



33-41 CHEETHAM HILL ROAD, MANCHESTER

OUTLINE DRAINAGE STRATEGY

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1.0 INTRODUCTION

1.1 Purpose of this report

This Surface Water Drainage Strategy has been prepared to support the planning application for the proposed development at 33-41 Cheetham Hill Road, Manchester.

The assessment includes a summary of the site, an estimate of the existing and proposed surface water discharge rates, an infiltration assessment, a SuDS assessment, and outline drainage proposals and performance criteria.

This report should be read in conjunction with the Site Specific Flood Risk Assessment, (renaissance, CHR-REN-XX-XX-RP-C-00009, November 2023).

The proposals within this report are intended to demonstrate the feasibility of the overarching drainage strategy to support the planning proposal.

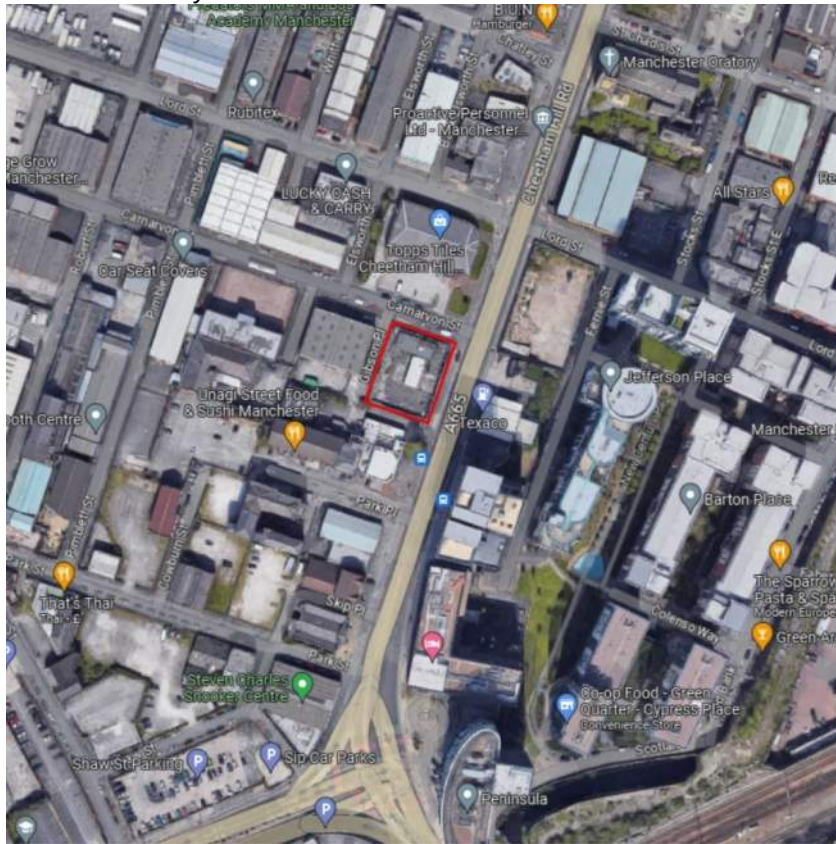
2.0 THE SITE

2.1 Site Location

The proposed development site is bounded by Gibson Place, Carnarvon Street and Cheetham Hill Road. The total site is located over an area of 0.125 hectares on a previously developed brownfield site, most recently used as a car wash. The site location is described below:

- Post Code M4 4FT
- OS Reference 384081, 399412
- National Grid Reference SJ840994

The proposed development forms part of a wider Strategic Regeneration Framework (SRF) put forward by Manchester City Council named Great Ducie Street SRF.



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Figure 2.1: Indicative Site Location

2.2 Site Description

The site is considered a brownfield site as it has been historically developed, with previous usage consisting of residential housing from 1850 to 1972 before it was converted into a petrol filling station (PFS). The site has most recently been used as a car wash with no evidence of alterations to the PFS structures. The overall area of the development site is approximately 0.125 hectares and is currently covered with approximately 95% hardstanding with a small area of vegetation growth to the north.

The topographical survey (Appendix A) indicates that the site is relatively flat with sitewide levels approximately between 44.20m AOD and 44.90m AOD.

United Utilities sewer records (Appendix B) indicate a 300mm diameter Combined Sewer present to the north of the site within Carnarvon Street which flows eastwards into a 600mm diameter Combined Sewer to the east of the site within Cheetham Hill Road.

2.3 Existing Site Drainage

The existing site is 95% impermeable and it is assumed that the previous developments positively drained to the local public sewer network.

A CCTV survey has been commissioned to trace the onsite drainage, however, at this stage it is assumed that surface water from the site is collected by surface water gullies before discharging into the United Utilities Sewer within Cheetham Hill Road as the site was developed prior to the construction of Carnarvon Street.

2.4 Geology

A phase II intrusive geotechnical ground investigation has been undertaken on the site by WML (Reference 10638G-WML-XX-ZZ-RP-G-0002-B, revision B dated November 2023). The investigation included two boreholes which extended up to 18.45m in depth and four window samples with associated in-situ and laboratory testing.

The findings confirm the ground conditions to comprise made ground of varying depths up to 4.80m, overlying glacial till deposits of sandy and silty boulder clays. Bedrock was not encountered in either of the boreholes which confirms bedrock is located >18.45m below external ground level.

British Geological Survey mapping displays that the site is located over the Chester Formation and bedrock is highly likely to be sandstone.

Reference should be made to the following site investigation documents for further information on the underlying site geology:

1) Phase 1 Desk Study Site Investigation, ESI Environment Specialists

Ref: 61519R1. Date: March 2013.

2) Phase 2 Intrusive Site Investigation, WML Consulting.

Ref: 10638G-WML-XX-ZZ-RP-G-0002-B. Revision B Date: November 23

2.5 Hydrology and Hydrogeology

There are two watercourses nearby the proposed development site, the River Irwell is located c.550m to the southwest of the site and the River Irk is located c.200m to the southeast of the site.

