700 42.525	Diameter / Length: 0.600	{1} Pipe (4)	Pipe	42.525	Diam/Width:150	Manhole
E:384405.909 N:397995.858	1.175		{a} Pipe (5)	Pipe	42.525	Diam/Width:150	Not Applicable
S8	43.535 42.410	Diameter / Length: 0.600	{1} Pipe (5) {2} Pipe (6)	Pipe Pipe	42.410 42.410	Diam/Width:150 Diam/Width:100	Manhole
E:384399.623 N:397988.593	1.125		{a} Pipe (19)	Pipe	42.410	Diam/Width:150	Not Applicable
S10	43.500 42.320	Diameter / Length: 0.600	{1} Pipe (19) {2} Pipe (20)	Pipe Pipe	42.320 42.320	Diam/Width:150 Diam/Width:100	Manhole
E:384394.849 N:397983.097	1.180		{a} Pipe (21)	Pipe	42.320	Diam/Width:150	Not Applicable
S19	43.450 42.267	Diameter / Length: 0.450	{1} Pipe (14) {2} Pipe (15)	Pipe Pipe	42.267 42.267	Diam/Width:150 Diam/Width:150	Manhole
E:384394.700 N:397966.109	1.183		{a} Pipe (14) (1)	Pipe	42.267	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:100 Year Storm Event + 45% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Inflow Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Att. Tank		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (1)	S16		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (2)	S15		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (3)	S16		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	S3		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (5)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (6)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	S11		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (10)	S9		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	S7		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	S5		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (13)	S17		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (14)	S18		Time of Concentration	0.014	100	0	100	0.014
R1	Blue Roof 3		Time of Concentration	0.007	100	0	100	0.007
R2	S2		Time of Concentration	0.005	100	0	100	0.005
R3 (Green Roof)	Blue Roof 3		Green Roof	0.016		0		0.016
R4	S1		Time of Concentration	0.027	100	0	100	0.027
R5	S12		Time of Concentration	0.015	100	0	100	0.015
R11	Blue Roof 1		Time of Concentration	0.039	100	0	100	0.039
R12	S14		Time of Concentration	0.002	100	0	100	0.002
R13	S14		Time of Concentration	0.002	100	0	100	0.002
R14 (Green Roof)	S14		Green Roof	0.009		0		0.009
TOTAL		**0.0**		**0.237**				**0.237**

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 384385 397964 SJ 84385 97964
Rainfall Version	2013
Data Type	Point
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

Summary Results for S11: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.350	42.776	0.426	4.3	0.068	0.000	2.6	1.571	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.350	42.835	0.485	4.6	0.077	0.000	2.7	1.740	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.350	42.819	0.469	2.9	0.075	0.000	2.2	2.073	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.350	42.887	0.537	3.1	0.085	0.000	2.3	2.302	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.350	42.873	0.523	2.6	0.083	0.000	1.9	2.637	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.350	42.948	0.598	2.3	0.095	0.000	1.7	2.940	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.350	42.964	0.614	1.8	0.098	0.000	1.4	3.250	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.350	43.146	0.796	1.5	0.127	0.000	1.2	3.625	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.350	43.006	0.656	1.4	0.104	0.000	1.1	3.684	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.350	43.331	0.981	1.1	0.156	0.000	0.8	4.129	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.350	43.024	0.674	1.2	0.107	0.000	0.9	4.073	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.350	43.403	1.053	0.9	0.167	0.000	0.7	4.546	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.350	43.026	0.676	0.9	0.107	0.000	0.7	4.685	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.350	43.395	1.045	0.6	0.166	0.000	0.5	5.208	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.350	43.018	0.668	0.7	0.106	0.000	0.5	5.170	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.350	43.369	1.019	0.5	0.162	0.000	0.4	5.763	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.350	43.007	0.657	0.6	0.104	0.000	0.5	5.507	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.350	43.319	0.969	0.4	0.154	0.000	0.3	6.199	Flood Risk

Summary Results for S7: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.550	42.475	42.963	0.488	4.5	0.078	0.000	2.3	1.766	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.550	42.475	43.037	0.562	4.7	0.089	0.000	2.5	1.950	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.550	42.475	42.957	0.482	3.0	0.077	0.000	2.1	2.284	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.550	42.475	43.039	0.564	3.1	0.090	0.000	2.2	2.525	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.550	42.475	42.980	0.505	2.6	0.080	0.000	1.9	2.866	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.550	42.475	43.011	0.536	2.4	0.085	0.000	1.8	3.181	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.550	42.475	42.967	0.492	1.9	0.078	0.000	1.4	3.486	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.550	42.475	43.148	0.673	1.5	0.107	0.000	1.2	3.874	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.550	42.475	43.009	0.534	1.5	0.085	0.000	1.2	3.943	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.550	42.475	43.333	0.858	1.1	0.136	0.000	0.9	4.376	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.550	42.475	43.027	0.552	1.2	0.088	0.000	0.9	4.351	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.475	43.405	0.930	0.9	0.148	0.000	0.7	4.811	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.550	42.475	43.028	0.553	0.9	0.088	0.000	0.7	4.957	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.550	42.475	43.398	0.923	0.7	0.147	0.000	0.5	5.511	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.550	42.475	43.019	0.544	0.7	0.087	0.000	0.6	5.417	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.550	42.475	43.371	0.896	0.5	0.143	0.000	0.4	6.040	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.550	42.475	43.008	0.533	0.6	0.085	0.000	0.5	5.664	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.550	42.475	43.321	0.846	0.4	0.134	0.000	0.4	6.353	Flood Risk

Summary Results for S12: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.420	42.778	0.358	9.8	0.057	0.000	8.0	4.035	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.420	42.838	0.418	10.3	0.066	0.000	8.4	4.495	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.420	42.821	0.401	6.6	0.064	0.000	5.8	5.336	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.420	42.890	0.470	6.9	0.075	0.000	6.1	5.943	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.420	42.873	0.453	5.8	0.072	0.000	5.1	6.763	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.420	42.948	0.528	5.2	0.084	0.000	4.7	7.546	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.420	42.964	0.544	4.1	0.086	0.000	3.7	8.166	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.420	43.146	0.726	3.3	0.115	0.000	3.0	9.097	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.420	43.006	0.586	3.2	0.093	0.000	2.9	9.117	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.420	43.331	0.911	2.5	0.145	0.000	2.2	10.174	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.420	43.024	0.604	2.6	0.096	0.000	2.4	9.873	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.420	43.403	0.983	2.0	0.156	0.000	1.8	11.004	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.420	43.026	0.606	2.0	0.096	0.000	1.8	11.030	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.420	43.395	0.975	1.5	0.155	0.000	1.3	12.292	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.420	43.018	0.598	1.6	0.095	0.000	1.4	11.876	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.420	43.369	0.949	1.2	0.151	0.000	1.1	13.274	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.420	43.007	0.587	1.4	0.093	0.000	1.2	12.462	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.420	43.319	0.899	1.0	0.143	0.000	0.9	13.949	Flood Risk

Summary Results for S20: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.450	42.250	42.626	0.376	16.0	0.106	0.000	15.3	7.116	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.450	42.250	42.672	0.422	16.2	0.119	0.000	15.4	7.938	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.450	42.250	42.749	0.499	11.3	0.141	0.000	10.6	10.208	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.450	42.250	42.810	0.560	11.6	0.159	0.000	10.9	11.354	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.450	42.250	42.872	0.622	9.8	0.176	0.000	9.2	14.696	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.450	42.250	42.947	0.697	8.8	0.197	0.000	8.3	16.300	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.450	42.250	42.962	0.712	7.1	0.202	0.000	6.7	21.376	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.450	42.250	43.144	0.894	5.8	0.253	0.000	5.5	23.592	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.450	42.250	43.004	0.754	5.6	0.213	0.000	5.3	27.228	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.450	42.250	43.328	1.078	4.5	0.305	0.000	4.2	30.066	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.450	42.250	43.023	0.773	4.8	0.219	0.000	4.5	32.458	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.250	43.400	1.150	3.8	0.326	0.000	3.6	35.832	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.450	42.250	43.025	0.775	3.7	0.219	0.000	3.5	41.344	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.450	42.250	43.393	1.143	2.9	0.324	0.000	2.8	45.664	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.450	42.250	43.016	0.766	3.2	0.217	0.000	3.0	47.952	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.450	42.250	43.367	1.117	2.5	0.316	0.000	2.4	53.283	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.450	42.250	43.005	0.755	2.8	0.214	0.000	2.6	52.578	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.450	42.250	43.317	1.067	2.2	0.302	0.000	2.1	58.675	Flood Risk

Summary Results for S14: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.550	42.385	42.647	0.262	3.0	0.042	0.000	1.8	1.022	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.550	42.385	42.692	0.307	3.1	0.049	0.000	1.9	1.121	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.550	42.385	42.750	0.365	2.0	0.058	0.000	1.6	1.306	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.550	42.385	42.812	0.427	2.1	0.068	0.000	1.4	1.443	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.550	42.385	42.872	0.487	1.8	0.077	0.000	1.1	1.670	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.550	42.385	42.947	0.562	1.6	0.089	0.000	1.0	1.829	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.550	42.385	42.963	0.578	1.2	0.092	0.000	0.8	2.061	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.550	42.385	43.144	0.759	1.0	0.121	0.000	0.7	2.295	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.550	42.385	43.004	0.619	1.0	0.098	0.000	0.7	2.393	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.550	42.385	43.329	0.944	0.7	0.150	0.000	0.5	2.660	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.550	42.385	43.023	0.638	0.8	0.101	0.000	0.5	2.662	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.385	43.401	1.016	0.6	0.162	0.000	0.4	2.994	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.550	42.385	43.025	0.640	0.6	0.102	0.000	0.4	3.148	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.550	42.385	43.394	1.009	0.4	0.160	0.000	0.3	3.516	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.550	42.385	43.017	0.632	0.5	0.100	0.000	0.3	3.531	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.550	42.385	43.368	0.983	0.4	0.156	0.000	0.2	3.913	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.550	42.385	43.006	0.621	0.4	0.099	0.000	0.3	3.768	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.550	42.385	43.318	0.933	0.3	0.148	0.000	0.2	4.200	Flood Risk

Summary Results for S18: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.450	42.282	42.626	0.344	17.5	0.055	0.000	16.6	7.423	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.450	42.282	42.672	0.390	18.0	0.062	0.000	16.8	8.314	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.450	42.282	42.749	0.467	12.3	0.074	0.000	11.7	9.806	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.450	42.282	42.810	0.528	12.4	0.084	0.000	12.0	10.967	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.450	42.282	42.872	0.590	10.3	0.094	0.000	9.8	12.479	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.450	42.282	42.947	0.665	9.3	0.106	0.000	8.8	13.961	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.450	42.282	42.962	0.680	7.3	0.108	0.000	6.9	15.121	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.450	42.282	43.144	0.862	5.9	0.137	0.000	5.6	16.890	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.450	42.282	43.004	0.722	5.7	0.115	0.000	5.4	16.934	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.450	42.282	43.329	1.047	4.4	0.166	0.000	4.2	18.944	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.450	42.282	43.023	0.741	4.7	0.118	0.000	4.5	18.337	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.282	43.401	1.119	3.6	0.178	0.000	3.4	20.505	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.450	42.282	43.025	0.743	3.5	0.118	0.000	3.3	20.580	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.450	42.282	43.394	1.112	2.6	0.177	0.000	2.5	22.927	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.450	42.282	43.017	0.735	2.9	0.117	0.000	2.7	22.211	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.450	42.282	43.367	1.085	2.1	0.173	0.000	2.0	24.773	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.450	42.282	43.006	0.724	2.4	0.115	0.000	2.3	23.435	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.450	42.282	43.317	1.035	1.8	0.165	0.000	1.7	26.158	Flood Risk

