



50 Fountain Street, Manchester

Outline Drainage Strategy

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Rev: 01

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1.0 INTRODUCTION

1.1 Purpose of this report

This Outline Drainage Strategy has been prepared to support the planning application for the proposed development for 50 Fountain Street, Manchester.

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

This report should be read in conjunctions with the Flood Risk Assessment, renaissance, June 2021.

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

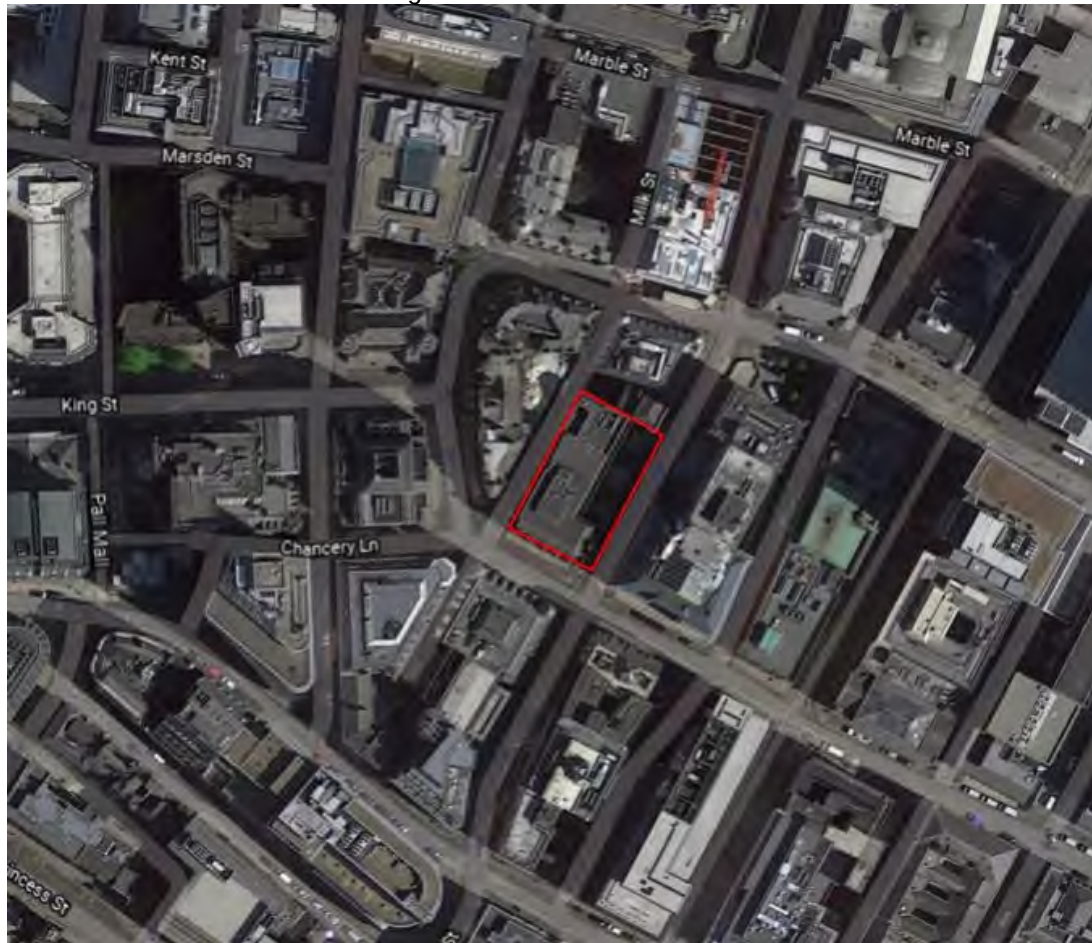
2.1 Site Location

The proposed development site is located at 50 Fountain Street, Manchester.

The site location is described below:

- Post Code M2 2AS
- OS X (Easting) 384069
- OS Y (Northing) 398225
- Nat. Grid SJ 84069 98225

The site location is illustrated in Figure 2.1 below.



Imagery ©2021 Google, Imagery ©2020 Infoterra Ltd & Bluesky

Figure 2.1: Site Location

2.1 Site Description

The site is circa 0.138 hectares and is currently used for office premises built from brick and stone construction. The building is 5 storeys in height and has a basement/semi-basement across the footprint ranging from 1.25m to 3.00m in depths which is used for car parking and houses an electricity substation. There are some trees present towards the south of the building, along Fountain Street.

The site is generally flat in level, as can be seen from the Topographical survey in Appendix A, however access to the building from Fountain Street is higher in level than the surrounding pavement.

The site is set within a largely commercial district with office buildings, banks and restaurants surrounding the site. All site boundaries are open, Concert Lane bounds the site to the north,

Fountain Street to the south and Spring Gardens to the west. The eastern boundary is defined by the adjacent office buildings.

There are currently no access restrictions at the site. Access to the building can be obtained from Concert Lane to the north or Fountain Street to the south. No access can be gained from Spring Gardens to the west.

2.2 Existing Site Drainage

The existing site is 100% impermeable with associated existing drainage, as shown by the Drainage Survey in Appendix B. Based on an assessment of the development site and the utility survey drawing the existing foul and surface water from the site discharges to the United Utilities (UU) combined sewer along Concert Street.

Refer to Appendix C for the existing combined United Utilities network surrounding the site.

2.3 Geology

BGS mapping does not show any made ground deposits on site, however based on the historical mapping and previous development that has taken place on the site, made ground deposits are highly likely to be present. The site is indicated to be underlain by Devensian Till. This stratum typically comprises clay with varying amounts of sand and gravel as minor constituents. The deeper solid geology is indicated to sandstone as part of the Chester Formation. No faults are shown on or within an influencing distance of the site.

2.4 Hydrology

There are no water network records of surface water features within 250m of the site. The nearest watercourse to the site is the Rochdale Canal, which lies at a distance of 480m south-east of the site at its closest point.

With regard to the hydrogeology, the superficial stratum is classified as a Secondary Undifferentiated Aquifer and the bedrock is classified as a Principal Aquifer.

Information obtained from the Environment Agency (EA) Risk of Flooding from Rivers and the Sea (RoFRaS) database indicates that the site does not lie within Flood Zone 2 or 3

The British Geological Survey indicate there is a potential for groundwater flooding at the subject site, with a moderate risk rating. Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

2.5 Proposed Development

Retention and refurbishment of the Grade II Listed 49 Spring Gardens façade following demolition of the existing 50 Fountain Street building and erection of adjoining 8 storey commercial building (Use Class E) with basement areas, roof terraces and plant enclosure, landscaping, and associated works.

Retention and refurbishment of the Grade II Listed 49 Spring Gardens façade following demolition and replacement of the existing 50 Fountain Street building for office use with associated works.

The proposed development plans can be seen in Appendix C.

3.0 EXISTING & PROPOSED SURFACE WATER DISCHARGE RATES

3.1 Pre-Development Surface Water Run-Off Rates

The existing development site area is 1,378m² (0.138ha) and is considered 100% impermeable in its current condition. 1,133m² (0.113 ha) of the site is positively drained via the onsite network, with the remaining 245m² (0.025 ha) being part of the adoptable footpath. Refer to Appendix E, Existing Area and Discharge Rates.

3.1.1 Existing Brownfield Run-Off Rates

To estimate the pre-development surface water discharge into the existing public sewer the existing onsite network has been simulated using industry approved Micro Drainage Software assuming a critical 60-minute storm. The calculations can be seen in Appendix F with the main results presented in the Table 3.1. The model is based on the existing drainage survey that can be seen in Appendix B.

For comparison the total surface water discharge based on a constant rainfall intensity of 50mm/hr (0.0139 l/s/m²) has been calculated. For the site this equates to an existing peak discharge run-off of 15.7 l/s based upon an impermeable area of 1,133m².

The pre-development run-off rates for the 1, 2, 30 and 100 year events and 50mm/hr rainfall intensity are therefore: -

Return Period	Q _{Brownfield} (l/s)
1 in 1 year	8.8
1 in 2 year	11.2
1 in 30 year	22.3
1 in 100 year	29.3
Q _{50mm/hr}	15.7

Table 3.1 – Brownfield Run-off Rates

3.1.2 Greenfield Run-Off Rates

Consideration has been given to reducing the discharge to Greenfield run-off rates however, this is not practicable given the site constraints which include size of site, limitations on infiltration due to interaction with foundations and the proximity to listed buildings and basements. However, practical measures in addition to the minimum 50% reduction in pre-development discharge are presented in the sections below, including allowance for climate change in post-development rates and use of SUDs to reduce runoff.

For comparison purposes the equivalent greenfield run-off rate for the site has been calculated using the Microdrainage ICP SUDS method.

The rates presented below are what would be typical of a site with an equivalent surface area which remains undeveloped / covered in grass or vegetation. A partly urbanised catchment ratio of 0.75 has been used. Q_{bar} has a return period of 2.3 years.

Return Period	Q _{Greenfield} (l/s)
Q _{bar} (rural)	0.8
Q _{bar} (urban)	1.9
1 in 1 year	1.7
1 in 2 year	2.0
1 in 30 year	2.8
1 in 100 year	3.1

Table 3.2: Greenfield Run-off Rates

3.2 Proposed Surface Water Discharge Rates & Attenuation Requirements

In line with the Manchester, Salford and Trafford SFRA the development is a brownfield site in the Core Conurbation Critical Drainage Area therefore the peak discharge rates will be restricted to 50% of the pre-development brownfield run-off rate, plus greenfield run-off rates for any remaining area.

The total proposed run-off rate for the development site has been presented in the table below.