Based on the inferred Geology, a summary of the Environment Agency aquifer designations are presented below

Stratum	Coverage	Aquifer Designation
Till, Devensian	Full Site	Secondary Aquifer (Undifferentiated). The classification is assigned where it is not possible to attribute either category A or B to the aquifer
Bedrock	Full Site	Principal Aquifer. This is the Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic level

Table 2.1 –Environment agency aquifer designations of site geology

A summary of the pertinent hydrogeological features within the Phase 1 Desk Study are provided below:

Description	Distance (m) & Direction	Details
Nearest Active Potable Groundwater Abstraction	250m, southwest	-
Source Protection Zones	-	Site lies within Zone 2 (Outer Catchment) of a Source Protection Zone and a Zone 1 (Inner Catchment) is

		located c.50m southwest of the site. Source Protection Zones are associated with the 'Nearest Active Ground Water Abstraction'
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Table 2.2 –Summary of Hydrogeological features

2.6 Proposed Development

The development is referred to as 33-41 Cheetham Hill Road, Manchester and consists of a single 23-storey residential building accommodating 237 individual apartments along with multiple areas of amenity space, located both at ground level & Level 17 with a rooftop external terrace area. A small area of public realm is located around the base of the proposed tower to allow pedestrian access. Refer to Appendix C for proposed development plans.

3.0 EXISTING & PROPOSED SURFACE WATER DISCHARGE RATES

3.1 Pre-Development Surface Water Run-Off Rates

The privately drained area of the development site is approximately 0.130 Ha (1300m²) consisting of 100% impermeable area. Refer to the topographical survey in Appendix A and existing drained areas drawing CHR-REN-XX-FN-DR-C-00050 in Appendix D.

3.1.1 Existing Brownfield Run-Off Rates

To estimate the pre-development surface water discharge into the public sewer, a two-pipe model has been created in industry approved Micro Drainage Software (Appendix E). The model uses a variable rainfall intensity for the different storm events and the critical storm duration for each return period has been calculated to determine the existing site run-off rates. A summary of the results is presented in the Table 3.1:

RETURN PERIOD	Q _{BROWNFIELD} (l/s)
1 in 1-year	14.4
1 in 2-year	18.6
1 in 30-year	34.7
1 in 100-year	43.1

Table 3.1 – Brownfield Run-off Rates

3.1.2 Existing Greenfield Run-Off Rates

As a comparison, the greenfield run-off for the site area has been considered. This has been calculated using the ICP SUDS method in Micro Drainage (Appendix F). The rates presented below are what would be typical of a site with an equivalent area which remains undeveloped / covered in grass or vegetation.

The equivalent greenfield run-off rate is tabled below: -

RETURN PERIOD	Q _{GREENFIELD} (l/s)
1 in 1-year	1.6
1 in 2-year	1.9
1 in 30-year	2.6
1 in 100-year	2.9
Q _{bar}	1.8

Table 3.2 – Greenfield Run-off Rates

3.2 Proposed Surface Water Discharge Rates

As set out within the Strategic Flood Risk Assessment (SFRA) developments which have been previously developed (brownfield), should aim for a minimum reduction in surface water runoff rates of 50%, with an aim of reducing runoff to Greenfield rates up to a 1 in 100 year storm event, considering climate change.

As required by the North West SuDS Pro-Forma the discharge from the development is to be restricted to Q_{bar} to control the flow and volume of runoff from the site.

Restricting the flow rate to Q_{bar} (1.8 l/s) would present a blockage risk to the system and therefore it is considered that restricting the discharge rate to this rate is not feasible and instead it is

proposed that the discharge rate from site is limited to a maximum of 3.0 l/s for all storm events up to the 1 in 100 year storm with an allowance for climate change.

Restricting the run-off to this rate would result in a 93% betterment from the existing run-off rates which complies with the requirements outlined in the Non-Statutory Technical Standards for Sustainable Drainage noted above.

3.3 Attenuation Requirements

The proposed development results in approximately 1300m² of impermeable area (conservatively ignoring soft landscaping)

Urban creep has not been considered as it is unlikely that the percentage of impermeable area will increase during the lifetime of the development due to its nature.

The post development discharge rates will include for an increase in the rainfall intensity of 40% and 45% for the 1 in 30-year and 1 in 100-year storm events respectively to allow for climate change. This is consistent with a design life for the development of 100 years, as outlined by the National Planning Practice Framework (NPPF).

A quick storage estimate for the 1 in 100 year +45% allowance for climate change Micro Drainage, indicates that the approximate attenuation volumes shown in table 3.3 are required to limit the peak surface water discharge to 3.0 l/s. The Micro Drainage calculations can be seen in Appendix G.

RETURN PERIOD	DEVELOPMENT AREA (ha)	SURFACE WATER ATTENUATION ESTIMATE (m ³)
1:100 Year +45% CC	0.130	53-76m ³

Table 3.3 – Surface Water Attenuation Estimates

4.0 SURFACE WATER DISCHARGE & SUDS ASSESSMENT

4.1 Surface Water Discharge Assessment

In accordance with the NPPF, the following hierarchy of surface water drainage options have been considered:

- Infiltration has been considered. Due to the limited space on site away from adjacent buildings or highways to accommodate soakaways, the potential contamination risk posed by the presence of made ground on site and the site geology consisting of low permeability clays, infiltration has been discounted as the primary method of discharging surface water from the site.
- Opportunities for discharge to a watercourse have been considered. There are two watercourses within 550m of the development site. However, providing a new drainage network which extends to these watercourses is not feasible due to the distance and the dense population of surrounding occupied sites. As a result, this method of discharge has been discounted.
- Opportunities to discharge into a surface water sewer have been considered. The nearest surface water sewer is private and is on the opposite side of Cheetham Hill Road, approximately 100m to the south of the site. It is not feasible for the network to extend over this distance and as a result, this method of discharge has been discounted.
- Opportunities to connect into a combined sewer have been considered. Two combined, public sewers are present immediately adjacent to the site, one to the north beneath Carnarvon Street and one to the east beneath Cheetham Hill Road. Both existing public sewers are to be surveyed as part of the drainage survey that has been commissioned to confirm the feasibility of providing an outfall connection for the proposed below ground drainage network. Based on the United Utilities Sewer Records (Appendix B), it is assumed that a connection will be feasible.

