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Client

Raja Asad,
787 Stockport Road,
Manchester,
M19 3DL

Site Address

816 Stockport Road
Levenshulme
Manchester
M19 3AG

Document Title

Drainage Strategy Report

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Revision History

Issue	Date	Status	Prepared By	Signature
P01	25.07.24	First Issue	Lee Meadowcroft BSc (Hons) PgDip MScCHE CEng MIStructE MICE IHBC	

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Executive Summary

Item	Brief Description
Proposed Development	The demolition of existing buildings currently used as a vehicle repair garage, and the construction of a multi-level development consisting of ground floor retail units and apartments above, with amenities and landscaping, at 816 Stockport Road, Levenshulme, Manchester, M19 3AG.
Site Area	0.042ha (Redline Area).
Flood Zone Classification	Flood Zone 1 – Low Risk.
Geology	At this time a Phase 2 site Investigation has not been undertaken. The British Geological Survey (BGS) dataset would indicate the superficial deposits to comprise Till, Devensian (Clays and silts), with the Bedrock Geology comprising the Chester Formation – Sandstone. A single local borehole, identified some 60m north of the sites on the BGS website has indicated shallow made ground over brown stiff clay to depth.
Infiltration Rate	Based on the assessment of the ground conditions and the building taking up the majority of the redline boundary, infiltration as a means of draining the site has been discounted.
Nearest Watercourses	A 870mm diameter brick culverted watercourse passes beneath the southern part of the site in a westerly direction at circa 2.1m depth. The proposed development will build over this existing culvert to mimic the current scenario. Appropriate applications to be submitted for this.
Nearest Adopted Sewers and Drainage Networks	The United Utilities (UU) sewer records have been reviewed and indicate there to be no public sewers within the site boundary. Within Stockport Road to the east of the site and flowing north is a 300mm diameter combined water sewer at circa 4.3m deep. A 225mm diameter surface water sewer is identified within Matthews Lane to the west. The site boundary currently encompasses a car repair garage with some outbuildings. Investigations have not been able to locate any positive drainage.
Surface Water Drainage Strategy and SuDS Hierarchal Approach	Based on current site information, the proposed strategy is to construct a new private drainage network and outfall to the culverted watercourse passing through the site.
Existing Discharge Rate	With no apparent positive drainage connection that existing site can be classed as Greenfield. The rates below are based on the site area of 420m$^{2.}$ 1 yr – 0.1l/s Qbar – 0.1l/s 30 yr – 0.2l/s 100 yr – 0.2l/s

Item	Brief Description
Proposed Discharge Rate	2l/s to satisfy Manchester City Council (MCC) policy, and reduce the risk of blockage.
Allowance for Climate Change	45% - based on a residential development with 100-year design life.
Proposed Attenuation & SuDS Methods	Increased permeable areas, geocellular attenuation tank and flow control.
Maintenance Responsibility	Management Company.
Foul Drainage Outfall	New foul water drainage to outfall to the existing combined water sewer via an existing or new connection.

Figure 1: Flood Risk and Drainage Strategy Summary

1.0 Introduction

1.1 Brennan Consult has been appointed by Raja Asad to prepare this Drainage Strategy Report to support a planning submission for the demolition of existing vehicle repair garage, and the construction of a multi-level development with ground floor retail units and apartments above, with amenities and landscaping at 816 Stockport Road, Levenshulme, Manchester, M19 3AG. The assessment has been undertaken in line with Section 14 of the 'National Planning Policy Framework' plus the accompanying Planning Policy Guidance on Flood Risk.

1.2 The outline Site Master Plan as indicated in Appendix A provides details of the proposed development intent.

1.3 This Drainage Strategy Report has been commissioned by Raja Asad and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A. This report may not be assigned.

1.4 The report has been commissioned to identify any drainage related issues associated with the proposed development and any likely constraints that could be imposed. The following issues have been addressed within this report.

- Determine any the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
- Discuss Sustainable Drainage Systems (SuDS) as an option for reducing surface water flood risk and devise an outline Drainage layout.
- Devise an appropriate outline surface water drainage strategy (including calculation where appropriate) to deal with any potential increase in surface water runoff and include for climate change. Include for a reduction in predevelopment discharge rates where possible.
- Devise an appropriate outline foul water drainage strategy.

2.0 Development Description and Location

2.1 Site Location

2.1.1 The site is referenced in Figure 2, and a site location map is provided in Appendix A.

Item	Brief Description
Project name	816 Stockport Road.
Site address and location	816 Stockport Road, Levenshulme, Manchester, M19 3AG.
Council Area	Manchester City Council (MCC)
Approximate Grid Reference	OS: 387317, 407583
General Locality	The site is located 5km to the south east of Manchester City Centre.

Figure 2 Site Referencing Information

2.2 Existing Site Description

2.2.1 The development site is largely rectangular in plan shape and currently encompasses a vehicle repair garage with outbuildings and car parking. Midway Street is located along the northern boundary with Stockport Road to the east. Existing buildings are located to the south and west.