Return Period	Q _{Brownfield} (l/s)	Q _{50% Brownfield} (l/s)
1 in 1 year	8.8	4.4
1 in 2 year	11.2	5.6
1 in 30 year	22.3	11.2
1 in 100 year	29.3	14.7
Q _{50mm/hr}	15.7	7.9

Table 3.3: Proposed Surface Water Run-off Rates

Following a pre-development enquiry with United Utilities the proposed discharge rate is to be limited to **8.0 l/s**, which is based on a 30% betterment of the existing 1 in 2 year event. Refer to appendix G for United Utilities correspondence.

The proposed development results in circa 1,133m² of building footprint and circa 245m² of adoptable footpath.

The post development discharge rates will include for an increase in the rainfall intensity of 40% to allow for climate change as is consistence with a design life of the development of 100 years, as outlined in NPPF.

To comply with the Non-Statutory Technical Standards for Sustainable Drainage: Practice Guidance the runoff volume for the post development 1 in 100 year 6 hour rainfall event will not exceed the pre-development runoff volume as the Brownfield runoff rates have been reduced at least 50%.

The total allowable discharge from the site is to be limited to 8.0 l/s, which results in a 64% betterment on the 1 in 30 year discharge rate and a 73% betterment for the 1 in 100 year discharge rate. The proposed discharge rate is subject to confirmation by United Utilities and Manchester City Council.

A quick storage estimate for the 1 in 100 year storm event, plus 40% for climate change, using Micro Drainage, indicates that circa 24-43m³ of attenuation will be required to limit the peak surface water discharge to the limits set out in Table 3.3 above.

Quick Storage Estimate - Variables

FSR Rainfall	Cv (Summer)	0.750
Return Period (years): 100	Cv (Winter)	0.840
Region: England and Wales	Impervious Area (ha)	0.113
Map	Maximum Allowable Discharge (l/s)	8.0
M5-60 (mm): 18.000	Infiltration Coefficient (m/hr)	0.00000
Ratio R: 0.360	Safety Factor	2.0
	Climate Change (%)	40

Quick Storage Estimate - Results

Global Variables require approximate storage of between 23 m³ and 43 m³.
These values are estimates only and should not be used for design purposes.

Figure 3.1: Quick Storage Estimate for Proposed Development Impermeable Areas

At this stage, the proposal is to provide the following areas of attenuation: -

Blue roofs on level 07 and the roof of the building, with the potential to provide circa 70m³ of storage, depending on the depth of attenuation cell provided within the overall build up on the roof and the extent of area that can be achieved on plan.

Attenuation Tank to accommodate roofs which cannot be attenuated via a blue roof system. Following the detailed design of the blue roof system the attenuation tank requirement will be reviewed and removed if possible.

4.0 SURFACE WATER DISCHARGE & SUDS ASSESSMENT

4.1 Surface Water Discharge Assessment

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

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

Infiltration direct to the ground has been considered, however as the existing building and proposed new building will cover the whole site it is not possible to infiltrate surface water to the ground without impacting the foundations. The site is also surrounded on three sides by Grade II* and Grade II listed buildings which include semi and full basements. Infiltration is therefore not viable.

Opportunities to discharge to watercourse have been considered, however as the nearest watercourse 480m away it is deemed not viable.

There are no surface water drains within the highway around the site, therefore, discharge to the public surface water sewer, as the current situation, has been discounted.

There are multiple existing United Utilities combined sewers in the surrounding highways. It has been confirmed via a CCTV survey that the site has a current connection to the combined sewer present within Concert Lane. It is therefore proposed that surface water will discharge to the existing public combined sewer within Concert Lane, utilising the existing connection is possible.

4.2 Sustainable Urban Drainage

Table 4.1 below provides a summary of typical SUDs techniques outlined within CIRIA guide 753 SUDs manual. Based on a review of the suitability of the SUDs techniques it is proposed that the development at 50 Fountain Street will incorporate the following:

- Adopt blue roof for building roof and level 07 terrace.
- Provide a flow control & underground storage to limit runoff to acceptable limits.

SUDs Technique	Description	Suitability for Development Site	
Soft Landscaping	Grassed areas that allow direct infiltration of rainwater	Not suitable due to no provision of grassed area.	✗
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 proximity of listed buildings.	✗
Swales	Shallow landscape channel that can infiltrate or convey runoff.	Not suitable due to proximity of listed buildings and site layout.	✗
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 proximity of listed buildings and site layout.	✗
Wet Ponds	Basins with permanent pool of water providing water quality treatment, wildlife and amenity benefit. Designed to provide temporary storage for additional runoff.	Not suitable due to proximity of listed buildings and site layout.	✗
Extended Detention Basins	Dry basins that are designed to temporarily store runoff providing water quality treatment.	Not suitable due to proximity of listed buildings and site layout.	✗

Constructed Wetland	Ponds and shallow wetland areas with vegetation to improve pollution removal and enhance wildlife habitat.	Not suitable due to proximity of listed buildings and site layout.	✗
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 proximity of listed buildings and no proposed external areas.	✗
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 proximity of listed buildings and no proposed external areas.	✗
Soakaways	Infiltration device to temporarily store runoff and allow it to percolate into the ground.	Not suitable due to proximity of listed buildings and site layout.	✗
Green Roof	Vegetated roof area that reduces runoff and increase time of concentration.	Not viable due to plant and access.	✗
Blue Roof	Roof area designed to store and reduce peak runoff rates during intense storms.	Suitable to the roof area.	✓
Underground Storage	Attenuation structures installed below ground to provide runoff storage.	Suitable	✓

✗ 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 to the building only. 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 with the National Standard for Sustainable Urban Drainage (NSSUD) and CIRIA Guide C753.

The pollution hazard levels for difference 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

As the site will be completely covered by the building footprint the Pollution Hazard Level is considered as very low with the primary consideration given to removal of larger debris like leaves, feathers etc. that could cause a blockage.

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	Med	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
Med	2	3
High	Consult the EA	

Table 4.4 – Surface Water Body Minimum Treatment Stages

Based on the above assessment the roof areas have a very low pollution hazard and the receiving sewer is considered as normal surface water. No treatment stages are therefore required. The adoption of SUDs as noted and good practice will provide inherent treatment. Areas of blue roofs, dependant on detailing, will act to absorb most frequent rainfall events and filter out solids and sediment. Sumps will also be provided to any gullies and channels provided at the ground floor level. The silt traps and sumps will allow most of the sediment and solids to settle out under low flows, prior to discharging to the sewer.

4.4 SUDS Management Plan

The Sustainable Urban Drainage systems are to be maintained by the Building Management Company selected by the client. The building management company will be required to maintain the SUDs features in line with the following recommendations and suppliers' requirements of the various features.

The following operation and maintenance requirements for the SUDs features incorporated into the development are to be adopted by the Building Management Company. These requirements are general and have been extracted from the CIRIA Guide C753.

- *Table 12.5 - Operation and maintenance requirement for green roofs (also applies to blue roofs)*
- *Table 21.3 - Operation and maintenance requirement for attenuation storage tanks*

The Main Contractor will 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.

TABLE 12.5 Operation and 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 21.3 Operation and maintenance requirements for attenuation storage tanks

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

5.0 OUTLINE DRAINAGE STRATEGY

5.1 Surface Water System

The surface water drainage is to collect the rainwater from the proposed building within a dedicated surface water network. The system is to then discharge under gravity to the United Utilities combined sewer present within Concert Lane subject to agreement with the LLFA and UU. An outline drainage strategy is presented in Appendix H.

The surface water discharge from the site is to be limited 30% of the existing brownfield 1 in 2 year event, as requested by United Utilities via pre-development enquiry, using a flow control device within the final manhole on site prior to discharge into the sewer.

Attenuation will be provided by blue roofs at the level 07 terrace and roof level. Initial calculations from a blue roof specialist, Bauder, are attached within Appendix J. An attenuation tank or oversized pipes will be required to attenuate the additional roof steps backs.

The surface water discharging from the site will be from the building roofs and terrace only. To ensure water quality and that the blue roofs function correctly, they must be maintained as set out in the SUDs management plan.

The surface water drainage network is to be designed in accordance with Building Regulation Part H, BS EN 752 and the 'Codes 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 Salford City Councils SuDS requirements for new developments:

- No surcharging of drainage network for design storm of 1 in 2 years.
- The drainage system will be designed to ensure flooding does not occur on site for both the 1 in 30 year and 1 in 100 year + 40% climate change rainfall events.

The new surface water drainage connection will be subject to a Section 106 application under the water industry act.

5.2 Exceedance Events

As the site is situated in Flood Zone 1 and has a less than 1 in 1000 annual probability of flooding there are no overland flood routes across the site.

5.3 Foul Water System

The foul water drainage from the offices, shower rooms, plant areas, and washdown gullies will be collected by a dedicated gravity foul network. The system is to be connected to the existing combined sewer in Concert Lane, as per existing.

The new foul drainage connection will be subject to a Section 106 application under the water industry act.

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

5.4 Phasing & Surface Water Management During Construction

It is assumed that given the scale of the development that it will be delivered in a single phase.

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:

- Due to the site history 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.
- Subject to the development of the remediation strategy, 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 and the adjacent watercourse.
- The risk of spillage of diesel 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 any nearby watercourse.