Therefore, surface water will be collected by a dedicated gravity system designed in accordance with BS EN 752 before discharging to the 300mm combined public sewer to the north of the site beneath Carnarvon Street. The connection will be subject to a S106 application with United Utilities under the Water Industry Act.

4.2 Sustainable Urban Drainage

Table 4.1 below provides a summary of typical SuDS techniques outlined within the CIRIA C753 SuDS manual. Based on a review of the suitability of SuDS techniques it is proposed that the development may incorporate the following:

SUDS TECHNIQUE	DESCRIPTION	SUITABILITY FOR DEVELOPMENT SITE	
Rainwater Harvesting	Collection of rainwater run-off for use	Not suitable due to limited potential use for rainwater	×
Soft Landscaping	Grassed areas that allow direct infiltration of rainwater	Small sections of soft landscaping provided at ground level in the landscape proposals surrounding the building footprint.	✓
Filter Drains	Granular filled Linear drains / soakaway with either granular fill and perforated pipe, or dense vegetation that treat runoff from adjacent impermeable areas	Not suitable due to limited space	×
Swales	Shallow landscape channel that can infiltrate or convey runoff.	Not suitable due to limited space	×
Infiltration Basins	Depressions in the ground designed to store and infiltration runoff to the ground. Can be landscaped to provide amenity value.	Not suitable due to limited space	×
Wet Ponds	Basins with permanent pool of water providing water quality treatment, wildlife, and amenity benefit.	Not suitable due to limited space	×

	Designed to provide temporary storage for additional runoff.		
Extended Detention Basins	Dry basins that are designed to temporarily store runoff providing water quality treatment.	Not suitable due to limited space	✗
Constructed Wetland	Ponds and shallow wetland areas with vegetation to improve pollution removal and enhance wildlife habitat.	Not suitable due to limited space	✗
Porous Paving	Granular build-up beneath permeable paving systems that can be used to either store runoff (lined system) and increase time of concentration or allow percolation into the ground.	Not suitable due to limited space	✗
Trees Pits	Managed permeable paving systems around tree pits that can be used to either store runoff (lined system) and increase time of concentration or allow percolation into the ground.	Not suitable due to limited space	✗
Soakaways	Infiltration device to temporarily store runoff and allow it to percolate into the ground.	Not suitable due to limited space and ground conditions	✗
Green Roof	Vegetated roof area that reduces runoff and increases time of concentration.	Suitable, subject to coordinated design development with Architect, Landscape Architect, Building Services Engineer and specialist roof designer.	✓
Blue Roof	Roof area designed to store and reduce peak runoff rates during intense storms.	Suitable, subject to coordinated design development with Architect, Landscape Architect, and specialist roof designer.	✓
Underground Storage	Attenuation structures installed below ground to provide runoff storage.	Suitable in the form of oversized pipes. Underground storage to be kept to a minimum due to limited space.	✓

✗ Not suitable

? Potentially suitable subject to further investigation

✓ Suitable

Table 4.1 – SUDs Techniques & Suitability for Development Site

4.3 Water Quality Assessment

The drainage from the site is from the roof and terrace areas of the building. Water quality is generally affected by frequent rainfall events (1 in 1-year events or less), which is circa 5mm/hr for the proposed development site. To assess the water quality, consideration will be given to the guidance within the National Standard for Sustainable Urban Drainage (NSSUD) and CIRIA Guide C753. The pollution hazard levels for different land uses are presented in table 4.2 and are based on the definitions in the NSSUD and C753.

POLLUTION HAZARD LEVEL	LAND USE
Very Low	Residential roofs
Low	Individual property driveways, non-residential roofs, residential car parks, low traffic roads, non-residential car parking with infrequent change (e.g. Schools, offices)
Medium	Commercial yards and delivery areas, non-residential car parking with frequent change (e.g. hospital, retail), minor roads
High	Site with heavy pollution (e.g. Haulage yards, lorry parks, waste sites, sites with chemical and fuels are delivered, handled, stored etc.)

Table 4.2 – Pollution Hazard Levels

The pollution hazard level is low based on Table 4.2 with the primary consideration given to removal of gross solids and sediment.

The following tables indicate the minimum number of treatment stages required before surface runoff should reach the infiltration or receiving water body and are extracted from the NSSUD.

POLLUTION HAZARD LEVEL	LAND USE	LOW	MEDIUM	HIGH
G1	Source Protection Zone 1, within 50m of a well, spring or borehole that supplies potable water.	1	3	Consult the EA

G2	Into or immediately adjacent to a sensitive receptor that could be influenced by infiltrated water. Includes designated nature conservation, heritage, and landscape sites – including Biodiversity Action Plan (BAP) habitats and Protected Species.	1	3	
G3	Source Protection Zone II and III or Principal Aquifer	1	3	
G4	Secondary Aquifer	1	2	
G5	Unproductive strata	1	2	

Table 4.3 – Groundwater Minimum Treatment Stages

POLLUTION HAZARD LEVEL	NORMAL SURFACE WATER	SENSITIVE SURFACE WATER
Low	0	1
Medium	2	3
High	Consult the EA	

Table 4.4 – Surface Water Body Minimum Treatment Stages

Infiltration is not viable due to the limited space on site. However, discharge into the principal and secondary aquifers would require 1 level of treatment for a low pollution level.

Discharge of surface water to the receiving public sewer requires no treatment stages due to the low pollution hazard level. However, the adoption of SuDS, sumps and good practice will provide inherent treatment to improve the water quality of the runoff.

External areas will pass through silt traps/sumps prior to passing through the flow control device. The silt traps and sumps will allow most of the sediment and solids to settle out under low flows, prior to discharging to the public sewer.

4.4 SuDS Management Plan

The Sustainable Urban Drainage systems are to be maintained by the property owner and/or a maintenance company on their behalf. They will be required to maintain the SuDS features in line with the following recommendations and suppliers' requirements of the various features. These requirements are general and have been extracted from the CIRA Guide C753.