2.2.2 The area is generally residential and commercial led.

2.2.3 Figure 3 identifies the overall site location details.

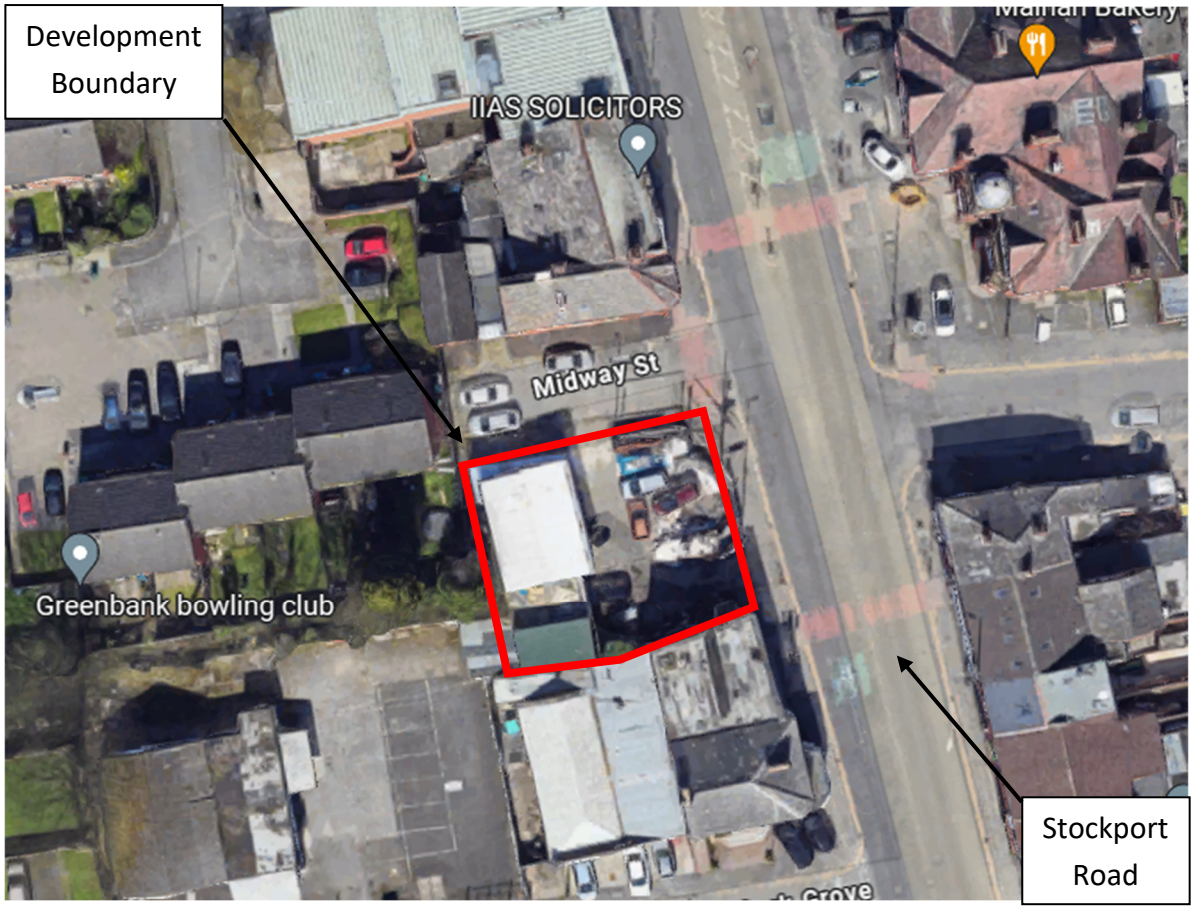


Figure 3 Site Location plan.

2.3 Topography

2.3.1 A full topographical survey has been undertaken at the site. This has identified the existing rear building to hold a level of 54.80m AOD. The front car park falls down towards Stockport Road, holding a level of 54.25m AOD.

3.0 Drainage Strategy

3.1 External Consultation

3.1.1 Brennan Consult have been in contact with United Utilities via a predevelopment drainage enquiry for the development site. Their considered response is currently awaiting. However, it would be anticipated that UU would require evidence that the SuDS Hierarchy has been assessed. Should it be proven that infiltration is not feasible then UU would expect connection to be made to the culverted watercourse at a peak rate to be agreed with the Lead Local Flood Authority. Refer to Appendix E for further details.

3.2 Existing Drainage

3.2.1 United Utilities

The United Utilities (UU) sewer records have been reviewed and indicate there to be no public sewers within the site boundary. Within Stockport Road to the east of the site and flowing north is a 300mm diameter combined water sewer at circa 4.3m deep. A 225mm diameter surface water sewer is identified within Matthews Lane to the west. Refer to Figure 4 below.

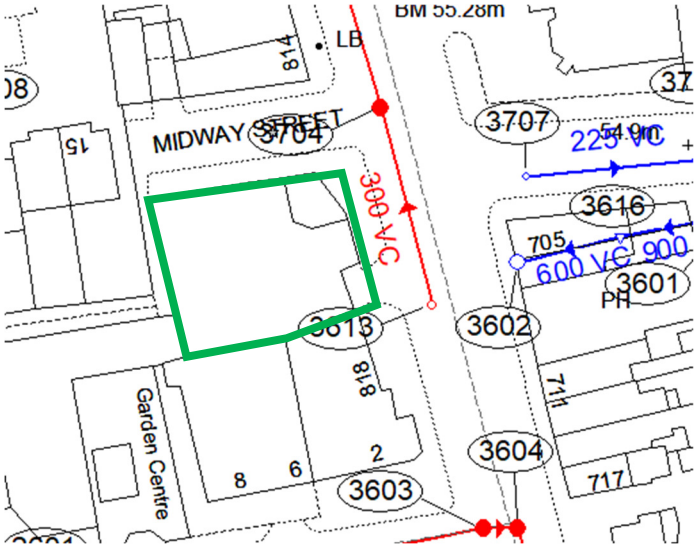


Figure 4 United Utilities Sewer Records

3.2.2 Private Drainage

The site boundary currently encompasses a car repair garage with some outbuildings. Investigations have not been able to locate any positive drainage.

3.3 Existing Runoff

3.3.1 The current site encompasses the garage buildings and hard paved areas with no identified outfall and thus can be classed as Greenfield. Figure 5 below defines the existing Greenfield runoff rates based on the site area of 0.042ha.

Existing Site Area (ha)	1yr Greenfield Rate	Qbar Greenfield Rate	30yr Greenfield Rate	100yr Greenfield Rate
0.042	0.1 l/s	0.1 l/s	0.2 l/s	0.2 l/s

Figure 5 Existing Greenfield Runoff Rates

3.3.2 Taking into consideration of MCC policy to reduce blockage risk, a peak flow rate of 2l/s will be applied to the post development drainage design.

3.4 Geology

3.4.1 At this time a Phase 2 site Investigation has not been undertaken. The British Geological Survey (BGS) dataset would indicate the superficial deposits to comprise Till, Devensian (Clays and silts), with the Bedrock Geology comprising the Chester Formation – Sandstone. A single local borehole, identified some 60m north of the sites on the BGS website has indicated shallow made ground over brown stiff clay to depth.

3.4.2 Based on the assessment of the ground conditions and the building taking up the majority of the redline boundary, infiltration as a means of draining the site has been discounted.

3.5 Hydrological Assessment

3.5.1 As discussed in previous sections, a review of the topographical survey, OS Maps and Environment Agency mapping would indicate a 870mm diameter brick culverted watercourse passes beneath the southern part of the site in a westerly direction at circa 2.1m depth.

3.6 Sustainable Drainage Systems (SuDS) Assessment

3.6.1 SuDS Objectives

Sustainable drainage developed in line with the ideals of sustainable development is collectively referred to as Sustainable Drainage Systems (SuDS). At a particular site, these systems are designed both to manage the environmental risks resulting from the urban runoff and to contribute wherever possible to environmental enhancement. SuDS objectives are therefore to minimise the impacts from the development on the quantity and quality of the runoff and maximise amenity and biodiversity opportunities (CIRIA C753, 2015).

3.6.2 SuDS Design Themes

The 'Management Train Approach' should be central to the surface water drainage strategy of the proposed site. The main objective is treatment and control of runoff as near to the source as possible protecting downstream habitats and further enhancing the amenity value of the site. This concept uses a hierarchy of drainage techniques to incrementally reduce pollution, flow rates and volumes of storm water discharge from the site, and is as follows:

i. **Prevention** – The use of good site design and housekeeping measures to prevent runoff and pollution and includes the use of rainwater reuse / harvesting.

ii. **Source Controls** – Control of runoff at source or as close to source as possible (e.g. soakaways, green roofs, pervious pavements).

iii. **Site Control** – Management of water in a local area and can include below ground storage / attenuation, detention basins, large infiltration devices.

iv. **Regional Control** – Management of water from a site or various sites and can include wetlands and balancing ponds.