APPENDIX A

Existing Topographical Survey

APPENDIX B
Existing Drainage Survey



BURIED ASSETS DETECTED ON SITE:

LINE TYPE	SERVICE DESCRIPTION
BT	TELECOMMUNICATIONS (BT)
CATV	TELECOMMUNICATIONS (CATV)
TELE	TELECOMMUNICATIONS (OTHER)
G	GAS
TCSU	TRAFFIC CONTROL SENSOR UNIT
SL	STREET LIGHTING
LV	LOW VOLTAGE
HV	HIGH VOLTAGE
W	WATER
FWD	FOUL WATER DRAINAGE
SWD	SURFACE WATER DRAINAGE
FWRM	FOUL WATER RISING MAIN
CS	COMBINED SEWER
OF	OIL/FUEL
	SUSPENDED RAINWATER PIPE
L(GPR)	UNKNOWN UTILITY (GPR)
L(EM)	UNKNOWN UTILITY (RADIO)

EDT END OF TRACE AIR ASSUMED ROUTE

UTD UNABLE TO OBTAIN DEPTH DUE TO FEINT SIGNAL

TFR TRANSFERRED FROM RECORDS

KEY DIMENSIONS SHOULD BE CHECKED ON SITE BEFORE COMMENCEMENT OF ANY WORKS

Amendments		
Date	Surveyor	Description of work



Meridian House
58-60 Hillside Road, Finsbury, Cheshire W46 6AG
Tel: 01928 734473 Fax: 01928 735573
Email: mail@powerdrainage.co.uk
www.powerdrainage.co.uk

50 Fountain Street
Manchester
Drainage Survey

Client : Lanes Group

Surveyed By : CS	Date : 24/03/21	A0 @ 1:200
Drawn By : CS	Drawing No : 8780/01	
Checked By : ****	Amendment : ****	

APPENDIX C
Sewer Records



RefNo	Cover	Func	Invert	Size x	Size y	Shape	Matt	Length	Grad
2204		CO		225			VC	8.73185	
9480		CO		225			VC	7.73424	
9507		CO		1500			CO	179.9222	
9901	43.89	CO		38.57	600		CO	67.85225	1 in 36
9404	36.74	CO		28.24	1500		CSB	51.40039	
9008	41.26	CO		34.19	450		VC	28.41208	1 in 42
2914	42.83	CO		900			CO	48.45311	
2007	44.21	CO		40.14	375		VC	53.64689	
3302	44.99	CO		40.4	300		VC	16.48242	1 in 7
8003	40.1	CO		35.71	380		VC	3	
0208	37.6	CO		32.43	300		VC	60.81538	
8501	37.04	CO		26.34	950		BR	6.403124	
0103	43.37	CO		39.02	375		VC	100.3408	1 in 787
8502		CO		0	750		CO	18.43909	
0200	44.08	CO		36.7	300		VC	36.49657	1 in 33
2112	44.5	CO		37.91	1550		CO	20.61553	
9207	41.95	CO		37.49	400		CO	9.219544	1 in 54
9608		CO		600			CO	9.084400	
8410	37.34	CO		33.84	500		PE	22.32272	1 in 17
2507	45.32	CO		35.35	1550		CO	17.46425	
0208	45.61	CO		42.67	300		BR	71.5891	
2302	44.4	CO		33.93	1550		CO	4.472136	
1215	44.16	CO		40.52	300		VC	16.88796	
9404	40.13	CO		33	340		BR	6.082703	1 in 7
2101	44.1	CO		36.63	490		BR	8.219544	
8332	37.17	CO		31.4	1520		CSB	39.20944	1 in 47
8116	37.12	CO		1320			CO	12.53283	
9206	41.88	CO		38.04	375		VC	7.615773	1 in 45
8311	37.12	CO		28.13	1500		PE	20.90259	1 in 348
8335	38.91	CO		28.82	1500		BR	25.03875	
9905	42.03	CO		32.95	1500		CO	87.95953	1 in 54
8342		CO		150			VC	7.322824	
9116		CO		150			VC	1.081039	
1002		CO		150			VC	2.200385	
8333		CO		31.79	900		PSC	2.935400	1 in 18
9812		CO		150			VC	12.02503	
9015	41.13	CO		38.38	300		PVC	8.792014	1 in 88
0002	42.88	CO		40	600		CO	34.65545	1 in 40
8312	38.88	CO		31.5	600		CO	20.25456	1 in 225
9010		CO		150			VC	18.8895	
9203	41.57	CO		35.97	300		VC	40.83669	1 in 27
9001	40.78	CO		38.41	750		BR	37.18894	1 in 186
1109		CO		300			VC	40.75195	

LEGEND

Abandoned
Foul
Surface Water
Combined

Public Sewer

Private Sewer

Section 104

Rising Main

Sludge Main

Water Course

Highway Drain

Manhole

Head of System

Extent of Survey

Rodding Eye

Inlet

Discharge Point

Vortex

Penstock

Wastout Chamber

Valve

Air Valve

Non Return Valve

Soakaway

Gully

Cascade

Flow Meter

Hatch Box

Oil Interceptor

Summit

Drop Shaft

Orifice Plate

Side Entry Manhole

Outfall

Screen Chamber

Inspection Chamber

Bifurcation Chamber

Lamp Hole

T Junction / Saddle

Catchpit

Valve Chamber

Vent Column

Vortex Chamber

Penstock Chamber

Network Storage Tank

Sewer Overflow

Ww Treatment Works

Ww Pumping Station

Septic Tank

Control Kiosk

Change of Characteristic

All point assets follow the standard colour convention:

red - combined
blue - surface water

brown - foul
purple - overflow

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

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

SEWER MATERIAL

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

Address or Site Reference:

Fountain Street 50 Fountain Street,
Manchester,
M2 2AS

Scale: 1:1250
Date: 18/12/2020

Sheet: 1 of 1

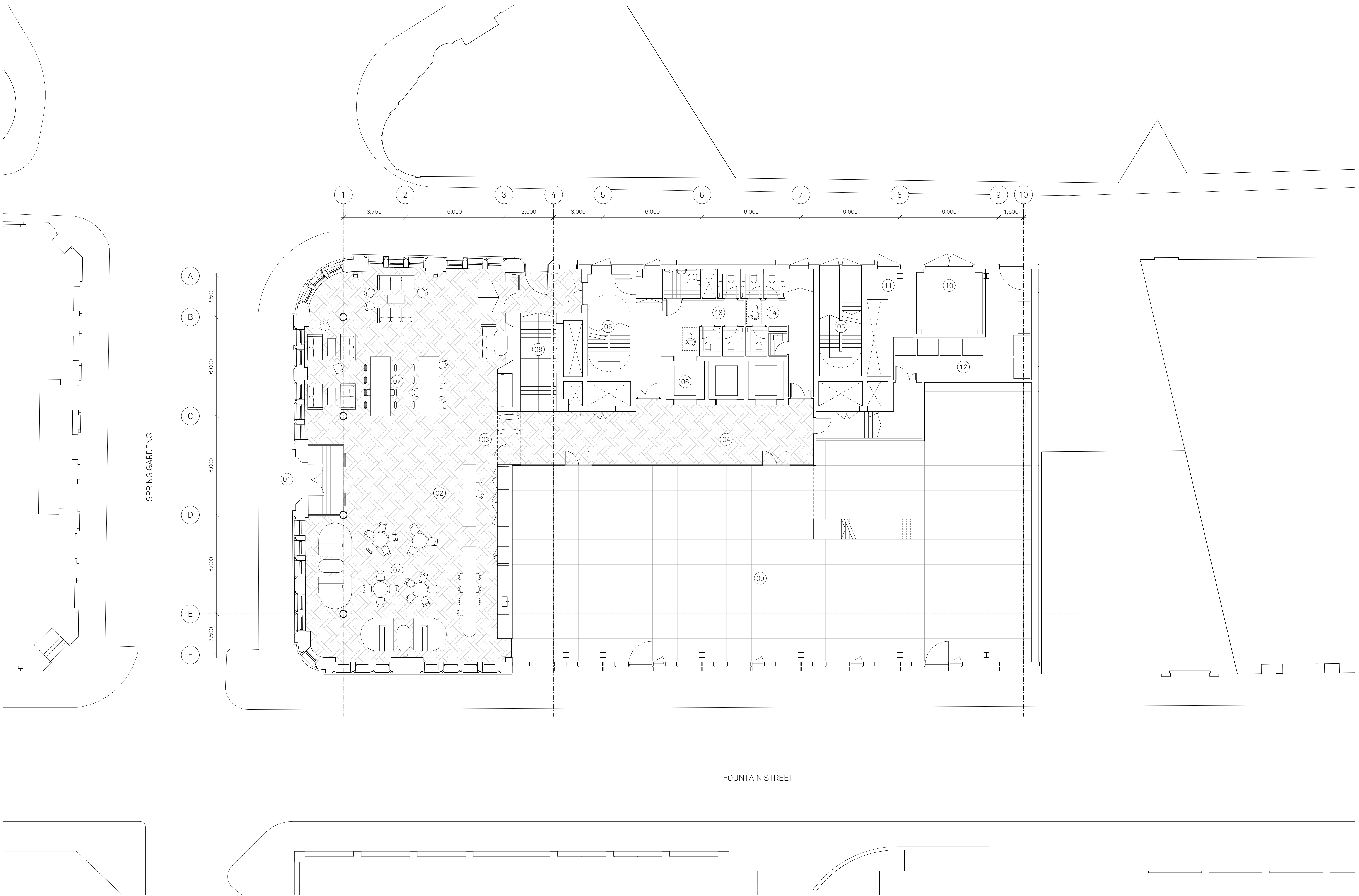
Printed by:
Property Searches

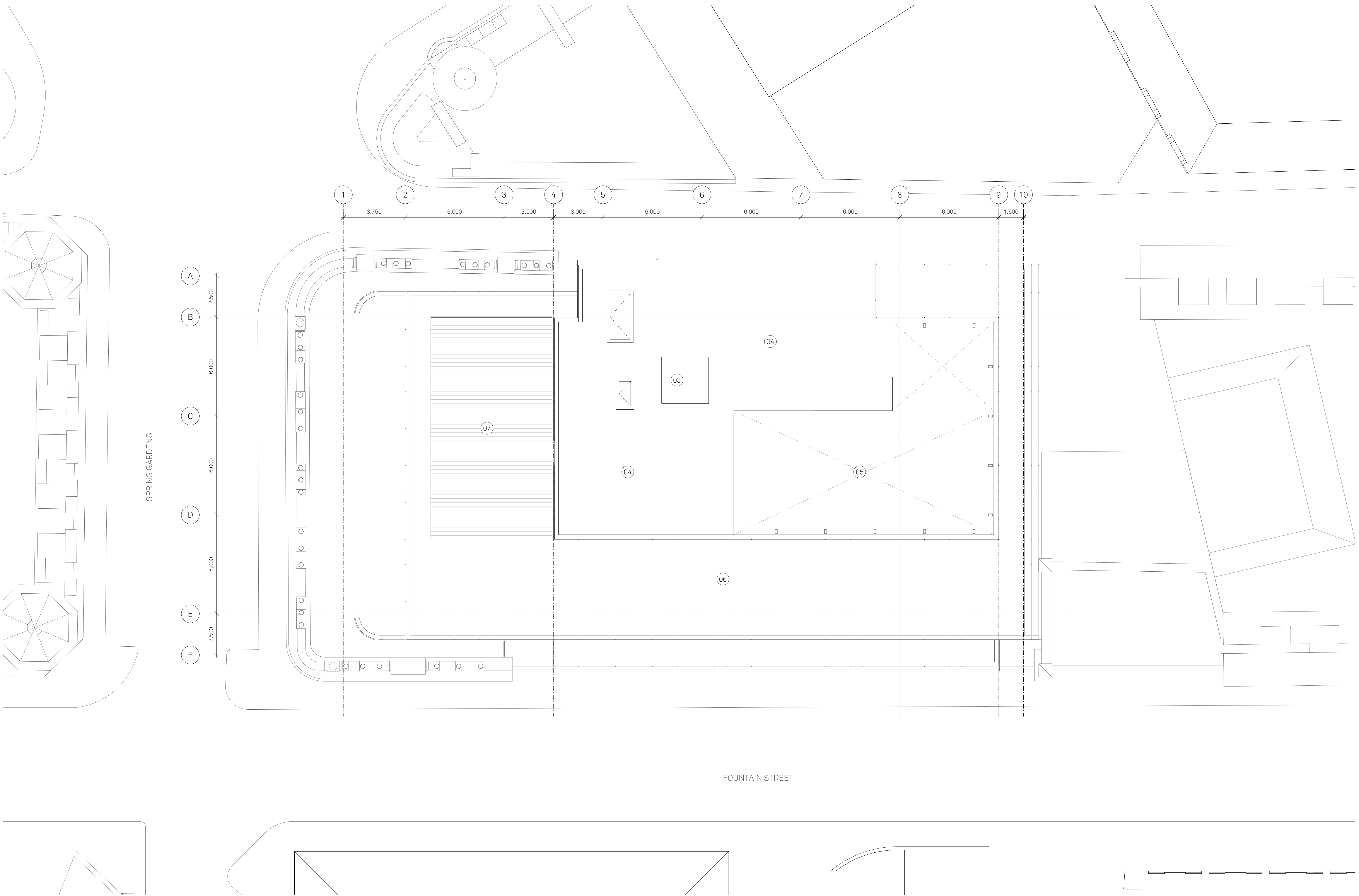
SEWER
RECORDS

United
Utilities

Water for the North West

APPENDIX D
Proposed Development Layouts





Notes

PLAN KEY:

- 01

Access hatch
- 02

Smoke ventilation
- 03

Lift overrun
- 04

Indicative zones for photovoltaic panels
- 05

Open plant roof space
- 06

Green roof 07th floor
- 07

Pedestrian terrace 07th floor

Project
50 Fountain Street

Title:
Roof GA Plan

Scale:
1:100 @A1

Drawn
ER

Checked:
MH

Status:
S2

Drawing No:

142-JMA-B1-RF-P-A-022208

Rev:

A

Details

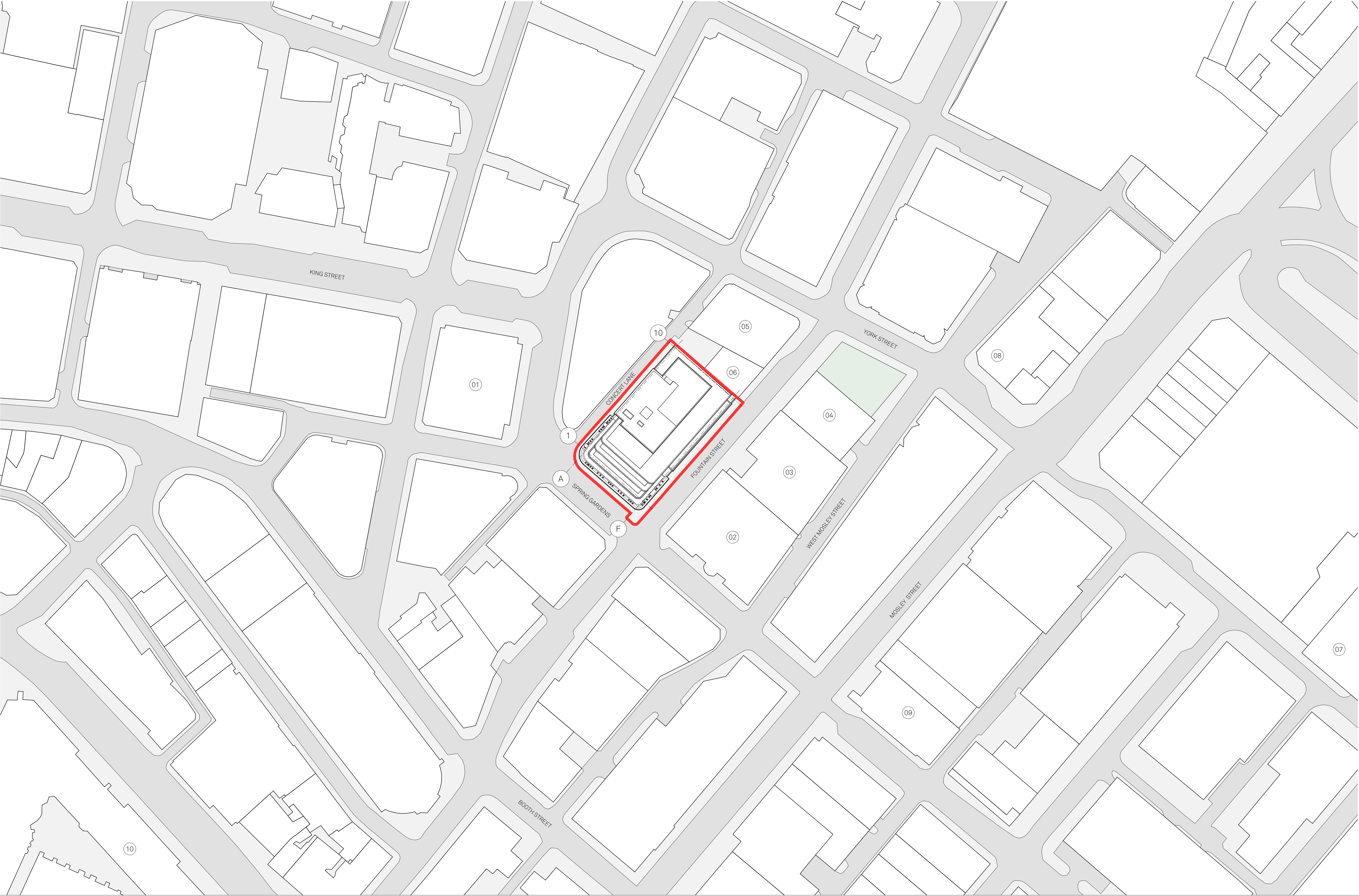
06/08/21 Issued for Information

Jon Matthews

22 City Tower, Picadilly Plaza, New York St, Manchester, M1 4BT

0161 974 3690

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Notes

PLAN KEY:

Site Application Boundary

01Midland Bank (Gotham Hotel)

0255 Spring Gardens

03Barnet House

04York House

0542-44 Fountain Street

0646 Fountain Street

07City Tower

08Colwyn Chambers

09The Portico Library

10Manchester City Council

Project

50 Fountain Street

Drawn

HM

Checked

ER

Status

S3

Details

19/05/21 Issued for Information

Title

Proposed Block Plan

Drawing No.

142-JMA-MP-RF-P-A-001200

Rev.