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 12.5 – Operation and maintenance requirement for green roofs

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 from 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

Table 21.3 – Operation and maintenance requirement for Attenuation storage tanks

The Contractor delivering the development is to update the general requirements to reflect the product specific requirements of the as-installed proprietary SuDS and incorporate these into the Operation & Maintenance manual for the development.

5.0 OUTLINE DRAINAGE STRATEGY

Refer to Appendix H for the general arrangement drawing of the proposed below ground drainage strategy.

5.1 Surface Water System

The development will have a dedicated surface water network that will collect the rainwater from the proposed building and surrounding hard standing areas. The network will then discharge under gravity to a new connection into the 300 diameter public combined sewer within Carnarvon Street, to the north of the site, subject to a section 106 agreement under the Water Industry Act.

The surface water discharge from the site is to be limited to the rate detailed within Section 3.2 of this report using a flow control device within the final manhole of the surface water network prior to combining with the foul water network and discharging into the combined public sewer. Proposed discharge rates are to be confirmed with the Lead Local Flood Authority and United Utilities as part of the detailed design. A pre-development enquiry has been issued to United Utilities and has received approval in principle, see correspondence in Appendix J.

Attenuation will be provided in the form of blue roofs, collecting rainfall at source, and oversized underground drainage runs.

The surface water drainage network is to be designed in accordance with Building Regulations Part H, BS EN 752 and Code for Adoption. In addition, the following requirements will also be adopted in accordance with the Non-Statutory Technical Standards for Sustainable Drainage: Practice Guidance and Oldham Councils SuDS requirements for new developments:

- The below ground drainage system will be designed to ensure flooding does not occur on site for the 1 in 30-year rainfall event with no internal flooding for the 1 in 100-year rainfall event.
- The surface water system is to be designed to accommodate the 1-, 2-, 30- and 100-year rainfall events with additional climate change allowances of +40% & +45% for the 1 in 30 & 1 in 100-year events, respectively.

5.2 Foul Water System

The site will have a dedicated foul water network that will collect the foul water associated with the development before combining with the surface water network in the final manhole on site and discharging into the 300 dia combined public sewer within Carnarvon Street to the north of the site.

The combined drainage connection will be subject to a section 106 application with United Utilities

The drainage system is to be designed in accordance with Building Regulations Part H, BS EN 752 and Codes for Adoption.

5.3 Phasing & Surface Water Management During Construction

Given the scale and nature of the development, it is assumed that it will be delivered in a single phase.

Surface water management during construction will be addressed by the Main Contractor as part of their 'Construction Management Plan'.

A brief overview of the key considerations relating to surface water management and flood risk that will need to be incorporated into the Main Contractor's construction methodology include:

- Subject to the level of contamination beneath the site and site remediation required, as well as the quality of working platform compaction to reduce infiltration, consideration should be given to the risk of residual contamination on site affecting groundwaters and the adjacent watercourse.
- The risk of diesel spillage and other contamination risk during construction activities are to be assessed and measures implemented to ensure they do not cause a risk to groundwaters and the adjacent watercourse.

6.0 FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SuDS techniques in accordance with the CIRIA SUDS Manual C753. The following SUD's features has been adopted in the 33-41 Cheetham Hill Road drainage strategy:-

- Cellular attenuation tank/Blue roof
- Inspection chambers, manholes and catchpits.
- Pipes.
- Drainage channels and gullies.
- Flow control Device

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

The Main Contractor delivering the development is to update the general requirements to reflect the product specific requirements of the as installed proprietary SuDS and incorporate these into the Operation & Maintenance manual for the building.

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

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

6.1 General Maintenance & Inspection Requirements

No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.

Maintenance/inspection work shall be carried out in a safe/planned manner.

All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.

Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped personnel working in accordance with current statutory safe working policies.

Drainage systems shall be inspected on a regular basis or when any problems arise. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.

It is recommended that the drainage system is inspected a minimum of twice a year, with the system also being inspected after all major storm events.

Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;

- Rodding – Manual/Mechanical with flexible rods.
- Jetting – High pressure water jetting.
- Plunging.

6.2 Cellular attenuation tank/Blue roof

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

The maintenance requirements for cellular attenuation tanks are outlined within table 21.3 of the CIRIA SuDS Manual C753. A copy of that table is replicated below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

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

6.2 Inspection Chambers, Manholes and Catchpits

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

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

6.3 Pipes

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

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

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

6.4 Drainage Channels and Gullies

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

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

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

6.5 Flow Control Device

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

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, the manufacturer's recommendations should be followed. Normally, little maintenance is required as a vortex flow control device has no moving parts.

If blockages occur they tend to do so at the intake of the vortex flow control device.

Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the vortex flow control device it is vitally important that any building materials etc. are removed from the unit and the chamber.

After the system is made fully functional, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