3.6.3 SuDS Site Constraints

SuDS techniques are suitable for all sites; therefore, an assessment of the existing site is required so that SuDS limitations can be determined.

- *Land Use Characteristics:* The size and type of development provides the opportunity to include site control SuDS devices only.
- *Site Characteristics:* Based on the ground conditions and the building taking the full development footprint, infiltration is not feasible.
- *Catchment Characteristics:* The site is currently classed as undeveloped and so will be classed as Greenfield.
- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. SuDS will be considered where feasible. Safety to all future users is paramount and so best practice guidance will be incorporated so that these devices blend into the surrounding without the need for significant safety precautions. Maintenance plans will be prepared for all SuDS devices that are included.

3.6.4 SuDS Methods

Figures 6 and 7 on the following pages provide an assessment of various above and below ground SuDS methods that can provide water quality treatment and management of flows to reduce runoff rates and volumes and whether they can be suitably incorporated at this development site. The purpose of this assessment is to set out options to be considered at the planning stage with consideration to time constraints, viability and lifetime maintenance of the residential development.

Method	Comment	Suitability for Development
Green Roofs	• Can be used on suitable low-rise buildings to provide retention, attenuation and treatment of rainwater, and promotes evaporation and local biodiversity.	*Not suitable*: • Architectural proposals for the development and maintenance issues deem this unsuitable.
Water Butts	• Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	*Suitable*: • No external rainwater pipes are proposed and limited end use.
Rainwater Harvesting	• Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	*Not Suitable*: • Additional costs of installation would have severe effect on viability of the development. • Running and maintenance costs would not be acceptable to our client and future occupiers. • The ability to restrict peak flow rates and short-term peak volumes is non-existent where a critical storm event occurs.
Infiltration Options	• Reduces total run off volume from the development.	*Not Suitable*: • Underlying cohesive ground and building taking up the majority of the site would negate infiltration options.
Permeable Surfacing (Infiltration)	• Reduces total run off volume from the development. • Can be used to enhance water quality.	*Not Suitable*: • Underlying cohesive ground and building taking up the majority of the site would negate infiltration options.
Permeable Surfacing (Standard)	• Can be used to enhance quality of runoff water. • Sub-base provides 'source' storage and reduces the volume of storage downstream.	*Suitable*: • Small external areas formed in permeable surfacing or falls to soft landscaping.
Swales, basins and ponds	• Provide areas for above ground surface runoff storage. • Swales also allow filtering of particulate matter, improving water quality	*Not suitable:* • No available area for attenuation pond or swales to be allocated.
Bio-Retention	• Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.	*Not suitable:* • Space constraints on site do not permit above ground areas for flood storage.

Figure 6 Surface SuDS Methods

Method	Comment	Suitability for Development
Geocellular Storage	• Suitable for sites with insufficient space for basins etc. • Suitable for sites where topography prevents the use of open basins etc. • Can be very effective infiltration devices subject to ground conditions.	*Suitable:* • To be incorporated as part of the attenuation measures beneath the rear external areas.
Large Diameter Pipes, Culverts or Tanks	• Suitable for sites with insufficient space for basins etc. • Provide a volume of below ground storage with a high void ratio and good man entry provision to allow for future maintenance and cleaning. • Generally, be suitable for adoption by the statutory water company (e.g. United Utilities).	*Not Suitable*: • No external areas for large, oversized pipes.

Figure 7 Sub-Surface SuDS Methods

3.6.5 SuDS Hierarchal Approach

Based on the SuDS assessment in Figure 6 and 7, plus an assessment of the local site conditions, the SuDS hierarchal approach for discharge of surface water at the development site is considered in greater detail below:

Method	Suitability	Suitability for Development
Infiltration to Ground	No	Underlying cohesive ground and building taking up the full footprint would negate infiltration options.
Connection to Watercourse	Yes	New connection to existing watercourse at restricted rates.
Connection to Surface Water Sewer	No	Higher options available.
Connection to a Combined Sewer	No	Higher options available.

Figure 8 SuDS Hierarchal Approach

3.6.6 SuDS Design Philosophy

The SuDS philosophy for the development site is the promotion of Site Control techniques with discharge to the culverted watercourse at restricted rates.

The following design philosophy is proposed:

- Increased permeable areas.
- Site control in the form of a geocellular attenuation tank and flow control to retain the peak storm events.
- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the local surface water culvert.

3.7 Climate Change

3.7.1 In May 2022, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Rather than nation wide allowances, each area will have its own peak rainfall allowances. In the case of the Manchester area, this is the Irwell Management Catchment peak rainfall allowances.

3.7.2 Based on the nature of the development, a lifespan of circa 100 years is anticipated. Therefore, the potential climate change allowance for the 2070's Upper End Allowance for residential developments is 45%, which will be included in the hydraulic calculations.

3.8 Outline Surface Water Drainage Strategy

3.8.1 Existing greenfield surface water runoff rates have been determined for the existing development site (refer to section 3.3 for details). To comply with MCC requirements, a peak flow rate of 2l/s will be applied to reduce the blockage risk.

3.8.2 The general principal of the surface water drainage strategy is to collect the runoff from the roof of the new roof areas and direct it to a new below ground surface water drainage network beneath the building that then outfalls to the culverted watercourse at a maximum rate of 2l/s. Due to the reduced flow rates an online geocellular tank will act as the means of attenuation.

3.8.3 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2008, Building Regulations part H and latest guidance. This is to provide no flooding up to the 30-year storm return period criterion.

3.8.4 Although it is envisaged that prevention and Source Controls measures could be included in the final scheme, this strategy will assume for outline calculation purposes that only Site Control methods are incorporated. A source control only attenuation assessment has been undertaken. This takes into account the peak flow rate of 2l/s and indicates peak 100-year plus 45% CC event in figure 9 below. It is noted that these rates and volumes are preliminary for this outline assessment and are likely to alter at detailed design stage when more site-specific information is made available.

Impermeable Area (ha)	Discharge Rate	Outline Attenuation Volume for the 100yr + 45% CC Event (m^3)
0.042	2.0 l/s	14

Figure 9 Outline Attenuation Volumes

3.8.5 Drawing 2987-BCL-00-XX-DR-D-0100 in Appendix C indicates the Drainage Strategy Plan based on the Architects master plan intent, with the hydraulic calculations in Appendix D.

3.9 Pollution Control

3.9.1 The development includes roof areas only that will add limited pollution to the downstream network.

3.10 Maintenance

3.10.1 This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints. The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

3.10.2 There are three types of maintenance activities associated with surface water drainage systems. The SuDS Manual, CIRIA C753, defines these as:

- Regular Maintenance – 'basic tasks undertaken on a frequent and predictable schedule' including vegetation management, litter and debris removal, and inspections.'
- Occasional Maintenance – 'tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the routine tasks (sediment removal is an example.'
- Remedial Maintenance – 'intermittent tasks that may be required to rectify faults associated with the system, although the likelihood of faults can be minimised by good design. Where remedial work is found to be necessary, it is likely to be due to site-specific characteristics or unforeseen events, and as such timings are difficult to predict.'