/

Scale

1:500 @A1

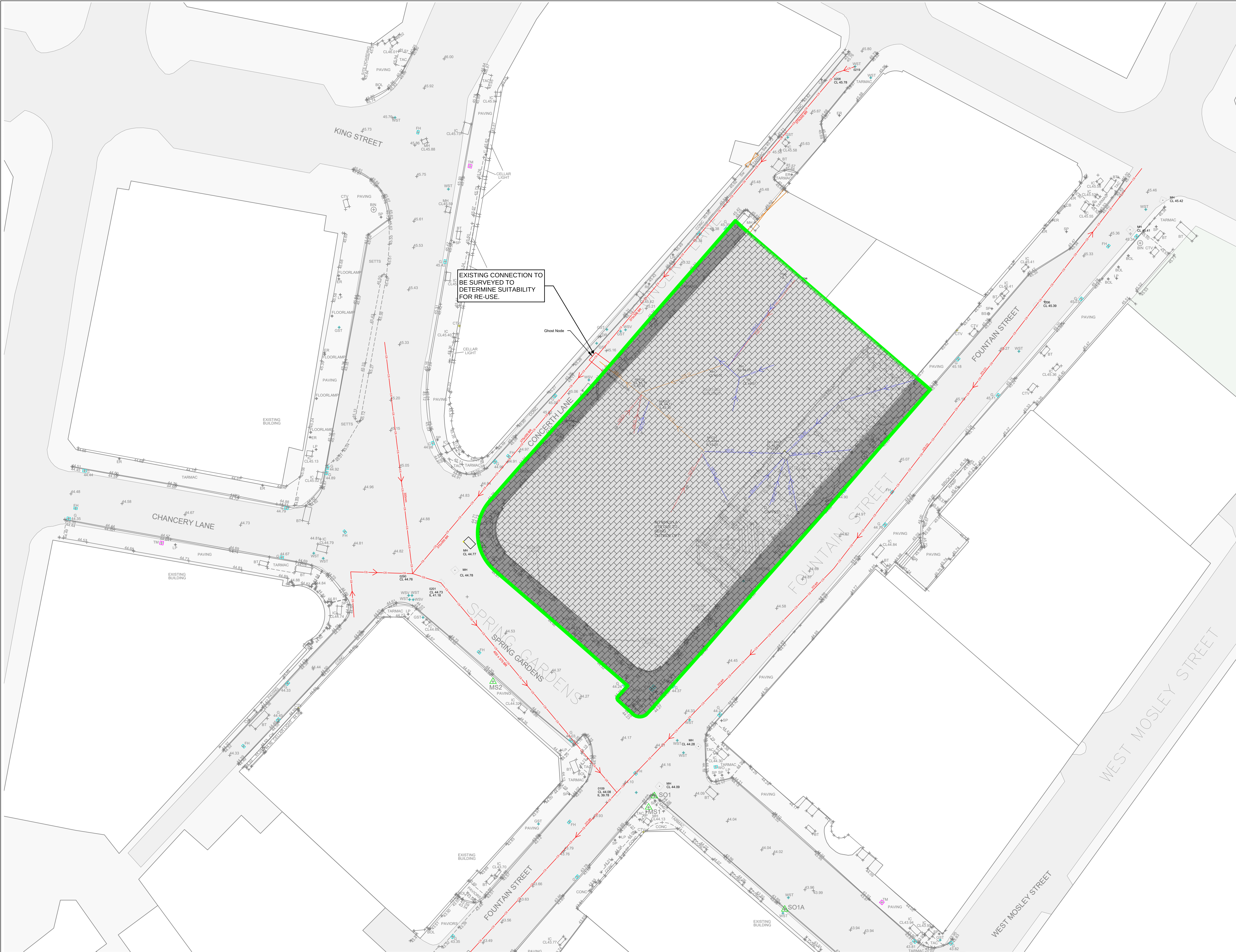
Jon Matthews

22 City Tower, Picadilly Plaza, New York St, Manchester, M1 4BT

0161 974 3690

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APPENDIX E
Existing Site Areas & Discharge Rates



- NOTES**
- THIS DRAWING IS INTENDED TO INDICATE THE EXISTING DRAINED AREAS FROM THE SITE. IT IS BASED UPON A REVIEW OF THE TOPOGRAPHICAL SURVEY AND AERIAL IMAGES OF THE SITE.
 - FOR TOPOGRPAHICAL SURVEY REFER TO SURVEY OPERATIONS DRAWING 20L115/001 DATED JAN 21.
 - FOR DRAINAGE SURVEY REFER TO LANES GROUP PLC DRAWING 8780/01 DATED 24/03/21.
 - EXISTING DISCHARGE RATES GIVEN HAVE BEEN CALCULATED USING MICRODRAINAGE. BROWNFIELD RUN-OFF RATES ARE BASED ON THE HARD PAVED AREAS. GREENFIELD RUN-OFF RATES TO LANDSCAPED AREAS HAVE BEEN CONSERVATIVELY IGNORED.
 - CONSERVATIVELY THE EXISTING BROWNFIELD RATE WILL BE TAKEN AS 50mm/hr BASED ON THE ASSUMPTION THAT THE UNITED UTILITY WOULD HAVE BEEN ORIGINALLY DESIGN TO THIS. IN PRACTICE LARGER FLOWS WILL BE TAKEN BY THE PUBLIC SEWER IN HIGHER RAINFALL EVENTS, HOWEVER, THIS WILL BE CONSERVATIVELY IGNORED.

KEY

- SITE BOUNDARY
TOTAL AREA: 1,378m² (0.138 ha)
- SOFT LANDSCAPED AREAS
AREA: 0 m² (0.000 ha)
- POSITIVELY DRAINED HARD PAVED AREAS
AREA: 1133m² (0.113 ha)
- ADOPTABLE PAVEMENT DRAINED VIA HIGHWAY GULLIES
AREA: 245m² (0.025 ha)

EXISTING & PROPOSED MAXIMUM DISCHARGE RATES		
RAINFALL EVENT	BROWNFIELD ¹ QBROWNFIELD	PROPOSED DISCHARGE ² 50% QBROWNFIELD
1 IN 1 YEAR	8.8 l/s	4.4 l/s
1 IN 2 YEAR	11.2 l/s	5.6 l/s
1 IN 30 YEAR	22.3 l/s	11.2 l/s
50mm/hr ³	15.7 l/s	7.9 l/s
1 IN 100 YEAR	29.3 l/s	14.7 l/s

- BROWNFIELD RUN-OFF CALCULATED USING A MICRODRAINAGE MODEL BASED ON THE CCTV SURVEY INFORMATION AND A DRAINED AREA OF 1133m²
- PROPOSED RUN-OFF IS BASED ON GREENFIELD + 50% BROWNFIELD RUN-OFF AS SITE IS LOCATED IN A CRITICAL DRAINAGE AREA.
- PEAK BROWNFIELD DISCHARGE TO UNITED UTILITIES SEWER CALCULATED USING A CONSTANT RATE OF 50mm/hr/m² (0.0139l/s/m²) AS THE PUBLIC SEWER SYSTEM MAY HAVE BEEN DESIGN TO ACCOMMODATE THIS.

P01	FOR INFORMATION	14.06.21	JB	KG
Rev:	Description:	Date:	By:	Chkd:
		Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG		
Project:				
50 FOUNTAIN STREET MANCHESTER				
Drawing Title:				
EXISTING AREAS AND DISCHARGE RATES				
Status:				
FOR INFORMATION				
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	JUN'21	JB	-	KG
Scale:	1:200	Project No:	2006-05	
Project:	Originator:	Volume:	Level:	Type:
Role: Category/Number: Rev:				
FSM-REN-00-ZZ-SK-C-01051-P01				

APPENDIX F

Micro Drainage Pre-Development Surface Water Run-Off

Renaissance Assoc.		Page 1
Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
Date 14/06/2021 12:07 File	Designed by JB Checked by KG	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.359	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	0.095	4-8	0.018

Total Area Contributing (ha) = 0.113

Total Pipe Volume (m³) = 1.194

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	8.774	0.135	65.0	0.065	5.00	0.0	0.600	o	150	Pipe/Conduit	🔧
1.001	8.416	0.129	65.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	🔧
1.002	1.132	0.145	7.8	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	🔧
2.000	0.935	0.012	80.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	🔧
2.001	0.818	0.010	80.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	🔧
2.002	10.218	0.128	80.0	0.016	0.00	0.0	0.600	o	225	Pipe/Conduit	🔧
1.003	6.017	0.093	65.0	0.000	0.00	0.0	0.600	o	225	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	50.00	5.12	43.510	0.065	0.0	0.0	0.0	1.25	22.1	8.8
1.001	50.00	5.20	43.300	0.081	0.0	0.0	0.0	1.62	64.6	11.0
1.002	50.00	5.21	43.171	0.097	0.0	0.0	0.0	4.71	187.4	13.1
2.000	50.00	5.02	43.300	0.000	0.0	0.0	0.0	0.86	6.8	0.0
2.001	50.00	5.03	43.288	0.000	0.0	0.0	0.0	0.86	6.8	0.0
2.002	50.00	5.15	43.153	0.016	0.0	0.0	0.0	1.46	58.2	2.2
1.003	50.00	5.27	43.025	0.113	0.0	0.0	0.0	1.62	64.6	15.3

Renaissance Assoc.		Page 2
Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
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Innovyze	Network 2020.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.065	0.065	0.065
1.001	-	-	100	0.016	0.016	0.016
1.002	-	-	100	0.016	0.016	0.016
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.016	0.016	0.016
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.113	0.113	0.113

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)
---------------------	--------------	--------------	--------------	------------------	----------	--------

1.003		45.160	42.933	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 Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 0 Number of Storage Structures 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.359		

Renaissance Assoc.		Page 3
Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
Date 14/06/2021 12:07 File	Designed by JB Checked by KG	
Innovyze	Network 2020.1	

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

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		

Synthetic Rainfall Details

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
	Name	Storm								
1.000	1 60	Summer	1	+0%					43.563	-0.097
1.001	2 60	Summer	1	+0%					43.353	-0.172
1.002	3 60	Summer	1	+0%					43.227	-0.169
2.000	4 60	Summer	1	+0%					43.300	-0.100
2.001	5 60	Summer	1	+0%					43.288	-0.100
2.002	6 60	Summer	1	+0%					43.177	-0.201
1.003	4 60	Summer	1	+0%					43.094	-0.156

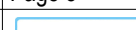
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Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
Date 14/06/2021 12:07 File	Designed by JB Checked by KG	
Innovyze	Network 2020.1	

