



Project Title

Drainage Strategy Report

At

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Manchester
M13 0EA**

For

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Executive Summary

Figure 1: Flood Risk and Drainage Strategy Summary

Item	Brief Description
Proposed Development	Construction of an Energy Centre with associated parking and landscaping on land adjacent to Octagon House, Hathersage Road, Manchester, M13 0EA.
Flood Zone Classification	Flood Zone 1 – Low Risk
Geology	A site investigation was undertaken at the site in 1980 to inform on a potential development building. A number of boreholes were taken down to circa 14.5m below ground level. The findings identified shallow made ground over firm to stiff clay to depth.
Infiltration Rate	Based on the assessment of the previous site investigation and the presence of the underlying clay, infiltration as a means of draining the site is discounted.
Nearest Watercourses	There is no identified watercourse located within close proximity.
Adopted Sewers and Onsite Private Drainage	The United Utilities (UU) sewer records have been reviewed. These have indicated no public sewers passing through the site. Within Carmoor Road to the west, a 450mm diameter combined sewer flows north. Within the wider car park area to the north a 225mm diameter combined sewer flows west and outfalls to the 450mm sewer in Carmoor Road. No surface water sewers have been identified. A CCTV survey has been completed at the site and indicates that the current building and external hard paved areas outfall unrestricted via a private combined drain to the offsite public sewers to the north and west.
Existing Discharge Rate	For the purpose of this assessment the site is classed as Brownfield with discharge rates defined below based on the modified rational method and an impermeable area of 2,400m²: 1yr (30mm/hr) – 18l/s 30yr (65mm/hr) – 39l/s 100yr (95mm/hr) – 57l/s
Proposed Discharge Rate and Outfall Location	Connection made to the combined water sewer at a peak discharge rate of 5l/s, considered the minimum orifice size to prevent blockage and in line with Manchester City Council local policy and UU agreed discharge rate.
Allowance for Climate Change	45% - based on a >100-year design life to 'the 2100's'.
SuDS features & Attenuation	Potential green roof, permeable surfacing, attenuation tank and flow controls.
Maintenance Responsibility	Management Company.
Foul Drainage Strategy	Existing foul drainage to be reused that outfalls offsite to UU adopted combined water sewer.

1. Introduction

- 1.1 Paul Graveney Consulting Ltd (PGC) has been appointed by Manchester Energy Partnership Ltd to prepare this Drainage Strategy Report to support a full planning submission for the proposed construction of an Energy Centre with associated parking and landscaping on land adjacent to Octagon House, Hathersage Road, Manchester, M13 0EA. The Site Masterplan as indicated in Appendix A provides details of the proposed development intent.
- 1.2 The assessment has been undertaken in line with Section 14 of the 2023 'National Planning Policy Framework', plus the accompanying Technical Guidance on Flood Risk and any local policies.
- 1.3 This report has been commissioned by Manchester Energy Partnership Ltd and is specific to their interests in the development proposals as described by the Architectural plan in Appendix A.
- 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 the current surface water drainage regime and assess any potential increase in surface water runoff as a result of the proposed development.
 - Assess local and national policy in relation to the inclusion of SuDS.
 - 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.
 - Devise an appropriate outline foul water drainage strategy.

2. Development Description and Location

2.1 Site Location

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

Item	Brief Description
Project name	Proposed Energy Centre
Site address and location	Octagon House, Hathersage Road, Manchester, M13 0EA.
Council Area	Manchester City Council
Approximate Grid Reference	OS: 385544, 395894
General Locality	The site is located approximately 3.5km southeast of Manchester City Centre.

Figure 2: Site Referencing Information

2.2 Existing Site Description

- 2.2.1 The development site (Red Line Boundary) is irregular in plan shape and currently encompasses an area of tarmac car parking adjacent the retained Octogan House.
- 2.2.2 The site is located within a predominantly residential led area, with housing and various halls of residence to the north, east and south. Manchester Royal Infirmary hospital is located beyond Upper Brook Street to the west.
- 2.2.3 Figure 3 identifies the overall site location details. Further details of the existing layout can be seen on the Red Line Plans in Appendix A.