3.10.3 Specific maintenance needs should be monitored, and maintenance schedules adjusted to suit the location and condition of the drainage feature in question.

Operation and Maintenance Activity	SuDS Component		
	Piped Network / Inspection Chambers	Flow Control	Attenuation Storage Tanks
Regular Maintenance			
Inspection	■	■	■
Litter and debris removal	■	■	
Occasional Maintenance			
Sediment management[1]	■	■	■
Remedial Maintenance			
Structure rehabilitation / repair	□	□	□

■ Will be required □ May be required

[1] Sediment should be collected and managed in pre-treatment systems, upstream of the main device.

Figure 10: Extract from The SuDS Manual Table 32.1: Typical key SuDS components operation and maintenance activities.

Inspection, Manhole and Catchpit Chambers

3.10.4 The appropriate health and safety equipment must be used when accessing manholes. 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.

3.10.5 Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed. Regardless of the product used, the pipes will be fully compliant with the drainage specification.

3.10.6 Pipes are intended to be the main conveyance across the development and where oversized they form the attenuation volume required by the limitation of the discharge rate. They are intended to be dry except for during rainfall events. These have been designed to be self-cleaning where possible for smaller diameter pipes, and for larger diameters the risk is reduced due to the overall pipe size.

3.10.7 Access for maintenance is provided through access chambers and manholes.

3.10.8 Regular inspection and maintenance are important to identify areas which may have been obstructed / clogged and may not be drainage correctly thus exposing the development to a greater level of flood risk.

Channels & Gullies

3.10.9 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.

3.10.10 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.

Maintenance schedule	**Required action**	**Typical frequency**
Regular Maintenance	Remove manhole and chamber covers to sewers and flow control on network– inspect to ensure water is flowing freely and that the water flow route is unobstructed. Remove debris and silt as required.	Half Yearly Undertake one of these inspections after leaf fall in autumn
Occasional Maintenance	None required	
Remedial Actions	Re-line or replace pipework if unable to clear blockages by jetting.	As required
Monitoring	Inspect chambers for build-up of silt and debris	Half yearly

Figure 11 – Operation & maintenance requirements for pipe network, manholes & inspection chambers, drainage channels & gullies.

Geocellular Attenuation Tank

3.10.11 Geocellular tanks are modular storage systems made with plastic units. These units can be assembled to achieve the required volume and usually on multiple layers. Generally, the units have 95% of voids content and are used to create an efficient below ground structure to store surface water.

3.10.12 The geocellular units and geotextile are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

3.10.13 Access for maintenance should be provided by an access shaft located on the tank and from the manhole chambers downstream of the tank.

3.10.14 Regular inspection and maintenance are important for the effective operation of attenuation tanks as designed. As the feature is buried, a regular inspection regime is very important to ensure the correction functionality of the surface water drainage network.

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 form 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 blockages by sediment, algae or other matter; remove and replace surface infiltration medium as required.	Annually.
	Remove sediments from pre-treatment structures and/or internal forebays.	Annually, or as required.
Remedial Actions	Repair/rehabilitate inlets, outlets, 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.

Figure 12 – Operation & maintenance requirements for attenuation storage tanks - Based on CIRIA SuDS Manual 2015

Flow Control Units

3.10.15 Flow control units are located in catchpit chambers to act as the means of controlling the downstream flow rate. The are constructed in Stainless steel with no moving parts. The vortex is sized to suit the required flow rate which will vary depending on the head of water that backs up behind.

3.10.16 The control units are proprietary products and therefore manufacturer's recommendations should also be taken into consideration.

Maintenance Schedule	Required Action	Typical Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required).	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.	Monthly and after large storms.
Regular maintenance\ inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then six monthly.
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and flow control chambers.	Annually (or as required after heavy rainfall events)
Remedial Actions	Repair/rehabilitation of inlets.	As required.

Figure 13 – Operation & maintenance requirements for Flow Controls - Based on CIRIA SuDS Manual 2015

3.11 Foul Water Strategy

3.11.1 The foul water drainage strategy is to construct a new network beneath the building and outfall to the combined sewer within Stockport Road via an existing or new connection.

3.11.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2017, Building Regulations Part H.

3.11.3 An indicative foul water drainage layout can be found on the drainage strategy drawing in Appendix C.

Appendix A – Architects Drawings



LOCATION PLAN
1:1250 @ A3

N

0 5 10 20 30 50 METRES

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PLANNING

REVISION	DATE	DESCRIPTION

CLIENT:

PROJECT:

ADDRESS: 816 STOCKPORT ROAD, MANCHESTER, M12 4QN

DRAWING TITLE: LOCATION PLAN

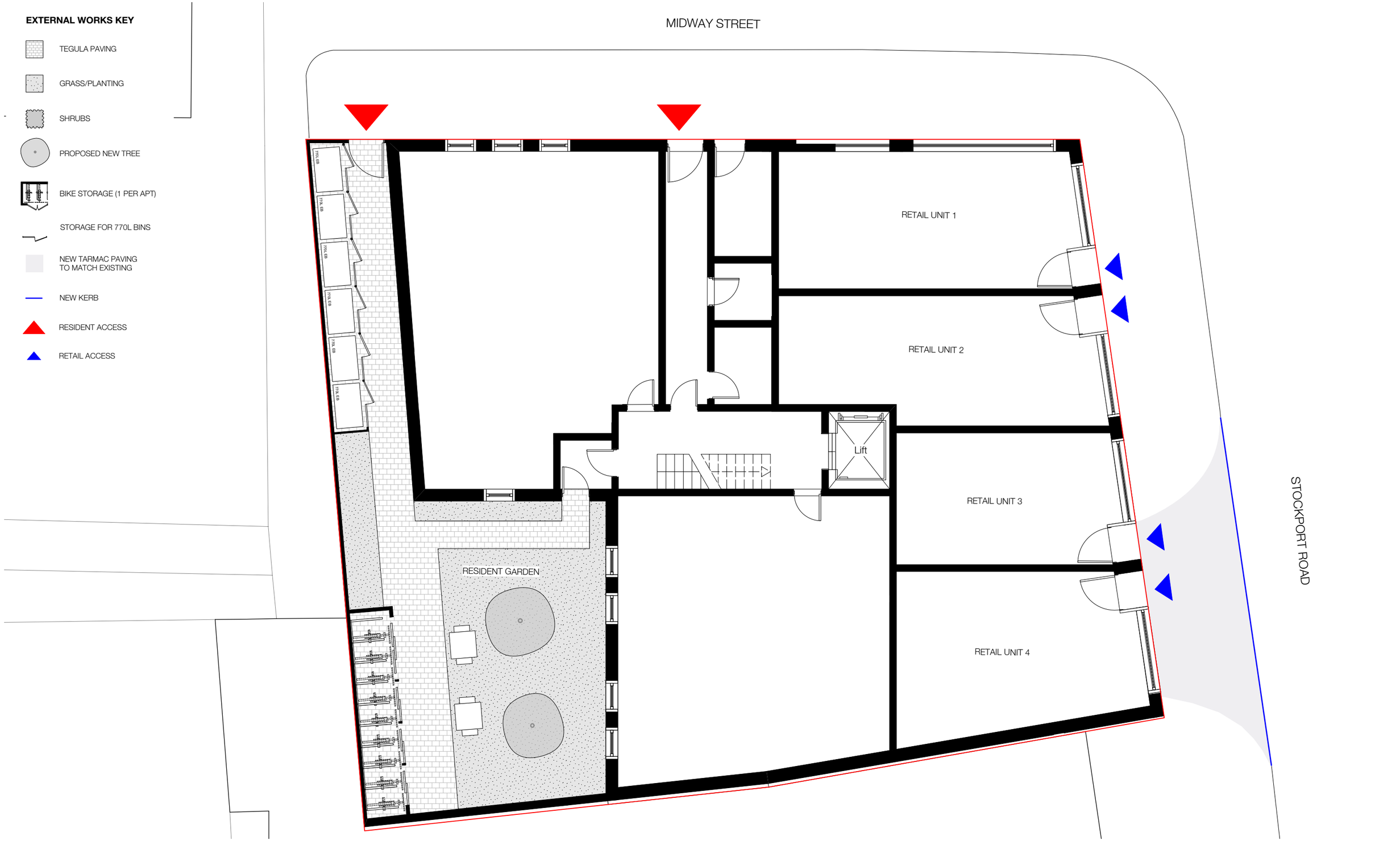
SCALE: 1:1250 @ A3 | DATE: JAN 2024

DRAWING NO: **A831_P_001**

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EXTERNAL WORKS KEY

- TEGULA PAVING
- GRASS/PLANTING
- SHRUBS
- PROPOSED NEW TREE
- BIKE STORAGE (1 PER APT)
- STORAGE FOR 770L BINS
- NEW TARMAC PAVING TO MATCH EXISTING
- NEW KERB
- RESIDENT ACCESS
- RETAIL ACCESS



PROPOSED SITE PLAN

1:100 @ A3

PLANNING

N

0 1 2 4 6 METRES

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REVISION	DATE	DESCRIPTION

CLIENT:

PROJECT:

ADDRESS: 816 STOCKPORT ROAD, MANCHESTER, M12 4QN

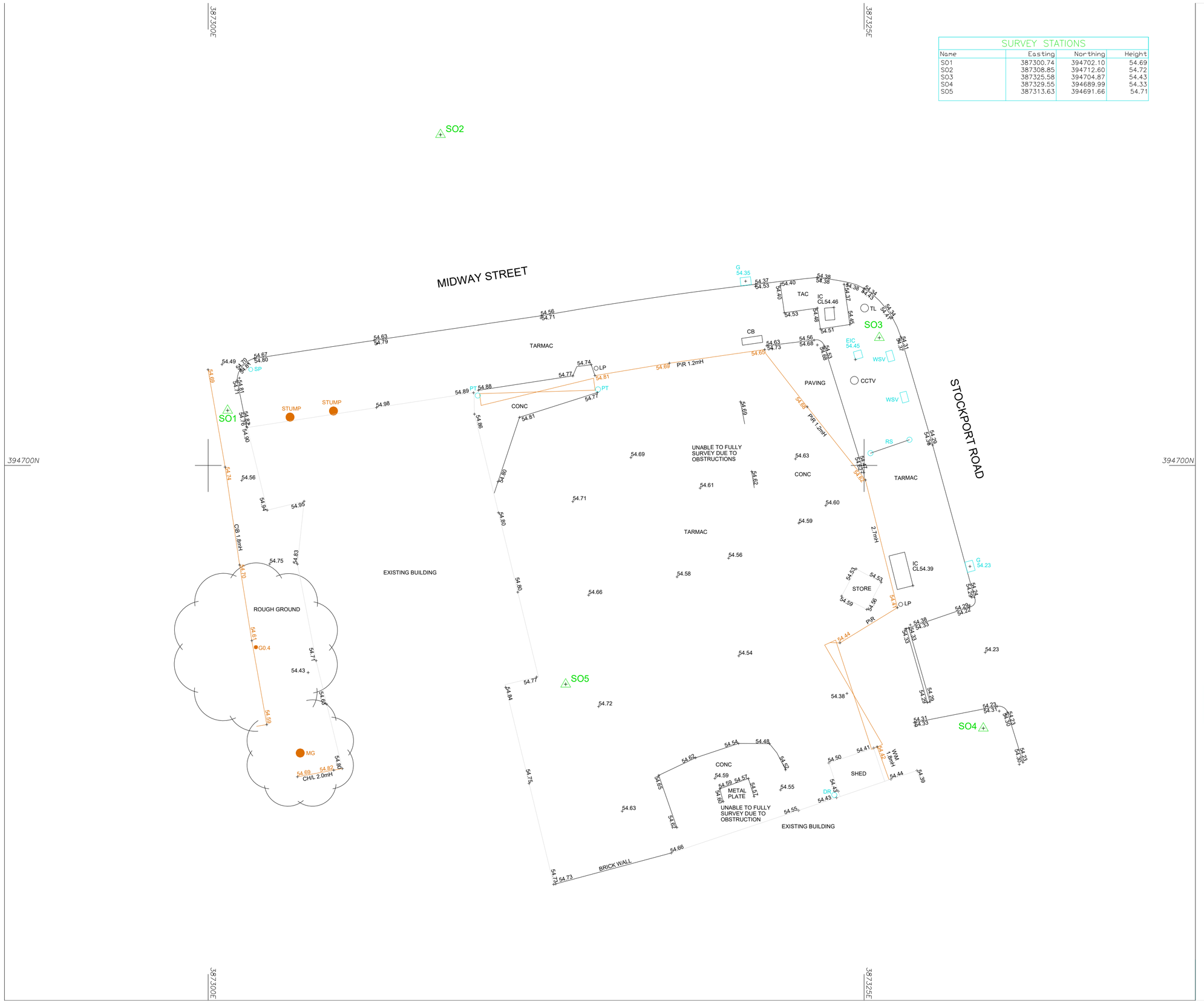
DRAWING TITLE: PROPOSED SITE PLAN

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Appendix B – Topographical Survey



SURVEY STATIONS			
Name	Easting	Northing	Height
SO1	387300.74	394702.10	54.69
SO2	387308.85	394712.60	54.72
SO3	387325.58	394704.87	54.43
SO4	387329.55	394689.99	54.33
SO5	387313.63	394691.66	54.71

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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.

