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Date: **5th January 2024**

Rev: **P02**

Client

**Cube Homes
2a Derwent Avenue
West Didsbury
Manchester
M21 7QP**

Site Address

**Land off High Lane
Chorlton
Manchester
M21 9FA**

Document Title

Drainage Strategy Report



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Revision History

Issue	Date	Status	Prepared By	Signature
P01	27.07.23	First Issue	Lee Meadowcroft BSc (Hons) PgDip MScCHE CEng MStructE MICE IHBC	
P02	05.01.24	Second Issue Minor layout changes	Lee Meadowcroft BSc (Hons) PgDip MScCHE CEng MStructE MICE IHBC	

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Executive Summary

Item	Brief Description
Development Proposed	The construction of fourteen town houses, six apartments and refurbishment of existing building into apartments, with associated access, landscaping and car parking on land off High Lane, Chorlton, Manchester, M21 9FA.
Site Area	0.44 ha (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 dataset would indicate the superficial deposits to be Glaciofluvial Sheet Deposits (Sand and Gravel), with the Bedrock Geology comprising the Wilmslow Sandstone Formation – Sandstone.
Infiltration Rate	Based on the assessment of the BGS data set, it is anticipated that infiltration would be suitable as a means of draining the site. As part of the future Phase 2 site investigation, infiltration tests in line with BRE 365 Guidance will be undertaken.
Nearest Watercourses	The Chorlton Brook is located 400m to the south of the site.
Nearest Adopted Sewers and Drainage Networks	The United Utilities sewer records have been reviewed and indicate a 300mm VC combined water sewer within Acres Road to the east, High Lane to the north and Stockton Road to the west. No surface water sewers have been identified in close proximity. A CCTV survey has been completed and indicates a number of small diameter combined water drains outfalling unrestricted to the combined sewers bounding the site.
Surface Water Drainage Strategy and SuDS Hierarchical Approach	Based on current site information, the proposed strategy is to infiltrate to the underlying sands and gravels via a number of infiltration tanks located in the rear gardens.
Existing Discharge Rate	Brownfield @ 4400m ² 1 yr – 37l/s (30mm/hr) 30 yr – 79l/s (65mm/hr) 100 yr – 116l/s (100mm/hr)
Proposed Discharge Rate	In lieu of formal testing, an infiltration rate of 5x10 ⁻⁵ m/s has been used.
Allowance for Climate Change	45% - based on a residential development with 100-year design life.
Proposed Attenuation & SuDS Methods	Water butts, Permeable Surfacing, Geocellular infiltration tanks.
Maintenance Responsibility	Property Owners / Management Company
Foul Drainage Outfall	Existing or new connection to the combined public sewer located beyond the north, east and western boundaries.

Figure 1: Flood Risk and Drainage Strategy Summary

1.0 Introduction

- 1.1 Brennan Consult has been appointed by Cube Homes to prepare this Drainage Strategy Report to support a planning submission for the construction of fourteen town houses, six apartments and refurbishment of existing building into apartments, with associated access, landscaping and car parking on land off High Lane, Chorlton, Manchester, M21 9FA. The assessment has been undertaken in line with Section 10 of the 'National Planning Policy Framework' plus the accompanying Technical 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 Cube Homes 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	Land off High Lane.
Site address and location	55 High Lane, Chorlton, Manchester, M21 9FA.
Council Area	Manchester City Council
Approximate Grid Reference	OS: 381502, 393735
General Locality	The site is located approx. 4km to the south west of Manchester City Centre within the suburb of Chorlton.

Figure 2 Site Referencing Information

2.2 Existing Site Description

2.2.1 The development site is rectangular in plan shape and currently encompasses the former Islamic high School for Girls, with buildings to the north and west of a tarmac playground. There are three access points, two from High Lane to the north and one from Stockton Road to the west.

2.2.2 The site is also bounded by residential areas to all sides.

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 site as being relatively flat with a slight fall from 28.30m AOD along the southern boundary to 27.70m AOD adjacent High Lane to the north.

2.4 Hydrology

- 2.4.1 The closest identified watercourse is the Chorlton Brook, located 400m to the south of the site flowing generally in a westerly direction where it outfalls to the River Mersey.

3.0 Flood Risk Review

3.1 Fluvial Flood Risk Review

- 3.1.1 Figure 4 below locates the site on the Environment Agency's indicative floodplain map. It is clear from this that the red line boundary sits outside of a fluvial generator of flood water from any identified water body or river. It is considered therefore that the site lays outside of the active 100-year and extreme event floodplains, thus lying within 'Flood Zone 1 Classification' in accordance with the National Planning Policy Framework (NPPF) Flood Risk Guidance Notes, i.e. probability of annual fluvial flooding significantly less than 1 in 1000 in any one year (<0.1%). The risk from fluvial flood water is diminished to acceptable levels.

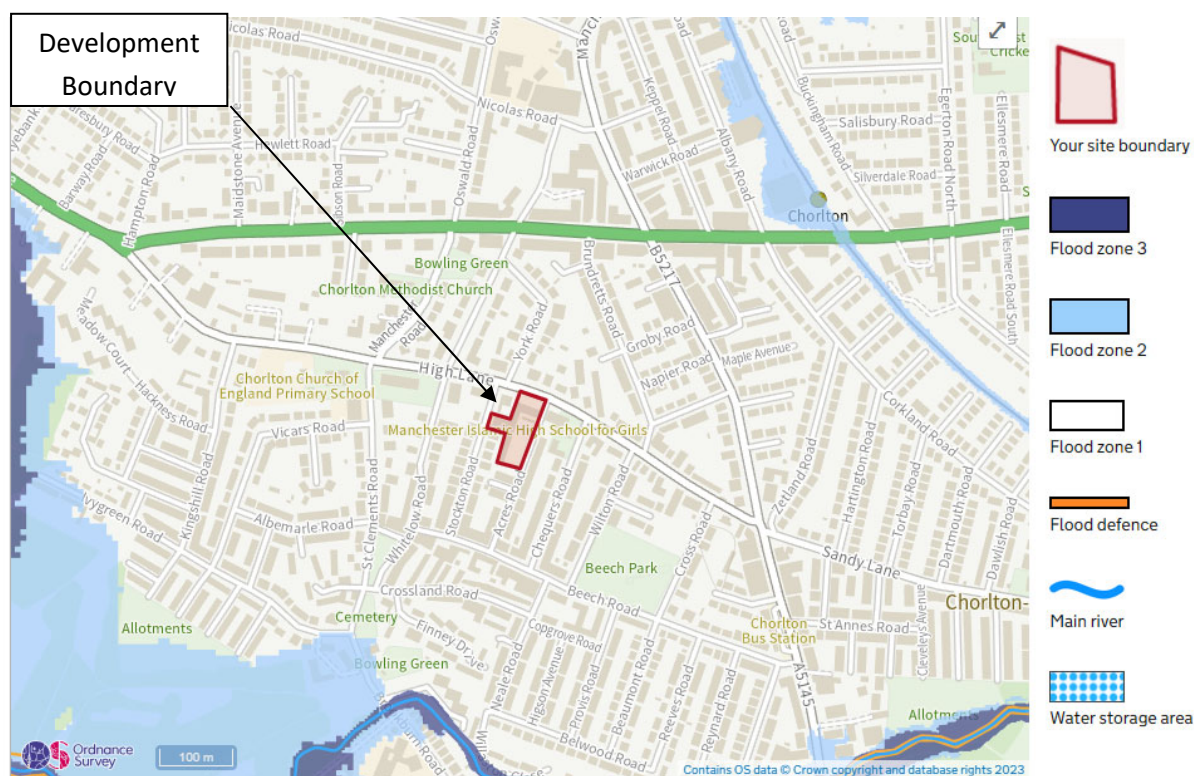


Figure 4 EA Indicative Flood Maps

- 3.1.2 In addition, the development application boundary is less than 1ha in plan area. In line with criteria set within the NPPF a Flood Risk Assessment is not required to support a planning application if the development is less than 1ha and in Flood Zone 1.

4.0 Drainage Strategy

4.1 External Consultation

- 4.1.1 Brennan Consult have been in contact with United Utilities via a predevelopment drainage enquiry for the development site. In their considered response they have advised that evidence should be provided that the SuDS Hierarchy has been assessed. Should this assessment confirm that infiltration is not feasible they would then allow connection to the combined sewer in High Lane at a peak rate not exceeding 5l/s.

4.2 Existing Drainage

4.2.1 United Utilities

The United Utilities sewer records have been reviewed and indicate a 300mm VC combined water sewer within Acres Road to the east, High Lane to the north and Stockton Road to the west. No surface water sewers have been identified in close proximity. Refer to Figure 5 below.