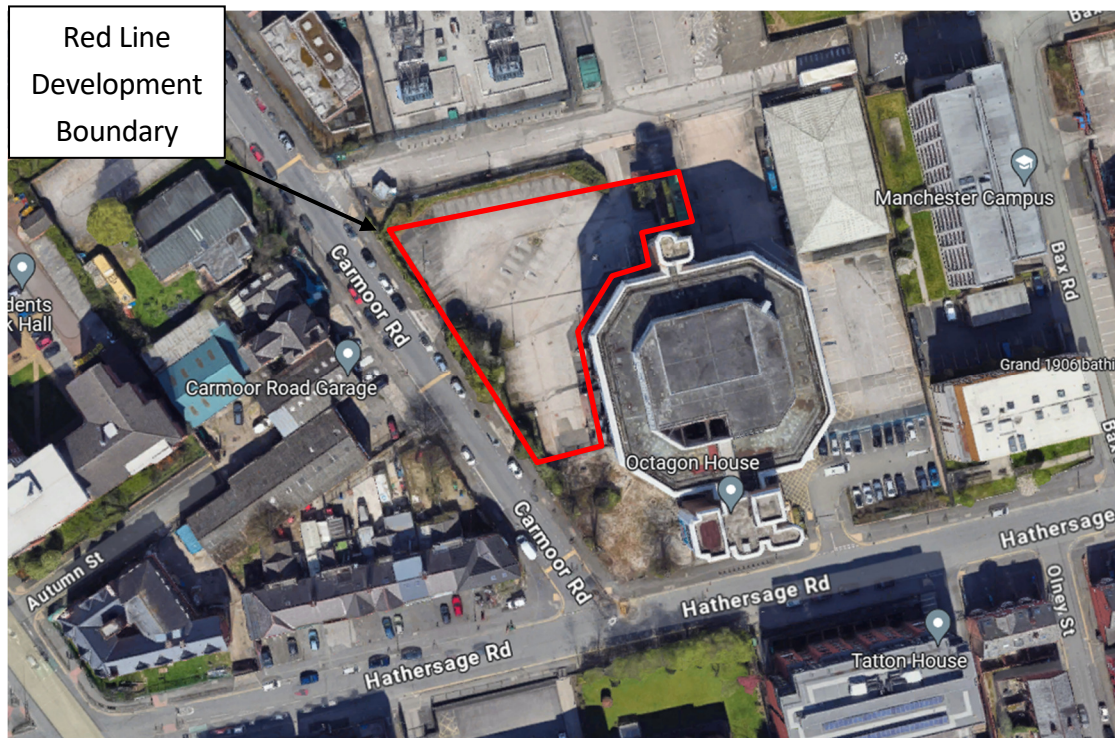


Figure 3: Location Plan as taken from Google Maps (2024)

2.3 Topography

- 2.3.1 A full topographical survey has been undertaken at this site. This has identified the location of the proposed building to be extremely flat holding levels between 43.75m AOD and 44.10m AOD. There are small variations in the car park levels to allow for falls to the drainage channels. Refer to Appendix B for details.

3. Fluvial Flood Risk Review

- 3.1 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 2023 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, removing the requirement for further investigation and assessment of the fluvial flood regime.

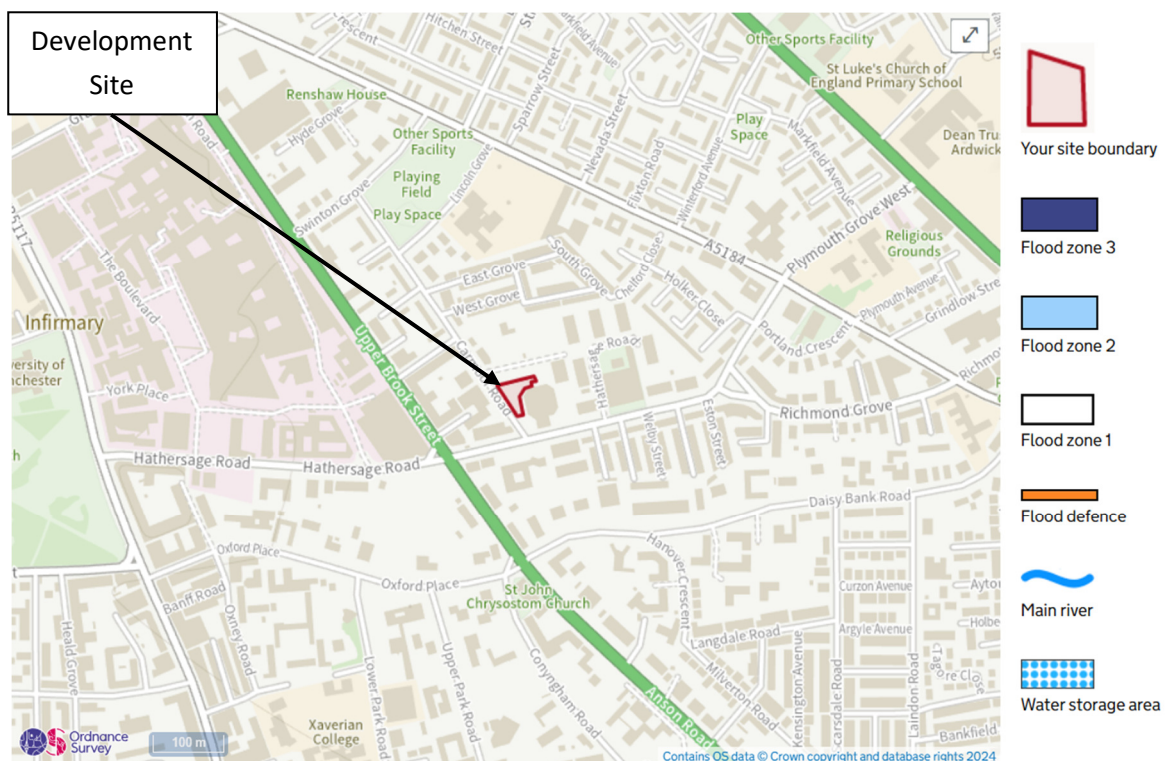


Figure 4: EA Indicative Flood Maps

- 3.2 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. Planning Policy

4.1 Strategic Flood Risk Assessment (SFRA)

- 4.1.1 SFRA's assess the risk associated with all types of flooding and provide the information required to identify the amount of development permitted in an area, how drainage systems in the area should function and also how risks in vulnerable areas can be reduced and/or mitigated. The NPPF states that regional planning bodies (RPB's) or Local Planning Authorities should prepare SFRA's in consultation with the EA.
- 4.1.2 Manchester City Council in consultation with adjacent authorities, produced the Manchester City Salford City and Trafford Councils Hybrid Level 2 Strategic Flood Risk Assessment (2011) to demonstrate and define its understanding and role in managing flood risk. A fundamental aim of the strategy is that the Council embraces and supports its role as Lead Local Flood Authority, and this means taking the lead in helping with infrastructure development and re-development and working with other bodies in dealing with flood risk. The Council wants to encourage and wherever possible enforce current thinking and guidance and be able to provide improvements through working better together. The Strategy is aimed at providing an overview and assessment of local flood risk, setting out objectives and measures for how the Council will manage and reduce local flood risk. This Strategy builds on existing and developing approaches to flood risk management and promotes the use of a wide range of measures to manage flood risk. Risk should be managed in a co-ordinated way within catchments and balance the needs of communities, the economy and the environment.
- 4.1.3 A summary of the main elements from the SFRA associated with the district is detailed below. The full report can be obtained from the Manchester City Council website.
- The most significant sources of flood risk are fluvial and surface water.
 - To better understand local flood risk and make best use of available information to better manage flood risk to people, businesses, property, infrastructure and the natural environment.
 - To reduce the potential impact and costs of flooding in the area.
 - To ensure resilience of local water bodies and drainage assets.
 - To develop a collaborative partnership approach to flood risk management and cooperate with other Risk Management Authorities (RMAs) and key stakeholders working across catchments.
 - Development should be designed so that there is no flooding to the development in a 1 in 30-year event and so that there is no property flooding in a 1 in 100 year plus climate change event.
 - For all sites, development proposals should look at opportunities to incorporate SuDS to reduce the risk of surface water flooding.