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

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		

Synthetic Rainfall Details

PN	US/MH		Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
	Name	Storm								
1.000	1	60 Summer	2	+0%					43.571	-0.089
1.001	2	60 Summer	2	+0%					43.360	-0.165
1.002	3	60 Summer	2	+0%					43.235	-0.161
2.000	4	60 Summer	2	+0%					43.300	-0.100
2.001	5	60 Summer	2	+0%					43.288	-0.100
2.002	6	60 Summer	2	+0%					43.179	-0.199
1.003	4	60 Summer	2	+0%					43.103	-0.147

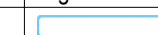
Renaissance Assoc.		Page 5
Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
Date 14/06/2021 12:07 File	Designed by JB Checked by KG	
Innovyze	Network 2020.1	

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

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		

Synthetic Rainfall Details

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water	Surcharged
									Level (m)	Depth (m)
1.000	1 60	Summer	30	+0%					43.599	-0.061
1.001	2 60	Summer	30	+0%					43.387	-0.138
1.002	3 60	Summer	30	+0%					43.264	-0.132
2.000	4 60	Summer	30	+0%					43.300	-0.100
2.001	5 60	Summer	30	+0%					43.288	-0.100
2.002	6 60	Summer	30	+0%					43.191	-0.187
1.003	4 60	Summer	30	+0%					43.141	-0.110

Renaissance Assoc.		Page 6
Carvers Warehouse 77 Dale Street Manchester M1 2HG	50 Fountain Street Manchester Existing Discharge Rates	
Date 14/06/2021 12:07 File	Designed by JB Checked by KG	
Innovyze	Network 2020.1	

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

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 Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Synthetic Rainfall Details

APPENDIX G
United Utilities Correspondence

JoeBullough

From: Perry, Graham <Graham.Perry@uuplc.co.uk>
Sent: 22 June 2021 16:41
To: JoeBullough
Cc: Wastewater Developer Services
Subject: Pre Development Enquiry for : 50 Fountain Street, Manchester M2 2AS UU ref : 4200040810

Pre Development Enquiry for: 0 Fountain Street, Manchester M2 2AS UU ref : 4200040810

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 3723223 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 the public foul water/combined sewer system.

Our preferred point of discharge would be to the 300mm x375mm diameter public combined sewer within Concert Lane located to the north of your proposed development at an unrestricted rate.

If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

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.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:
<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to the 300mm x375mm diameter public combined sewer within Concert Lane located north of the proposed site at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 8l/s.

I have based this rate on the rate suggested by modelling the 1 in 2 year event (11.2 l/s) and then reduced the value to achieve a 30% betterment in line with local policy

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-connections/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Kind regards,

Graham Perry



Graham Perry
Development Engineer
Developer Services
M: 07557 577548
T: 01925 679405
unitedutilities.com

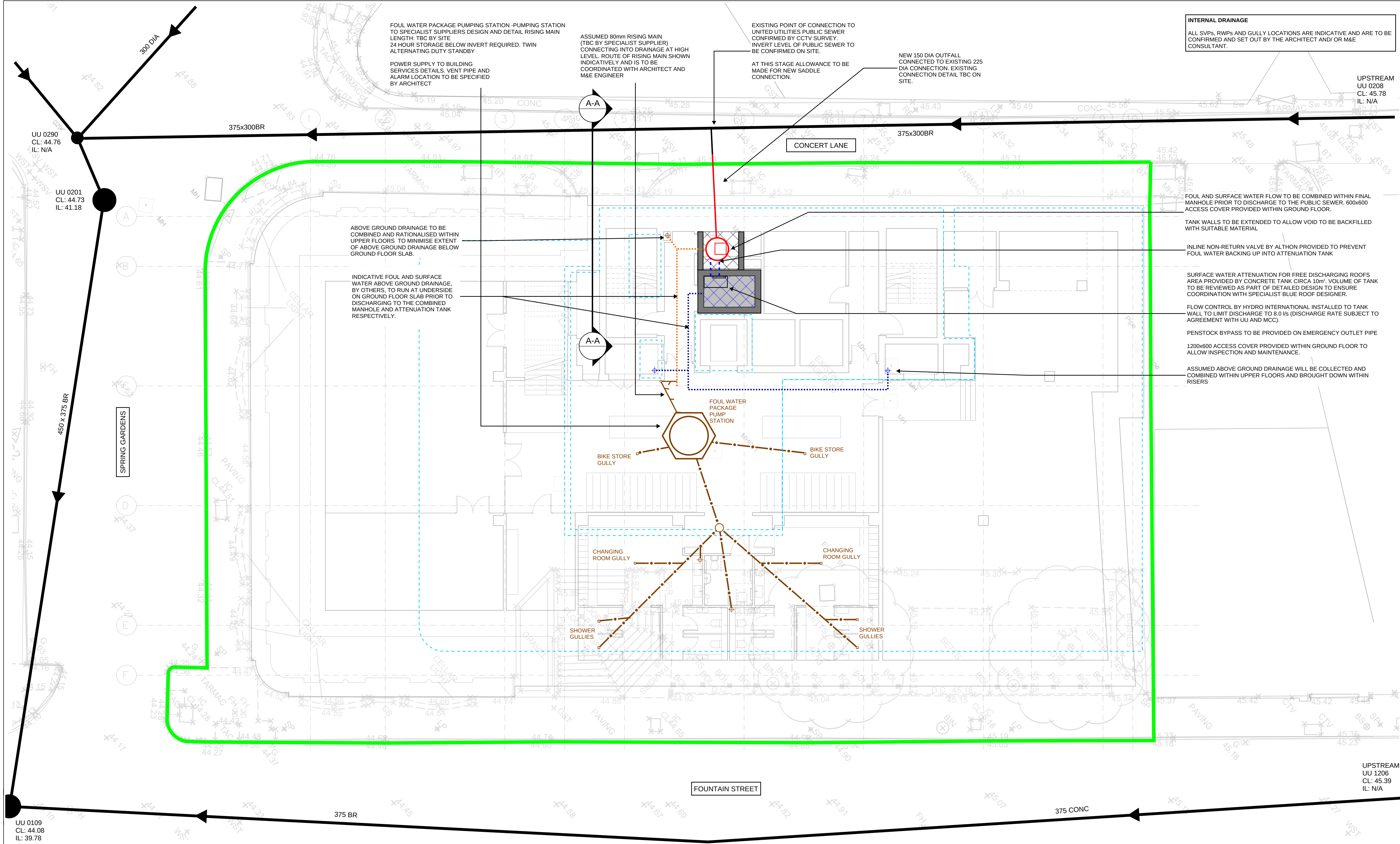
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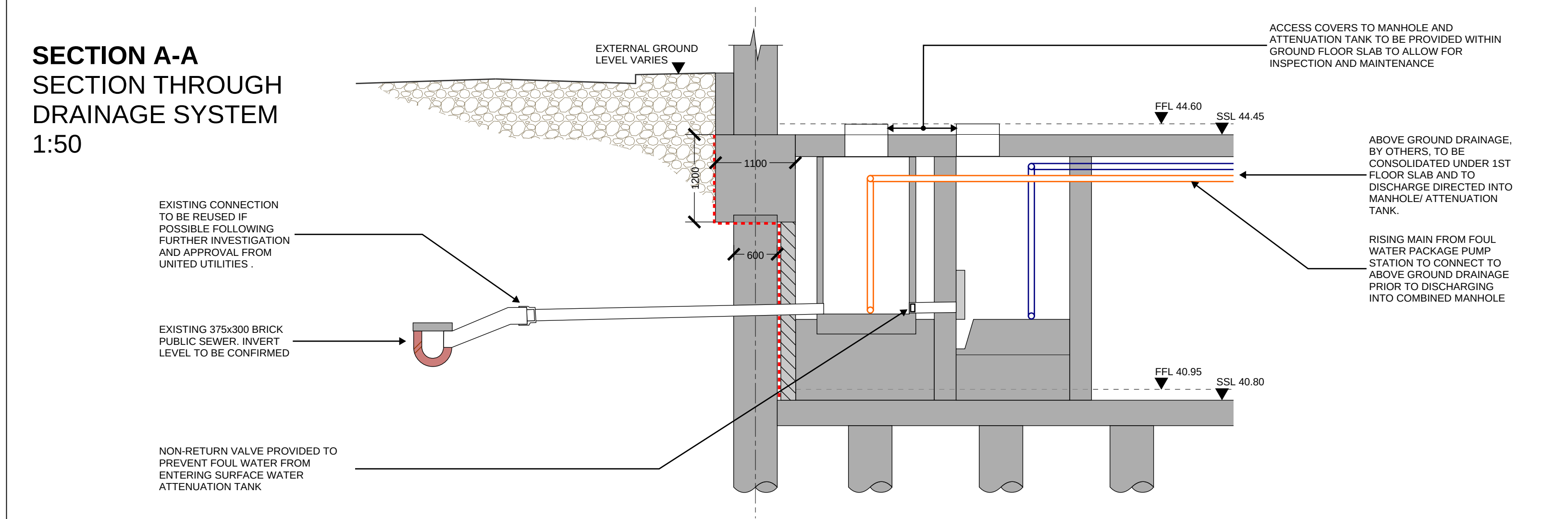
APPENDIX H
Outline Drainage Strategy