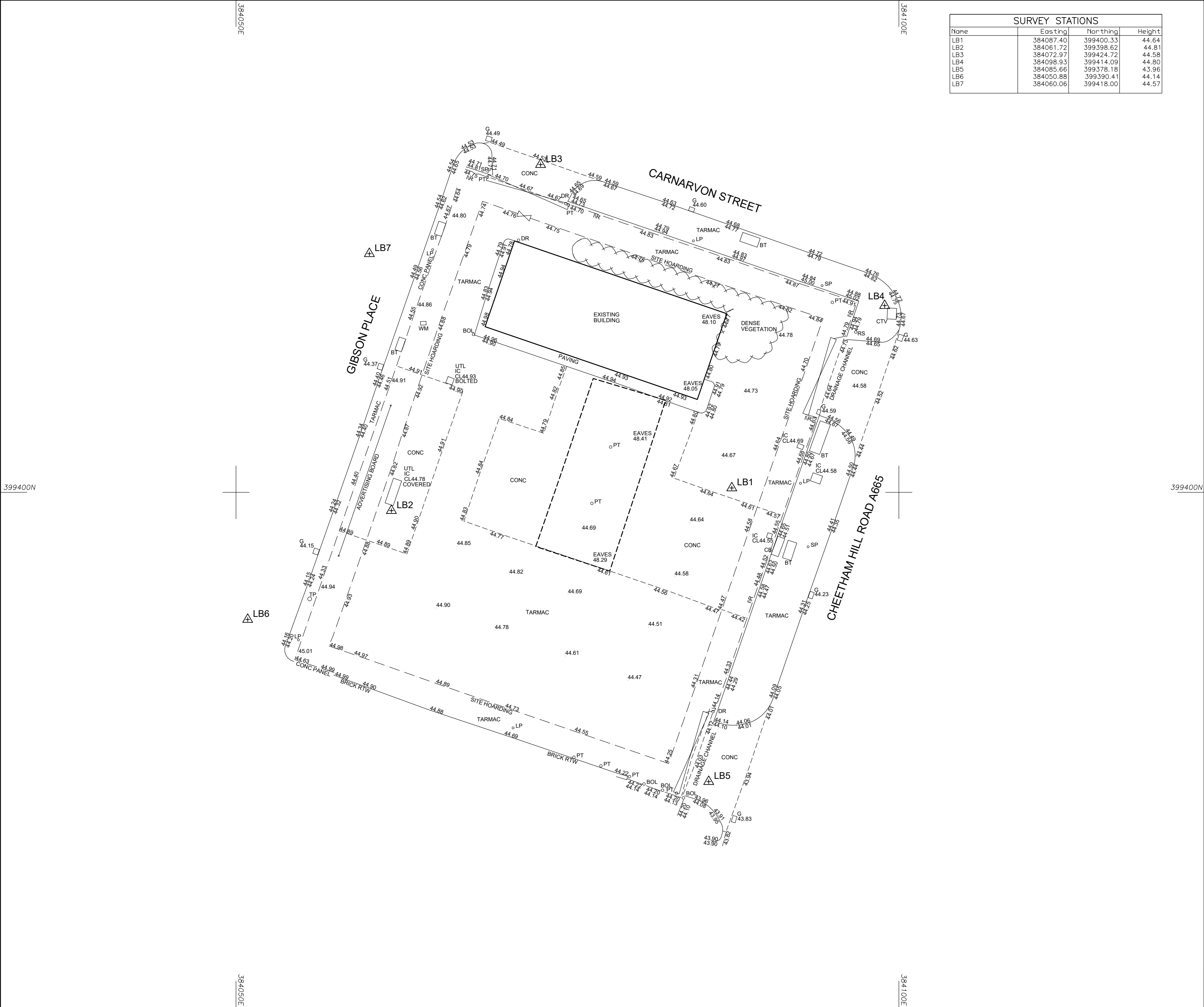
6.6 Surface Water Management During Construction

The management of surface water management during construction will be addressed by the Main Contractor as part of their 'Construction Management Plan'.

A brief overview of the key consideration relating to surface water management and flood risk that will need to be incorporated into the Main Contractors construction methodology include:

- The existing buildings on site are to be demolished. Stockpiling of material on site is to be minimised to ensure that the flood storage capacity for the 1 in 1000 year (0.1% AEP) event is not compromised.
- Due to the industrial history of the site it is anticipated that ground remediation may be required. A working platform will also be required during construction to allow for formation of piled foundations etc. The top of the working platform is to be located at or lower than existing site levels to ensure that the flood storage capacity for the 1 in 1000 year (0.1% AEP) event is not compromised.
- Subject to the level of contamination beneath the site, level of site remediation, and quality of working platform compaction to reduce infiltration, consideration should be given to the risk of residual contamination on site affecting groundwaters.
- The risk of spillage of diesel and other contamination risks during construction activities are to be assessed, and measures implemented to ensure they do not cause a risk to groundwaters.

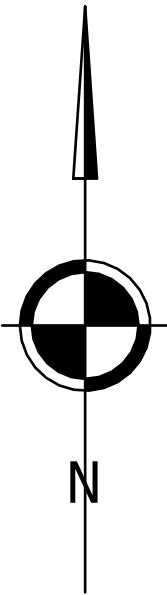
APPENDIX A
Existing Topographical Survey



SURVEY STATIONS			
Name	Easting	Northing	Height
LB1	384087.40	399400.33	44.64
LB2	384061.72	399398.62	44.81
LB3	384072.97	399424.72	44.58
LB4	384098.93	399414.09	44.80
LB5	384085.66	399378.18	43.96
LB6	384050.88	399390.41	44.14
LB7	384060.06	399418.00	44.57

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Note:

The survey is plotted on a plane local Grid. Orientation to National Grid.

All levels relate to Ordnance Datum, achieved using the OS National GPS Network.

Survey Control Markers established for Mapping purposes only and should not be used for Construction without the written approval of Survey Operations Ltd.

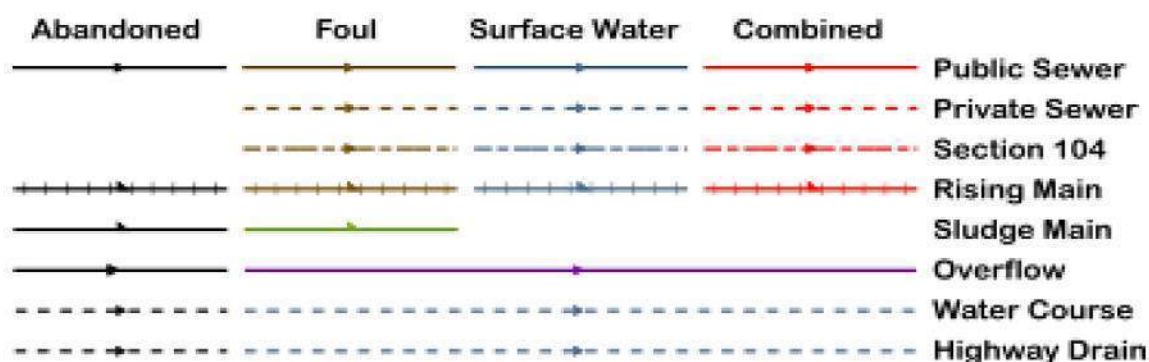


Smith Street, Skelmersdale, Lancs. WN8 8LN
Tel: 01695 725662 Fax: 01695 51816
Email: mail@survops.co.uk – www.survops.co.uk