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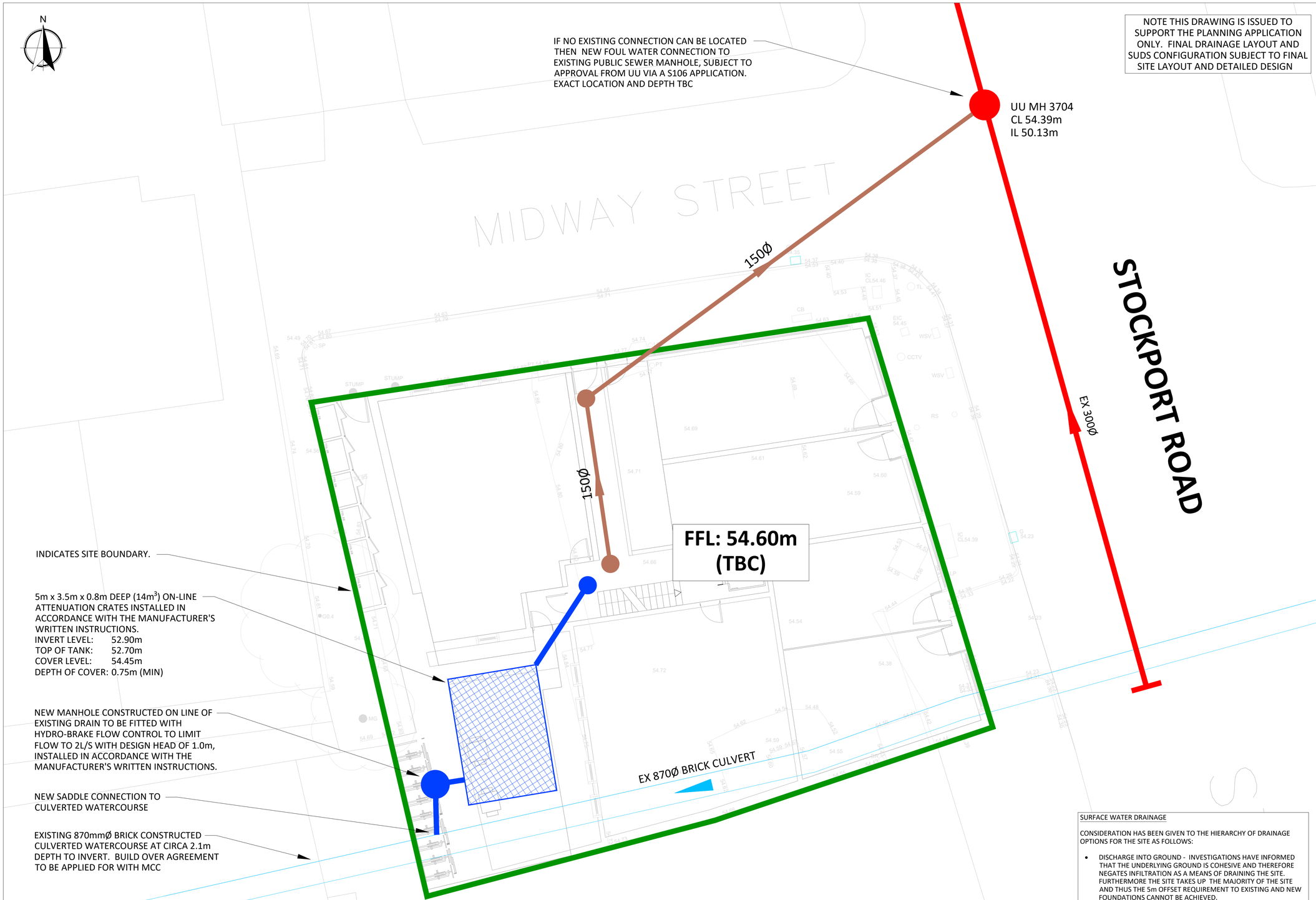
Client
Ollier Smurthwaite Architects

Drawing Title
Topographical Survey of Land at:
816 Stockport Road
Manchester

Scale(s) 1:100	Surveyor DC
Date Jan 23	Drawn OKS
Job Number 23K226	Checked TP

Sheet Size & Drg Number & Revision
A2 23K226/001

Appendix C – Brennan Consult Drawings



DRAINAGE STRATEGY PLAN

SCALE 1:75

FOUL WATER DRAINAGE

FOUL WATER GENERATED BY THE NEW DEVELOPMENT WILL OUTFALL TO THEEXISTING COMBINED PUBLIC SEWER VIA AN EXISTING (IF LOCATED) OR NEW CONNECTION.

SURFACE WATER DRAINAGE

CONSIDERATION HAS BEEN GIVEN TO THE HIERARCHY OF DRAINAGE OPTIONS FOR THE SITE AS FOLLOWS:

- DISCHARGE INTO GROUND - INVESTIGATIONS HAVE INFORMED THAT THE UNDERLYING GROUND IS COHESIVE AND THEREFORE NEGATES INFILTRATION AS A MEANS OF DRAINING THE SITE. FURTHERMORE THE SITE TAKES UP THE MAJORITY OF THE SITE AND THUS THE 5m OFFSET REQUIREMENT TO EXISTING AND NEW FOUNDATIONS CANNOT BE ACHIEVED.
- DISCHARGE TO SURFACE WATER BODY - NEW CONNECTION TO BE MADE TO CULVERTED WATERCOURSE PASSING THROUGH THE SITE AT RESTRICTED RATES.
- DISCHARGE TO SURFACE WATER SEWER, HIGHWAY DRAIN OR OTHER DRAINAGE SYSTEM - NO SURFACE WATER SEWER IN CLOSE PROXIMITY.
- DISCHARGE TO COMBINED WATER SEWER - HIGHER OPTIONS AVAILABLE.

SUMMARY

NEW CONNECTION FROM DEVELOPMENT SITE TO CULVERTED WATERCOURSE AT A PEAK RATE NOT TO EXCEED 2L/S.

SUDS TO ENCOMPASS:

- INCREASED PERMEABLE AREAS.
- GEOCELLULAR ATTENUATION CRATES.
- FLOW CONTROL.

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GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER ASSOCIATED DRAWINGS. ANY DISCREPANCY TO BE RAISED PRIOR TO CONSTRUCTION. ANY CONSTRUCTION WORKS WHICH COMMENCE BEFORE THESE DRAWINGS ARE APPROVED ARE AT THE RISK OF THE BUILDING CONTRACTOR.
2. ALL DIMENSIONS ARE IN MILLIMETERS (mm). DO NOT SCALE FROM THIS DRAWING, WORK TO STATED DIMENSIONS ONLY.
3. BUILDING CONTRACTOR TO ENSURE ALL WORKS COMPLY WITH THE CURRENT EDITION OF THE BUILDING REGULATIONS. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH APPROVED DOCUMENT REGULATION 7.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, FABRICATION, ERECTION AND REMOVAL OF ALL TEMPORARY WORKS AND SHALL PROVIDE ALL TEMPORARY BRACING AS NECESSARY TO MAINTAIN STRUCTURAL STABILITY DURING CONSTRUCTION.
5. IF THE CONTRACTOR CONSIDERS THAT HE DOES NOT HAVE SUFFICIENT INFORMATION TO SAFELY COMPLETE THE WORKS DETAILED ON THIS DRAWING, HE SHOULD CONTACT THE ENGINEER.