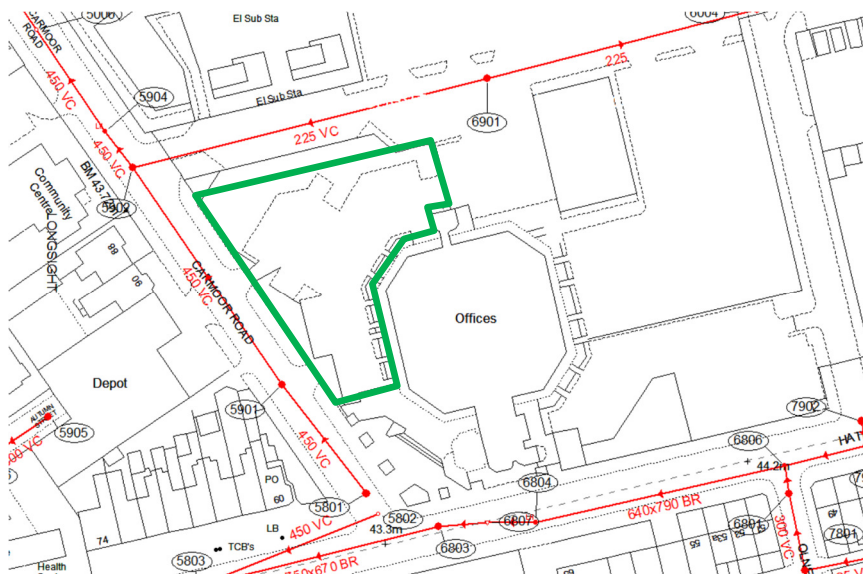
5. Outline Drainage Strategy

5.1 Consultation

- 5.1.1 PGC have been in contact with United Utilities via a predevelopment drainage enquiry for the development site. Their considered response is that UU would require evidence that the SuDS Hierarchy has been assessed. Should it be proven that infiltration is not feasible then UU would accept a connection to the combined sewer at a rate not to exceed 5l/s. Refer to Appendix E for further details.

5.2 Existing Drainage

- 5.2.1 A review of the United Utilities adopted sewer records has identified no public sewers passing through the site boundary.
- 5.2.2 Within Carmoor Road to the west, a 450mm diameter combined sewer flows north. Within the wider car park area to the north a 225mm diameter combined sewer flows west and outfalls to the 450mm sewer in Carmoor Road. Refer to Figure 5 below for details.



5.3 Existing Runoff

5.3.1 The site area is predominantly hard paved and so is considered to be Brownfield for drainage purposes. The brownfield rates have been calculated in the table below based on 90% of the red line boundary of 2,400m².

	Area (m ²)	1 year (30mm/hr)	30 year (65mm/hr)	100 year (95mm/hr)
Brownfield Runoff Rates	2,160	18 l/s	39 l/s	57 l/s

Figure 6: Existing Brownfield Runoff Rates

5.4 Hydrological Assessment

5.4.1 No watercourse has been identified in close proximity to the site.

5.5 Geology

5.5.1 A site investigation was undertaken at the site in 1980 to inform on a potential development building. A number of boreholes were taken down to circa 14.5m below ground level. The findings identified shallow made ground over firm to stiff clay to depth.

5.5.2 In light of these findings, infiltration as a means of draining the site has been discounted.

5.6 Sustainable Drainage Systems (SuDS) Assessment

5.6.1 SuDS Objectives

5.6.1.1 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 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).

5.6.2 SuDS Design Themes

5.6.2.1 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.

5.6.3 SuDS Site Constraints

5.6.3.1 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:* A range of prevention, source control and site control SuDS devices are to be considered.
- *Site Characteristics:* Based on a review of the historic site investigation, infiltration would not be suitable.
- *Catchment Characteristics:* The site is currently classed for drainage purposes as 'Brownfield'.
- *Environmental and Amenity Performance:* The inclusion of SuDS within the overall development is a key driver in providing both amenity and habitat creation. All types of SuDS will be considered and blended into the project where feasible. Maintenance plans will be prepared for all SuDS devices that are included.

5.6.4 SuDS Methods

5.6.4.1 Figure 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 & 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. Promotes evaporation and local biodiversity.	<u>Suitable:</u> • Proposed flat roof allows a potential green roof to be incorporated.
Water Butts	• Plastic tanks placed at the base of rainwater down pipes to collect rainwater runoff from the roof areas for reuse by the property owners.	<u>Not suitable:</u> • Internal rainwater pipes and limited end use for a energy centre led scheme.
Rainwater Harvesting	• Rainwater harvesting reduces the total runoff volume from the developed site by reusing as 'Grey' water. Also reduces treated water consumption.	<u>Not suitable:</u> • Additional costs of installation would have a severe effect on the 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.