Summary Results for Existing CW Sewer: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.185	42.223	0.038	2.6	0.000	0.000	2.6	3.097	OK
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.185	42.224	0.039	2.7	0.000	0.000	2.7	3.294	OK
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.185	42.226	0.041	3.0	0.000	0.000	3.0	7.852	OK
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.185	42.227	0.042	3.1	0.000	0.000	3.1	8.339	OK
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.185	42.228	0.043	3.3	0.000	0.000	3.3	18.288	OK
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.185	42.229	0.044	3.5	0.000	0.000	3.5	19.421	OK
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.185	42.230	0.045	3.5	0.000	0.000	3.5	39.651	OK
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.185	42.232	0.047	4.0	0.000	0.000	4.0	42.533	OK
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.185	42.230	0.045	3.6	0.000	0.000	3.6	60.766	OK
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.185	42.235	0.050	4.3	0.000	0.000	4.3	66.484	OK
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.185	42.230	0.045	3.7	0.000	0.000	3.7	80.910	OK
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.185	42.235	0.050	4.5	0.000	0.000	4.5	89.076	OK
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.185	42.231	0.046	3.7	0.000	0.000	3.7	116.876	OK
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.185	42.235	0.050	4.5	0.000	0.000	4.5	128.666	OK
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.185	42.230	0.045	3.7	0.000	0.000	3.7	145.925	OK
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.185	42.235	0.050	4.4	0.000	0.000	4.4	160.687	OK
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.185	42.230	0.045	3.6	0.000	0.000	3.6	167.457	OK
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.185	42.234	0.049	4.3	0.000	0.000	4.3	185.100	OK

Summary Results for S21: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.525	42.213	42.625	0.412	2.7	0.117	0.000	2.6	3.147	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.525	42.213	42.671	0.458	2.9	0.130	0.000	2.7	3.345	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.525	42.213	42.748	0.535	3.1	0.151	0.000	3.0	7.906	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.525	42.213	42.809	0.596	3.3	0.169	0.000	3.1	8.395	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.525	42.213	42.870	0.657	3.3	0.186	0.000	3.3	18.345	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.525	42.213	42.945	0.732	3.5	0.207	0.000	3.5	19.481	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.525	42.213	42.961	0.748	3.6	0.212	0.000	3.5	39.709	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.525	42.213	43.142	0.929	4.1	0.263	0.000	4.0	42.593	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.525	42.213	43.002	0.789	3.6	0.223	0.000	3.6	60.823	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.525	42.213	43.326	1.113	4.4	0.315	0.000	4.3	66.543	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.525	42.213	43.021	0.808	3.7	0.229	0.000	3.7	80.965	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.213	43.398	1.185	4.5	0.335	0.000	4.5	89.133	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.525	42.213	43.023	0.810	3.7	0.229	0.000	3.7	116.925	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.525	42.213	43.391	1.178	4.5	0.333	0.000	4.5	128.718	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.525	42.213	43.015	0.802	3.7	0.227	0.000	3.7	145.967	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.525	42.213	43.365	1.152	4.4	0.326	0.000	4.4	160.732	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.525	42.213	43.004	0.791	3.6	0.224	0.000	3.6	167.490	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.525	42.213	43.315	1.102	4.3	0.312	0.000	4.3	185.136	Flood Risk

Summary Results for S15: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.550	42.360	42.647	0.287	5.2	0.081	0.000	4.4	2.185	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.550	42.360	42.692	0.332	5.4	0.094	0.000	4.0	2.407	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.550	42.360	42.750	0.390	3.8	0.110	0.000	3.0	2.831	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.550	42.360	42.812	0.452	3.7	0.128	0.000	3.0	3.131	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.550	42.360	42.872	0.512	3.1	0.145	0.000	2.5	3.615	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.550	42.360	42.947	0.587	2.8	0.166	0.000	2.3	3.975	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.550	42.360	42.963	0.603	2.2	0.171	0.000	1.8	4.464	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.550	42.360	43.144	0.784	1.8	0.222	0.000	1.5	4.993	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.550	42.360	43.004	0.644	1.8	0.182	0.000	1.4	5.139	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.550	42.360	43.329	0.969	1.3	0.274	0.000	1.1	5.765	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.550	42.360	43.023	0.663	1.4	0.188	0.000	1.2	5.744	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.550	42.360	43.401	1.041	1.1	0.295	0.000	0.9	6.457	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.550	42.360	43.025	0.665	1.1	0.188	0.000	0.9	6.751	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.550	42.360	43.394	1.034	0.8	0.293	0.000	0.7	7.557	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.550	42.360	43.017	0.657	0.9	0.186	0.000	0.7	7.548	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.550	42.360	43.368	1.008	0.6	0.285	0.000	0.5	8.380	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.550	42.360	43.006	0.646	0.7	0.183	0.000	0.6	8.050	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.550	42.360	43.318	0.958	0.6	0.271	0.000	0.5	9.016	Flood Risk

Summary Results for S16: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.525	42.245	42.646	0.401	38.8	0.114	0.000	38.1	27.873	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.525	42.245	42.691	0.446	40.0	0.126	0.000	38.7	30.904	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.525	42.245	42.750	0.505	34.7	0.143	0.000	34.0	38.232	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.525	42.245	42.812	0.567	36.0	0.161	0.000	35.3	42.459	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.525	42.245	42.872	0.627	31.4	0.177	0.000	30.8	51.638	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.525	42.245	42.947	0.702	29.2	0.199	0.000	28.7	57.093	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.525	42.245	42.963	0.718	23.9	0.203	0.000	23.5	67.554	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.525	42.245	43.144	0.899	20.1	0.255	0.000	19.8	74.825	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.525	42.245	43.004	0.759	19.7	0.215	0.000	19.4	78.587	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.525	42.245	43.329	1.084	15.8	0.307	0.000	15.6	87.437	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.525	42.245	43.023	0.778	16.7	0.220	0.000	16.5	86.890	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.245	43.401	1.156	13.1	0.327	0.000	12.9	97.020	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.525	42.245	43.025	0.780	12.9	0.221	0.000	12.7	99.160	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.525	42.245	43.394	1.149	9.9	0.325	0.000	9.8	110.627	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.525	42.245	43.017	0.772	10.7	0.218	0.000	10.5	107.823	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.525	42.245	43.368	1.123	8.2	0.318	0.000	8.1	120.388	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.525	42.245	43.006	0.761	9.2	0.215	0.000	9.0	113.926	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.525	42.245	43.318	1.073	7.0	0.304	0.000	6.9	127.602	Flood Risk

Summary Results for S2: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	44.100	43.050	43.341	0.291	18.0	0.082	0.000	14.9	9.743	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	44.100	43.050	43.461	0.411	18.6	0.116	0.000	15.4	10.899	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	44.100	43.050	43.358	0.308	14.1	0.087	0.000	13.5	13.770	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	44.100	43.050	43.436	0.386	14.9	0.109	0.000	14.7	15.380	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	44.100	43.050	43.288	0.238	12.7	0.067	0.000	12.2	18.931	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	44.100	43.050	43.276	0.226	11.6	0.064	0.000	11.6	21.107	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	44.100	43.050	43.129	0.079	9.4	0.022	0.000	9.4	24.594	OK
FEH: 100 years: +45 %: 120 mins: Winter	44.100	43.050	43.156	0.106	7.7	0.030	0.000	7.7	27.528	OK
FEH: 100 years: +45 %: 180 mins: Summer	44.100	43.050	43.119	0.069	7.5	0.019	0.000	7.5	27.850	OK
FEH: 100 years: +45 %: 180 mins: Winter	44.100	43.050	43.341	0.291	5.9	0.082	0.000	5.9	31.198	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	44.100	43.050	43.113	0.063	6.3	0.018	0.000	6.3	30.092	OK
FEH: 100 years: +45 %: 240 mins: Winter	44.100	43.050	43.413	0.363	4.9	0.103	0.000	4.9	33.722	Surcharged
FEH: 100 years: +45 %: 360 mins: Summer	44.100	43.050	43.104	0.054	4.8	0.015	0.000	4.8	33.187	OK
FEH: 100 years: +45 %: 360 mins: Winter	44.100	43.050	43.404	0.354	3.7	0.100	0.000	3.7	37.161	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	44.100	43.050	43.099	0.049	4.0	0.014	0.000	4.0	35.352	OK
FEH: 100 years: +45 %: 480 mins: Winter	44.100	43.050	43.378	0.328	3.1	0.093	0.000	3.1	39.579	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	44.100	43.050	43.095	0.045	3.4	0.013	0.000	3.4	37.045	OK
FEH: 100 years: +45 %: 600 mins: Winter	44.100	43.050	43.327	0.277	2.6	0.078	0.000	2.6	41.464	Surcharged

Summary Results for S4: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	44.000	42.825	43.272	0.447	17.5	0.126	0.000	15.1	12.312	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	44.000	42.825	43.378	0.553	17.9	0.156	0.000	15.2	13.765	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	44.000	42.825	43.233	0.408	16.3	0.116	0.000	14.8	18.013	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	44.000	42.825	43.302	0.477	16.7	0.135	0.000	14.8	20.073	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	44.000	42.825	43.185	0.360	14.8	0.102	0.000	13.3	25.947	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	44.000	42.825	43.214	0.389	13.7	0.110	0.000	12.5	28.603	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	44.000	42.825	43.049	0.224	11.4	0.063	0.000	11.2	35.870	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	44.000	42.825	43.155	0.330	9.6	0.093	0.000	9.5	39.637	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	44.000	42.825	43.015	0.190	9.4	0.054	0.000	9.1	42.334	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	44.000	42.825	43.340	0.515	7.7	0.146	0.000	7.5	47.119	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	44.000	42.825	43.032	0.207	8.1	0.059	0.000	8.1	46.646	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	44.000	42.825	43.411	0.586	6.5	0.166	0.000	6.4	52.276	Surcharged
FEH: 100 years: +45 %: 360 mins: Summer	44.000	42.825	43.032	0.207	6.3	0.059	0.000	6.3	52.256	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	44.000	42.825	43.403	0.578	5.0	0.164	0.000	5.0	58.555	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	44.000	42.825	43.024	0.199	5.4	0.056	0.000	5.3	56.013	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	44.000	42.825	43.377	0.552	4.2	0.156	0.000	4.2	62.731	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	44.000	42.825	43.013	0.188	4.6	0.053	0.000	4.6	58.869	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	44.000	42.825	43.326	0.501	3.7	0.142	0.000	3.7	65.958	Surcharged

Summary Results for S5: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.800	42.591	43.120	0.529	19.7	0.150	0.000	17.4	14.246	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.800	42.591	43.208	0.617	20.0	0.175	0.000	17.7	15.838	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.800	42.591	43.074	0.483	17.9	0.137	0.000	16.4	20.372	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.800	42.591	43.168	0.577	18.0	0.163	0.000	17.0	22.679	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.800	42.591	43.081	0.490	16.0	0.139	0.000	15.1	28.907	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.800	42.591	43.109	0.518	14.9	0.147	0.000	14.3	31.882	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.800	42.591	42.979	0.388	13.1	0.110	0.000	12.1	39.467	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.800	42.591	43.151	0.560	11.0	0.158	0.000	10.5	43.621	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.800	42.591	43.012	0.421	10.6	0.119	0.000	10.0	46.400	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.800	42.591	43.336	0.745	8.7	0.211	0.000	8.5	51.628	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	43.800	42.591	43.029	0.438	9.3	0.124	0.000	9.0	51.101	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.800	42.591	43.408	0.817	7.4	0.231	0.000	7.1	57.219	Surcharged
FEH: 100 years: +45 %: 360 mins: Summer	43.800	42.591	43.030	0.439	7.3	0.124	0.000	7.0	57.461	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.800	42.591	43.400	0.809	5.7	0.229	0.000	5.6	64.314	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	43.800	42.591	43.021	0.430	6.1	0.122	0.000	5.9	61.530	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.800	42.591	43.374	0.783	4.7	0.222	0.000	4.6	68.937	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	43.800	42.591	43.010	0.419	5.3	0.119	0.000	5.1	64.639	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.800	42.591	43.323	0.732	4.1	0.207	0.000	4.0	72.430	Surcharged