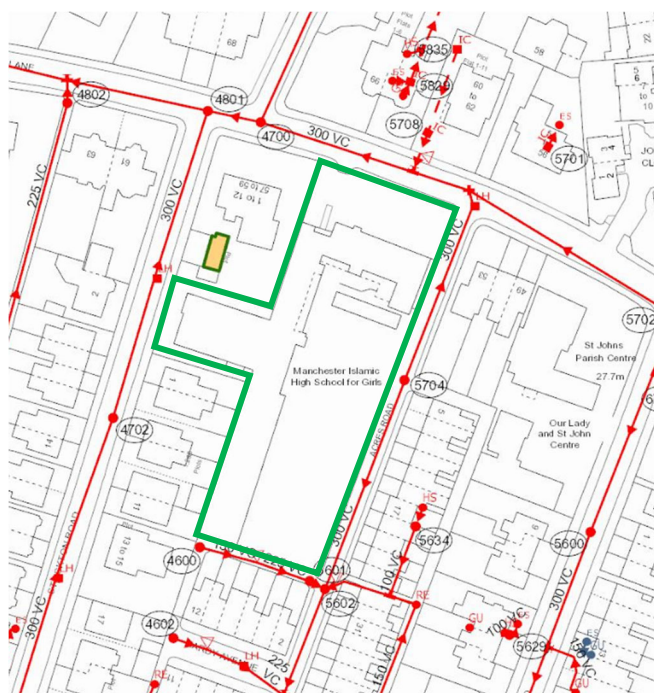


Figure 5 United Utilities Sewer Records

4.2.2 Private Drainage

A CCTV survey has been completed and indicates a number of small diameter combined water drains outfalling unrestricted to the combined water sewers bounding the site. Refer to Appendix For details.

4.3 Existing Runoff

- 4.3.1 The site area is fully impermeable with unrestricted outflows to the combined sewers bounding the site. Figure 6 below defines the existing brownfield runoff rates based on a site area of 0.44ha.

Existing Site Area (ha)	1yr Brownfield Rate (30mm/hr)	30yr Brownfield Rate (65mm/hr)	100yr Brownfield Rate (95mm/hr)
0.44	37l/s	79l/s	116l/s

Figure 6 Existing Brownfield Runoff Rates

4.4 Geology

- 4.4.1 At this time a Phase 2 site Investigation has not been undertaken. The British Geological Survey dataset would indicate the superficial deposits to be Glaciofluvial Sheet Deposits (Sand and Gravel) with the Bedrock Geology comprising the Wilmslow Sandstone Formation - Sandstone. In light of these findings it is considered that infiltration has the potential to be suitable for draining the site. At this time an infiltration rate of 5×10^{-5} m/s will be used for outline sizing of the soakaway tanks, with formal BRE 365 testing to be completed as part of the Phase 2 intrusive investigations.

4.5 Hydrological Assessment

- 4.5.1 As discussed in previous sections, a review of the topographical survey, OS Maps and Environment Agency maps would indicate the closest watercourse to be the Chorlton Brook, located approximately 400m to the south.

4.6 Sustainable Drainage Systems (SuDS) Assessment

4.6.1 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).

4.6.2 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.

4.6.3 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 BGS mapping, infiltration may be suitable subject to the results of infiltration testing.
- *Catchment Characteristics:* The existing site is fully impermeable and so for drainage purposes it will be classed Brownfield.
- *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.

4.6.4 SuDS Methods

Figures 7 and 8 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.	<u>Suitable:</u> Architectural proposals for the development have indicated some small areas of green roof to the flat roof areas of Block Type A.
Water Butts	Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas.	<u>Suitable:</u> Can be located at base of rainwater down-pipes. Subject to Client approval.
Rainwater Harvesting	Rainwater harvesting reduces the total runoff volume from the developed site and reduces treated water consumption.	<u>Not Suitable:</u> - 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.	<u>May be Suitable:</u> Potential underlying sands and gravels would indicate ground should be suitable for infiltration. Further investigations to be undertaken.
Permeable Surfacing (Infiltration)	- Reduces total run off volume from the development. - Can be used to enhance water quality.	<u>May be Suitable:</u> Potential underlying sands and gravels would indicate ground should be suitable for infiltration. Further investigations to be undertaken.
Permeable Surfacing (Standard)	- Can be used to enhance quality of runoff water. - Sub-base provides 'source' storage and reduces the volume of storage downstream.	<u>Suitable:</u> Private driveways and parking bays have the potential to attenuate and filter surface water flows through the use of permeable surfacing (subject to confirmation of surface finishes).
Swales, basins and ponds	- Provide areas for above ground surface runoff storage. - Swales also allow filtering of particulate matter, improving water quality	<u>Not suitable:</u> No available area for attenuation pond to be allocated.
Bio-Retention	Collect and retain run-off to help improve water quality, prior to discharge in piped system on infiltration.	<u>Not suitable:</u> Space constraints on site do not permit above ground areas for flood storage.

Figure 7 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.	<u>Suitable:</u> • To be incorporated as part of the infiltration attenuation measures beneath the rear gardens and parking 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).	<u>Not suitable:</u> • Oversized pipes more suitable to larger developments where the drainage is adopted.

Figure 8 Sub-Surface SuDS Methods

4.6.5 SuDS Hierarchal Approach

Based on the SuDS assessment in Figure 7 and 8, 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	Maybe	Initial assessment has determined that the underlying ground has the potential to be suitable for infiltration-based options. Further investigation and testing required.
Connection to Watercourse	No	No watercourse in close proximity.
Connection to Surface Water Sewer	No	No viable surface water sewer that is reasonably accessible by gravity in close proximity.
Connection to a Combined Sewer	Yes *	Site has existing connections into the combined sewers bounding the site. Should it be found that infiltration is not feasible then connection to the combined sewer at restricted rates.

Figure 9 SuDS Hierarchal Approach

4.6.6 SuDS Design Philosophy

The SuDS philosophy for the development site is the promotion of Prevention, Source Control and Site Control techniques with discharge to the underlying sands & gravels and if not suitable, then the adjacent combined sewer.

The following design philosophy is proposed:

- Surface water treatment using the 'Management Train' approach to remove and isolate contamination at all SuDS facilities prior to conveyance to the local watercourse.
- Prevention measures in the form of water butts.
- Source control measures in the form of green roofs and permeable paving.
- Geocellular infiltration tanks to enable infiltration to the underlying sands and gravels, and to retain the peak storm events.
- Reduce the impermeable fraction of the post development area.

4.7 Climate Change

- 4.7.1 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 Upper Mersey Management Catchment peak rainfall allowances.
- 4.7.2 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.

4.8 Outline Surface Water Drainage Strategy

- 4.8.1 At this time, the general principal of the surface water drainage strategy is to collect the runoff from the roof of the new residential units and outfall into a geocellular infiltration tank located in the rear garden of each property that will enable the water to infiltrate to the underlying sands and gravels. The front rainwater pipes will outfall into the no fines sub base of the permeable driveways. * Note that should the formal BRE 365 infiltration testing indicate that the ground is not suitable then connection will be made to the combined water sewer at a peak rate not exceeding 5l/s.
- 4.8.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2008 and Building Regulations part H guidance. This is to provide no flooding up to the 30-year storm return period criterion.
- 4.8.3 Flooding can occur on a local scale beyond the 30yr criterion due to runoff exceeding the capacity of the minor system during extreme events and it can only be addressed on a site-specific basis. In the case of this development, exceedance flows will be all those over and above the 30-year design criterion. Using storage within the external hard standing and soft landscaping areas would be achievable and would direct flood water away from the new property with flows directed back into the surface water drainage network as the water levels in the drainage network recede.

- 4.8.4 Although it is envisaged that Prevention and green roof Source Controls measures could be included in the final scheme, this strategy will assume for outline calculations purposes that Source Control infiltration methods are incorporated. A source control attenuation assessment has been simulated in the Microdrainage Design Software for each House Type. This takes into account an estimated infiltration rate of $5 \times 10^{-5} \text{m/s}$ and factor of safety of 5. 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.

Block Type	New Impermeable Area	Infiltration Rate	Outline Attenuation Volume for 100yr + 45% CC Event
A (Rear)	0.006 ha	$5 \times 10^{-5} \text{m/s}$	3m^3
B	0.016 ha	$5 \times 10^{-5} \text{m/s}$	8m^3
C	0.021 ha	$5 \times 10^{-5} \text{m/s}$	11m^3

Figure 10 Outline Attenuation Volumes

- 4.8.5 Drawing 2835-100 in Appendix C indicates the Drainage Strategy Plan based on the Architects master plan intent, with the outline hydraulic calculations in Appendix D.

4.9 Pollution Control

- 4.9.1 Silt is to be prevented from entering the drainage system by the use of trapped gullies, channels with silt traps or by the use of Sustainable Drainage techniques. Runoff from the private driveways will be directed through the permeable paving; this will help to remove pollutants prior to connection to the drainage network. Silt and debris will also be prevented from entering the drainage system by the use of trapped gullies and silt boxes.

4.10 Maintenance

- 4.10.1 The long-term maintenance of the new drainage and SuDS infrastructure will be with the property owners and a maintenance company in line with best practice guidance. Annual inspections will need to be carried out and clearing of gullies, channel drains, catchpits constructed.

Typically the maintenance regime will be in line with Figure 11 below.