Client	
RPS Group	
Drawing Title	
Topographical Survey of Land at:	
31-44 Cheetham Hill	
Manchester	
Scale(s)	1:200
Surveyor	LB
Date	AUG 22
Drawn	CD
Job Number	22F169
Checked	TP
Sheet Size & Drg Number & Revision	
A2 22F169/001	

APPENDIX B
United Utilities Sewer Records

Wastewater Symbolology



All point assets follow the standard colour convention:

red – combined	brown - foul
blue – surface water	purple - overflow

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



Scale: 1:1250
Date: 28/07/2022

SEWER RECORDS



Water for the North West

Address or Site Reference: 33-41 Cheetham Hill Road Cheetham Hill
Manchester M4 4FT

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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APPENDIX C

Proposed Development Plans

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Rev	Description	Date
-----	-------------	------

Key:

- Site Boundary
- 1B-1P
- 1B-2P
- 2B-3P
- 2B-4P
- Amenity & Concierge
- Bicycle Storage
- Circulation
- Commercial
- Plant Room
- Refuse
- Roof Terrace

26-28 Hilton Street
Manchester M1 2EH

mail@hawkinsbrown.com
hawkinsbrown.com

Hawkins\Brown

Project
33-41 Cheetham Hill Road
Manchester
M4 4FT

Drawing
Proposed Ground Floor Plan

Scale @ A1
1 : 100

Date
Dec 2023

Drawn By
JD

Checked By
NT

Job Number
230069

Status
S2

Purpose of Issue
Planning

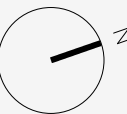
Drawing No.

CHR-HBA-ZZ-00-DR-A-080100

Rev



0 1 5 10 m
Scale 1:100



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Rev	Description	Date
-----	-------------	------

- Key:
- Site Boundary
 - 1B-1P
 - 1B-2P
 - 2B-3P
 - 2B-4P
 - Amenity & Concierge
 - Bicycle Storage
 - Circulation
 - Commercial
 - Plant Room
 - Refuse
 - Roof Terrace

26-28 Hilton Street
Manchester M1 2EH

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hawkinsbrown.com

Hawkins\Brown

Project
33-41 Cheetham Hill Road
Manchester
M4 4FT

Drawing
Proposed Level 1 (Typical to Level 16) Plan

Scale @ A1
1 : 100

Date
Dec 2023

Drawn By
JD

Checked By
NT

Job Number
230069

Status
S2

Purpose of Issue
Planning

Drawing No.
CHR-HBA-ZZ-01-DR-A-080101

Rev

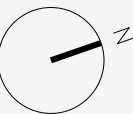


GIBSON PLACE

CARNARVON STREET

CHEETHAM HILL ROAD

0 1 5 10 m
Scale 1:100



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Rev	Description	Date
-----	-------------	------

Key:

- Site Boundary
- 1B-1P
- 1B-2P
- 2B-3P
- 2B-4P
- Amenity & Concierge
- Bicycle Storage
- Circulation
- Commercial
- Plant Room
- Refuse
- Roof Terrace

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Hawkins\Brown

Project
33-41 Cheetham Hill Road
Manchester
M4 4FT

Drawing
Proposed Level 17 Plan

Scale @ A1 1 : 100	Date Dec 2023
-----------------------	------------------

Drawn By JD	Checked By NT
----------------	------------------

Job Number 230069	Status S2	Purpose of Issue Planning
----------------------	--------------	------------------------------

Drawing No. CHR-HBA-ZZ-17-DR-A-080117	Rev
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GIBSON PLACE

CARNARVON STREET

CHEETHAM HILL ROAD

0 1 5 10 m
Scale 1:100



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Rev	Description	Date
-----	-------------	------

Key:

- Site Boundary
- 1B-1P
- 1B-2P
- 2B-3P
- 2B-4P
- Amenity & Concierge
- Bicycle Storage
- Circulation
- Commercial
- Plant Room
- Refuse
- Roof Terrace

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M4 4FT

Drawing
Proposed Level 18 (Typical to
Level 22) Plan

Scale @ A1
1 : 100

Date
Dec 2023

Drawn By
JD

Checked By
NT

Job Number
230069

Status
S2

Purpose of Issue
Planning

Drawing No.

CHR-HBA-ZZ-18-DR-A-080118

Rev

GIBSON PLACE

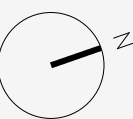
CARNARVON STREET

CHEETHAM HILL ROAD

L17 Roof Terrace
Below

Refer to Landscape
Architects Drawings

0 1 5 10 m
Scale 1:100



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Rev	Description	Date
-----	-------------	------

- Key:
- Site Boundary
 - 1B-1P
 - 1B-2P
 - 2B-3P
 - 2B-4P
 - Amenity & Concierge
 - Bicycle Storage
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Manchester M1 2EH

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Project
33-41 Cheetham Hill Road
Manchester
M4 4FT