Method	Comment	Suitability for Development
Infiltration Options	Reduces total run off volume from the development by allowing water to infiltrate to suitable sub strata.	<u>Not suitable:</u> Underlying cohesive ground conditions preclude infiltration.
Permeable Surfacing (Infiltration)	- Reduces total run off volume from the development by allowing water to infiltrate to suitable sub strata. - Can be used to enhance water quality.	<u>Not suitable:</u> Underlying cohesive ground conditions preclude infiltration.
Permeable Surfacing (Standard)	- Can be used to enhance quality of runoff water. - Sub-base provides 'source' storage and reduces the volume of storage downstream with selection of stone fill or use of plastic box stems. - Impermeable membrane at base of construction to prevent impact on pavement stability.	<u>Suitable:</u> Parking bays to be constructed in permeable surfacing with filter drain beneath.
Bio-Retention	Collect and retain run-off within tree pits or above ground planers to help improve water quality, prior to discharge in piped system or infiltration.	<u>Not Suitable:</u> The size and type of development restricts the use of above ground surface runoff storage.
Swales, basins and ponds	- Provide areas for above ground surface runoff storage. - Swales also improve water quality through filtration.	<u>Not Suitable:</u> The size and type of development restricts the use of above ground surface runoff 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.	<u>Suitable:</u> Subject to detailed design and drainage layout to be used to attenuate the peak flows.
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> The use of oversized pipes is more suited to large residential schemes.

Figure 8: Sub-Surface SuDS Methods

5.6.5 SuDS Hierarchal Approach

Based on the SuDS assessment in Tables 7 & 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	No	Previous site investigations at the site have identified cohesive ground to depth, thus precluding infiltration.
Connection to Watercourse	No	No watercourse is located in close proximity.
Connection to Surface Water Sewer	No	No surface water sewer is located in close proximity
Connection to a Combined Sewer	Yes	Reuse existing connection to combined water sewer at restricted rates.

Figure 9: SuDS Hierarchal Approach

5.7 Climate Change

5.7.1 In May 2022, the Environment Agency released updated climate change allowances for peak rainfall intensities which should be applied to new developments. Rather than nationwide 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.

5.7.2 Based on the nature of the development, a lifespan in excess of 75 years is anticipated. Therefore, the potential climate change allowance for the 2070's Upper End Allowance for a Energy Centre Development is 45%, which will be included in the hydraulic calculations.

5.8 Outline Surface Water Drainage Strategy

5.8.1 The general principal of the surface water drainage strategy is to collect the runoff from the roof of the new energy centre roof, and direct it to a number of RWPs. These will then drop down to a new private surface water network that merges with the runoff from the permeable surfaced car park and outfalls to the existing 450mm diameter combined sewer in Carmoor Road via an existing 225mm diameter combined water drain. The flows will be restricted to 5l/s by the inclusion of a hydrobrake flow control within the last chamber. Due to this restriction, attenuation will take the form of an online geocellular tank.

5.8.2 SuDS in the form of a potential Green Roof and Permeable Surfacing will be integrated into the scheme.

5.8.3 A hydraulic model has been simulated within the Causeway Flow design software and confirms that no flooding will occur up to the extreme 100 year + 45% CC storm event. The post development peak runoff rates from the model provide a minimum 73% reduction in the unrestricted pre-development discharge rates.

5.8.4 Drawing PGC952-DR-C-001 in Appendix C indicates the Drainage Strategy based on the Architects masterplan intent.

5.9 Pollution Control

5.9.1 Runoff from roofs is generally considered to be clean and will be discharged directly into the new drainage network. Surface water run-off from hard paved areas will pass through the new permeable surfacing to provide the required treatment prior to outfall.

5.10 Maintenance

5.10.1 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.

5.10.2 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.'*

5.10.3 Piped Networks, Inspection, Manhole and Catchpit Chambers

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 where required.

Pipes are proprietary products, and the materials can vary across the site and as such where used the manufacture's recommendations should be followed.

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.

Access for maintenance is provided through access chambers and manholes.

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.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any features that are not operating correctly. If required, take remedial action	Monthly for three months, then six monthly
	Debris removal from catchment surface / gratings (where may cause risks to performance)	Monthly (and after large storms)
	Remove sediment from trapped sumps, manholes and catchpits.	Annually or as required
Remedial Maintenance	Repair / rehabilitation of gratings, inlets and outlets	As required
Monitoring	Inspect / check all gratings, trapped sumps, manholes and catchpits to ensure that they are in good condition and operating as designed	Annually and after large storm events
Structure Rehabilitation / Repair	Regular Maintenance and Monitoring to identify if repair and / or replacement of features or pipework is required.	As required

Figure 10: Operation and Maintenance Requirements of Piped Networks and Inspection Chambers

5.10.4 Attenuation Storage

Geocellular tanks are modular storage systems made with plastic units. These units can be assembled to achieved re 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.

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

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

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	Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually.
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly.
	For systems where rainfall infiltrates into the tank from above, check surface of filter for 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.
Occasional Maintenance	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
Remedial Actions	Survey inside of tank for sediment build-up and remove if necessary.	Every 5 years or as required.

Figure 11: Operation and Maintenance Requirements for Attenuation Crates

5.10.5 Flow Control Units

The flow control units are intended for flood control and flow restriction.

The flow control is specified as an orifice plate and is a proprietary product; therefore, manufacturer's recommendations should also be taken into consideration.

Access for maintenance has been provided by locating within manhole chambers.

Maintenance Schedule	Required Action	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	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 12: Operation and Maintenance Requirements for Flow Controls

5.10.6 Permeable Paving

Permeable paving provides a surface suitable for vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The surface itself is impervious to water, but the blocks are laid to provide void space through the surface to the sub-base. The water is temporarily stored within this sub-base before controlled discharge downstream.