Future Maintenance of the Drainage System			
Responsibility	Feature	Maintenance	Frequency
Property Owner / Management Company	Drainage Channel.	Regular maintenance / removal of blockages and silts.	Ad-hoc flushing/jetting and emptying of silt traps required.
	Rainwater gutters, downpipes and above ground drainage.	Regular maintenance and inspections.	Ad-hoc sweeping and emptying of silt and debris required. Annual visual inspections to check for damage/leaks.
	Soakaways	Regular maintenance / removal of debris in upstream catchpits.	Annual inspection and following significant rainfall events.
	Permeable Paving	Brushing and Vacuuming, removal of weeds	Annual inspection and following significant rainfall events.
	Pipes, sewers, manholes, outfall headwall.	Regular maintenance / removal of blockages and debris.	Annual inspection and removal of silts if required.

Figure 11 Outline Management and Maintenance Strategy

4.11 Foul Water Strategy

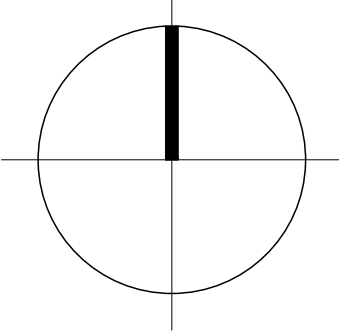
- 4.11.1 The foul water drainage strategy is to construct a new foul water drainage network for each block area that outfalls via gravity to the combined public sewer via the existing connections.
- 4.11.2 The proposed private drainage layout for the new development site will be designed in accordance with BS EN 752: 2017 and Building Regulations Part H guidance.
- 4.11.2 An indicative foul water drainage layout can be found on the drainage strategy drawing in Appendix C.

Appendix A – Architects Drawings

High Lane, Chorlton.

ACCOMODATION SCHEDULE - (NIA)							
HOUSE NAME	STOREYS	DESCRIPTION	NO.	SQFT	SQM	TOTAL SQFT	TOTAL SQM
TYPE E	2.5	4 BED (APPROX.) SEMI DETACHED	1	2744	254.9	2744	254.92
TYPE D	2.5	4 BED (APPROX.) SEMI DETACHED	1	2413	224.2	2413	224.17
TYPE A	2.5	4 BED TOWNHOUSE	12	1938	180	23256	2160
TYPE B	2.5	4 BED TOWNHOUSE	2	1794	166.7	3588	333.4
TYPE C	2.5	2 BED APARTMENT	6	764	71	4584	426
TOTAL			22			36585	3398
			PLOTS			SQFT	SQM
Site Area - 1.08 Acres							

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- Only scale for 'Town and Country Planning Act 1990' services. For construction purposes, work to figured dimensions only. All dimensions to be checked with MPSSL and on site prior to the execution of any work.
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NOTE:
Layout to be read in conjunction with boundary treatment layout, boundary treatment details and engineer's drawings.

- GENERAL**
- Denotes bin storage area.
 - Denotes cycle storage area. Cycle storage provided underneath external staircase for plots 02 - 12.
 - Denotes proposed fiber-reinforced concrete bollard with built-in light to detail.
 - Denotes indicative wall mounted EV charger location.
 - Denotes indicative pedestal EV charger location.
 - Denotes PV panels subject to manufacturers details.
 - Denotes visibility splays. Refer to drawing reference (SCP-220567-DO1).

- BOUNDARY TREATMENTS**
- Denotes 1.8m high horizontal double slatted screen fence with 0.3m trellis.
 - Denotes metal frame to accommodate side access gate.
 - Denotes 2.1m high brick wall - To match development facings.
 - Denotes 1.1m high metal railings.
 - Denotes lockable gate.

- SURFACE FINISH**
- Denotes proposed granite flags 600 x 900.
 - Denotes proposed concrete flags 600 x 900.
 - Denotes private access driveways constructed in tegular paving.
 - Denotes resin bound paving with block edging.

- TREES / HEDGES**
- Denotes existing trees to be retained - Refer to AIA for details.
 - Denotes proposed tree planting - Refer to landscape layout for details.
 - Denotes proposed low level hedge planting - Refer to landscape layout for details.

Rev	Date	Revision	Initial
P3	03.01.23	External staircase to the first floor terrace on the Type A added and rear gardens amended to suit.	CW
P2	08.12.23	Type A's footprint updated to accord with the revised house type. Apartment's shared driveway and parking layout amended to reflect highway comments.	CW
P1	04.08.23	Type C relocated. Shared driveways serving plots 13, 14, 15, 16, 17 - 22 redesigned. 1.1m high metal railings added to the frontage of plots D1E.	CW

CUBE HOMES

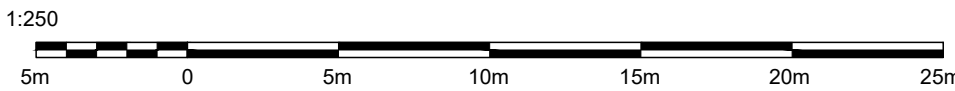
Proposed Site Layout

Proposed Residential Development, High Lane, Chorlton.

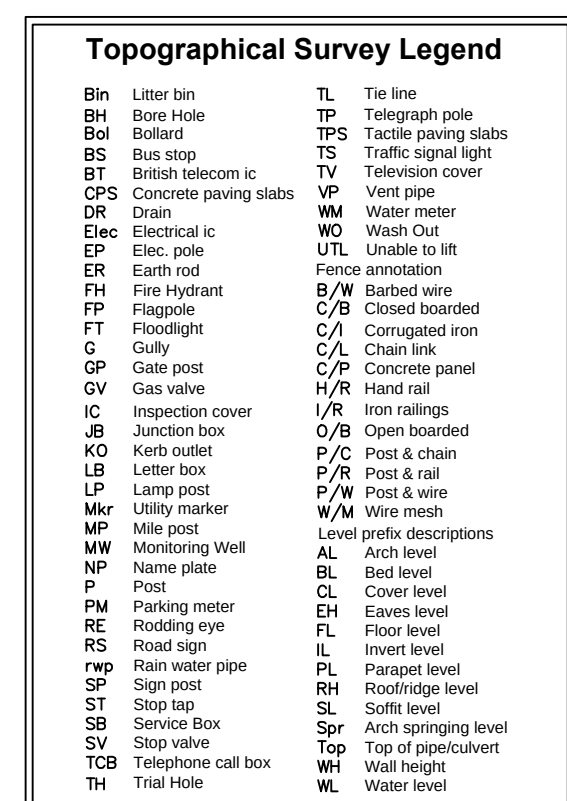
Job No	Dwg No	Drawn	Rev
22114	01	CW	P3
Scale	Date	Stage	
1:250 @ A1	MAY 2023	FOR PLANNING	

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Appendix B – Topographical Survey



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

ONLY MARKINGS AND SERVICES VISIBLE AT TIME OF SURVEY SHOWN

DRAINAGE INFORMATION MUST BE CHECKED AND VERIFIED WITH LOCAL AUTHORITY RECORDS PRIOR TO WORK COMMENCING

Levels defining edge of carriageway are observed at channel (bottom of kerb). Unless otherwise stated.

TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE AVERAGE SPREAD.

THE DRIPLINE (LAYER) DENOTES THE TREES EXTENT

SURVEY STATIONS			
stn1	381544.517	393783.148	27.618
stn1a	381506.997	393772.048	28.156
stn2	381471.429	393806.607	27.046
stn2a	381453.577	393745.886	27.307
stn3	381532.326	393737.866	27.495
tq1	381532.202	393718.620	33.171
tq2	381520.398	393684.817	36.759
tq3	381562.724	393736.862	36.930

REV.	DESCRIPTION	SURVEYED	DRAWN	D

JLP Surveying Consultants Ltd,
Suite 45 Rodney House,
King Street,
Wigan
WN1 1BT
Tel - 01942 243313
Fax - 01942 493230
Mobile - 07710 426498
EMAIL: peterhoustone@jlp-surveys.com

DRAWING TITLE

SCALE 1 : 200	SHEET SIZE A0	No. of SHEETS 1	DATE 26.08.2022	REVISION
DRAWING NUMBER S22-816				

Project Title Land off High Lane, Chorlton, Manchester
Report Title Drainage Strategy Report
Doc Ref 2835-BCL-00-XX-RP-D-0001
Date 5th January 2024