Summary Results for S1: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	44.200	43.180	43.396	0.216	17.8	0.061	0.000	14.4	7.725	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	44.200	43.180	43.484	0.304	18.7	0.086	0.000	14.8	8.653	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	44.200	43.180	43.416	0.236	11.9	0.067	0.000	11.7	10.308	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	44.200	43.180	43.498	0.318	12.5	0.090	0.000	12.3	11.551	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	44.200	43.180	43.331	0.151	10.5	0.043	0.000	10.3	13.096	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	44.200	43.180	43.296	0.116	9.4	0.033	0.000	9.4	14.669	OK
FEH: 100 years: +45 %: 120 mins: Summer	44.200	43.180	43.251	0.071	7.4	0.020	0.000	7.4	15.691	OK
FEH: 100 years: +45 %: 120 mins: Winter	44.200	43.180	43.242	0.062	6.0	0.018	0.000	6.0	17.587	OK
FEH: 100 years: +45 %: 180 mins: Summer	44.200	43.180	43.241	0.061	5.8	0.017	0.000	5.8	17.321	OK
FEH: 100 years: +45 %: 180 mins: Winter	44.200	43.180	43.341	0.161	4.5	0.046	0.000	4.5	19.404	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	44.200	43.180	43.235	0.055	4.8	0.016	0.000	4.8	18.540	OK
FEH: 100 years: +45 %: 240 mins: Winter	44.200	43.180	43.413	0.233	3.6	0.066	0.000	3.6	20.748	Surcharged
FEH: 100 years: +45 %: 360 mins: Summer	44.200	43.180	43.227	0.047	3.6	0.013	0.000	3.6	20.280	OK
FEH: 100 years: +45 %: 360 mins: Winter	44.200	43.180	43.404	0.224	2.6	0.064	0.000	2.7	22.704	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	44.200	43.180	43.222	0.042	2.9	0.012	0.000	2.9	21.540	OK
FEH: 100 years: +45 %: 480 mins: Winter	44.200	43.180	43.378	0.198	2.1	0.056	0.000	2.1	24.108	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	44.200	43.180	43.218	0.038	2.5	0.011	0.000	2.5	22.572	OK
FEH: 100 years: +45 %: 600 mins: Winter	44.200	43.180	43.327	0.147	1.8	0.042	0.000	1.8	25.242	OK

Summary Results for S9: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.525	42.375	42.853	0.478	4.4	0.076	0.000	2.5	1.640	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.525	42.375	42.918	0.543	4.7	0.086	0.000	2.7	1.817	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.525	42.375	42.875	0.500	3.0	0.080	0.000	2.2	2.156	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.525	42.375	42.949	0.574	3.1	0.091	0.000	2.3	2.391	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.525	42.375	42.910	0.535	2.6	0.085	0.000	1.9	2.738	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.525	42.375	42.950	0.575	2.3	0.091	0.000	1.8	3.041	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.525	42.375	42.965	0.590	1.9	0.094	0.000	1.4	3.346	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.525	42.375	43.146	0.771	1.5	0.123	0.000	1.2	3.730	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.525	42.375	43.007	0.632	1.4	0.100	0.000	1.2	3.803	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.525	42.375	43.331	0.956	1.1	0.152	0.000	0.9	4.251	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.525	42.375	43.025	0.650	1.2	0.103	0.000	0.9	4.186	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.525	42.375	43.404	1.029	0.9	0.164	0.000	0.7	4.668	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.525	42.375	43.027	0.652	0.9	0.104	0.000	0.7	4.828	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.525	42.375	43.396	1.021	0.7	0.162	0.000	0.5	5.379	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.525	42.375	43.018	0.643	0.7	0.102	0.000	0.6	5.313	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.525	42.375	43.370	0.995	0.5	0.158	0.000	0.4	5.916	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.525	42.375	43.007	0.632	0.6	0.101	0.000	0.5	5.621	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.525	42.375	43.320	0.945	0.4	0.150	0.000	0.4	6.324	Flood Risk

Summary Results for S17: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.400	42.626	0.226	9.3	0.036	0.000	8.2	3.775	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.400	42.672	0.272	9.7	0.043	0.000	8.2	4.216	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.400	42.749	0.349	6.2	0.055	0.000	6.1	4.972	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.400	42.810	0.410	6.5	0.065	0.000	5.9	5.549	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.400	42.871	0.471	5.5	0.075	0.000	4.9	6.309	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.400	42.947	0.547	4.9	0.087	0.000	4.4	7.049	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.400	42.962	0.562	3.9	0.089	0.000	3.5	7.623	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.400	43.144	0.744	3.1	0.118	0.000	2.8	8.516	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.400	43.004	0.604	3.0	0.096	0.000	2.7	8.536	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.400	43.329	0.929	2.3	0.148	0.000	2.1	9.543	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.400	43.023	0.623	2.5	0.099	0.000	2.2	9.238	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.400	43.401	1.001	1.9	0.159	0.000	1.7	10.321	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.400	43.025	0.625	1.9	0.099	0.000	1.7	10.359	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.400	43.394	0.994	1.4	0.158	0.000	1.2	11.535	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.400	43.017	0.617	1.5	0.098	0.000	1.4	11.175	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.400	43.367	0.967	1.1	0.154	0.000	1.0	12.455	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.400	43.006	0.606	1.3	0.096	0.000	1.2	11.730	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.400	43.317	0.917	0.9	0.146	0.000	0.8	13.113	Flood Risk

Summary Results for S3: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	44.000	42.840	43.273	0.433	4.6	0.122	0.000	2.5	1.992	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	44.000	42.840	43.379	0.539	4.9	0.152	0.000	2.6	2.233	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	44.000	42.840	43.234	0.394	3.1	0.112	0.000	2.6	2.661	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	44.000	42.840	43.303	0.463	3.2	0.131	0.000	2.3	2.984	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	44.000	42.840	43.186	0.346	2.7	0.098	0.000	2.2	3.380	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	44.000	42.840	43.214	0.374	2.5	0.106	0.000	1.9	3.724	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	44.000	42.840	43.050	0.210	1.9	0.059	0.000	1.8	4.049	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	44.000	42.840	43.155	0.315	1.6	0.089	0.000	1.5	4.438	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	44.000	42.840	43.015	0.175	1.5	0.050	0.000	1.5	4.481	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	44.000	42.840	43.340	0.500	1.2	0.141	0.000	1.1	4.970	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	44.000	42.840	43.032	0.192	1.2	0.054	0.000	1.2	4.800	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	44.000	42.840	43.411	0.571	0.9	0.162	0.000	0.9	5.382	Surcharged
FEH: 100 years: +45 %: 360 mins: Summer	44.000	42.840	43.032	0.192	0.9	0.054	0.000	0.9	5.250	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	44.000	42.840	43.403	0.563	0.7	0.159	0.000	0.7	5.870	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	44.000	42.840	43.024	0.184	0.8	0.052	0.000	0.8	5.562	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	44.000	42.840	43.377	0.537	0.6	0.152	0.000	0.5	6.272	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	44.000	42.840	43.013	0.173	0.6	0.049	0.000	0.6	5.838	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	44.000	42.840	43.326	0.486	0.5	0.138	0.000	0.5	6.534	Surcharged

Summary Results for S13: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.290	42.775	0.485	26.6	0.137	0.000	26.0	22.017	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.290	42.835	0.545	27.8	0.154	0.000	27.6	24.385	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.290	42.819	0.529	26.2	0.150	0.000	25.5	30.469	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.290	42.887	0.597	27.1	0.169	0.000	26.3	33.801	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.290	42.873	0.583	23.9	0.165	0.000	23.2	41.710	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.290	42.948	0.658	22.4	0.186	0.000	21.9	46.040	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.290	42.964	0.674	18.6	0.191	0.000	18.1	55.407	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.290	43.146	0.856	15.7	0.242	0.000	15.4	61.249	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.290	43.006	0.716	15.4	0.203	0.000	15.1	64.839	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.290	43.331	1.041	12.6	0.294	0.000	12.3	72.088	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.290	43.024	0.734	13.3	0.208	0.000	13.0	71.812	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.290	43.403	1.113	10.4	0.315	0.000	10.2	80.146	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.290	43.026	0.736	10.3	0.208	0.000	10.1	81.957	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.290	43.395	1.105	8.0	0.313	0.000	7.8	91.439	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.290	43.018	0.728	8.6	0.206	0.000	8.4	88.946	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.290	43.369	1.079	6.6	0.305	0.000	6.5	99.384	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.290	43.007	0.717	7.4	0.203	0.000	7.2	93.860	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.290	43.319	1.029	5.7	0.291	0.000	5.6	105.152	Flood Risk

Summary Results for S6: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.700	42.525	43.063	0.538	17.4	0.152	0.000	17.0	14.119	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.700	42.525	43.145	0.620	17.7	0.176	0.000	17.8	15.658	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.700	42.525	43.030	0.505	16.4	0.143	0.000	15.6	20.116	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.700	42.525	43.121	0.596	17.0	0.169	0.000	16.0	22.352	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.700	42.525	43.043	0.518	15.1	0.147	0.000	14.4	28.539	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.700	42.525	43.070	0.545	14.3	0.154	0.000	13.7	31.428	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.700	42.525	42.970	0.445	12.1	0.126	0.000	11.6	39.074	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.700	42.525	43.150	0.625	10.5	0.177	0.000	10.1	43.132	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.700	42.525	43.010	0.485	10.0	0.137	0.000	9.7	46.058	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.700	42.525	43.335	0.810	8.5	0.229	0.000	8.3	51.196	Surcharged
FEH: 100 years: +45 %: 240 mins: Summer	43.700	42.525	43.028	0.503	9.0	0.142	0.000	8.7	50.843	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.700	42.525	43.407	0.882	7.1	0.250	0.000	6.9	56.880	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.700	42.525	43.029	0.504	7.0	0.143	0.000	6.8	57.396	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.700	42.525	43.399	0.874	5.6	0.247	0.000	5.4	64.184	Surcharged
FEH: 100 years: +45 %: 480 mins: Summer	43.700	42.525	43.021	0.496	5.9	0.140	0.000	5.8	61.525	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.700	42.525	43.373	0.848	4.6	0.240	0.000	4.5	68.930	Surcharged
FEH: 100 years: +45 %: 600 mins: Summer	43.700	42.525	43.009	0.484	5.1	0.137	0.000	5.0	64.635	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.700	42.525	43.322	0.797	4.0	0.226	0.000	3.9	72.425	Surcharged

Summary Results for S8: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.535	42.410	42.959	0.549	18.6	0.155	0.000	19.3	15.587	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.535	42.410	43.032	0.622	19.6	0.176	0.000	20.1	17.255	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.535	42.410	42.953	0.543	17.7	0.154	0.000	16.9	21.973	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.535	42.410	43.035	0.625	18.2	0.177	0.000	17.5	24.378	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.535	42.410	42.976	0.566	16.3	0.160	0.000	15.6	30.866	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.535	42.410	43.006	0.596	15.5	0.169	0.000	14.8	33.982	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.535	42.410	42.967	0.557	13.0	0.158	0.000	12.5	41.995	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.535	42.410	43.148	0.738	11.1	0.209	0.000	10.7	46.343	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.535	42.410	43.009	0.599	10.8	0.169	0.000	10.5	49.486	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.535	42.410	43.333	0.923	9.2	0.261	0.000	8.9	54.967	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.535	42.410	43.027	0.617	9.6	0.174	0.000	9.4	54.761	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.535	42.410	43.405	0.995	7.7	0.282	0.000	7.5	61.177	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.535	42.410	43.028	0.618	7.5	0.175	0.000	7.3	62.112	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.535	42.410	43.398	0.988	5.9	0.279	0.000	5.8	69.390	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.535	42.410	43.019	0.609	6.3	0.172	0.000	6.2	66.923	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.535	42.410	43.371	0.961	4.9	0.272	0.000	4.8	74.880	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.535	42.410	43.008	0.598	5.5	0.169	0.000	5.3	70.292	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.535	42.410	43.321	0.911	4.3	0.258	0.000	4.2	78.771	Flood Risk

Summary Results for S10: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.500	42.320	42.850	0.530	20.8	0.150	0.000	21.4	16.867	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.500	42.320	42.914	0.594	21.9	0.168	0.000	22.3	18.660	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.500	42.320	42.873	0.553	19.0	0.157	0.000	18.3	23.644	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.500	42.320	42.946	0.626	19.6	0.177	0.000	19.3	26.212	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.500	42.320	42.908	0.588	17.5	0.166	0.000	16.9	33.005	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.500	42.320	42.950	0.630	16.6	0.178	0.000	16.0	36.337	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.500	42.320	42.965	0.645	14.0	0.182	0.000	13.5	44.713	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.500	42.320	43.146	0.826	11.9	0.234	0.000	11.6	49.348	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.500	42.320	43.007	0.687	11.7	0.194	0.000	11.4	52.712	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.500	42.320	43.331	1.011	9.8	0.286	0.000	9.5	58.552	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.500	42.320	43.025	0.705	10.3	0.200	0.000	10.0	58.455	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.500	42.320	43.404	1.084	8.2	0.307	0.000	8.0	65.270	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.500	42.320	43.027	0.707	8.0	0.200	0.000	7.8	66.638	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.500	42.320	43.396	1.076	6.3	0.305	0.000	6.2	74.403	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.500	42.320	43.018	0.698	6.7	0.198	0.000	6.6	72.114	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.500	42.320	43.370	1.050	5.3	0.297	0.000	5.1	80.619	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.500	42.320	43.007	0.687	5.8	0.195	0.000	5.7	75.908	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.500	42.320	43.320	1.000	4.6	0.283	0.000	4.5	85.073	Flood Risk