Permeable surfaces, together with their associated substructures, are an efficient means of managing surface water runoff close to its source – intercepting runoff, reducing the volume and frequency of runoff, and providing a treatment medium. Treatment processes that occur within the surface structure, sub-base and geotextile layers include filtration, absorption, biodegradation and sedimentation.

Permeable paving should be inspected regularly, preferably during and after heavy rainfall to check effective operation and identify areas of ponding. Permeable paving needs to be regularly cleaned of silt and other sediments to preserve their infiltration capacity. Evidence suggests that sweeping once per year should be sufficient to maintain an acceptable infiltration rate on most developments.

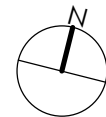
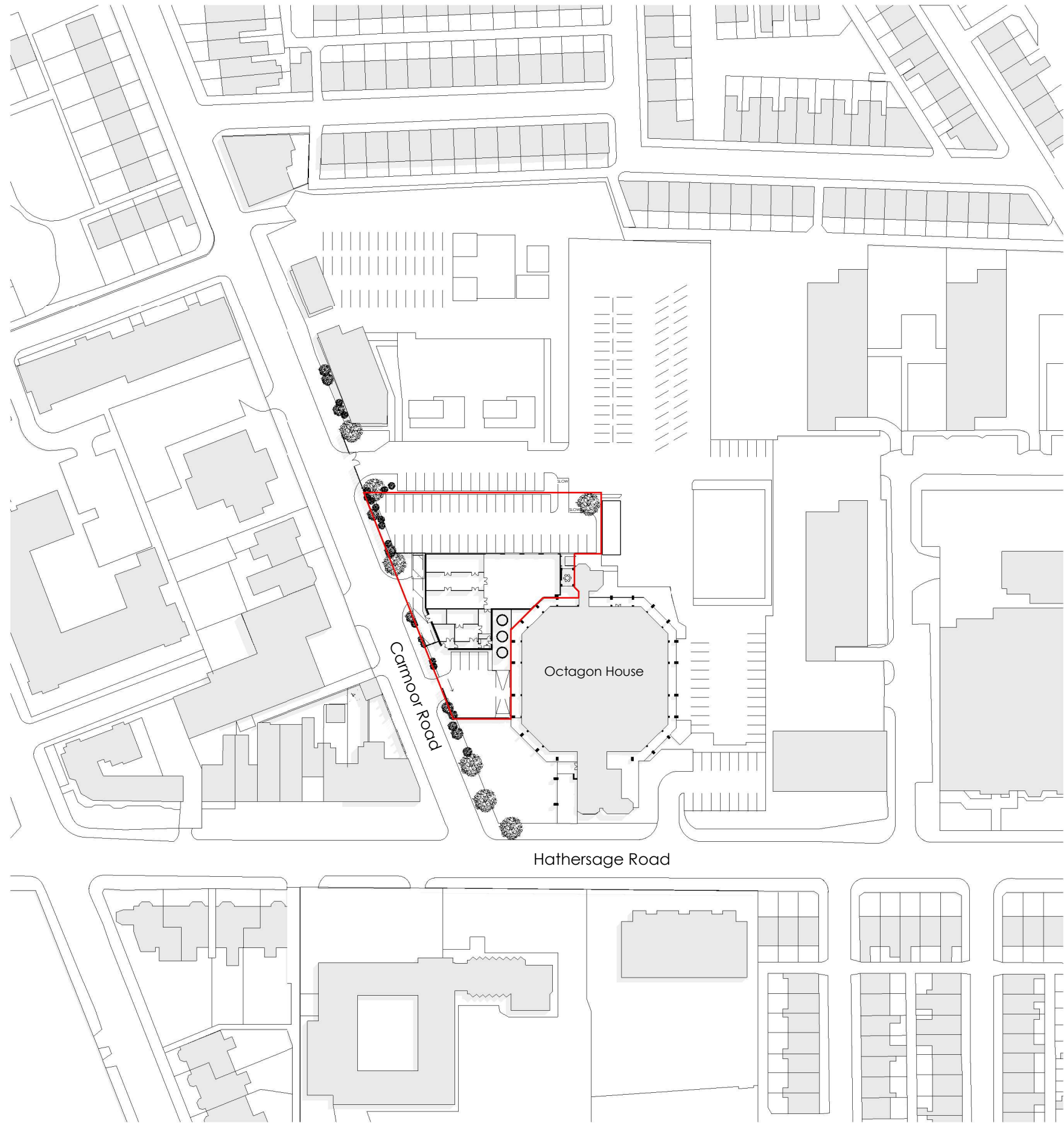
Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year, or when required during autumn leaf fall
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48hours	Every 3 months, 48 hours after large storms.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Manage other weeds and vegetation and remove nuisance plants	Once a year, or when required
Remedial Actions	Repair erosion of any adjacent soft landscaping adjacent to the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks.	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	As required
	Remove and dispose of oils or petrol residues using safe standard practices	As required

Figure 13: Operation and Maintenance Requirements for Permeable Paving

5.11 Foul Water Drainage

- 5.11.1 Foul flows generated by the new building will discharge via a new below ground foul drainage network and outfall to the same combined water drain to the UU combined sewer.
- 5.11.2 Drawing PGC952-DR-C-001 in Appendix C indicates the outline foul water Drainage Strategy.