Appendix C – Brennan Consult Drawings

Appendix D – Hydraulic Calculations

Brennan Consult				Page 1	
Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY		Former Chorlton School Block A - Rear Soakaway 100yr + 45%			
Date 21/07/2023 File House Type A Rear Soaka...		Designed by paulg Checked by			
Innovyze		Source Control 2017.1.2			
Summary of Results for 100 year Return Period (+45%)					
Half Drain Time : 225 minutes.					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	26.982	0.182	0.1	1.3	O K
30 min Summer	27.038	0.238	0.1	1.7	O K
60 min Summer	27.090	0.290	0.1	2.1	O K
120 min Summer	27.125	0.325	0.1	2.3	O K
180 min Summer	27.132	0.332	0.1	2.4	O K
240 min Summer	27.131	0.331	0.1	2.4	O K
360 min Summer	27.121	0.321	0.1	2.3	O K
480 min Summer	27.109	0.309	0.1	2.2	O K
600 min Summer	27.097	0.297	0.1	2.1	O K
720 min Summer	27.084	0.284	0.1	2.0	O K
960 min Summer	27.059	0.259	0.1	1.8	O K
1440 min Summer	27.014	0.214	0.1	1.5	O K
2160 min Summer	26.959	0.159	0.1	1.1	O K
2880 min Summer	26.917	0.117	0.1	0.8	O K
4320 min Summer	26.864	0.064	0.1	0.5	O K
5760 min Summer	26.846	0.046	0.1	0.3	O K
7200 min Summer	26.839	0.039	0.1	0.3	O K
8640 min Summer	26.834	0.034	0.1	0.2	O K
10080 min Summer	26.830	0.030	0.0	0.2	O K
15 min Winter	27.005	0.205	0.1	1.5	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
15 min Summer	125.082	0.0	27		
30 min Summer	83.017	0.0	40		
60 min Summer	52.627	0.0	66		
120 min Summer	32.304	0.0	122		
180 min Summer	23.981	0.0	168		
240 min Summer	19.304	0.0	198		
360 min Summer	14.098	0.0	262		
480 min Summer	11.273	0.0	332		
600 min Summer	9.476	0.0	400		
720 min Summer	8.219	0.0	468		
960 min Summer	6.560	0.0	604		
1440 min Summer	4.767	0.0	868		
2160 min Summer	3.458	0.0	1240		
2880 min Summer	2.750	0.0	1596		
4320 min Summer	1.989	0.0	2260		
5760 min Summer	1.578	0.0	2944		
7200 min Summer	1.318	0.0	3672		
8640 min Summer	1.138	0.0	4408		
10080 min Summer	1.004	0.0	5136		
15 min Winter	125.082	0.0	28		
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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY		Former Chorlton School Block A - Rear Soakaway 100yr + 45%			
Date 21/07/2023 File House Type A Rear Soaka...		Designed by paulg Checked by			
Innovyze		Source Control 2017.1.2			
Summary of Results for 100 year Return Period (+45%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	27.068	0.268	0.1	1.9	O K
60 min Winter	27.128	0.328	0.1	2.3	O K
120 min Winter	27.172	0.372	0.1	2.7	O K
180 min Winter	27.183	0.383	0.1	2.7	O K
240 min Winter	27.180	0.380	0.1	2.7	O K
360 min Winter	27.167	0.367	0.1	2.6	O K
480 min Winter	27.151	0.351	0.1	2.5	O K
600 min Winter	27.132	0.332	0.1	2.4	O K
720 min Winter	27.113	0.313	0.1	2.2	O K
960 min Winter	27.076	0.276	0.1	2.0	O K
1440 min Winter	27.010	0.210	0.1	1.5	O K
2160 min Winter	26.933	0.133	0.1	0.9	O K
2880 min Winter	26.878	0.078	0.1	0.6	O K
4320 min Winter	26.843	0.043	0.1	0.3	O K
5760 min Winter	26.835	0.035	0.1	0.2	O K
7200 min Winter	26.829	0.029	0.0	0.2	O K
8640 min Winter	26.825	0.025	0.0	0.2	O K
10080 min Winter	26.822	0.022	0.0	0.2	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.017	0.0	40		
60 min Winter	52.627	0.0	66		
120 min Winter	32.304	0.0	122		
180 min Winter	23.981	0.0	176		
240 min Winter	19.304	0.0	224		
360 min Winter	14.098	0.0	280		
480 min Winter	11.273	0.0	358		
600 min Winter	9.476	0.0	434		
720 min Winter	8.219	0.0	508		
960 min Winter	6.560	0.0	652		
1440 min Winter	4.767	0.0	924		
2160 min Winter	3.458	0.0	1300		
2880 min Winter	2.750	0.0	1624		
4320 min Winter	1.989	0.0	2216		
5760 min Winter	1.578	0.0	2944		
7200 min Winter	1.318	0.0	3680		
8640 min Winter	1.138	0.0	4392		
10080 min Winter	1.004	0.0	5136		
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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Former Chorlton School Block A - Rear Soakaway 100yr + 45%	
Date 21/07/2023 File House Type A Rear Soaka...	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

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	0.379	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.006

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.002	4 8 0.002	8 12 0.001	12 16 0.001				