- NOTES:**
1. THE DRAWING IS INTENDED TO COMMUNICATE THE OUTLINE DRAINAGE STRATEGY TO SUPPORT THE PLANNING APPLICATION FOR THE PROPOSED 50 FOUNTAIN STREET, MANCHESTER DEVELOPMENT.
 2. DO NOT SCALE FROM THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS TO BE CHECKED/VERIFIED ON SITE.
 3. THIS DRAINAGE IS TO BE READ IN CONJUNCTION WITH THE 'FLOOD RISK ASSESSMENT' AND SITE WIDE DRAINAGE STRATEGY REPORTS, RENAISSANCE, JUN 21.
 4. THE LAYOUT OF THE PRIMARY DRAINAGE RUNS IS INDICATIVE AT THIS STAGE AND SUBJECT TO COORDINATION WITH THE DESIGN TEAM AND REVIEW AS THE DESIGN DEVELOPS.
 5. ALL ADOPTED DRAINAGE WORKS TO BE IN ACCORDANCE WITH THE 'CODE FOR ADOPTION' AND UNITED UTILITIES APPROVED DETAILS. IF DISCREPANCIES ARE NOTED BETWEEN THE UU, SA AND RENAISSANCE DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
 6. ALL NON-ADOPTED (PRIVATE) DRAINAGE WORKS TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE BUILDING REGULATIONS AND RENAISSANCE DETAILS.
 7. DRAINAGE SIZES AND FALLS TO BE AS INDICATED, AND NOT LESS THAN THE FOLLOWING MINIMAL FALLS:
FOUL
1/80 FOR SVP WITH WC
1/40 FOR SVP WITH NO WC SURFACE
1/150 FOR 150 DIA PIPES
1/100 FOR 100 DIA PIPES
 8. ALL GULLIES, CHANNEL DRAINS, TO BE TRAPPED AND WITH RODDABLE ACCESS.
 9. ALL RWPS AND SVPs TO BE RODDABLE
 10. BASEMENT DRAINAGE CONCRETE ENCASEMENT: ALLOW FOR ALL DRAINAGE, INCLUDING MANHOLES, GULLIES AND PIPE TO BE CONCRETE ENCASED AND CAST INTO BASEMENT SLAB. CONCRETE ENCASEMENT TO MANHOLES AND GULLIES WITHIN GRADE 2 OR 3 WATERPROOFED ENVIRONMENTS TO BE MINIMUM 200MM WATER-RESISTING CONCRETE SPECIALIST DETAILS.
 11. ALL MANHOLES IN BASEMENT TO BE DOUBLE SEALED.
 12. SEWERS TO BE LAID IN MAXIMUM 3m LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER AND THIS IS AGREED BETWEEN THE CONTRACTOR AND THE PIPE SUPPLIER.
 13. MANHOLE COVERS SHALL HAVE A CLEAR OPENING OF 600mm AND BE CLASS D400 BS EN 124 WITH 150mm DEEP FRAMES IN HIGHWAY.
 14. COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOADING BEARING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO 600mm X 600mm.
 15. ALL CONCRETE PIPES TO BE TO BS EN 1916 CLASS 120 (54kN/m).
 16. PLASTIC PIPES SHOULD HAVE THE BSI KITEMARK AND CERTIFIED TO BS EN 13476-1 AND CONFORM WITH WIS 4-35-01 OR BS 13476-2. PIPES LESS THAN OR EQUAL TO 500 DIA SHALL HAVE A SHORT TERM RING STIFFNESS NOT LESS THAN 8kN/m2.
 17. SEWERS TO BE LAID IN CLASS 'S' BEDDING WHERE MINIMUM COVER REQUIREMENTS ARE MET. WHERE MINIMUM COVER DEPTHS CANNOT BE ACHIEVED THEN A 150mm CONCRETE PROTECTION SLAB SHOULD BE PROVIDED.
 18. RISING MAINS TO BE PROVIDED WITH MARKER TAPE ABOVE THE RISING MAIN.
 19. THE DRAINAGE DESIGN, LAYOUT AND DETAILS ARE ALL SUBJECT TO APPROVAL FROM:
- MANCHESTER CITY COUNCIL
- UNITED UTILITIES S106 APPLICATION

- KEY**
- SITE BOUNDARY
 - EXISTING COMBINED SEWER
 - PROPOSED COMBINED DRAINAGE
 - PROPOSED FOUL WATER DRAINAGE
 - PROPOSED SURFACE WATER DRAINAGE
 - INDICATIVE FOUL WATER RISING MAIN
 - INDICATIVE ABOVE GROUND FOUL WATER DRAINAGE
 - INDICATIVE ABOVE GROUND SURFACE WATER DRAINAGE
 - PROPOSED ATTENUATION TANK
 - APPROX BLUE ROOF EXTENTS ABOVE

SECTION A-A SECTION THROUGH DRAINAGE SYSTEM 1:50



BLUE ROOF SUMMARY					
ZONE	BLUE ROOF AREA (m²)	POTENTIAL VOLUME¹ (m³)	CATCHMENT AREA (m²)	TOTAL DISCHARGE (l/s)	NO. OUTLETS
LEVEL 07 TERRACE	528.7	50.2	556.2	556.2	2
ROOF	224.2	21.3	259.6	259.6	2

¹ASSUMES A 100mm ATTENUATION CELL WITH A 90% POROSITY
¹INITIAL BLUE ROOF CALCULATIONS PROVIDED BY BAUDER

P01	ISSUED FOR PLANNING	20.08.21	JB	KG
Rev.	Description:	Date:	By:	Chkd:
				
Project: Renaissance Associates Ltd Carvers Warehouse 77 Dale Street Manchester M1 2HG				

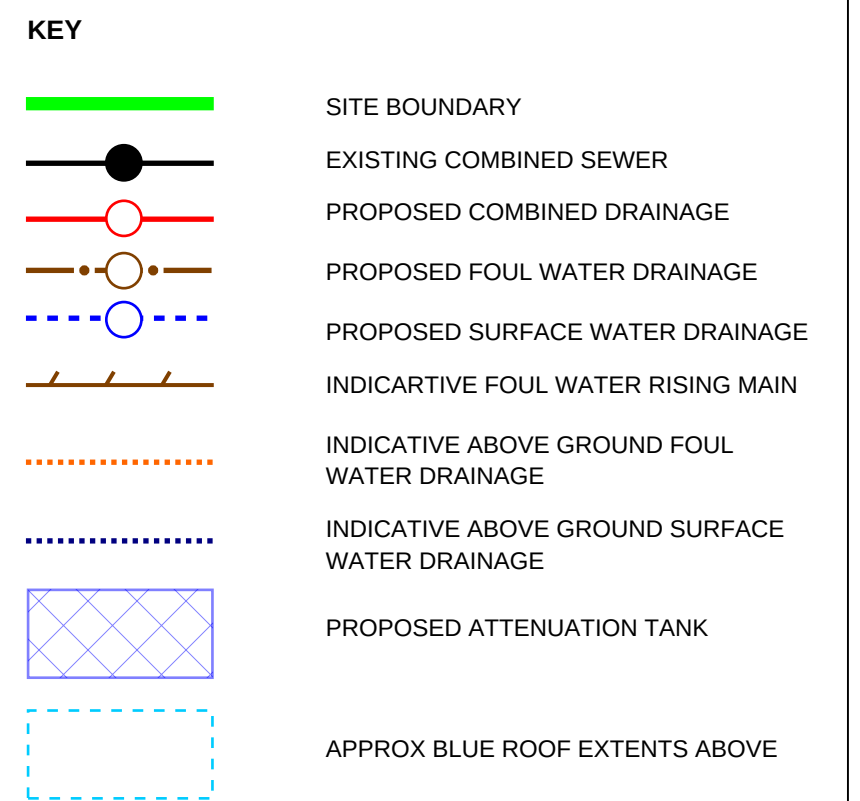
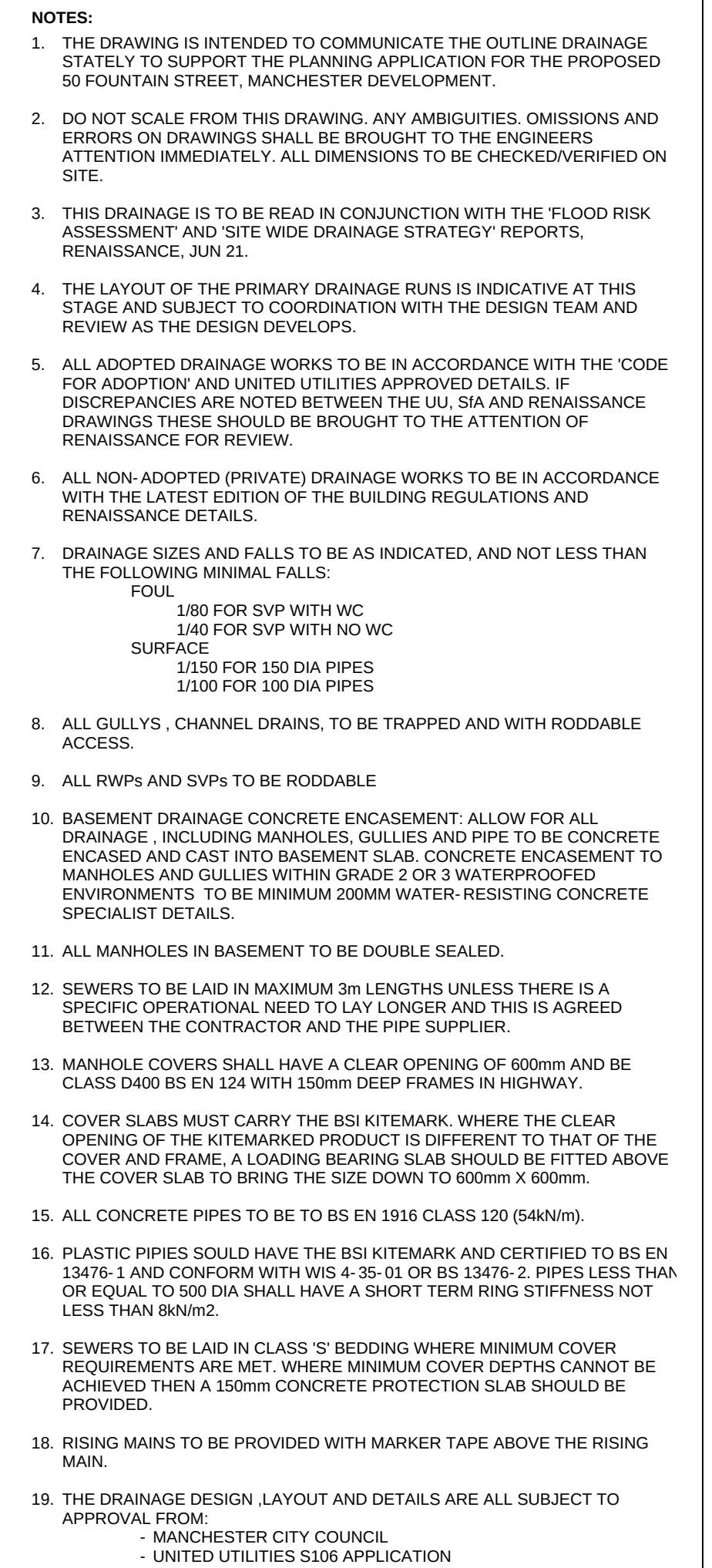
50 FOUNTAIN STREET,
MANCHESTER