Summary Results for S19: Rank By: Max. Resident Volume

Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
FEH: 100 years: +45 %: 15 mins: Summer	43.450	42.267	42.626	0.359	16.8	0.057	0.000	16.0	7.574	Surcharged
FEH: 100 years: +45 %: 15 mins: Winter	43.450	42.267	42.672	0.405	17.1	0.064	0.000	16.2	8.460	Surcharged
FEH: 100 years: +45 %: 30 mins: Summer	43.450	42.267	42.749	0.482	11.9	0.077	0.000	11.3	10.773	Surcharged
FEH: 100 years: +45 %: 30 mins: Winter	43.450	42.267	42.810	0.543	12.3	0.086	0.000	11.6	11.992	Surcharged
FEH: 100 years: +45 %: 60 mins: Summer	43.450	42.267	42.872	0.605	10.3	0.096	0.000	9.8	15.375	Surcharged
FEH: 100 years: +45 %: 60 mins: Winter	43.450	42.267	42.947	0.680	9.3	0.108	0.000	8.8	17.066	Surcharged
FEH: 100 years: +45 %: 120 mins: Summer	43.450	42.267	42.962	0.695	7.5	0.111	0.000	7.1	22.082	Surcharged
FEH: 100 years: +45 %: 120 mins: Winter	43.450	42.267	43.144	0.877	6.1	0.139	0.000	5.8	24.395	Surcharged
FEH: 100 years: +45 %: 180 mins: Summer	43.450	42.267	43.004	0.737	6.0	0.117	0.000	5.6	27.885	Surcharged
FEH: 100 years: +45 %: 180 mins: Winter	43.450	42.267	43.329	1.062	4.7	0.169	0.000	4.5	30.809	Flood Risk
FEH: 100 years: +45 %: 240 mins: Summer	43.450	42.267	43.023	0.756	5.0	0.120	0.000	4.8	33.032	Surcharged
FEH: 100 years: +45 %: 240 mins: Winter	43.450	42.267	43.401	1.134	4.0	0.180	0.000	3.8	36.480	Flood Risk
FEH: 100 years: +45 %: 360 mins: Summer	43.450	42.267	43.025	0.758	3.9	0.120	0.000	3.7	41.726	Surcharged
FEH: 100 years: +45 %: 360 mins: Winter	43.450	42.267	43.394	1.127	3.1	0.179	0.000	2.9	46.107	Flood Risk
FEH: 100 years: +45 %: 480 mins: Summer	43.450	42.267	43.017	0.750	3.3	0.119	0.000	3.2	48.154	Surcharged
FEH: 100 years: +45 %: 480 mins: Winter	43.450	42.267	43.367	1.100	2.6	0.175	0.000	2.5	53.539	Flood Risk
FEH: 100 years: +45 %: 600 mins: Summer	43.450	42.267	43.005	0.738	2.9	0.117	0.000	2.8	52.640	Surcharged
FEH: 100 years: +45 %: 600 mins: Winter	43.450	42.267	43.317	1.050	2.3	0.167	0.000	2.2	58.777	Flood Risk

Summary Results for Blue Roof 1: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	65.055	65.055	0.055	0.055	26.1	11.050	0.000	0.000	0.5	0.584	670	56.558	OK
FEH: 100 years: +45 %: 15 mins: Winter	65.061	65.061	0.061	0.061	27.5	12.386	0.000	0.000	0.5	0.639	677	51.308	OK
FEH: 100 years: +45 %: 30 mins: Summer	65.072	65.072	0.072	0.072	17.5	14.493	0.000	0.000	0.6	1.517	406	43.025	OK
FEH: 100 years: +45 %: 30 mins: Winter	65.080	65.080	0.080	0.080	18.4	16.252	0.000	0.000	0.6	1.647	401	36.112	OK
FEH: 100 years: +45 %: 60 mins: Summer	65.088	65.088	0.088	0.088	15.4	17.810	0.000	0.000	0.7	3.557	347	29.985	OK
FEH: 100 years: +45 %: 60 mins: Winter	65.099	65.099	0.099	0.099	13.9	19.989	0.000	0.000	0.7	3.854	339	21.419	OK
FEH: 100 years: +45 %: 120 mins: Summer	65.099	65.099	0.099	0.099	10.9	20.085	0.000	0.000	0.7	7.652	301	21.042	OK
FEH: 100 years: +45 %: 120 mins: Winter	65.112	65.112	0.112	0.112	8.8	22.664	0.000	0.000	0.8	8.299	301	10.905	OK
FEH: 100 years: +45 %: 180 mins: Summer	65.103	65.103	0.103	0.103	8.5	20.860	0.000	0.000	0.7	11.591	352	17.994	OK
FEH: 100 years: +45 %: 180 mins: Winter	65.117	65.117	0.117	0.117	6.6	23.655	0.000	0.000	0.8	12.602	336	7.006	OK
FEH: 100 years: +45 %: 240 mins: Summer	65.104	65.104	0.104	0.104	7.0	21.129	0.000	0.000	0.8	15.251	312	16.938	OK
FEH: 100 years: +45 %: 240 mins: Winter	65.118	65.118	0.118	0.118	5.3	23.933	0.000	0.000	0.8	16.621	302	5.913	OK
FEH: 100 years: +45 %: 360 mins: Summer	65.105	65.105	0.105	0.105	5.3	21.321	0.000	0.000	0.8	21.511	308	16.181	OK
FEH: 100 years: +45 %: 360 mins: Winter	65.118	65.118	0.118	0.118	3.9	23.924	0.000	0.000	0.8	23.617	320	5.948	OK

FEH: 100 years: +45 %: 480 mins: Summer	65.105	65.105	0.105	0.105	4.3	21.238	0.000	0.000	0.8	26.127	303	16.509	OK
FEH: 100 years: +45 %: 480 mins: Winter	65.117	65.117	0.117	0.117	3.1	23.647	0.000	0.000	0.8	29.013	302	7.038	OK
FEH: 100 years: +45 %: 600 mins: Summer	65.104	65.104	0.104	0.104	3.6	21.002	0.000	0.000	0.8	29.249	297	17.438	OK
FEH: 100 years: +45 %: 600 mins: Winter	65.114	65.114	0.114	0.114	2.6	23.173	0.000	0.000	0.8	32.708	305	8.901	OK

Summary Results for Att. Tank: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	42.626	42.626	0.401	0.401	59.5	34.267	0.000	0.000	2.7	3.629	142	50.265	OK
FEH: 100 years: +45 %: 15 mins: Winter	42.672	42.672	0.447	0.447	60.6	38.192	0.000	0.000	2.9	3.886	150	44.569	OK
FEH: 100 years: +45 %: 30 mins: Summer	42.749	42.749	0.524	0.524	48.5	44.808	0.000	0.000	3.1	8.513	207	34.967	OK
FEH: 100 years: +45 %: 30 mins: Winter	42.810	42.810	0.585	0.585	50.5	50.050	0.000	0.000	3.3	9.072	214	27.359	OK
FEH: 100 years: +45 %: 60 mins: Summer	42.871	42.871	0.646	0.646	43.6	55.275	0.000	0.000	3.3	19.065	207	19.775	OK
FEH: 100 years: +45 %: 60 mins: Winter	42.947	42.947	0.722	0.722	40.3	61.714	0.000	0.000	3.5	20.287	207	10.430	OK
FEH: 100 years: +45 %: 120 mins: Summer	42.962	42.962	0.737	0.737	32.8	63.033	0.000	0.000	3.6	40.457	194	8.516	OK
FEH: 100 years: +45 %: 120 mins: Winter	43.144	43.144	0.919	0.919	27.3	68.543	0.000	0.000	4.1	43.440	176	0.517	OK
FEH: 100 years: +45 %: 180 mins: Summer	43.003	43.003	0.778	0.778	26.7	66.559	0.000	0.000	3.6	61.522	186	3.398	OK
FEH: 100 years: +45 %: 180 mins: Winter	43.328	43.328	1.103	1.103	21.4	68.719	0.000	0.000	4.4	67.342	176	0.263	OK
FEH: 100 years: +45 %: 240 mins: Summer	43.022	43.022	0.797	0.797	22.6	68.180	0.000	0.000	3.7	81.581	179	1.045	OK
FEH: 100 years: +45 %: 240 mins: Winter	43.400	43.400	1.175	1.175	17.7	68.787	0.000	0.000	4.5	89.843	177	0.163	OK
FEH: 100 years: +45 %: 360 mins: Summer	43.024	43.024	0.799	0.799	17.4	68.351	0.000	0.000	3.7	117.350	190	0.797	OK
FEH: 100 years: +45 %: 360 mins: Winter	43.393	43.393	1.168	1.168	13.5	68.781	0.000	0.000	4.5	129.215	167	0.173	OK

FEH: 100 years: +45 %: 480 mins: Summer	43.016	43.016	0.791	0.791	14.5	67.647	0.000	0.000	3.7	146.213	195	1.819	OK
FEH: 100 years: +45 %: 480 mins: Winter	43.367	43.367	1.142	1.142	11.2	68.756	0.000	0.000	4.4	161.035	164	0.210	OK
FEH: 100 years: +45 %: 600 mins: Summer	43.005	43.005	0.780	0.780	12.5	66.704	0.000	0.000	3.6	167.595	181	3.188	OK
FEH: 100 years: +45 %: 600 mins: Winter	43.317	43.317	1.092	1.092	9.6	68.708	0.000	0.000	4.3	185.283	164	0.279	OK

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion 1:100 Year Storm Event + 45% CC Restricted Flow Rate 4.5 l/s	28/04/2025 Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Summary Results for Blue Roof 2: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	65.065	65.065	0.065	0.065	8.2	3.220	0.000	0.000	0.6	0.671	170	48.984	OK
FEH: 100 years: +45 %: 15 mins: Winter	65.073	65.073	0.073	0.073	8.6	3.617	0.000	0.000	0.6	0.732	172	42.703	OK
FEH: 100 years: +45 %: 30 mins: Summer	65.082	65.082	0.082	0.082	5.5	4.070	0.000	0.000	0.7	1.636	92	35.526	OK
FEH: 100 years: +45 %: 30 mins: Winter	65.093	65.093	0.093	0.093	5.8	4.579	0.000	0.000	0.7	1.779	91	27.464	OK
FEH: 100 years: +45 %: 60 mins: Summer	65.094	65.094	0.094	0.094	4.8	4.654	0.000	0.000	0.7	3.483	75	26.278	OK
FEH: 100 years: +45 %: 60 mins: Winter	65.106	65.106	0.106	0.106	4.4	5.245	0.000	0.000	0.8	3.795	74	16.910	OK
FEH: 100 years: +45 %: 120 mins: Summer	65.097	65.097	0.097	0.097	3.4	4.825	0.000	0.000	0.7	6.042	87	23.568	OK
FEH: 100 years: +45 %: 120 mins: Winter	65.108	65.108	0.108	0.108	2.8	5.352	0.000	0.000	0.8	6.735	78	15.221	OK
FEH: 100 years: +45 %: 180 mins: Summer	65.096	65.096	0.096	0.096	2.7	4.753	0.000	0.000	0.7	7.341	70	24.703	OK
FEH: 100 years: +45 %: 180 mins: Winter	65.105	65.105	0.105	0.105	2.1	5.183	0.000	0.000	0.8	8.243	76	17.891	OK
FEH: 100 years: +45 %: 240 mins: Summer	65.093	65.093	0.093	0.093	2.2	4.605	0.000	0.000	0.7	8.143	74	27.049	OK
FEH: 100 years: +45 %: 240 mins: Winter	65.099	65.099	0.099	0.099	1.7	4.923	0.000	0.000	0.7	9.155	72	22.018	OK
FEH: 100 years: +45 %: 360 mins: Summer	65.086	65.086	0.086	0.086	1.7	4.264	0.000	0.000	0.7	9.161	67	32.445	OK
FEH: 100 years: +45 %: 360 mins: Winter	65.088	65.088	0.088	0.088	1.2	4.363	0.000	0.000	0.7	10.274	71	30.890	OK