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File House Type A Rear Soaka...	Checked by																																																																																					
Innovyze		Source Control 2017.1.2																																																																																				
<u>Model Details</u> Storage is Online Cover Level (m) 28.000 <u>Cellular Storage Structure</u> Invert Level (m) 26.800 Safety Factor 5.0 Infiltration Coefficient Base (m/hr) 0.18000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.18000 <table border="1"> <thead> <tr> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> <th>Depth (m)</th> <th>Area (m²)</th> <th>Inf. Area (m²)</th> </tr> </thead> <tbody> <tr><td>0.000</td><td>7.5</td><td>7.5</td><td>2.600</td><td>0.0</td><td>11.9</td></tr> <tr><td>0.200</td><td>7.5</td><td>9.7</td><td>2.800</td><td>0.0</td><td>11.9</td></tr> <tr><td>0.400</td><td>7.5</td><td>11.9</td><td>3.000</td><td>0.0</td><td>11.9</td></tr> <tr><td>0.401</td><td>0.0</td><td>11.9</td><td>3.200</td><td>0.0</td><td>11.9</td></tr> <tr><td>0.800</td><td>0.0</td><td>11.9</td><td>3.400</td><td>0.0</td><td>11.9</td></tr> <tr><td>1.000</td><td>0.0</td><td>11.9</td><td>3.600</td><td>0.0</td><td>11.9</td></tr> <tr><td>1.200</td><td>0.0</td><td>11.9</td><td>3.800</td><td>0.0</td><td>11.9</td></tr> <tr><td>1.400</td><td>0.0</td><td>11.9</td><td>4.000</td><td>0.0</td><td>11.9</td></tr> <tr><td>1.600</td><td>0.0</td><td>11.9</td><td>4.200</td><td>0.0</td><td>11.9</td></tr> <tr><td>1.800</td><td>0.0</td><td>11.9</td><td>4.400</td><td>0.0</td><td>11.9</td></tr> <tr><td>2.000</td><td>0.0</td><td>11.9</td><td>4.600</td><td>0.0</td><td>11.9</td></tr> <tr><td>2.200</td><td>0.0</td><td>11.9</td><td>4.800</td><td>0.0</td><td>11.9</td></tr> <tr><td>2.400</td><td>0.0</td><td>11.9</td><td>5.000</td><td>0.0</td><td>11.9</td></tr> </tbody> </table>			Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	0.000	7.5	7.5	2.600	0.0	11.9	0.200	7.5	9.7	2.800	0.0	11.9	0.400	7.5	11.9	3.000	0.0	11.9	0.401	0.0	11.9	3.200	0.0	11.9	0.800	0.0	11.9	3.400	0.0	11.9	1.000	0.0	11.9	3.600	0.0	11.9	1.200	0.0	11.9	3.800	0.0	11.9	1.400	0.0	11.9	4.000	0.0	11.9	1.600	0.0	11.9	4.200	0.0	11.9	1.800	0.0	11.9	4.400	0.0	11.9	2.000	0.0	11.9	4.600	0.0	11.9	2.200	0.0	11.9	4.800	0.0	11.9	2.400	0.0	11.9	5.000	0.0	11.9
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Summary of Results for 100 year Return Period (+45%) Half Drain Time : 350 minutes. <table><thead><tr><th>Storm Event</th><th>Max Level (m)</th><th>Max Depth (m)</th><th>Max Infiltration (l/s)</th><th>Max Volume (m³)</th><th>Status</th></tr></thead><tbody><tr><td>15 min Summer</td><td>26.904</td><td>0.304</td><td>0.2</td><td>3.5</td><td>O K</td></tr><tr><td>30 min Summer</td><td>27.003</td><td>0.403</td><td>0.2</td><td>4.6</td><td>O K</td></tr><tr><td>60 min Summer</td><td>27.099</td><td>0.499</td><td>0.2</td><td>5.7</td><td>O K</td></tr><tr><td>120 min Summer</td><td>27.180</td><td>0.580</td><td>0.2</td><td>6.6</td><td>O K</td></tr><tr><td>180 min Summer</td><td>27.210</td><td>0.610</td><td>0.2</td><td>7.0</td><td>O K</td></tr><tr><td>240 min Summer</td><td>27.219</td><td>0.619</td><td>0.2</td><td>7.1</td><td>O K</td></tr><tr><td>360 min Summer</td><td>27.211</td><td>0.611</td><td>0.2</td><td>7.0</td><td>O K</td></tr><tr><td>480 min Summer</td><td>27.199</td><td>0.599</td><td>0.2</td><td>6.8</td><td>O K</td></tr><tr><td>600 min Summer</td><td>27.186</td><td>0.586</td><td>0.2</td><td>6.7</td><td>O K</td></tr><tr><td>720 min Summer</td><td>27.171</td><td>0.571</td><td>0.2</td><td>6.5</td><td>O K</td></tr><tr><td>960 min Summer</td><td>27.142</td><td>0.542</td><td>0.2</td><td>6.2</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>27.086</td><td>0.486</td><td>0.2</td><td>5.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>27.011</td><td>0.411</td><td>0.2</td><td>4.7</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>26.946</td><td>0.346</td><td>0.2</td><td>3.9</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>26.841</td><td>0.241</td><td>0.2</td><td>2.7</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>26.765</td><td>0.165</td><td>0.1</td><td>1.9</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>26.710</td><td>0.110</td><td>0.1</td><td>1.2</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>26.673</td><td>0.073</td><td>0.1</td><td>0.8</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>26.652</td><td>0.052</td><td>0.1</td><td>0.6</td><td>O K</td></tr><tr><td>15 min Winter</td><td>26.943</td><td>0.343</td><td>0.2</td><td>3.9</td><td>O K</td></tr></tbody></table> <table><thead><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr></thead><tbody><tr><td>15 min Summer</td><td>125.082</td><td>0.0</td><td>38</td></tr><tr><td>30 min Summer</td><td>83.017</td><td>0.0</td><td>51</td></tr><tr><td>60 min Summer</td><td>52.627</td><td>0.0</td><td>76</td></tr><tr><td>120 min Summer</td><td>32.304</td><td>0.0</td><td>130</td></tr><tr><td>180 min Summer</td><td>23.981</td><td>0.0</td><td>186</td></tr><tr><td>240 min Summer</td><td>19.304</td><td>0.0</td><td>242</td></tr><tr><td>360 min Summer</td><td>14.098</td><td>0.0</td><td>308</td></tr><tr><td>480 min Summer</td><td>11.273</td><td>0.0</td><td>370</td></tr><tr><td>600 min Summer</td><td>9.476</td><td>0.0</td><td>436</td></tr><tr><td>720 min Summer</td><td>8.219</td><td>0.0</td><td>506</td></tr><tr><td>960 min Summer</td><td>6.560</td><td>0.0</td><td>644</td></tr><tr><td>1440 min Summer</td><td>4.767</td><td>0.0</td><td>918</td></tr><tr><td>2160 min Summer</td><td>3.458</td><td>0.0</td><td>1316</td></tr><tr><td>2880 min Summer</td><td>2.750</td><td>0.0</td><td>1704</td></tr><tr><td>4320 min Summer</td><td>1.989</td><td>0.0</td><td>2440</td></tr><tr><td>5760 min Summer</td><td>1.578</td><td>0.0</td><td>3168</td></tr><tr><td>7200 min Summer</td><td>1.318</td><td>0.0</td><td>3832</td></tr><tr><td>8640 min Summer</td><td>1.138</td><td>0.0</td><td>4504</td></tr><tr><td>10080 min Summer</td><td>1.004</td><td>0.0</td><td>5152</td></tr><tr><td>15 min Winter</td><td>125.082</td><td>0.0</td><td>38</td></tr></tbody></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	26.904	0.304	0.2	3.5	O K	30 min Summer	27.003	0.403	0.2	4.6	O K	60 min Summer	27.099	0.499	0.2	5.7	O K	120 min Summer	27.180	0.580	0.2	6.6	O K	180 min Summer	27.210	0.610	0.2	7.0	O K	240 min Summer	27.219	0.619	0.2	7.1	O K	360 min Summer	27.211	0.611	0.2	7.0	O K	480 min Summer	27.199	0.599	0.2	6.8	O K	600 min Summer	27.186	0.586	0.2	6.7	O K	720 min Summer	27.171	0.571	0.2	6.5	O K	960 min Summer	27.142	0.542	0.2	6.2	O K	1440 min Summer	27.086	0.486	0.2	5.5	O K	2160 min Summer	27.011	0.411	0.2	4.7	O K	2880 min Summer	26.946	0.346	0.2	3.9	O K	4320 min Summer	26.841	0.241	0.2	2.7	O K	5760 min Summer	26.765	0.165	0.1	1.9	O K	7200 min Summer	26.710	0.110	0.1	1.2	O K	8640 min Summer	26.673	0.073	0.1	0.8	O K	10080 min Summer	26.652	0.052	0.1	0.6	O K	15 min Winter	26.943	0.343	0.2	3.9	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.082	0.0	38	30 min Summer	83.017	0.0	51	60 min Summer	52.627	0.0	76	120 min Summer	32.304	0.0	130	180 min Summer	23.981	0.0	186	240 min Summer	19.304	0.0	242	360 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60 min Summer	52.627	0.0	76																																																																																																																																																																																																																				
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2160 min Summer	3.458	0.0	1316																																																																																																																																																																																																																				
2880 min Summer	2.750	0.0	1704																																																																																																																																																																																																																				
4320 min Summer	1.989	0.0	2440																																																																																																																																																																																																																				
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7200 min Summer	1.318	0.0	3832																																																																																																																																																																																																																				
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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY		Former Chorlton School Block B - Soakaway 100yr + 45%			
Date 21/07/2023		Designed by paulg			
File House Type B Rear Soaka...		Checked by			
Innovyze		Source Control 2017.1.2			
Summary of Results for 100 year Return Period (+45%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	27.054	0.454	0.2	5.2	O K
60 min Winter	27.163	0.563	0.2	6.4	O K
120 min Winter	27.258	0.658	0.2	7.5	O K
180 min Winter	27.297	0.697	0.2	7.9	O K
240 min Winter	27.312	0.712	0.2	8.1	O K
360 min Winter	27.305	0.705	0.2	8.0	O K
480 min Winter	27.290	0.690	0.2	7.9	O K
600 min Winter	27.273	0.673	0.2	7.7	O K
720 min Winter	27.253	0.653	0.2	7.4	O K
960 min Winter	27.211	0.611	0.2	7.0	O K
1440 min Winter	27.128	0.528	0.2	6.0	O K
2160 min Winter	27.018	0.418	0.2	4.8	O K
2880 min Winter	26.926	0.326	0.2	3.7	O K
4320 min Winter	26.785	0.185	0.1	2.1	O K
5760 min Winter	26.691	0.091	0.1	1.0	O K
7200 min Winter	26.649	0.049	0.1	0.6	O K
8640 min Winter	26.642	0.042	0.1	0.5	O K
10080 min Winter	26.637	0.037	0.1	0.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.017	0.0	51		
60 min Winter	52.627	0.0	76		
120 min Winter	32.304	0.0	130		
180 min Winter	23.981	0.0	184		
240 min Winter	19.304	0.0	240		
360 min Winter	14.098	0.0	342		
480 min Winter	11.273	0.0	390		
600 min Winter	9.476	0.0	466		
720 min Winter	8.219	0.0	544		
960 min Winter	6.560	0.0	696		
1440 min Winter	4.767	0.0	988		
2160 min Winter	3.458	0.0	1408		
2880 min Winter	2.750	0.0	1804		
4320 min Winter	1.989	0.0	2552		
5760 min Winter	1.578	0.0	3192		
7200 min Winter	1.318	0.0	3680		
8640 min Winter	1.138	0.0	4408		
10080 min Winter	1.004	0.0	5144		
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<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.379</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+45</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.016 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>0.003</td> <td>8 12</td> <td>0.003</td> <td>16 20</td> <td>0.002</td> <td>24 28</td> <td>0.001</td> </tr> <tr> <td>4 8</td> <td>0.003</td> <td>12 16</td> <td>0.002</td> <td>20 24</td> <td>0.002</td> <td></td> <td></td> </tr> </tbody> </table>			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	0.379	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+45	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	0 4	0.003	8 12	0.003	16 20	0.002	24 28	0.001	4 8	0.003	12 16	0.002	20 24	0.002		
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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Former Chorlton School Block B - Soakaway 100yr + 45%	
Date 21/07/2023 File House Type B Rear Soaka...	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

Model Details

Storage is Online Cover Level (m) 28.000

Cellular Storage Structure

Invert Level (m) 26.600 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.18000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.18000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	12.0	12.0	5.200	0.0	23.1
0.400	12.0	17.5	5.600	0.0	23.1
0.800	12.0	23.1	6.000	0.0	23.1
0.801	0.0	23.1	6.400	0.0	23.1
1.600	0.0	23.1	6.800	0.0	23.1
2.000	0.0	23.1	7.200	0.0	23.1
2.400	0.0	23.1	7.600	0.0	23.1
2.800	0.0	23.1	8.000	0.0	23.1
3.200	0.0	23.1	8.400	0.0	23.1
3.600	0.0	23.1	8.800	0.0	23.1
4.000	0.0	23.1	9.200	0.0	23.1
4.400	0.0	23.1	9.600	0.0	23.1
4.800	0.0	23.1	10.000	0.0	23.1