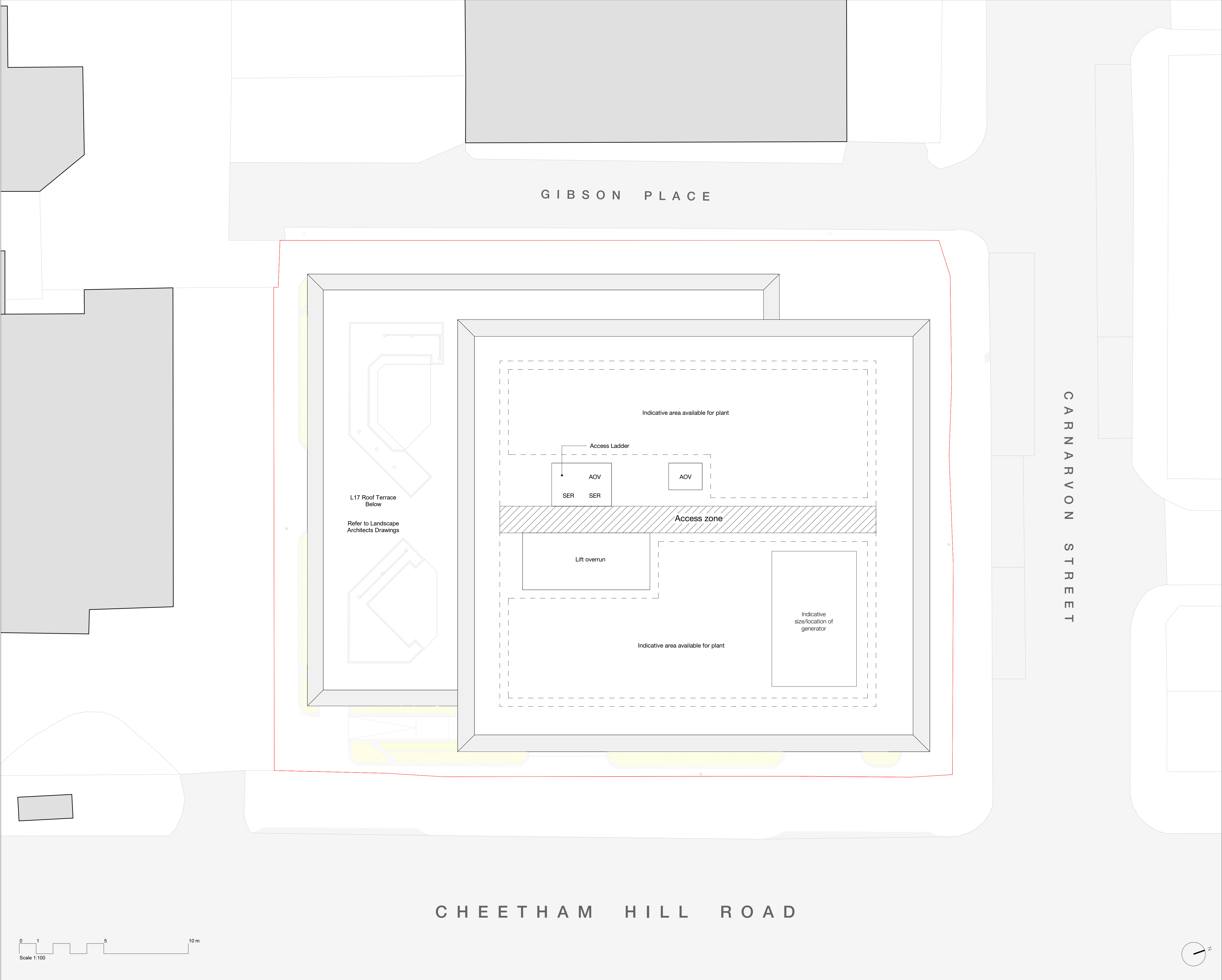
Drawing
Proposed Roof Plan

Scale @ A1 1 : 100	Date Dec 2023
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Drawn By JD	Checked By NT
----------------	------------------

Job Number 230069	Status S2	Purpose of Issue Planning
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Drawing No. CHR-HBA-ZZ-RF-DR-A-080123	Rev
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APPENDIX D
Existing Impermeable Areas Plan



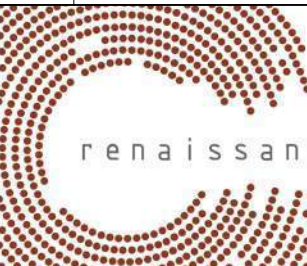
- NOTES:
1. THIS DRAWING IS INTENDED TO INDICATE THE EXISTING DRAINED AREAS OF THE 33-41 CHEETHAM HILL ROAD DEVELOPMENT. IT IS BASED UPON A REVIEW OF THE TOPOGRPHICAL SURVEY AND AERIAL IMAGES OF THE SITE.
 2. FOR TOPOGRPHICAL SURVEY REFER TO SURVEY OPERATIONS DRAWING 22F169 REVISION 001, DATED AUGUST 2022.
 3. EXISTING DISCHARGE RATES GIVEN HAVE BEEN CALCULATED USING MICRODRAINAGE. GREENFIELD RUN-OFF RATES ARE BASED ON THE AREA OF SOFT LANDSCAPING AND BROWNFIELD RUN-OFF RATES ARE BASED ON THE HARD PAVED AREAS.

KEY

OWNERSHIP BOUNDARY
TOTAL AREA: 1247m² (0.13ha)

SOFT LANDSCAPED AREAS
AREA: 0m² (0ha)

HARD PAVED AREAS
AREA: 1247m² (0.13ha)

P01	FOR INFORMATION			16.06.23	SA	HG
Rev:	Description:			Date:	By:	Chkd:
				Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG		
				Project: 33-41 CHEETHAM HILL ROAD, MANCHESTER		
				Drawing Title: EXISTING DRAINED AREAS PLAN		
Status: RIBA STAGE 2						
Size:	Date:	Drawn by:	Designed by:	Checked by:		
A1	JUN'23	SA	SA	HG		
Scale:	1:125		Project No:		2206-11	
Project - Originator - Volume - Level - Type - Role - Number:						Revision:
CHR-REN-XX-FN-DR-C-00050						P01

APPENDIX E
MicroDrainage Pre-development Surface Water Run-off

Renaissance Assoc.		Page 1
Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Date 15/06/2023 11:27 File	Designed by SelvanaAhmad Checked by	
Innovyze	Network 2020.1.3	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

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

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.104	4-8	0.026

Total Area Contributing (ha) = 0.130

Total Pipe Volume (m³) = 0.992

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	19.650	0.197	100.0	0.065	5.00	0.0	0.600	o	175	Pipe/Conduit	
1.001	21.575	0.216	100.0	0.065	0.00	0.0	0.600	o	175	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	45.68	5.29	43.170	0.065	0.0	0.0	0.0	1.11	26.7	8.0
1.001	44.51	5.62	42.974	0.130	0.0	0.0	0.0	1.11	26.7	15.7

Renaissance Assoc.		Page 2
Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Date 15/06/2023 11:27 File	Designed by SelvanaAhmad Checked by	
Innovyze	Network 2020.1.3	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.065	0.065	0.065
1.001	-	-	100	0.065	0.065	0.065
				Total	Total	Total
				0.130	0.130	0.130