FEH: 100 years: +45 %: 480 mins: Summer	65.079	65.079	0.079	0.079	1.4	3.914	0.000	0.000	0.6	9.836	67	37.994	OK
FEH: 100 years: +45 %: 480 mins: Winter	65.078	65.078	0.078	0.078	1.0	3.872	0.000	0.000	0.6	11.027	67	38.668	OK
FEH: 100 years: +45 %: 600 mins: Summer	65.073	65.073	0.073	0.073	1.1	3.589	0.000	0.000	0.6	10.316	66	43.147	OK
FEH: 100 years: +45 %: 600 mins: Winter	65.070	65.070	0.070	0.070	0.8	3.444	0.000	0.000	0.6	11.569	63	45.437	OK

Summary Results for Blue Roof 3: Rank By: Max. Resident Volume

Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
FEH: 100 years: +45 %: 15 mins: Summer	62.065	62.065	0.065	0.065	12.9	5.247	0.000	0.000	0.6	0.668	279	48.811	OK
FEH: 100 years: +45 %: 15 mins: Winter	62.073	62.073	0.073	0.073	13.5	5.888	0.000	0.000	0.6	0.728	283	42.561	OK
FEH: 100 years: +45 %: 30 mins: Summer	62.083	62.083	0.083	0.083	8.6	6.730	0.000	0.000	0.7	1.674	158	34.341	OK
FEH: 100 years: +45 %: 30 mins: Winter	62.093	62.093	0.093	0.093	9.1	7.558	0.000	0.000	0.7	1.814	156	26.259	OK
FEH: 100 years: +45 %: 60 mins: Summer	62.099	62.099	0.099	0.099	7.6	7.992	0.000	0.000	0.7	3.739	134	22.032	OK
FEH: 100 years: +45 %: 60 mins: Winter	62.111	62.111	0.111	0.111	6.8	9.013	0.000	0.000	0.8	4.058	132	12.066	OK
FEH: 100 years: +45 %: 120 mins: Summer	62.104	62.104	0.104	0.104	5.4	8.449	0.000	0.000	0.8	7.349	154	17.573	OK
FEH: 100 years: +45 %: 120 mins: Winter	62.117	62.117	0.117	0.117	4.3	9.510	0.000	0.000	0.8	8.042	142	7.215	OK
FEH: 100 years: +45 %: 180 mins: Summer	62.106	62.106	0.106	0.106	4.2	8.548	0.000	0.000	0.8	10.075	127	16.606	OK
FEH: 100 years: +45 %: 180 mins: Winter	62.118	62.118	0.118	0.118	3.2	9.548	0.000	0.000	0.8	11.157	142	6.849	OK
FEH: 100 years: +45 %: 240 mins: Summer	62.105	62.105	0.105	0.105	3.5	8.492	0.000	0.000	0.8	11.809	135	17.149	OK
FEH: 100 years: +45 %: 240 mins: Winter	62.116	62.116	0.116	0.116	2.6	9.386	0.000	0.000	0.8	13.218	120	8.428	OK
FEH: 100 years: +45 %: 360 mins: Summer	62.101	62.101	0.101	0.101	2.6	8.205	0.000	0.000	0.7	13.857	125	19.950	OK
FEH: 100 years: +45 %: 360 mins: Winter	62.109	62.109	0.109	0.109	1.9	8.846	0.000	0.000	0.8	15.553	118	13.697	OK

FEH: 100 years: +45 %: 480 mins: Summer	62.097	62.097	0.097	0.097	2.1	7.834	0.000	0.000	0.7	15.128	117	23.575	OK
FEH: 100 years: +45 %: 480 mins: Winter	62.101	62.101	0.101	0.101	1.5	8.204	0.000	0.000	0.7	16.903	121	19.960	OK
FEH: 100 years: +45 %: 600 mins: Summer	62.092	62.092	0.092	0.092	1.8	7.420	0.000	0.000	0.7	16.010	110	27.607	OK
FEH: 100 years: +45 %: 600 mins: Winter	62.094	62.094	0.094	0.094	1.3	7.616	0.000	0.000	0.7	17.979	112	25.695	OK

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 40% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			



Blue Roof 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	50
Number of Crates Wide	18
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	25.438

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	R11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (15)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Att. Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.525
Depth (m)	0.800
Base Level (m)	42.225
Number of Crates Long	18
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	68.900

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (16)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (17)
Outlet Type	Free Discharge



Blue Roof 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	22
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	6.313

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (22)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Blue Roof 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	62.250
Depth (m)	0.125
Base Level (m)	62.000
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	10.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7) Catchment Area (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	R3 (Green Roof)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	R1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	62.000

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 40% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	43.500 42.350	Diameter / Length: 0.450					Manhole
E:384389.778 N:397979.886	1.150		{a} Pipe (7)	Pipe	42.350	Diam/Width:150	Not Applicable
S7	43.550 42.475	Diameter / Length: 0.450					Manhole
E:384402.334 N:397993.114	1.075		{a} Pipe (6)	Pipe	42.475	Diam/Width:100	Not Applicable
S12	43.500 42.420	Diameter / Length: 0.450					Manhole
E:384385.621 N:397972.695	1.080		{a} Pipe (8)	Pipe	42.420	Diam/Width:150	Not Applicable
S20	43.450 42.250	Diameter / Length: 0.600	{1} Pipe (14) (1)	Pipe	42.250	Diam/Width:150	Manhole
E:384395.728 N:397967.232	1.200		{a} Pipe (16)	Pipe	42.250	Diam/Width:150	Not Applicable
S14	43.550 42.385	Diameter / Length: 0.450					Manhole
E:384406.221 N:397985.162	1.165		{a} Pipe (10)	Pipe	42.385	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S18	43.450 42.282	Diameter / Length: 0.450	{1} Pipe (13)	Pipe	42.282	Diam/Width:150	Manhole
E:384393.728 N:397965.046	1.168		{a} Pipe (14)	Pipe	42.282	Diam/Width:150	Not Applicable
Existing CW Sewer	43.500 42.185	Diameter / Length: 0.600	{1} Pipe (18)	Pipe	42.185	Diam/Width:150	Manhole
E:384392.239 N:397977.387	1.315						Not Applicable
S21	43.525 42.213	Diameter / Length: 0.600	{1} Pipe (17)	Pipe	42.213	Diam/Width:150	Manhole
E:384394.874 N:397977.835	1.312		{a} Pipe (18)	Pipe	42.213	Diam/Width:150	Not Applicable
S15	43.550 42.360	Diameter / Length: 0.600	{1} Pipe (10)	Pipe	42.360	Diam/Width:150	Manhole
E:384404.334 N:397986.575	1.190		{a} Pipe (11)	Pipe	42.360	Diam/Width:150	Not Applicable
S16	43.525 42.245	Diameter / Length: 0.600	{1} Pipe (11) {2} Pipe (9)	Pipe Pipe	42.245 42.245	Diam/Width:150 Diam/Width:150	Manhole
E:384396.334 N:397978.790	1.280		{a} Pipe (12)	Pipe	42.245	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 40% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S2	44.100 43.050	Diameter / Length: 0.600	{1} Pipe	Pipe	43.050	Diam/Width:150	Manhole
E:384376.343 N:397999.309	1.050		{2} Pipe (22)	Pipe	43.050	Diam/Width:150	
			{a} Pipe (1)	Pipe	43.050	Diam/Width:150	Not Applicable
S4	44.000 42.825	Diameter / Length: 0.600	{1} Pipe (2)	Pipe	42.825	Diam/Width:150	Manhole
E:384391.819 N:398015.616	1.175		{2} Pipe (1)	Pipe	42.825	Diam/Width:150	
			{3} Pipe (23)	Pipe	42.825	Diam/Width:150	
			{a} Pipe (3)	Pipe	42.825	Diam/Width:150	Not Applicable
S5	43.800 42.591	Diameter / Length: 0.600	{1} Pipe (3)	Pipe	42.591	Diam/Width:150	Manhole
E:384408.413 N:397999.841	1.209		{a} Pipe (4)	Pipe	42.591	Diam/Width:150	Not Applicable
S1	44.200 43.180	Diameter / Length: 0.600					Manhole
E:384367.553 N:397990.036	1.020		{a} Pipe	Pipe	43.180	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 40% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S9	43.525 42.375	Diameter / Length: 0.450					Manhole
E:384396.229 N:397986.557	1.150		{a} Pipe (20)	Pipe	42.375	Diam/Width:100	Not Applicable
S17	43.500 42.400	Diameter / Length: 0.450					Manhole
E:384387.427 N:397970.988	1.100		{a} Pipe (13)	Pipe	42.400	Diam/Width:150	Not Applicable
S3	44.000 42.840	Diameter / Length: 0.600					Manhole
E:384390.481 N:398016.049	1.160		{a} Pipe (2)	Pipe	42.840	Diam/Width:150	Not Applicable
S13	43.500 42.290	Diameter / Length: 0.600	{1} Pipe (21) {2} Pipe (7) {3} Pipe (8)	Pipe Pipe Pipe	42.290 42.290 42.290	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384393.128 N:397980.806	1.210		{a} Pipe (9)	Pipe	42.290	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	43.700 42.525	Diameter / Length: 0.600	{1} Pipe (4)	Pipe	42.525	Diam/Width:150	Manhole
E:384405.909 N:397995.858	1.175		{a} Pipe (5)	Pipe	42.525	Diam/Width:150	Not Applicable
S8	43.535 42.410	Diameter / Length: 0.600	{1} Pipe (5) {2} Pipe (6)	Pipe Pipe	42.410 42.410	Diam/Width:150 Diam/Width:100	Manhole
E:384399.623 N:397988.593	1.125		{a} Pipe (19)	Pipe	42.410	Diam/Width:150	Not Applicable
S10	43.500 42.320	Diameter / Length: 0.600	{1} Pipe (19) {2} Pipe (20)	Pipe Pipe	42.320 42.320	Diam/Width:150 Diam/Width:100	Manhole
E:384394.849 N:397983.097	1.180		{a} Pipe (21)	Pipe	42.320	Diam/Width:150	Not Applicable
S19	43.450 42.267	Diameter / Length: 0.450	{1} Pipe (14) {2} Pipe (15)	Pipe Pipe	42.267 42.267	Diam/Width:150 Diam/Width:150	Manhole
E:384394.700 N:397966.109	1.183		{a} Pipe (14) (1)	Pipe	42.267	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:30 Year Storm Event + 40% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Inflow Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Att. Tank		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (1)	S16		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (2)	S15		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (3)	S16		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	S3		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (5)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (6)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	S11		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (10)	S9		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	S7		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	S5		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (13)	S17		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (14)	S18		Time of Concentration	0.014	100	0	100	0.014
R1	Blue Roof 3		Time of Concentration	0.007	100	0	100	0.007
R2	S2		Time of Concentration	0.005	100	0	100	0.005
R3 (Green Roof)	Blue Roof 3		Green Roof	0.016		0		0.016
R4	S1		Time of Concentration	0.027	100	0	100	0.027
R5	S12		Time of Concentration	0.015	100	0	100	0.015
R11	Blue Roof 1		Time of Concentration	0.039	100	0	100	0.039
R12	S14		Time of Concentration	0.002	100	0	100	0.002
R13	S14		Time of Concentration	0.002	100	0	100	0.002
R14 (Green Roof)	S14		Green Roof	0.009		0		0.009
TOTAL		**0.0**		**0.237**				**0.237**