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K</td></tr><tr><td>600 min Summer</td><td>27.430</td><td>0.630</td><td>0.2</td><td>9.0</td><td>O K</td></tr><tr><td>720 min Summer</td><td>27.415</td><td>0.615</td><td>0.2</td><td>8.8</td><td>O K</td></tr><tr><td>960 min Summer</td><td>27.386</td><td>0.586</td><td>0.2</td><td>8.3</td><td>O K</td></tr><tr><td>1440 min Summer</td><td>27.329</td><td>0.529</td><td>0.2</td><td>7.5</td><td>O K</td></tr><tr><td>2160 min Summer</td><td>27.252</td><td>0.452</td><td>0.2</td><td>6.4</td><td>O K</td></tr><tr><td>2880 min Summer</td><td>27.185</td><td>0.385</td><td>0.2</td><td>5.5</td><td>O K</td></tr><tr><td>4320 min Summer</td><td>27.075</td><td>0.275</td><td>0.2</td><td>3.9</td><td>O K</td></tr><tr><td>5760 min Summer</td><td>26.992</td><td>0.192</td><td>0.2</td><td>2.7</td><td>O K</td></tr><tr><td>7200 min Summer</td><td>26.931</td><td>0.131</td><td>0.2</td><td>1.9</td><td>O K</td></tr><tr><td>8640 min Summer</td><td>26.887</td><td>0.087</td><td>0.2</td><td>1.2</td><td>O K</td></tr><tr><td>10080 min Summer</td><td>26.860</td><td>0.060</td><td>0.2</td><td>0.9</td><td>O K</td></tr><tr><td>15 min Winter</td><td>27.159</td><td>0.359</td><td>0.2</td><td>5.1</td><td>O K</td></tr></table> <table><tr><th>Storm Event</th><th>Rain (mm/hr)</th><th>Flooded Volume (m³)</th><th>Time-Peak (mins)</th></tr><tr><td>15 min Summer</td><td>125.082</td><td>0.0</td><td>41</td></tr><tr><td>30 min Summer</td><td>83.017</td><td>0.0</td><td>52</td></tr><tr><td>60 min Summer</td><td>52.627</td><td>0.0</td><td>78</td></tr><tr><td>120 min Summer</td><td>32.304</td><td>0.0</td><td>132</td></tr><tr><td>180 min Summer</td><td>23.981</td><td>0.0</td><td>188</td></tr><tr><td>240 min Summer</td><td>19.304</td><td>0.0</td><td>244</td></tr><tr><td>360 min Summer</td><td>14.098</td><td>0.0</td><td>318</td></tr><tr><td>480 min Summer</td><td>11.273</td><td>0.0</td><td>380</td></tr><tr><td>600 min Summer</td><td>9.476</td><td>0.0</td><td>446</td></tr><tr><td>720 min Summer</td><td>8.219</td><td>0.0</td><td>514</td></tr><tr><td>960 min Summer</td><td>6.560</td><td>0.0</td><td>652</td></tr><tr><td>1440 min Summer</td><td>4.767</td><td>0.0</td><td>926</td></tr><tr><td>2160 min Summer</td><td>3.458</td><td>0.0</td><td>1328</td></tr><tr><td>2880 min Summer</td><td>2.750</td><td>0.0</td><td>1720</td></tr><tr><td>4320 min Summer</td><td>1.989</td><td>0.0</td><td>2472</td></tr><tr><td>5760 min Summer</td><td>1.578</td><td>0.0</td><td>3184</td></tr><tr><td>7200 min Summer</td><td>1.318</td><td>0.0</td><td>3896</td></tr><tr><td>8640 min Summer</td><td>1.138</td><td>0.0</td><td>4528</td></tr><tr><td>10080 min Summer</td><td>1.004</td><td>0.0</td><td>5168</td></tr><tr><td>15 min Winter</td><td>125.082</td><td>0.0</td><td>42</td></tr></table>						Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status	15 min Summer	27.118	0.318	0.2	4.5	O K	30 min Summer	27.223	0.423	0.2	6.0	O K	60 min Summer	27.326	0.526	0.2	7.5	O K	120 min Summer	27.414	0.614	0.2	8.7	O K	180 min Summer	27.449	0.649	0.3	9.2	O K	240 min Summer	27.461	0.661	0.3	9.4	O K	360 min Summer	27.454	0.654	0.3	9.3	O K	480 min Summer	27.443	0.643	0.2	9.2	O K	600 min Summer	27.430	0.630	0.2	9.0	O K	720 min Summer	27.415	0.615	0.2	8.8	O K	960 min Summer	27.386	0.586	0.2	8.3	O K	1440 min Summer	27.329	0.529	0.2	7.5	O K	2160 min Summer	27.252	0.452	0.2	6.4	O K	2880 min Summer	27.185	0.385	0.2	5.5	O K	4320 min Summer	27.075	0.275	0.2	3.9	O K	5760 min Summer	26.992	0.192	0.2	2.7	O K	7200 min Summer	26.931	0.131	0.2	1.9	O K	8640 min Summer	26.887	0.087	0.2	1.2	O K	10080 min Summer	26.860	0.060	0.2	0.9	O K	15 min Winter	27.159	0.359	0.2	5.1	O K	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)	15 min Summer	125.082	0.0	41	30 min Summer	83.017	0.0	52	60 min Summer	52.627	0.0	78	120 min Summer	32.304	0.0	132	180 min Summer	23.981	0.0	188	240 min Summer	19.304	0.0	244	360 min Summer	14.098	0.0	318	480 min Summer	11.273	0.0	380	600 min Summer	9.476	0.0	446	720 min Summer	8.219	0.0	514	960 min Summer	6.560	0.0	652	1440 min Summer	4.767	0.0	926	2160 min Summer	3.458	0.0	1328	2880 min Summer	2.750	0.0	1720	4320 min Summer	1.989	0.0	2472	5760 min Summer	1.578	0.0	3184	7200 min Summer	1.318	0.0	3896	8640 min Summer	1.138	0.0	4528	10080 min Summer	1.004	0.0	5168	15 min Winter	125.082	0.0	42
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720 min Summer	8.219	0.0	514																																																																																																																																																																																																																				
960 min Summer	6.560	0.0	652																																																																																																																																																																																																																				
1440 min Summer	4.767	0.0	926																																																																																																																																																																																																																				
2160 min Summer	3.458	0.0	1328																																																																																																																																																																																																																				
2880 min Summer	2.750	0.0	1720																																																																																																																																																																																																																				
4320 min Summer	1.989	0.0	2472																																																																																																																																																																																																																				
5760 min Summer	1.578	0.0	3184																																																																																																																																																																																																																				
7200 min Summer	1.318	0.0	3896																																																																																																																																																																																																																				
8640 min Summer	1.138	0.0	4528																																																																																																																																																																																																																				
10080 min Summer	1.004	0.0	5168																																																																																																																																																																																																																				
15 min Winter	125.082	0.0	42																																																																																																																																																																																																																				
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Brennan Consult				Page 2	
Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY		Former Chorlton School Block C - Rear Soakaway 100yr + 45%			
Date 21/07/2023		Designed by paulg			
File House Type C Rear Soaka...		Checked by			
Innovyze		Source Control 2017.1.2			
Summary of Results for 100 year Return Period (+45%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	27.277	0.477	0.2	6.8	O K
60 min Winter	27.394	0.594	0.2	8.5	O K
120 min Winter	27.497	0.697	0.3	9.9	O K
180 min Winter	27.541	0.741	0.3	10.6	O K
240 min Winter	27.559	0.759	0.3	10.8	O K
360 min Winter	27.557	0.757	0.3	10.8	O K
480 min Winter	27.541	0.741	0.3	10.6	O K
600 min Winter	27.525	0.725	0.3	10.3	O K
720 min Winter	27.506	0.706	0.3	10.1	O K
960 min Winter	27.464	0.664	0.3	9.5	O K
1440 min Winter	27.381	0.581	0.2	8.3	O K
2160 min Winter	27.268	0.468	0.2	6.7	O K
2880 min Winter	27.172	0.372	0.2	5.3	O K
4320 min Winter	27.021	0.221	0.2	3.2	O K
5760 min Winter	26.916	0.116	0.2	1.7	O K
7200 min Winter	26.855	0.055	0.2	0.8	O K
8640 min Winter	26.845	0.045	0.1	0.6	O K
10080 min Winter	26.839	0.039	0.1	0.6	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)		
30 min Winter	83.017	0.0	53		
60 min Winter	52.627	0.0	78		
120 min Winter	32.304	0.0	132		
180 min Winter	23.981	0.0	186		
240 min Winter	19.304	0.0	242		
360 min Winter	14.098	0.0	348		
480 min Winter	11.273	0.0	398		
600 min Winter	9.476	0.0	474		
720 min Winter	8.219	0.0	550		
960 min Winter	6.560	0.0	704		
1440 min Winter	4.767	0.0	1000		
2160 min Winter	3.458	0.0	1424		
2880 min Winter	2.750	0.0	1824		
4320 min Winter	1.989	0.0	2572		
5760 min Winter	1.578	0.0	3248		
7200 min Winter	1.318	0.0	3768		
8640 min Winter	1.138	0.0	4392		
10080 min Winter	1.004	0.0	5152		
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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Former Chorlton School Block C - Rear Soakaway 100yr + 45%	
Date 21/07/2023 File House Type C Rear Soaka...	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

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	0.379	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+45

Time Area Diagram

Total Area (ha) 0.021

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)	From: To: (ha)
0 4 0.003	8 12 0.004	16 20 0.003	24 28 0.001				
4 8 0.004	12 16 0.003	20 24 0.002	28 32 0.001				

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Oak House, 2 Gatley Road Cheadle Stockport, SK8 1PY	Former Chorlton School Block C - Rear Soakaway 100yr + 45%	
Date 21/07/2023 File House Type C Rear Soaka...	Designed by paulg Checked by	
Innovyze	Source Control 2017.1.2	