Drawing Title:
**BASEMENT OUTLINE
DRAINAGE STRATEGY**

Status:
PRELIMINARY

Size:	Date:	Drawn by:	Designed by:	Checked by:			
A1	JUN'21	JB	JB	KG			
Scale:	1:100	Project No:	2006-05				
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

FRM-REN-00-ZZ-SK-C-01090-P01



P01	ISSUED FOR PLANNING	20.08.21	JB	KG
Rev:	Description:	Date:	By:	Chkd:



50 FOUNTAIN STREET,
MANCHESTER

Drawing Title:

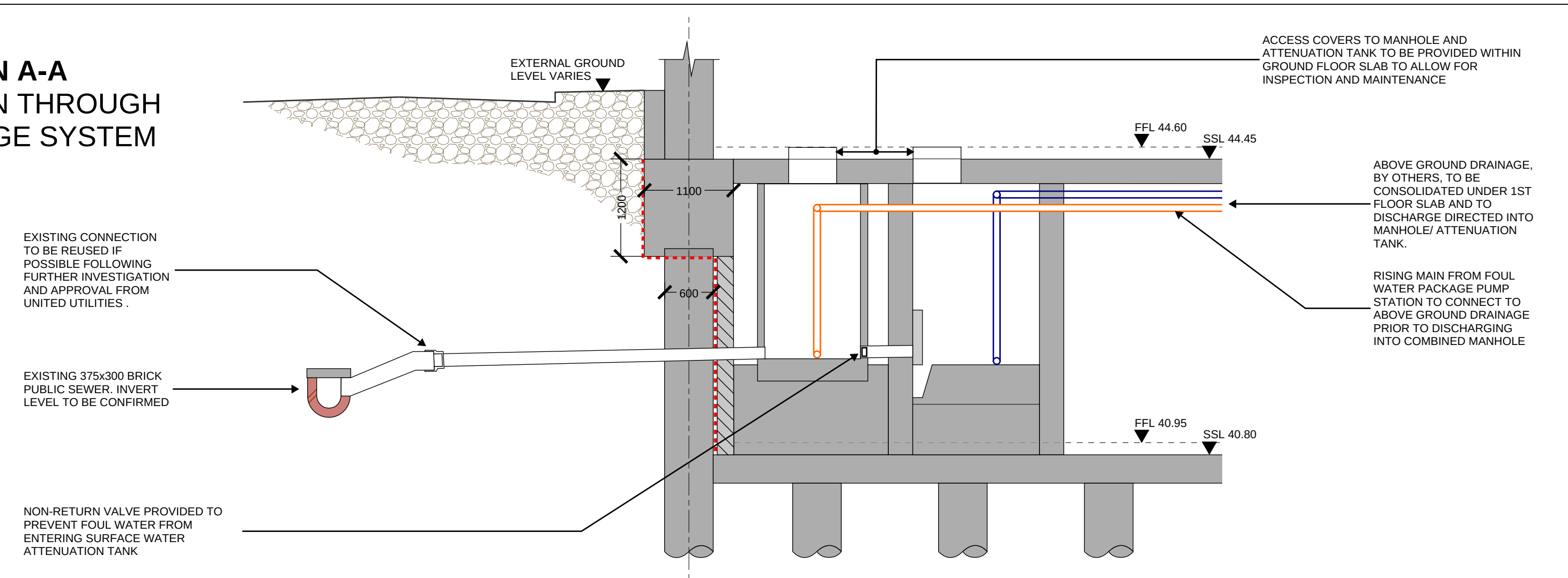
**GROUND FLOOR OUTLINE
DRAINAGE STRATEGY**

Status: **PRELIMINARY**

Size: A1	Date: JUN'21	Drawn by: JB	Designed by: JB	Checked by: KG			
Scale: 1:100		Project No: 2006-05					
Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:

FRM-REN-00-ZZ-SK-C-01100-P01

SECTION A-A
SECTION THROUGH
DRAINAGE SYSTEM
1:50



BLUE ROOF SUMMARY					
ZONE	BLUE ROOF AREA (m²)	POTENTIAL VOLUME¹ (m³)	CATCHMENT AREA (m²)	TOTAL DISCHARGE (l/s)	NO. OUTLETS
LEVEL 07 TERRACE	528.7	50.2	556.2	556.2	2
ROOF	224.2	21.3	259.6	259.6	2

¹ ASSUMES A 100mm ATTENUATION CELL WITH A 95% POROSITY
² INITIAL BLUE ROOF CALCULATIONS PROVIDED BY BAUDER

APPENDIX J
Blue Roof Supplier Calculations

Date: 21/06/2021

Revision: A (1168)

Page: 1

Client: Renaissance Ltd
Project: 50 Fountain Street
Location: Manchester
Roof Location: Roof

Roof Details:

BlueRoof	224.24 m ²	x 100 %
Additional Area	35.36 m ²	x 100 %
Effective Area	259.6 m ²	

Storage Details:

Length	224.24 m
Width	1 m
Depth	100 mm
Porosity	95 %

Rainfall Details - FEH Method:

Return Period	100 years
Climate Change Factor	40 %

Summer Storm Profile

Duration	Intensity		Required storage(m ³)
	mm	mm/h	
5 min	20.3	243.1	5.2
10 min	29.7	178.1	7.6
15 min	37.1	148.4	9.5
30 min	49.5	99.1	12.5
45 min	57.3	76.4	14.3
60 min	63.0	63.0	15.6
2 hours	75.6	37.8	18.1
6 hours	98.1	16.3	20.3
24 hours	129.7	5.4	18.5

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	2 holes
Sump Depth	None
Discharge rate	0.38 l/s
Outlet	2 No
Flow Per Outlet	0.19 l/s

Result:

Outcome	Pass
Critical Storm Duration	6 hrs
Hmax	95 mm
Required Volume	20.3 m ³
Time to half empty	7.5 hrs
Roof Loading	90.53 Kg/m ²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

Whilst the information contained herein is to the best of our knowledge true and accurate we specifically exclude any liability for errors omissions or otherwise arising therefrom.

Details practices principles values and calculations should be verified for accuracy and suitability for the required purpose for use.

NOTE: These calculations are valid for a zero fall roof with minimal variation in levels. Any significant variation will affect the volume of water stored and the roofs ability to attenuate extreme rain events. Typically variations in roof level should be less than 0 to +30mm with no back falls. The H-Max is measured from the mean roof level

Date: 21/06/2021

Revision: A (1168)

Page: 2

Client: Renaissance Ltd
Project: 50 Fountain Street
Location: Manchester
Roof Location: Level 07 Terrace

Roof Details:

BlueRoof	528.7 m ²	x 100 %
Additional Area	27.5 m ²	x 100 %
Effective Area	556.2 m ²	

Storage Details:

Length	528.7 m
Width	1 m
Depth	100 mm
Porosity	95 %

Rainfall Details - FEH Method:

Return Period	100 years
Climate Change Factor	40 %

Summer Storm Profile

Duration	Intensity mm	Intensity mm/h	Required storage(m ³)
5 min	20.3	243.1	11.2
10 min	29.7	178.1	16.4
15 min	37.1	148.4	20.4
30 min	49.5	99.1	27.1
45 min	57.3	76.4	31.1
60 min	63.0	63.0	34.0
2 hours	75.6	37.8	39.8
6 hours	98.1	16.3	47.0
24 hours	129.7	5.4	46.0

Outflow Details:

Attenuation Control	BlueRoof Outlet
Control	3 holes
Sump Depth	None
Discharge rate	0.56 l/s
Outlet	2 No
Flow Per Outlet	0.28 l/s

Result:

Outcome	Pass
Critical Storm Duration	9.22 hrs
Hmax	95 mm
Required Volume	47.7 m ³
Time to half empty	11.8 hrs
Roof Loading	90.22 Kg/m ²

All results based on input data. Please check that input data has been correctly interpreted.

The Bauder Blue Flat Roof Rainwater Calculation Software will perform calculations in accordance with industry best practice for blue roof design based upon provided data relating to a specific building's dimensions geographical location and the flow rate performance of the selected Bauder rainwater outlet product.

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