DRAINAGE LEGEND

- INDICATES NEW FW DRAINAGE
- INDICATES EXISTING CW SEWER
- INDICATES NEW SW DRAINAGE
- INDICATES EXISTING CULVERT
- INDICATES SITE BOUNDARY

CDM DESIGNER'S RISK ASSESSMENT

BRENNANCONSULT ASSUME THAT THE CONTRACTOR IS COMPETENT IN MATTERS OF HEALTH & SAFETY AND IS AWARE OF ALL THE NORMAL RISKS ASSOCIATED WITH CONSTRUCTION OF THE TYPE SHOWN ON THIS DRAWING. REMAINING UNUSUAL RISKS ARE:-

CONSTRUCTION	CHK'D.
1. POSSIBILITY OF UNCHARTED BURIED SERVICES. CONTRACTOR TO SURVEY AND SCAN FOR LOCATION OF ANY POSSIBLE BURIED SERVICES IN ADVANCE OF ANY DRAINAGE WORKS BEING UNDERTAKEN. 2. REFER TO SI REPORT FOR GROUND CONDITIONS.	CB
MAINTENANCE / CLEANING	
NO UNUSUAL RISKS	CB
DECOMMISSIONING / DEMOLITION	
NO UNUSUAL RISKS	CB

REV	REVISION DESCRIPTION	BY	DATE	CHECKED
P01	PRELIMINARY ISSUE	PG	24.07.24	LM

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RESIDENTIAL DEVELOPMENT
DRAINAGE STRATEGY PLAN

Status: PRELIMINARY

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Revision
2987	BCL	00	XX	DR	D	0100	P01

Scale	Size	Drawn	Date	Checked	Passed
1:75	A1	PG	JULY 24	LM	CB

Appendix D – Hydraulic Calculations

ICP SUDS Mean Annual Flood

Input

Return Period (years)	1	Soil	0.300
Area (ha)	0.042	Urban	0.000
SAAR (mm)	828	Region Number	Region 10

Results l/s

QBAR Rural	0.1
QBAR Urban	0.1
Q1 year	0.1
Q1 year	0.1
Q30 years	0.2
Q100 years	0.2

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Summary of Results for 100 year Return Period (+45%)

Half Drain Time : 61 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	53.331	0.431	0.0	2.0	2.0	7.4	O K
30 min Summer	53.474	0.574	0.0	2.0	2.0	9.8	O K
60 min Summer	53.553	0.653	0.0	2.0	2.0	11.2	O K
120 min Summer	53.549	0.649	0.0	2.0	2.0	11.1	O K
180 min Summer	53.512	0.612	0.0	2.0	2.0	10.5	O K
240 min Summer	53.467	0.567	0.0	2.0	2.0	9.7	O K
360 min Summer	53.351	0.451	0.0	2.0	2.0	7.7	O K
480 min Summer	53.252	0.352	0.0	2.0	2.0	6.0	O K
600 min Summer	53.174	0.274	0.0	2.0	2.0	4.7	O K
720 min Summer	53.115	0.215	0.0	2.0	2.0	3.7	O K
960 min Summer	53.041	0.141	0.0	1.9	1.9	2.4	O K
1440 min Summer	52.985	0.085	0.0	1.6	1.6	1.5	O K
2160 min Summer	52.963	0.063	0.0	1.2	1.2	1.1	O K
2880 min Summer	52.953	0.053	0.0	1.0	1.0	0.9	O K
4320 min Summer	52.943	0.043	0.0	0.7	0.7	0.7	O K
5760 min Summer	52.938	0.038	0.0	0.6	0.6	0.6	O K
7200 min Summer	52.934	0.034	0.0	0.5	0.5	0.6	O K
8640 min Summer	52.931	0.031	0.0	0.4	0.4	0.5	O K
10080 min Summer	52.929	0.029	0.0	0.4	0.4	0.5	O K
15 min Winter	53.398	0.498	0.0	2.0	2.0	8.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	123.799	0.0	9.7	27
30 min Summer	82.577	0.0	13.0	38
60 min Summer	52.627	0.0	16.6	60
120 min Summer	32.469	0.0	20.4	94
180 min Summer	24.166	0.0	22.8	130
240 min Summer	19.482	0.0	24.5	164
360 min Summer	14.250	0.0	26.9	228
480 min Summer	11.426	0.0	28.8	288
600 min Summer	9.617	0.0	30.3	346
720 min Summer	8.350	0.0	31.6	402
960 min Summer	6.676	0.0	33.6	514
1440 min Summer	4.862	0.0	36.7	740
2160 min Summer	3.534	0.0	40.1	1100
2880 min Summer	2.815	0.0	42.6	1452
4320 min Summer	2.040	0.0	46.3	2172
5760 min Summer	1.621	0.0	49.0	2880
7200 min Summer	1.355	0.0	51.2	3632
8640 min Summer	1.171	0.0	53.1	4408
10080 min Summer	1.034	0.0	54.7	5120
15 min Winter	123.799	0.0	10.9	28

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Summary of Results for 100 year Return Period (+45%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
30 min Winter	53.557	0.657	0.0	2.0	2.0	11.2	O K
60 min Winter	53.653	0.753	0.0	2.0	2.0	12.9	O K
120 min Winter	53.643	0.743	0.0	2.0	2.0	12.7	O K
180 min Winter	53.587	0.687	0.0	2.0	2.0	11.7	O K
240 min Winter	53.516	0.616	0.0	2.0	2.0	10.5	O K
360 min Winter	53.335	0.435	0.0	2.0	2.0	7.4	O K
480 min Winter	53.189	0.289	0.0	2.0	2.0	4.9	O K
600 min Winter	53.092	0.192	0.0	2.0	2.0	3.3	O K
720 min Winter	53.034	0.134	0.0	1.9	1.9	2.3	O K
960 min Winter	52.986	0.086	0.0	1.6	1.6	1.5	O K
1440 min Winter	52.963	0.063	0.0	1.2	1.2	1.1	O K
2160 min Winter	52.950	0.050	0.0	0.9	0.9	0.8	O K
2880 min Winter	52.943	0.043	0.0	0.7	0.7	0.7	O K
4320 min Winter	52.936	0.036	0.0	0.5	0.5	0.6	O K
5760 min Winter	52.931	0.031	0.0	0.4	0.4	0.5	O K
7200 min Winter	52.928	0.028	0.0	0.3	0.3	0.5	O K
8640 min Winter	52.926	0.026	0.0	0.3	0.3	0.4	O K
10080 min Winter	52.925	0.025	0.0	0.3	0.3	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	82.577	0.0	14.6	39
60 min Winter	52.627	0.0	18.6	62
120 min Winter	32.469	0.0	22.9	100
180 min Winter	24.166	0.0	25.6	138
240 min Winter	19.482	0.0	27.5	176
360 min Winter	14.250	0.0	30.2	244
480 min Winter	11.426	0.0	32.2	300
600 min Winter	9.617	0.0	33.9	352
720 min Winter	8.350	0.0	35.3	404
960 min Winter	6.676	0.0	37.7	502
1440 min Winter	4.862	0.0	41.2	744
2160 min Winter	3.534	0.0	44.9	1104
2880 min Winter	2.815	0.0	47.7	1464
4320 min Winter	2.040	0.0	51.8	2152
5760 min Winter	1.621	0.0	54.9	2936
7200 min Winter	1.355	0.0	57.4	3680
8640 min Winter	1.171	0.0	59.5	4360
10080 min Winter	1.034	0.0	61.3	5128