Model Details

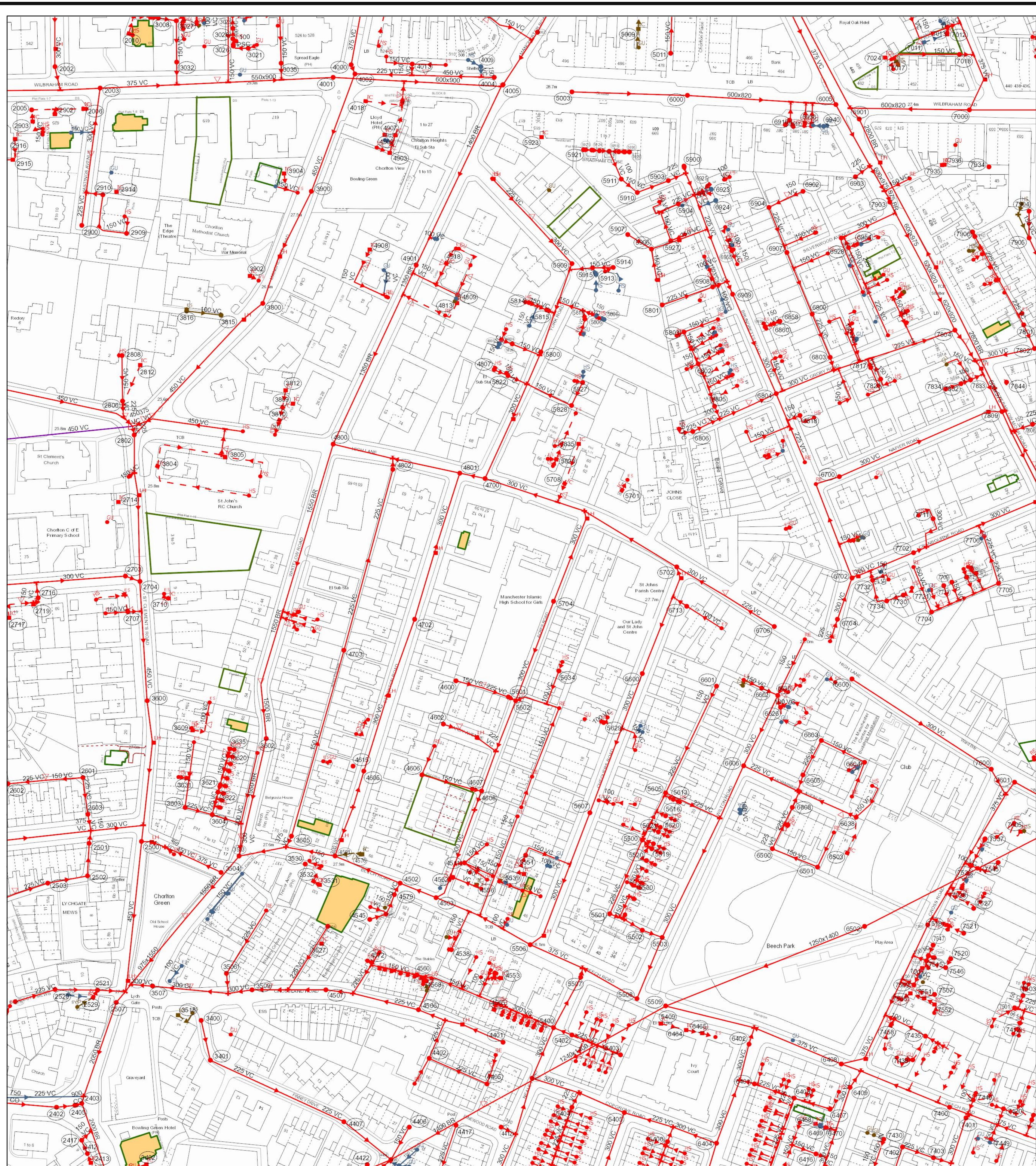
Storage is Online Cover Level (m) 28.000

Cellular Storage Structure

Invert Level (m) 26.800 Safety Factor 5.0
Infiltration Coefficient Base (m/hr) 0.18000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.18000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	15.0	15.0	5.200	0.0	27.4
0.400	15.0	21.2	5.600	0.0	27.4
0.800	15.0	27.4	6.000	0.0	27.4
0.801	0.0	27.4	6.400	0.0	27.4
1.600	0.0	27.4	6.800	0.0	27.4
2.000	0.0	27.4	7.200	0.0	27.4
2.400	0.0	27.4	7.600	0.0	27.4
2.800	0.0	27.4	8.000	0.0	27.4
3.200	0.0	27.4	8.400	0.0	27.4
3.600	0.0	27.4	8.800	0.0	27.4
4.000	0.0	27.4	9.200	0.0	27.4
4.400	0.0	27.4	9.600	0.0	27.4
4.800	0.0	27.4	10.000	0.0	27.4