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 384385 397964 SJ 84385 97964
Rainfall Version	2013
Data Type	Point
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	40.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:30 Year Storm Event + 40% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Junctions Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Resident Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FEH: 30 years: +40 %: 360 mins: Winter	43.500	42.350	42.849	0.499	0.5	0.079	0.000	0.4	3.830	Surcharged
S7	FEH: 30 years: +40 %: 360 mins: Winter	43.550	42.475	42.850	0.375	0.5	0.060	0.000	0.4	4.025	Surcharged
S12	FEH: 30 years: +40 %: 360 mins: Winter	43.500	42.420	42.849	0.429	1.0	0.068	0.000	0.9	8.856	Surcharged
S20	FEH: 30 years: +40 %: 360 mins: Winter	43.450	42.250	42.847	0.597	2.1	0.169	0.000	2.0	33.725	Surcharged
S14	FEH: 30 years: +40 %: 360 mins: Winter	43.550	42.385	42.848	0.463	0.3	0.074	0.000	0.2	2.617	Surcharged
S18	FEH: 30 years: +40 %: 360 mins: Winter	43.450	42.282	42.848	0.566	1.9	0.090	0.000	1.8	16.502	Surcharged
Existing CW Sewer	FEH: 30 years: +40 %: 15 mins: Summer	43.500	42.185	42.220	0.035	2.1	0.000	0.000	2.1	2.585	OK
S21	FEH: 30 years: +40 %: 360 mins: Winter	43.525	42.213	42.846	0.633	3.2	0.179	0.000	3.2	99.935	Surcharged
S15	FEH: 30 years: +40 %: 360 mins: Winter	43.550	42.360	42.848	0.488	0.6	0.138	0.000	0.5	5.552	Surcharged
S16	FEH: 30 years: +40 %: 360 mins: Winter	43.525	42.245	42.848	0.603	7.3	0.171	0.000	7.2	79.829	Surcharged
S2	FEH: 30 years: +40 %: 15 mins: Winter	44.100	43.050	43.161	0.111	15.5	0.032	0.000	15.1	7.647	OK
S4	FEH: 30 years: +40 %: 15 mins: Winter	44.000	42.825	42.971	0.146	17.2	0.041	0.000	14.2	9.671	OK
S5	FEH: 30 years: +40 %: 15 mins: Winter	43.800	42.591	42.882	0.291	17.6	0.082	0.000	16.2	11.194	Surcharged
S1	FEH: 30 years: +40 %: 15 mins: Winter	44.200	43.180	43.284	0.104	13.1	0.029	0.000	12.9	6.044	OK
S9	FEH: 30 years: +40 %: 360 mins: Winter	43.525	42.375	42.849	0.474	0.5	0.075	0.000	0.4	3.925	Surcharged
S17	FEH: 30 years: +40 %: 360 mins: Winter	43.500	42.400	42.848	0.448	1.0	0.071	0.000	0.9	8.317	Surcharged
S3	FEH: 30 years: +40 %: 15 mins: Winter	44.000	42.840	42.972	0.132	3.4	0.037	0.000	2.5	1.554	OK
S13	FEH: 30 years: +40 %: 360 mins: Winter	43.500	42.290	42.849	0.559	5.9	0.158	0.000	5.8	65.878	Surcharged
S6	FEH: 30 years: +40 %: 360 mins: Winter	43.700	42.525	42.851	0.326	4.2	0.092	0.000	4.1	45.685	Surcharged
S8	FEH: 30 years: +40 %: 360 mins: Winter	43.535	42.410	42.850	0.440	4.4	0.124	0.000	4.3	49.658	Surcharged
S10	FEH: 30 years: +40 %: 360 mins: Winter	43.500	42.320	42.849	0.529	4.7	0.150	0.000	4.6	53.436	Surcharged
S19	FEH: 30 years: +40 %: 360 mins: Winter	43.450	42.267	42.848	0.581	2.2	0.092	0.000	2.1	33.953	Surcharged

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 40% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			

Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Blue Roof 1	FEH: 30 years: +40 %: 360 mins: Winter	65.082	65.082	0.082	0.082	2.8	16.617	0.000	0.000	0.6	17.662	274	34.675
Att. Tank	FEH: 30 years: +40 %: 360 mins: Winter	42.847	42.847	0.622	0.622	9.9	53.211	0.000	0.000	3.2	100.206	171	22.770
Blue Roof 2	FEH: 30 years: +40 %: 120 mins: Winter	65.073	65.073	0.073	0.073	1.9	3.617	0.000	0.000	0.6	4.704	67	42.695
Blue Roof 3	FEH: 30 years: +40 %: 180 mins: Winter	62.080	62.080	0.080	0.080	2.3	6.500	0.000	0.000	0.6	7.983	121	36.582

Status
OK
OK
OK
OK

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			



Blue Roof 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	50
Number of Crates Wide	18
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	25.438

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	R11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (15)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Att. Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.525
Depth (m)	0.800
Base Level (m)	42.225
Number of Crates Long	18
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	68.900

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (16)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (17)
Outlet Type	Free Discharge



Blue Roof 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	22
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	6.313

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (22)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Blue Roof 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	62.250
Depth (m)	0.125
Base Level (m)	62.000
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	10.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7) Catchment Area (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	R3 (Green Roof)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	R1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	62.000

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	43.500 42.350	Diameter / Length: 0.450					Manhole
E:384389.778 N:397979.886	1.150		{a} Pipe (7)	Pipe	42.350	Diam/Width:150	Not Applicable
S7	43.550 42.475	Diameter / Length: 0.450					Manhole
E:384402.334 N:397993.114	1.075		{a} Pipe (6)	Pipe	42.475	Diam/Width:100	Not Applicable
S12	43.500 42.420	Diameter / Length: 0.450					Manhole
E:384385.621 N:397972.695	1.080		{a} Pipe (8)	Pipe	42.420	Diam/Width:150	Not Applicable
S20	43.450 42.250	Diameter / Length: 0.600	{1} Pipe (14) (1)	Pipe	42.250	Diam/Width:150	Manhole
E:384395.728 N:397967.232	1.200		{a} Pipe (16)	Pipe	42.250	Diam/Width:150	Not Applicable
S14	43.550 42.385	Diameter / Length: 0.450					Manhole
E:384406.221 N:397985.162	1.165		{a} Pipe (10)	Pipe	42.385	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S18	43.450 42.282	Diameter / Length: 0.450	{1} Pipe (13)	Pipe	42.282	Diam/Width:150	Manhole
E:384393.728 N:397965.046	1.168		{a} Pipe (14)	Pipe	42.282	Diam/Width:150	Not Applicable
Existing CW Sewer	43.500 42.185	Diameter / Length: 0.600	{1} Pipe (18)	Pipe	42.185	Diam/Width:150	Manhole
E:384392.239 N:397977.387	1.315						Not Applicable
S21	43.525 42.213	Diameter / Length: 0.600	{1} Pipe (17)	Pipe	42.213	Diam/Width:150	Manhole
E:384394.874 N:397977.835	1.312		{a} Pipe (18)	Pipe	42.213	Diam/Width:150	Not Applicable
S15	43.550 42.360	Diameter / Length: 0.600	{1} Pipe (10)	Pipe	42.360	Diam/Width:150	Manhole
E:384404.334 N:397986.575	1.190		{a} Pipe (11)	Pipe	42.360	Diam/Width:150	Not Applicable
S16	43.525 42.245	Diameter / Length: 0.600	{1} Pipe (11) {2} Pipe (9)	Pipe Pipe	42.245 42.245	Diam/Width:150 Diam/Width:150	Manhole
E:384396.334 N:397978.790	1.280		{a} Pipe (12)	Pipe	42.245	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S2	44.100 43.050	Diameter / Length: 0.600	{1} Pipe {2} Pipe (22)	Pipe Pipe	43.050 43.050	Diam/Width:150 Diam/Width:150	Manhole
E:384376.343 N:397999.309	1.050		{a} Pipe (1)	Pipe	43.050	Diam/Width:150	Not Applicable
S4	44.000 42.825	Diameter / Length: 0.600	{1} Pipe (2) {2} Pipe (1) {3} Pipe (23)	Pipe Pipe Pipe	42.825 42.825 42.825	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384391.819 N:398015.616	1.175		{a} Pipe (3)	Pipe	42.825	Diam/Width:150	Not Applicable
S5	43.800 42.591	Diameter / Length: 0.600	{1} Pipe (3)	Pipe	42.591	Diam/Width:150	Manhole
E:384408.413 N:397999.841	1.209		{a} Pipe (4)	Pipe	42.591	Diam/Width:150	Not Applicable
S1	44.200 43.180	Diameter / Length: 0.600					Manhole
E:384367.553 N:397990.036	1.020		{a} Pipe	Pipe	43.180	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S9	43.525 42.375	Diameter / Length: 0.450					Manhole
E:384396.229 N:397986.557	1.150						
			{a} Pipe (20)	Pipe	42.375	Diam/Width:100	Not Applicable
S17	43.500 42.400	Diameter / Length: 0.450					Manhole
E:384387.427 N:397970.988	1.100						
			{a} Pipe (13)	Pipe	42.400	Diam/Width:150	Not Applicable
S3	44.000 42.840	Diameter / Length: 0.600					Manhole
E:384390.481 N:398016.049	1.160						
			{a} Pipe (2)	Pipe	42.840	Diam/Width:150	Not Applicable
S13	43.500 42.290	Diameter / Length: 0.600	{1} Pipe (21) {2} Pipe (7) {3} Pipe (8)	Pipe Pipe Pipe	42.290 42.290 42.290	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384393.128 N:397980.806	1.210						
			{a} Pipe (9)	Pipe	42.290	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	43.700 42.525	Diameter / Length: 0.600	{1} Pipe (4)	Pipe	42.525	Diam/Width:150	Manhole
E:384405.909 N:397995.858	1.175		{a} Pipe (5)	Pipe	42.525	Diam/Width:150	Not Applicable
S8	43.535 42.410	Diameter / Length: 0.600	{1} Pipe (5) {2} Pipe (6)	Pipe Pipe	42.410 42.410	Diam/Width:150 Diam/Width:100	Manhole
E:384399.623 N:397988.593	1.125		{a} Pipe (19)	Pipe	42.410	Diam/Width:150	Not Applicable
S10	43.500 42.320	Diameter / Length: 0.600	{1} Pipe (19) {2} Pipe (20)	Pipe Pipe	42.320 42.320	Diam/Width:150 Diam/Width:100	Manhole
E:384394.849 N:397983.097	1.180		{a} Pipe (21)	Pipe	42.320	Diam/Width:150	Not Applicable
S19	43.450 42.267	Diameter / Length: 0.450	{1} Pipe (14) {2} Pipe (15)	Pipe Pipe	42.267 42.267	Diam/Width:150 Diam/Width:150	Manhole
E:384394.700 N:397966.109	1.183		{a} Pipe (14) (1)	Pipe	42.267	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:30 Year Storm Event + 0% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Inflow Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Att. Tank		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (1)	S16		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (2)	S15		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (3)	S16		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	S3		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (5)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (6)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	S11		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (10)	S9		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	S7		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	S5		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (13)	S17		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (14)	S18		Time of Concentration	0.014	100	0	100	0.014
R1	Blue Roof 3		Time of Concentration	0.007	100	0	100	0.007
R2	S2		Time of Concentration	0.005	100	0	100	0.005
R3 (Green Roof)	Blue Roof 3		Green Roof	0.016		0		0.016
R4	S1		Time of Concentration	0.027	100	0	100	0.027
R5	S12		Time of Concentration	0.015	100	0	100	0.015
R11	Blue Roof 1		Time of Concentration	0.039	100	0	100	0.039
R12	S14		Time of Concentration	0.002	100	0	100	0.002
R13	S14		Time of Concentration	0.002	100	0	100	0.002
R14 (Green Roof)	S14		Green Roof	0.009		0		0.009
TOTAL		**0.0**		**0.237**				**0.237**