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Shortest Storm (mins)	15
Ratio R	0.368	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.042

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.010	8	12	0.010	16	20	0.002
4	8	0.010	12	16	0.010			

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Model Details

Storage is Online Cover Level (m) 54.450

Cellular Storage Structure

Invert Level (m) 52.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	18.0	18.0	5.200	0.0	31.6
0.400	18.0	24.8	5.600	0.0	31.6
0.800	18.0	31.6	6.000	0.0	31.6
0.801	0.0	31.6	6.400	0.0	31.6
1.600	0.0	31.6	6.800	0.0	31.6
2.000	0.0	31.6	7.200	0.0	31.6
2.400	0.0	31.6	7.600	0.0	31.6
2.800	0.0	31.6	8.000	0.0	31.6
3.200	0.0	31.6	8.400	0.0	31.6
3.600	0.0	31.6	8.800	0.0	31.6
4.000	0.0	31.6	9.200	0.0	31.6
4.400	0.0	31.6	9.600	0.0	31.6
4.800	0.0	31.6	10.000	0.0	31.6

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0070-2000-0800-2000
Design Head (m)	0.800
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	70
Invert Level (m)	52.900
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	2.0
Flush-Flo™	0.240	2.0
Kick-Flo®	0.504	1.6
Mean Flow over Head Range	-	1.7

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

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Hydro-Brake® Optimum Outflow Control

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.8	1.200	2.4	3.000	3.7	7.000	5.5
0.200	2.0	1.400	2.6	3.500	3.9	7.500	5.6
0.300	2.0	1.600	2.7	4.000	4.2	8.000	5.8
0.400	1.9	1.800	2.9	4.500	4.4	8.500	6.0
0.500	1.6	2.000	3.0	5.000	4.7	9.000	6.2
0.600	1.8	2.200	3.2	5.500	4.9	9.500	6.3
0.800	2.0	2.400	3.3	6.000	5.1		
1.000	2.2	2.600	3.4	6.500	5.3		

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Appendix E – UU Pre Development Enquiry Response

From:	Paul Graveney
To:	Lee Meadowcroft
Subject:	FW: Pre Development Enquiry for: Land at 816 Stocckport Road, Manchester, M12 1PY UU Reference Number : 06091295
Date:	01 August 2024 10:04:00
Attachments:	~WRD0003.jpg image001.png image002.png

Hi Lee,

Pre dev from UU if time to still add into the appendix.

Paul

From: wastewaterdeveloperservices@uuplc.co.uk <wastewaterdeveloperservices@uuplc.co.uk>
Sent: Wednesday, July 31, 2024 4:20 PM
To: Paul Graveney <pgraveney@brennanconsult.com>
Subject: Pre Development Enquiry for: Land at 816 Stocckport Road, Manchester, M12 1PY UU Reference Number : 06091295

Good afternoon Paul,
Pre Development Enquiry for: Land at 816 Stocckport Road, Manchester, M12 1PY
UU Reference Number : 06091295

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 the public foul water/combined sewer system.
Our preferred point of discharge would be to the 300mm diameter public combined sewer within Stockport Road located to the East 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.
In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

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.

Waterbody

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you contact the Lead Local Flood Authority and/or Environment Agency to discuss a point of discharge to the 600mm watercourselocated in the site boundary. We would encourage you to identify and engage with any third party landowner and riparian owner to agree access and discharge rights to the water body if this is not in your ownership.

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 pubic sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

We have reviewed our records and can confirm that there does not appear to be any charted public sewers located within the boundary of proposed development. However, due to the accuracy of the records and the public sewer transfer legislation in 2011, not all public sewers are shown on our records so we would ask that you proceed with caution and carry out your own site investigation works. If any uncharted sewers are identified while carrying out your works we would ask that you contact United Utilities at the earliest opportunity so that we can offer guidance and update our records.

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/wastewater-services/sewer-connections/sewer-connection/

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

Lewis Barr
Assistant Developer Engineer
Developer Services & Metering
Customer Services
07827286541
unitedutilities.com

If you have received a great service today why not tell us?
Visit: http://unitedutilities.thewowawards.co.uk/nominate

---------- Original Message ----------
From: wastewaterdeveloperservices@uuplc.co.uk
[wastewaterdeveloperservices@uuplc.co.uk]
Sent: 31/07/2024 09:13
To: pgraveney@brennanconsult.com
Subject: 06091295 - Pre Development Enquiry - 816 Stockport Road, Manchester

Good Morning

Please accept this email as receipt of your application received on 25/07/2024 for the above development. This has now been logged on our system and the job reference is **06091295** we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Lewis Barr for technical assessment. You will receive their response within 10 working days.

Kind regards

Lois Williams
Developer Services Assistant
Developer Services & Metering
Customer Services
unitedutilities.com
Tel: 0345 072 6067 Option 2 for Wastewater Services)
Direct Tel:

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated



Visit: *https://unitedutilities.thewowawards.co.uk/nominate*

---------- Original Message ----------

From: Paul Graveney [pgraveney@brennanconsult.com]

Sent: 25/07/2024 11:03

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: Pre Development Enquiry - 816 Stockport Road, Manchester

Good Morning,

Please find attached our pre development wastewater enquiry for a proposed multi level residential development off Stockport Road, manchester

Regards

Paul

Paul Graveney
Civil Engineer for

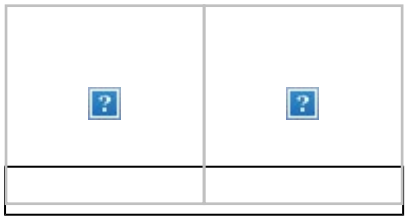
[Image is no longer available]

Signatories to the Engineer's Climate & Biodiversity Emergency declaration #engineersdeclare

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