Appendix E – United Utilities Sewer Records



Refo	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad	Refo	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
780	21.27	CO	20.12	225			VC	29.15476	1 in 8	780	21.27	CO	20.12	225			VC	29.15476	1 in 8
2802	27.35	CO	26.12	225			VC	33.10599	1 in 9	781	21.27	CO	20.12	225			VC	29.15476	1 in 8
6906	27.23	CO	24.45	300			VC	16.97774	1 in 10	782	21.27	CO	20.12	225			VC	29.15476	1 in 8
5800	27.7	CO	24.7	300			VC	60.00833	1 in 214	783	21.27	CO	20.12	225			VC	29.15476	1 in 8
6909	27.7	CO	24.7	300			VC	7.890251	1 in 10	784	21.27	CO	20.12	225			VC	29.15476	1 in 8
7501	28.39	CO	25.76	225			VC	47.12754	1 in 73	785	21.27	CO	20.12	225			VC	29.15476	1 in 8
4013	28.05	CO	24.37	375			VC	5.235951	1 in 10	786	21.27	CO	20.12	225			VC	29.15476	1 in 8
4546	28.05	CO	24.37	375			VC	11.82041	1 in 453	787	21.27	CO	20.12	225			VC	29.15476	1 in 8
6402	28.28	CO	24.7	375			VC	9.50184	1 in 123	788	21.27	CO	20.12	225			VC	29.15476	1 in 8
5828	27.79	CO	0	150			VC	27.20891	1 in 123	789	21.27	CO	20.12	225			VC	29.15476	1 in 8
4008	27.79	CO	24.33	300			VC	11.08103	1 in 123	790	21.27	CO	20.12	225			VC	29.15476	1 in 8
6000	28.04	CO	24.33	600			VC	82.1523	1 in 483	791	21.27	CO	20.12	225			VC	29.15476	1 in 8
4007	28.98	CO	25.98	300			VC	37.20972	1 in 63	792	21.27	CO	20.12	225			VC	29.15476	1 in 8
5704	27.54	CO	25.38	300			VC	53.51846	1 in 59	793	21.27	CO	20.12	225			VC	29.15476	1 in 8
3816	27.43	CO	23.86	100			VC	54.5834	1 in 303	794	21.27	CO	20.12	225			VC	29.15476	1 in 8
4005	29	CO	22.52	400			VC	19.29796	1 in 1009	795	21.27	CO	20.12	225			VC	29.15476	1 in 8
4201	27.8	CO	23.13	375			VC	11.0044	1 in 1009	796	21.27	CO	20.12	225			VC	29.15476	1 in 8
2801	27.5	CO	0	225			VC	8.12007	1 in 1009	797	21.27	CO	20.12	225			VC	29.15476	1 in 8
6902	28.05	CO	24.37	375			VC	20.59818	1 in 1009	798	21.27	CO	20.12	225			VC	29.15476	1 in 8
5502	28.08	CO	25.94	225			VC	9.848082	1 in 1009	799	21.27	CO	20.12	225			VC	29.15476	1 in 8
4406	28.93	CO	27.43	150			VC	11.7047	1 in 1009	800	21.27	CO	20.12	225			VC	29.15476	1 in 8
2808	28.93	CO	27.43	150			VC	34.2085	1 in 1009	801	21.27	CO	20.12	225			VC	29.15476	1 in 8
5904	28.87	CO	25.35	225			VC	25.23052	1 in 1009	802	21.27	CO	20.12	225			VC	29.15476	1 in 8
4201	27.8	CO	23.13	375			VC	10.29503	1 in 1009	803	21.27	CO	20.12	225			VC	29.15476	1 in 8
2802	25.57	CO	22.49	450			VC	10.29503	1 in 1009	804	21.27	CO	20.12	225			VC	29.15476	1 in 8
7713	27.3	CO	22.49	450			VC	8.117594	1 in 1009	805	21.27	CO	20.12	225			VC	29.15476	1 in 8
6858	27.3	CO	22.49	450			VC	10.81946	1 in 1009	806	21.27	CO	20.12	225			VC	29.15476	1 in 8
3900	27.88	CO	22.59	450			VC	3.671323	1 in 1009	807	21.27	CO	20.12	225			VC	29.15476	1 in 8
7732	27.62	CO	22.59	450			VC	67.76286	1 in 1009	808	21.27	CO	20.12	225			VC	29.15476	1 in 8
7441	27.62	CO	22.59	450			VC	4.49839	1 in 1009	809	21.27	CO	20.12	225			VC	29.15476	1 in 8
4507	28.19	CO	25.18	300			VC	14.47138	1 in 1009	810	21.27	CO	20.12	225			VC	29.15476	1 in 8
6901	28.19	CO	25.18	300			VC	9.225866	1 in 1009	811	21.27	CO	20.12	225			VC	29.15476	1 in 8
7729	28.19	CO	25.18	300			VC	20.98	1 in 1009	812	21.27	CO	20.12	225			VC	29.15476	1 in 8
5904	28.93	CO	25.04	100			VC	181.7854	1 in 1009	813	21.27	CO	20.12	225			VC	29.15476	1 in 8
3401	27.4	CO	25.39	225			VC	4.44548	1 in 1009	814	21.27	CO	20.12	225			VC	29.15476	1 in 8
6909	27.7	CO	24.37	375			VC	67.85184	1 in 1009	815	21.27	CO	20.12	225			VC	29.15476	1 in 8
6408	28.33	CO	24.2	375			VC	81.4371	1 in 1009	816	21.27	CO	20.12	225			VC	29.15476	1 in 8
4401	28.84	CO	28.49	225			VC	91.80559	1 in 1009	817	21.27	CO	20.12	225			VC	29.15476	1 in 8
3407	28.84	CO	28.49	225			VC	102.448	1 in 1009	818	21.27	CO	20.12	225			VC	29.15476	1 in 8
5404	28.94	CO	28.17	225			VC	32.24942	1 in 1009	819	21.27	CO	20.12	225			VC	29.15476	1 in 8
2810	28.94	CO	28.17	225			VC	22.84967	1 in 1009	820	21.27	CO	20.12	225			VC	29.15476	1 in 8
3605	27.67	CO	0	150			VC	8.944272	1 in 1009	821	21.27	CO	20.12	225			VC	29.15476	1 in 8
3507	27.36	CO	24.15	150			VC	9.220559	1 in 1009	822	21.27	CO	20.12	225			VC	29.15476	1 in 8
4807	27.36	CO	24.15	150			VC	107.0047	1 in 1009	823	21.27	CO	20.12	225			VC	29.15476	1 in 8
6902	28.05	CO	24.37	375			VC	12.04159	1 in 1009	824	21.27	CO	20.12	225			VC	29.15476	1 in 8
5918	28.05	CO	24.37	375			VC	8.384904	1 in 1009	825	21.27	CO	20.12	225			VC	29.15476	1 in 8
7403	28.29	CO	28.07	225			VC	18.84507	1 in 1009	826	21.27	CO	20.12	225			VC	29.15476	1 in 8
6808	27.66	CO	25.63	225			VC	16.74941	1 in 1009	827	21.27	CO	20.12	225			VC	29.15476	1 in 8
5822	27.66	CO	25.63	225			VC	10.4031	1 in 1009	828	21.27	CO	20.12	225			VC	29.15476	1 in 8
5908	27.66	CO	25.63	225			VC	7.309128	1 in 1009	829	21.27	CO	20.12	225			VC	29.15476	1 in 8
3504	27.6	CO	22.81	375			VC	11.68275	1 in 1009	830	21.27	CO	20.12	225			VC	29.15476	1 in 8
5914	27.6	CO	22.81	375			VC	18.78329	1 in 1009	831	21.27	CO	20.12	225			VC	29.15476	1 in 8
4417	28.76	CO	27.4	225			VC	16.55295	1 in 1009	832	21.27	CO	20.12	225			VC	29.15476	1 in 8
4545	27.64	CO	24.44	225			VC	15.52626	1 in 1009	833	21.27	CO	20.12	225			VC	29.15476	1 in 8
7702	27.64	CO	24.44	225			VC	4.47189	1 in 1009	834	21.27	CO	20.12	225			VC	29.15476	1 in 8
6902	27.64	CO	24.44	225			VC	8.87119	1 in 1009	835	21.27	CO	20.12	225			VC	29.15476	1 in 8
5702	27.91	CO	24.91	300			VC	7.92077	1 in 1009	836	21.27	CO	20.12	225			VC	29.15476	1 in 8
2417	27.77	CO	25.21	300			VC	59.8825	1 in 1009	837	21.27	CO	20.12	225			VC	29.15476	1 in 8
7402	28.52	CO	26.61	225			VC	5.00772	1 in 1009	838	21.27	CO	20.12	225			VC	29.15476	1 in 8
2500	26.95	CO	22.18	450			VC	7.48543	1 in 1009	839	21.27	CO	20.12	225			VC	29.15476	1 in 8
6908	27.66	CO	25.63	225			VC	18.02776	1 in 1009	840	21.27	CO	20.12	225			VC	29.15476	1 in 8
6902	27.94	CO	24.99	150			VC	8.34723	1 in 1009	841	21.27	CO	20.12	225			VC	29.15476	1 in 8
7412	27.94	CO	24.99	150			VC	8.840023	1 in 1009	842	21.27	CO	20.12	225			VC	29.15476	1 in 8
2501	27.27	CO	25.2	225			VC	9.848585	1 in 1009	843	21.27	CO	20.12	225			VC	29.15476	1 in 8
5914	27.27	CO	25.2	225			VC	7.20452	1 in 1009	844	21.27	CO	20.12	225			VC	29.15476	1 in 8
4800	26.59	CO	22.29	1550			VC	10.701068	1 in 1009	845	21.27	CO	20.12	225			VC	29.15476	1 in 8
3508	27.87	CO	25.45	100			VC	5.09922	1 in 1009	846	21.27	CO	20.12	225			VC	29.15476	1 in 8
6713	27.87	CO	25.45	100			VC	13.88448	1 in 1009	847	21.27	CO	20.12	225			VC	29.15476	1 in 8
7503	28.07	CO	25.63	225			VC	11.04386	1 in 1009	848	21.27	CO	20.12	225			VC	29.15476	1 in 8
4511	28.07	CO	25.63	225			VC	5.25552	1 in 1009	849	21.27	CO	20.12	225			VC	29.15476	1 in 8
5814	28.07	CO	25.63	225			VC	7.912793	1 in 1009	850	21.27	CO	20.12	225			VC	29.15476	1 in 8
5400	28.07	CO	25.43	300			VC	31.0911	1 in 1009	851	21.27	CO	20.12	225			VC	29.15476	1 in 8
4406	28.34	CO	26.75	150			VC	17.30233	1 in 1009	852	21.27	CO	20.12	225			VC	29.15476	1 in 8
2502	27.34	CO	26.13	225			VC	4.915844	1 in 1009	853	21.27	CO	20.12	225			VC	29.15476	1 in 8
6859	27.34	CO	26.13	225															

Appendix F – United Utilities Pre-Development Response

Paul Graveney

From: seweradoptions@uuplc.co.uk
Sent: 23 March 2023 11:45
To: Paul Graveney
Subject: Pre Development Enquiry for: Former Chorlton Islamic School For Girls Chorlton Manchester M21 9FA UU Reference Number : 03733831

Good morning Paul,

Pre Development Enquiry for: Former Chorlton Islamic School For Girls Chorlton Manchester M21 9FA UU Reference Number : 03733831

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 High 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.

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.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

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 diameter public combined sewer within High 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 5l/s, in line with HR Wallingford IH124 set to soil type 5 to calculate brownfield rates.

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 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.

Many thanks and kind regards,



Ashleigh Bellerby
Assistant Developer Engineer
Developer Services & Metering
Customer Services
T: 07826891650
unitedutilities.com

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

From: seweradoptions@uuplc.co.uk [seweradoptions@uuplc.co.uk]

Sent: 09/03/2023 13:49

To: pgraveney@brennanconsult.com

Subject: 03733831 Former Chorlton Islamic School For Girls Chorlton Manchester M21 9FA

Dear Paul

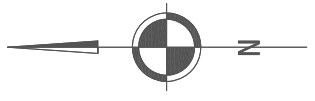
PRE DEVELOPMENT APPLICATION AT: – UU Ref 03733831

Please accept this email as receipt of your application received on 9.3.2023 for the above development. This has now been logged on our system and the job reference is 03733831 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 Ashleigh Bellerby for technical assessment. You will receive their response within 8 working days.

Kind regards Jill

Appendix G – CCTV Plan



Legend/Notes:

- Combined Sewer
- Foul Sewer
- SW Sewer
- Assumed Sewer (Not Proven)
- Rising Main
- Highway Drainage
- Culvert Sewer
- Open Water Course
- Overflow Line
- Treated Line
- Rain Water Down Pipe
- Foul Water Down Pipe
- Combined Down Pipe
- Gray Water Down Pipe
- Highway Gully
- Septic Tanks
- Direction of overland flows
- Spot levels



Warrington Business Park, Long Lane, Warrington, Cheshire, W42 8TX
Tel: 01925 244376 Fax: 01925 241517
Email: kevin@invek.com - www.invek.com

Client

Brennan Consult

Drawing Title

High Lane, Chorlton
Drainage Layout

Scale(s)	N.T.S	Drawn	PW
Date	07.06.23	Checked	RD
Job Number	2108	Approved	KN

Sheet Size, Drawing Number & Revision

A1_2108/01_Rev_00