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.001		44.355	42.758	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	0
Number of Online Controls	0	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	1	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

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Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Date 15/06/2023 11:27 File	Designed by SelvanaAhmad Checked by	
Innovyze	Network 2020.1.3	

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.361
Region England and Wales	Cv (Summer)		0.750
M5-60 (mm)	18.000	Cv (Winter)	0.840

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600
Return Period(s) (years)	1, 2, 30, 100
Climate Change (%)	0, 0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Water Level
1.000	1	15 Winter	2	+0%	30/15 Summer			43.248
1.001	2	15 Winter	2	+0%	30/15 Summer			43.088

PN	US/MH Name	Depth (m)	Volume (m ³)	Flow / Cap. (l/s)	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Level Exceeded
1.000	1	-0.097	0.000	0.40			10.0	OK
1.001	2	-0.061	0.000	0.75			18.6	OK

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Renaissance Assoc.		Page 6	
Carvers Warehouse 77 Dale Street Manchester M1 2HG			
Date 15/06/2023 11:27 File			
Designed by SelvanaAhmad Checked by			
Innovyze		Network 2020.1.3	
<u>100 year Return Period Summary of Critical Results by Maximum Outflow (Rank 1) for Storm</u>			
<u>Simulation Criteria</u>			
Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000			
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000			
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800			
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000			
Foul Sewage per hectare (l/s) 0.000			
Number of Input Hydrographs 0 Number of Storage Structures 0			
Number of Online Controls 0 Number of Time/Area Diagrams 0			
Number of Offline Controls 0 Number of Real Time Controls 0			
<u>Synthetic Rainfall Details</u>			
Rainfall Model FSR Ratio R 0.361			
Region England and Wales Cv (Summer) 0.750			
M5-60 (mm) 18.000 Cv (Winter) 0.840			
Margin for Flood Risk Warning (mm) 300.0			
Analysis Timestep 2.5 Second Increment (Extended)			
DTS Status OFF			
DVD Status ON			
Inertia Status ON			
Profile(s) Summer and Winter			
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600			
Return Period(s) (years) 1, 2, 30, 100			
Climate Change (%) 0, 0, 0, 0			

APPENDIX F
MicroDrainage Greenfield Run-off Rates



ICP SUDS

ICP SUDS Input (FSR Method)

Return Period (Years)

Area (ha)

SAAR (mm)

Soil

Growth Curve

Partly Urbanised Catchment (QBAR)

Urban

Region

Results

QBAR rural (l/s)

QBAR urban (l/s)

Return Period Flood

Region	QBAR (l/s)	Q (2yrs) (l/s)	Q (1 yrs) (l/s)	Q (30 yrs) (l/s)	Q (100 yrs) (l/s)
Region 1	1.8	1.8	1.5	2.8	3.1
Region 2	1.8	1.8	1.6	2.7	3.2
Region 3	1.8	1.9	1.6	2.8	2.9
Region 4	1.8	1.8	1.5	2.9	3.2
Region 5	1.8	1.9	1.6	3.3	3.9
Region 6/Region 7	1.8	1.8	1.5	3.2	3.7
Region 8	1.8	1.8	1.4	2.9	3.2
Region 9	1.8	1.9	1.6	2.7	2.9
Region 10	1.8	1.9	1.6	2.6	2.9

IH 124

ICP SUDS

ADAS 345

FEH

ReFH2

Greenfield Volume

Greenfield Volume (ReFH2)

Enter Return Period between 1 and 1000

APPENDIX G
MicroDrainage Quick Storage Estimates



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Variables

FSR Rainfall

Return Period (years)

Region

Map

M5-60 (mm)

Ratio R

100

England and Wales

19.200

0.403

Cv (Summer)

Cv (Winter)

Impemeable Area (ha)

Maximum Allowable Discharge (l/s)

Infiltration Coefficient (m/hr)

Safety Factor

Climate Change (%)

0.750

0.840

0.130

3.0

0.00000

2.0

45

Analyse

OK

Cancel

Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0



Variables

Results

Design

Overview 2D

Overview 3D

Vt

Results

Global Variables require approximate storage of between 53 m³ and 76 m³.

These values are estimates only and should not be used for design purposes.

Analyse

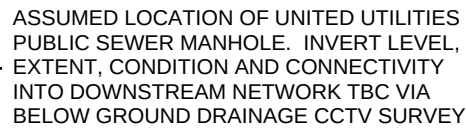
OK

Cancel

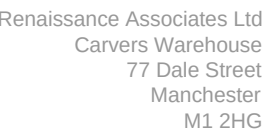
Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

APPENDIX H
Below Ground Drainage General Arrangement



- | | | | | |
|------|----------------|----------|-----|-------|
| P03 | PLANNING ISSUE | 30.11.23 | AM | HG |
| P02 | PLANNING ISSUE | 24.11.23 | AM | HG |
| P01 | STAGE 2 | 16.06.23 | SA | HG |
| Rev: | Description: | Date: | By: | Chkd: |



TITLE						DRAWING							REVISION
Project -	Originator -	Volume -	Level -	Type -	Role -	Number:						Revision:	

APPENDIX J
United Utilities Correspondence

Andrew McLaughlin

From: seweradoptions@uuplc.co.uk
Sent: 30 August 2023 12:16
To: Andrew McLaughlin
Subject: Our reference - 04565336 - 31-44 Cheetham Hill Road, Manchester



Good Afternoon Andrew,

Our reference - 04565336 - 31-44 Cheetham Hill Road, Manchester

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into combined sewer system as indicated on your drawing.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The [North West SuDS Pro-Forma](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of

the jurisdiction of United Utilities

Should the above be ruled out and a connection to the combined system is required I can confirm we have no objections to 3 l/s maximum pass forward flow as shown in your design.

Regards

Anthony



Anthony Laithwaite

Ww Lead - ICS / Portal Project
Ww Engineer
Developer Services & Metering
Customer Services

M: 07880 298897
unitedutilities.com



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