Appendix A – Architects Drawings

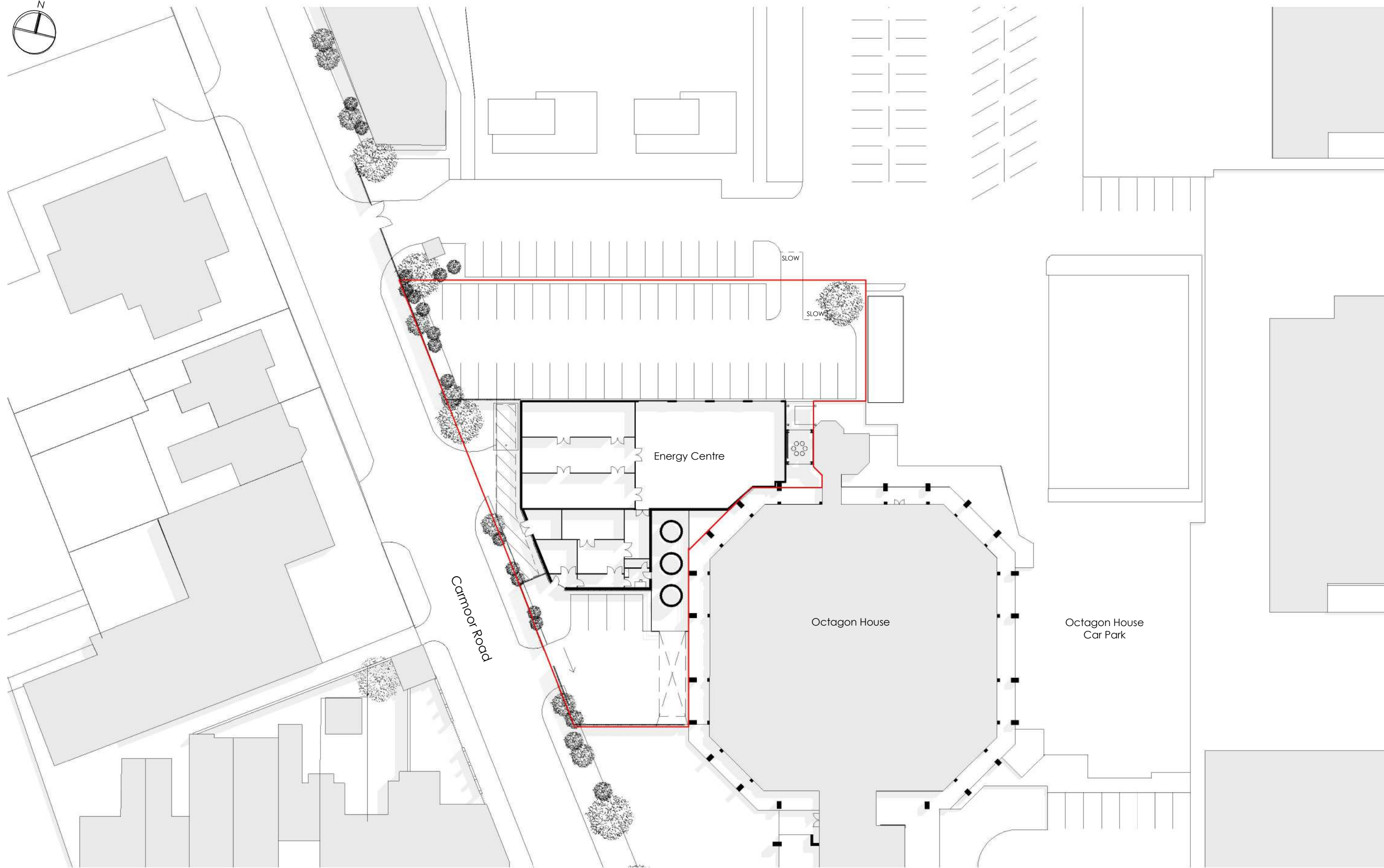


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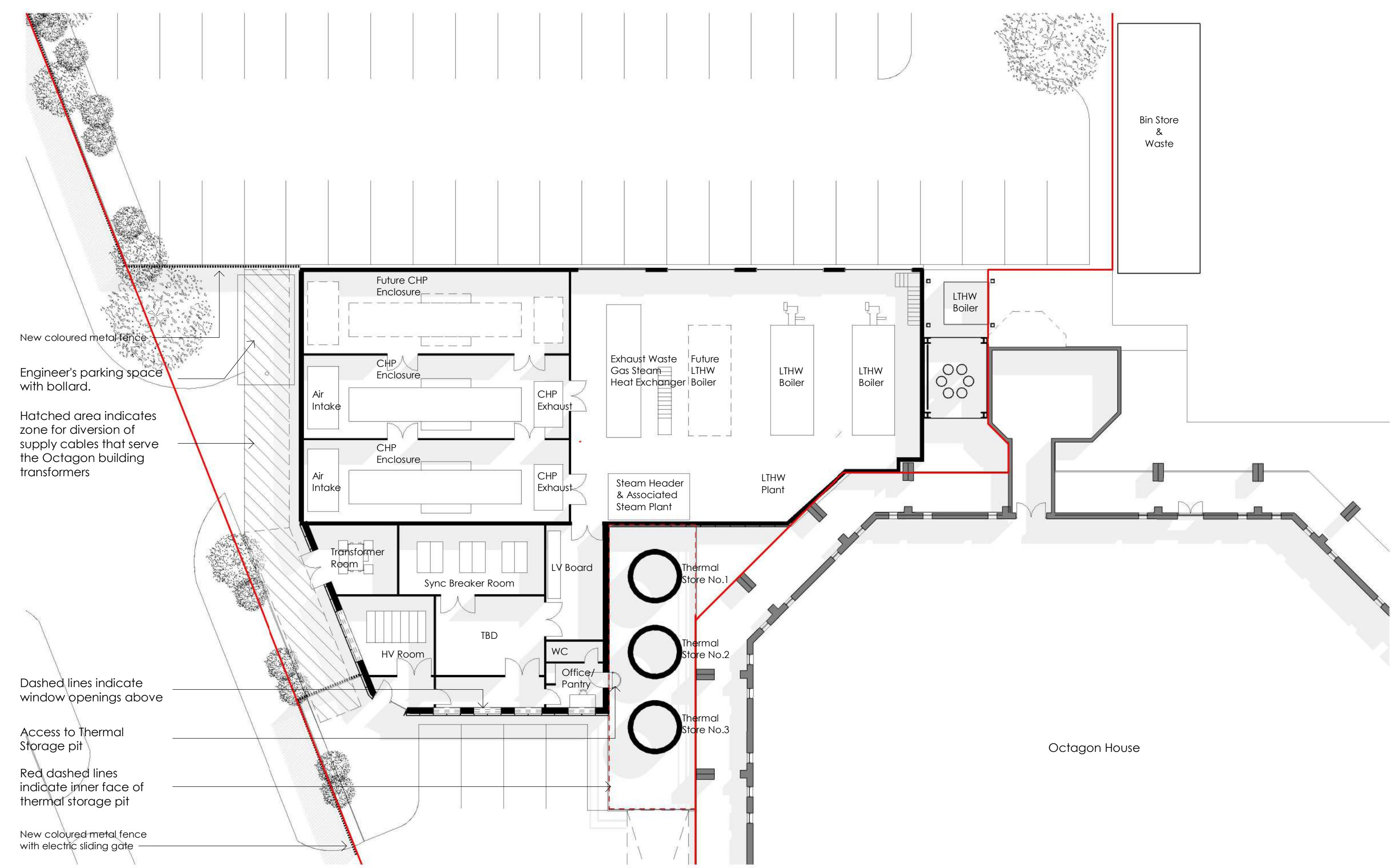
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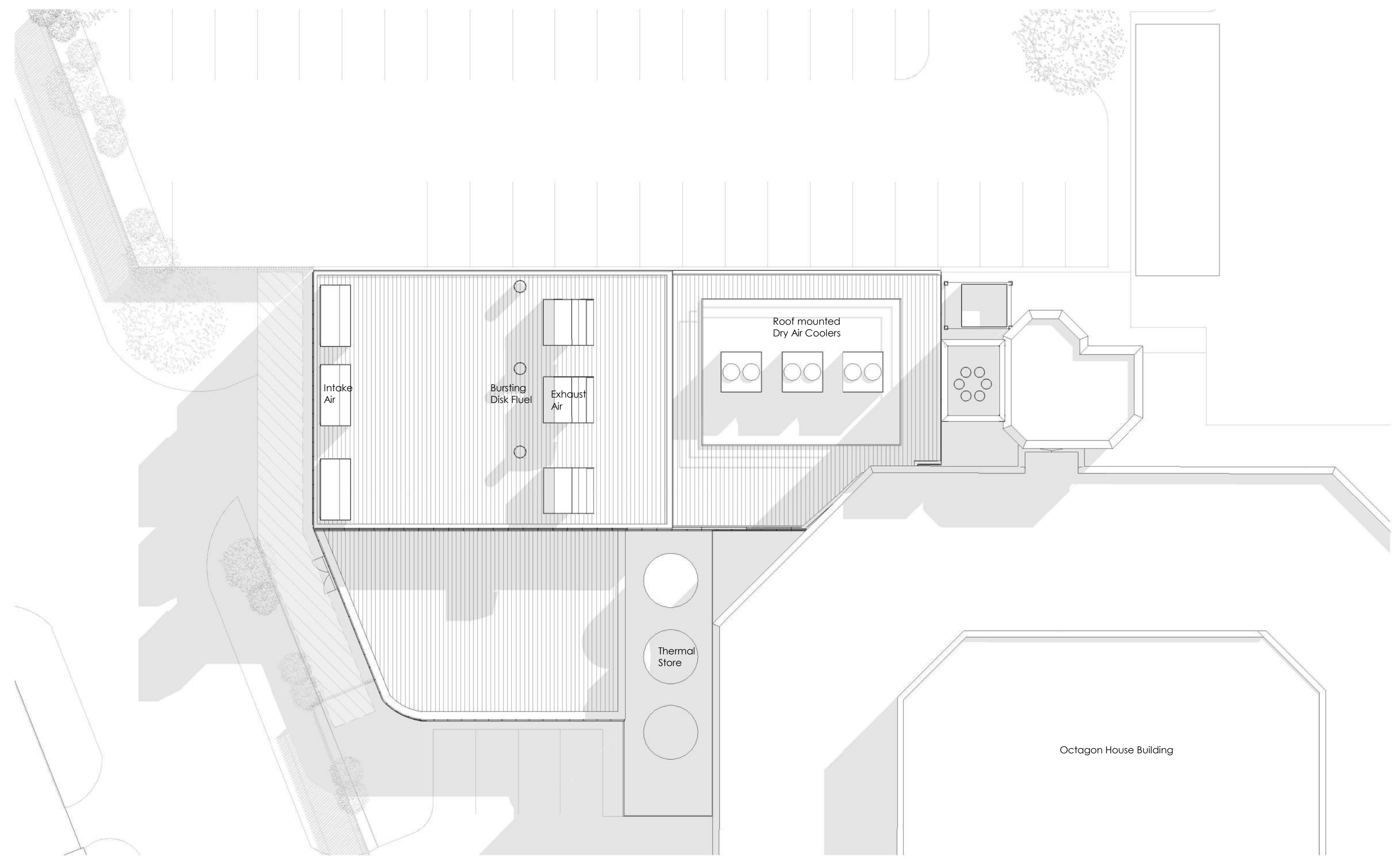
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Rev	Description	Date	By						

SCALE 1 : 200 @A3	STATUS PLANNING	DATE 31/07/2020
DWG No OEC/PL/002	DRAWN CA	REV
WEB: www.artformarchitects.com EMAIL: info@artformarchitects.com		
XYZ Building 1st Floor 2 Hardman Blvd Manchester TEL 0161 6600377		

Energy Centre
Proposed Ground Floor Plan

ARTFORM
ARCHITECTS



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Specific details and materials/colours are subject to further design development.