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 384385 397964 SJ 84385 97964
Rainfall Version	2013
Data Type	Point
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:30 Year Storm Event + 0% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Junctions Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Resident Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FEH: 30 years: +0 %: 240 mins: Winter	43.500	42.350	42.654	0.304	0.4	0.048	0.000	0.3	2.452	Surcharged
S7	FEH: 30 years: +0 %: 240 mins: Winter	43.550	42.475	42.655	0.180	0.5	0.029	0.000	0.5	2.609	Surcharged
S12	FEH: 30 years: +0 %: 240 mins: Winter	43.500	42.420	42.654	0.234	1.0	0.037	0.000	1.0	5.725	Surcharged
S20	FEH: 30 years: +0 %: 240 mins: Winter	43.450	42.250	42.653	0.403	1.9	0.114	0.000	1.8	19.625	Surcharged
S14	FEH: 30 years: +0 %: 240 mins: Winter	43.550	42.385	42.653	0.268	0.3	0.043	0.000	0.3	1.688	Surcharged
S18	FEH: 30 years: +0 %: 240 mins: Winter	43.450	42.282	42.653	0.371	1.8	0.059	0.000	1.7	10.606	Surcharged
Existing CW Sewer	FEH: 30 years: +0 %: 15 mins: Summer	43.500	42.185	42.217	0.032	1.8	0.000	0.000	1.8	2.162	OK
S21	FEH: 30 years: +0 %: 240 mins: Winter	43.525	42.213	42.652	0.439	2.7	0.124	0.000	2.7	56.135	Surcharged
S15	FEH: 30 years: +0 %: 240 mins: Winter	43.550	42.360	42.653	0.293	0.5	0.083	0.000	0.5	3.580	Surcharged
S16	FEH: 30 years: +0 %: 240 mins: Winter	43.525	42.245	42.653	0.408	6.9	0.116	0.000	6.8	50.639	Surcharged
S2	FEH: 30 years: +0 %: 15 mins: Winter	44.100	43.050	43.137	0.087	11.0	0.025	0.000	10.6	5.478	OK
S4	FEH: 30 years: +0 %: 15 mins: Winter	44.000	42.825	42.920	0.095	12.9	0.027	0.000	12.1	6.931	OK
S5	FEH: 30 years: +0 %: 15 mins: Winter	43.800	42.591	42.699	0.108	14.5	0.030	0.000	14.0	8.017	OK
S1	FEH: 30 years: +0 %: 15 mins: Winter	44.200	43.180	43.262	0.082	9.4	0.023	0.000	9.2	4.317	OK
S9	FEH: 30 years: +0 %: 240 mins: Winter	43.525	42.375	42.654	0.279	0.4	0.044	0.000	0.4	2.529	Surcharged
S17	FEH: 30 years: +0 %: 240 mins: Winter	43.500	42.400	42.653	0.253	0.9	0.040	0.000	0.8	5.372	Surcharged
S3	FEH: 30 years: +0 %: 15 mins: Winter	44.000	42.840	42.922	0.082	2.4	0.023	0.000	2.2	1.110	OK
S13	FEH: 30 years: +0 %: 240 mins: Winter	43.500	42.290	42.654	0.364	5.6	0.103	0.000	5.5	41.698	Surcharged
S6	FEH: 30 years: +0 %: 240 mins: Winter	43.700	42.525	42.655	0.130	3.8	0.037	0.000	3.8	28.763	OK
S8	FEH: 30 years: +0 %: 240 mins: Winter	43.535	42.410	42.655	0.245	4.2	0.069	0.000	4.1	31.345	Surcharged
S10	FEH: 30 years: +0 %: 240 mins: Winter	43.500	42.320	42.654	0.334	4.4	0.095	0.000	4.3	33.745	Surcharged
S19	FEH: 30 years: +0 %: 240 mins: Winter	43.450	42.267	42.653	0.386	2.0	0.061	0.000	1.9	19.835	Surcharged

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:30 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			

Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Blue Roof 1	FEH: 30 years: +0 %: 360 mins: Winter	65.058	65.058	0.058	0.058	2.0	11.721	0.000	0.000	0.5	12.671	284	53.921
Att. Tank	FEH: 30 years: +0 %: 240 mins: Winter	42.653	42.653	0.428	0.428	9.2	36.578	0.000	0.000	2.7	56.387	142	46.912
Blue Roof 2	FEH: 30 years: +0 %: 120 mins: Winter	65.052	65.052	0.052	0.052	1.4	2.558	0.000	0.000	0.5	3.324	63	59.477
Blue Roof 3	FEH: 30 years: +0 %: 180 mins: Winter	62.056	62.056	0.056	0.056	1.6	4.568	0.000	0.000	0.5	5.652	113	55.437

Status
OK
OK
OK
OK

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:2 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025			Nimbus ENGINEERING CONSULTANTS
	Designed by: M.HAM	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX			



Blue Roof 1

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	50
Number of Crates Wide	18
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	25.438

Inlets

Inlet

Inlet Type	Lateral Inflow
Incoming Item(s)	R11
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (15)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Att. Tank

Type : Cellular Storage

Dimensions

Exceedance Level (m)	43.525
Depth (m)	0.800
Base Level (m)	42.225
Number of Crates Long	18
Number of Crates Wide	10
Number of Crates High	2
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	68.900

Inlets

Inlet (4)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (12)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (5)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (16)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (17)
Outlet Type	Free Discharge



Blue Roof 2

Type : Cellular Storage

Dimensions

Exceedance Level (m)	65.250
Depth (m)	0.125
Base Level (m)	65.000
Number of Crates Long	22
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	6.313

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (5)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (6)
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (22)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	65.000



Blue Roof 3

Type : Cellular Storage

Dimensions

Exceedance Level (m)	62.250
Depth (m)	0.125
Base Level (m)	62.000
Number of Crates Long	36
Number of Crates Wide	10
Number of Crates High	1
Porosity (%)	90
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.125
Total Volume (m³)	10.250

Inlets

Inlet

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (7) Catchment Area (8)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	R3 (Green Roof)
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	R1
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (23)
Outlet Type	Orifice

Diameter (m)	0.035
Coefficient of Discharge	0.600
Invert Level (m)	62.000

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:2 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S11	43.500 42.350	Diameter / Length: 0.450					Manhole
E:384389.778 N:397979.886	1.150		{a} Pipe (7)	Pipe	42.350	Diam/Width:150	Not Applicable
S7	43.550 42.475	Diameter / Length: 0.450					Manhole
E:384402.334 N:397993.114	1.075		{a} Pipe (6)	Pipe	42.475	Diam/Width:100	Not Applicable
S12	43.500 42.420	Diameter / Length: 0.450					Manhole
E:384385.621 N:397972.695	1.080		{a} Pipe (8)	Pipe	42.420	Diam/Width:150	Not Applicable
S20	43.450 42.250	Diameter / Length: 0.600	{1} Pipe (14) (1)	Pipe	42.250	Diam/Width:150	Manhole
E:384395.728 N:397967.232	1.200		{a} Pipe (16)	Pipe	42.250	Diam/Width:150	Not Applicable
S14	43.550 42.385	Diameter / Length: 0.450					Manhole
E:384406.221 N:397985.162	1.165		{a} Pipe (10)	Pipe	42.385	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S18	43.450 42.282	Diameter / Length: 0.450	{1} Pipe (13)	Pipe	42.282	Diam/Width:150	Manhole
E:384393.728 N:397965.046	1.168		{a} Pipe (14)	Pipe	42.282	Diam/Width:150	Not Applicable
Existing CW Sewer	43.500 42.185	Diameter / Length: 0.600	{1} Pipe (18)	Pipe	42.185	Diam/Width:150	Manhole
E:384392.239 N:397977.387	1.315						Not Applicable
S21	43.525 42.213	Diameter / Length: 0.600	{1} Pipe (17)	Pipe	42.213	Diam/Width:150	Manhole
E:384394.874 N:397977.835	1.312		{a} Pipe (18)	Pipe	42.213	Diam/Width:150	Not Applicable
S15	43.550 42.360	Diameter / Length: 0.600	{1} Pipe (10)	Pipe	42.360	Diam/Width:150	Manhole
E:384404.334 N:397986.575	1.190		{a} Pipe (11)	Pipe	42.360	Diam/Width:150	Not Applicable
S16	43.525 42.245	Diameter / Length: 0.600	{1} Pipe (11) {2} Pipe (9)	Pipe Pipe	42.245 42.245	Diam/Width:150 Diam/Width:150	Manhole
E:384396.334 N:397978.790	1.280		{a} Pipe (12)	Pipe	42.245	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S2	44.100 43.050	Diameter / Length: 0.600	{1} Pipe	Pipe	43.050	Diam/Width:150	Manhole
E:384376.343 N:397999.309	1.050		{2} Pipe (22)	Pipe	43.050	Diam/Width:150	
			{a} Pipe (1)	Pipe	43.050	Diam/Width:150	Not Applicable
S4	44.000 42.825	Diameter / Length: 0.600	{1} Pipe (2)	Pipe	42.825	Diam/Width:150	Manhole
E:384391.819 N:398015.616	1.175		{2} Pipe (1)	Pipe	42.825	Diam/Width:150	
			{3} Pipe (23)	Pipe	42.825	Diam/Width:150	
			{a} Pipe (3)	Pipe	42.825	Diam/Width:150	Not Applicable
S5	43.800 42.591	Diameter / Length: 0.600	{1} Pipe (3)	Pipe	42.591	Diam/Width:150	Manhole
E:384408.413 N:397999.841	1.209		{a} Pipe (4)	Pipe	42.591	Diam/Width:150	Not Applicable
S1	44.200 43.180	Diameter / Length: 0.600					Manhole
E:384367.553 N:397990.036	1.020		{a} Pipe	Pipe	43.180	Diam/Width:150	Not Applicable

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S9	43.525 42.375	Diameter / Length: 0.450					Manhole
E:384396.229 N:397986.557	1.150		{a} Pipe (20)	Pipe	42.375	Diam/Width:100	Not Applicable
S17	43.500 42.400	Diameter / Length: 0.450					Manhole
E:384387.427 N:397970.988	1.100		{a} Pipe (13)	Pipe	42.400	Diam/Width:150	Not Applicable
S3	44.000 42.840	Diameter / Length: 0.600					Manhole
E:384390.481 N:398016.049	1.160		{a} Pipe (2)	Pipe	42.840	Diam/Width:150	Not Applicable
S13	43.500 42.290	Diameter / Length: 0.600	{1} Pipe (21) {2} Pipe (7) {3} Pipe (8)	Pipe Pipe Pipe	42.290 42.290 42.290	Diam/Width:150 Diam/Width:150 Diam/Width:150	Manhole
E:384393.128 N:397980.806	1.210		{a} Pipe (9)	Pipe	42.290	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY: Office to Apartment Conversion 1:2 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Date: 28/04/2025		
	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
Coordinates (m)	Depth (m)		Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
S6	43.700 42.525	Diameter / Length: 0.600	{1} Pipe (4)	Pipe	42.525	Diam/Width:150	Manhole
E:384405.909 N:397995.858	1.175		{a} Pipe (5)	Pipe	42.525	Diam/Width:150	Not Applicable
S8	43.535 42.410	Diameter / Length: 0.600	{1} Pipe (5) {2} Pipe (6)	Pipe Pipe	42.410 42.410	Diam/Width:150 Diam/Width:100	Manhole
E:384399.623 N:397988.593	1.125		{a} Pipe (19)	Pipe	42.410	Diam/Width:150	Not Applicable
S10	43.500 42.320	Diameter / Length: 0.600	{1} Pipe (19) {2} Pipe (20)	Pipe Pipe	42.320 42.320	Diam/Width:150 Diam/Width:100	Manhole
E:384394.849 N:397983.097	1.180		{a} Pipe (21)	Pipe	42.320	Diam/Width:150	Not Applicable
S19	43.450 42.267	Diameter / Length: 0.450	{1} Pipe (14) {2} Pipe (15)	Pipe Pipe	42.267 42.267	Diam/Width:150 Diam/Width:150	Manhole
E:384394.700 N:397966.109	1.183		{a} Pipe (14) (1)	Pipe	42.267	Diam/Width:150	Not Applicable

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:2 Year Storm Event + 0% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Inflow Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	Att. Tank		Time of Concentration	0.009	100	0	100	0.009
Catchment Area (1)	S16		Time of Concentration	0.004	100	0	100	0.004
Catchment Area (2)	S15		Time of Concentration	0.005	100	0	100	0.005
Catchment Area (3)	S16		Time of Concentration	0.010	100	0	100	0.010
Catchment Area (4)	S3		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (5)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (6)	Blue Roof 2		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (7)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (8)	Blue Roof 3		Time of Concentration	0.006	100	0	100	0.006
Catchment Area (9)	S11		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (10)	S9		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (11)	S7		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (12)	S5		Time of Concentration	0.007	100	0	100	0.007
Catchment Area (13)	S17		Time of Concentration	0.014	100	0	100	0.014
Catchment Area (14)	S18		Time of Concentration	0.014	100	0	100	0.014
R1	Blue Roof 3		Time of Concentration	0.007	100	0	100	0.007
R2	S2		Time of Concentration	0.005	100	0	100	0.005
R3 (Green Roof)	Blue Roof 3		Green Roof	0.016		0		0.016
R4	S1		Time of Concentration	0.027	100	0	100	0.027
R5	S12		Time of Concentration	0.015	100	0	100	0.015
R11	Blue Roof 1		Time of Concentration	0.039	100	0	100	0.039
R12	S14		Time of Concentration	0.002	100	0	100	0.002
R13	S14		Time of Concentration	0.002	100	0	100	0.002
R14 (Green Roof)	S14		Green Roof	0.009		0		0.009
TOTAL		**0.0**		**0.237**				**0.237**

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

FEH

Type: FEH

Site Location	GB 384385 397964 SJ 84385 97964
Rainfall Version	2013
Data Type	Point
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion	28/04/2025		
1:2 Year Storm Event + 0% CC	Designed by:	Checked by:	Approved By:
Restricted Flow Rate 4.5 l/s	M.HAM		
Report Details:	Kemp House:		
Type: Junctions Summary	124 City Road		
Storm Phase: Phase	London		
	EC1V 2NX		

Critical Storm Per Item: Rank By: Max. Resident Volume

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S11	FEH: 2 years: +0 %: 360 mins: Winter	43.500	42.350	42.413	0.063	0.2	0.010	0.000	0.2	1.410	OK
S7	FEH: 2 years: +0 %: 15 mins: Winter	43.550	42.475	42.501	0.026	1.0	0.004	0.000	1.0	0.478	OK
S12	FEH: 2 years: +0 %: 15 mins: Winter	43.500	42.420	42.454	0.034	2.3	0.005	0.000	2.2	1.056	OK
S20	FEH: 2 years: +0 %: 360 mins: Winter	43.450	42.250	42.412	0.162	0.8	0.046	0.000	0.7	11.749	Surcharged
S14	FEH: 2 years: +0 %: 360 mins: Winter	43.550	42.385	42.412	0.027	0.1	0.004	0.000	0.1	0.960	OK
S18	FEH: 2 years: +0 %: 360 mins: Winter	43.450	42.282	42.412	0.130	0.7	0.021	0.000	0.7	5.975	OK
Existing CW Sewer	FEH: 2 years: +0 %: 15 mins: Summer	43.500	42.185	42.210	0.025	1.2	0.000	0.000	1.2	1.318	OK
S21	FEH: 2 years: +0 %: 360 mins: Winter	43.525	42.213	42.412	0.199	1.7	0.056	0.000	1.7	41.148	Surcharged
S15	FEH: 2 years: +0 %: 360 mins: Winter	43.550	42.360	42.412	0.052	0.2	0.015	0.000	0.2	2.039	OK
S16	FEH: 2 years: +0 %: 360 mins: Winter	43.525	42.245	42.412	0.167	2.8	0.047	0.000	2.8	28.677	Surcharged
S2	FEH: 2 years: +0 %: 15 mins: Winter	44.100	43.050	43.103	0.053	4.9	0.015	0.000	4.6	2.368	OK
S4	FEH: 2 years: +0 %: 15 mins: Winter	44.000	42.825	42.882	0.057	5.6	0.016	0.000	5.3	2.956	OK
S5	FEH: 2 years: +0 %: 15 mins: Winter	43.800	42.591	42.652	0.061	6.3	0.017	0.000	6.1	3.435	OK
S1	FEH: 2 years: +0 %: 15 mins: Winter	44.200	43.180	43.230	0.050	4.1	0.014	0.000	4.1	1.905	OK
S9	FEH: 2 years: +0 %: 360 mins: Winter	43.525	42.375	42.413	0.038	0.2	0.006	0.000	0.2	1.440	OK
S17	FEH: 2 years: +0 %: 15 mins: Winter	43.500	42.400	42.432	0.032	2.1	0.005	0.000	2.1	0.990	OK
S3	FEH: 2 years: +0 %: 15 mins: Winter	44.000	42.840	42.883	0.043	1.1	0.012	0.000	1.0	0.493	OK
S13	FEH: 2 years: +0 %: 360 mins: Winter	43.500	42.290	42.413	0.123	2.3	0.035	0.000	2.2	23.524	OK
S6	FEH: 2 years: +0 %: 15 mins: Winter	43.700	42.525	42.585	0.060	6.1	0.017	0.000	5.9	3.422	OK
S8	FEH: 2 years: +0 %: 15 mins: Winter	43.535	42.410	42.477	0.067	6.9	0.019	0.000	6.7	3.886	OK
S10	FEH: 2 years: +0 %: 360 mins: Winter	43.500	42.320	42.413	0.093	1.8	0.026	0.000	1.8	18.930	OK
S19	FEH: 2 years: +0 %: 360 mins: Winter	43.450	42.267	42.412	0.145	0.8	0.023	0.000	0.8	11.756	OK

Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Blue Roof 1	FEH: 2 years: +0 %: 600 mins: Winter	65.031	65.031	0.031	0.031	0.7	6.179	0.000	0.000	0.3	8.219	294	75.707
Att. Tank	FEH: 2 years: +0 %: 360 mins: Winter	42.412	42.412	0.187	0.187	3.8	16.005	0.000	0.000	1.7	41.181	99	76.771
Blue Roof 2	FEH: 2 years: +0 %: 180 mins: Winter	65.026	65.026	0.026	0.026	0.5	1.274	0.000	0.000	0.2	1.811	74	79.810
Blue Roof 3	FEH: 2 years: +0 %: 240 mins: Winter	62.028	62.028	0.028	0.028	0.6	2.306	0.000	0.000	0.2	2.996	125	77.501

Boulton House, 17 Chorlton Street, Manchester, M1 3HY:	Date:		
Office to Apartment Conversion 1:2 Year Storm Event + 0% CC Restricted Flow Rate 4.5 l/s	Designed by: M.HAM	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Kemp House: 124 City Road London EC1V 2NX		

Status
OK
OK
OK
OK

APPENDIX C – UNITED UTILITIES ASSET PLANS

United Utilities
Water for the North West

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

Nimbus Engineering Consultants

124
City Road,
london,
ec1v 2nx

FAO:

Your Ref: C3516
Our Ref: UUPS-ORD-642358
Date: 04/04/2025

Dear Sirs

Location: BROOME & WELLINGTON BOULTON HOUSE 17-21 CHORLTON STREET, MANCHESTER, M1 3HY

I acknowledge with thanks your request dated 31/03/2025 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

United Utilities Water Limited
Registered In England & Wales No. 2366678
Registered Office Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

Water for the North West

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)".

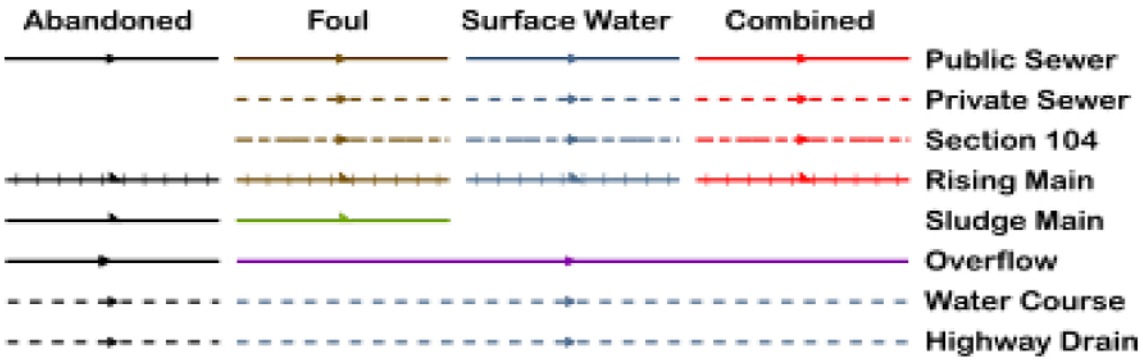
TERMS AND CONDITIONS:

- 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.

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Lingley Green Avenue, Great Sankey, Warrington, WA5 3LP

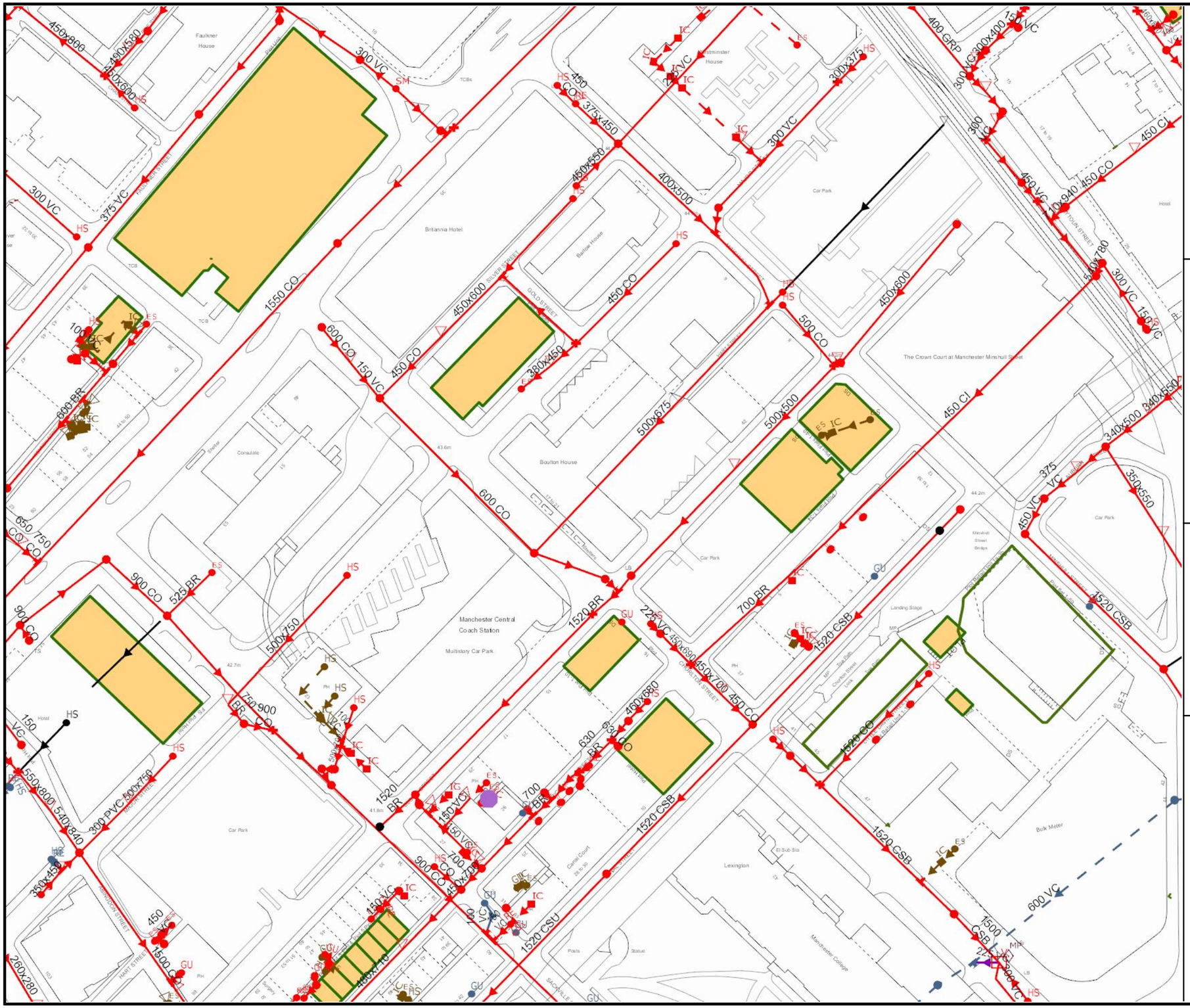
United Utilities
Water for the North West

Wastewater Symbology



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

- Manhole
- HS Head of System
- ES Extent of Survey
- RE Rodding Eye
- IN Inlet
- DP Discharge Point
- HY Vortex
- PE Penstock
- WO Washout Chamber
- VA Valve
- AV Air Valve
- NRV Non Return Valve
- SO Soakaway
- GU Gully
- CA Cascade
- FM Flow Meter
- HA Hatch Box
- OI Oil Interceptor
- SM Summit
- DS Drop Shaft
- OP Orifice Plate
- Side Entry Manhole
- Outfall
- Screen Chamber
- IC Inspection Chamber
- Bifurcation Chamber
- LH Lamp Hole
- T Junction / Saddle
- CA Catchpit
- VC Valve Chamber
- Vent Column
- Vortex Chamber
- Penstock Chamber
- T Network Storage Tank
- V Sewer Overflow
- WwTW Ww Treatment Works
- Ww Pumping Station
- Septic Tank
- CK Control Kiosk
- DNM Network Monitoring Point
- Change of Characteristic



United Utilities

Water for the North West

SEWER RECORDS

Address or Site Reference

BROOME & WELLINGTON
BOULTON HOUSE 17-21
CHORLTON STREET,
MANCHESTER,
M1 3HY

Scale: 1:1250
Date: 04/04/2025

Printed by: Property Searches

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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