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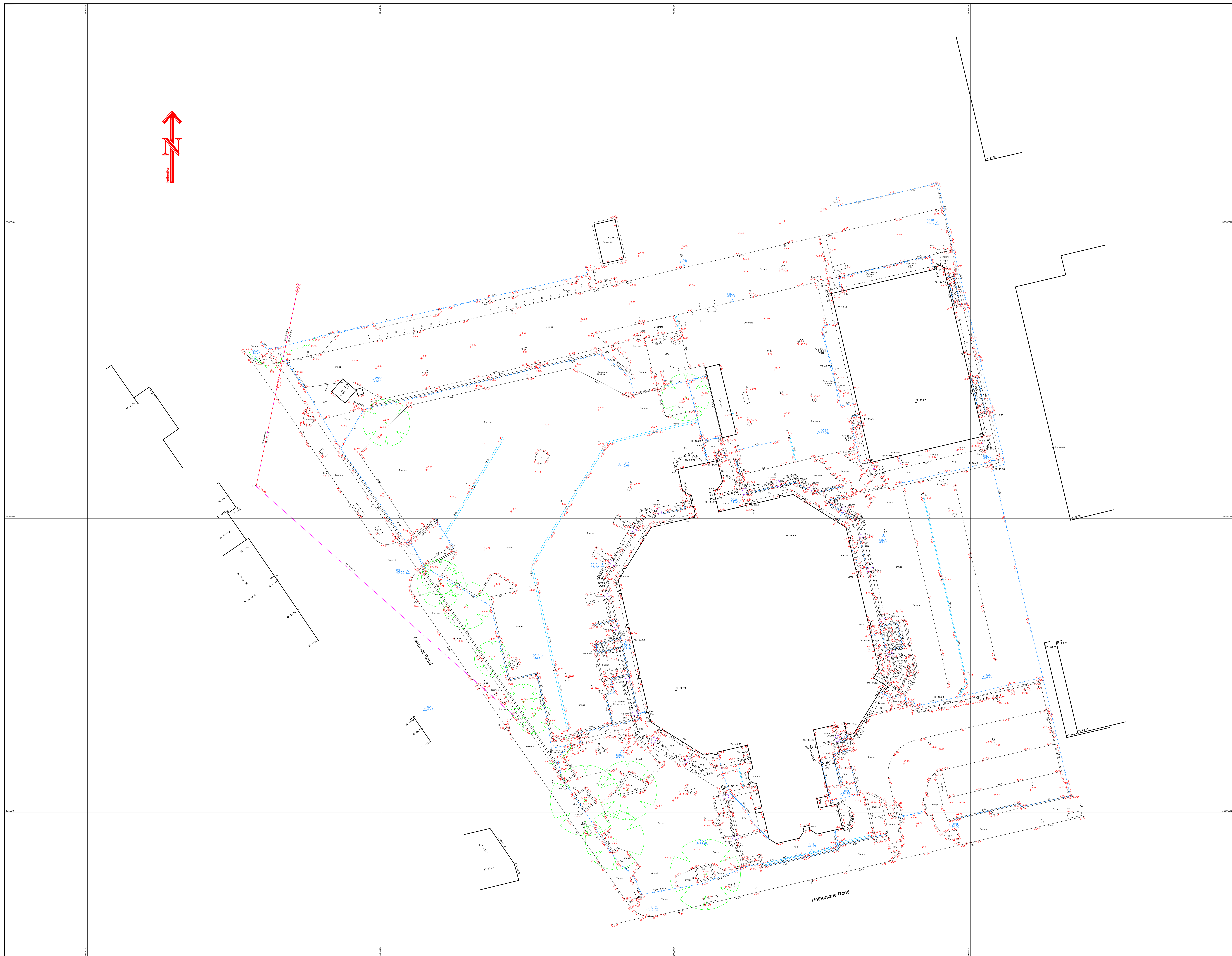
Rev	Description	Date	By						

SCALE 1 : 200 @A3	STATUS PLANNING	DATE 31/07/2020
DWG No OEC/PL/003	DRAWN CA	REV
WEB: www.artformarchitects.com EMAIL: info@artformarchitects.com		
XYZ Building 1st Floor 2 Hardman Blvd Manchester TEL 0161 6600377		

Energy Centre
Proposed Roof Plan

ARTFORM
ARCHITECTS

Appendix B – Topographical Survey and CCTV Plan

[illegible]

Survey Station Coordinates			
Stn	Easting	Northing	Level
0001	358646.41	358649.72	44.06
0021	358596.18	358683.82	43.82
0003	358554.41	358697.72	44.32
0004	358526.61	358697.30	44.24
0005	358548.53	358973.43	43.61
0013	358601.27	358993.97	43.71
0007	358590.40	358995.00	43.67
0010	358590.40	358995.00	43.69
0012	358603.64	358994.75	43.85
0013	358590.82	358989.47	43.57
0014	358577.20	358989.47	43.66
0015	358591.43	358982.85	44.41
0016	358587.49	358984.13	44.79
0017	358628.04	359003.10	44.38
0018	358628.04	359003.10	44.38
0019	358628.04	359003.10	44.38
0023	358563.83	358964.57	43.85
0024	358636.22	358964.59	43.75
0025	358624.23	358964.57	43.88
0026	358610.19	358962.90	44.29
0027	358600.46	358960.10	44.77
0028	358644.34	358980.10	44.10
0029	358557.35	358977.65	43.42

Please note:

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to archive benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.

Head and Registered Office:
Survey Systems Ltd
Willow Bank House
Old Road
Handford - Wiltshire

Levels are related to **OSGB15**
Value n/a

Coordinates are related to **National Grid** (GPS)

Scale **1:200**

0 2 4 6 8 10 12 14 16 18
metres

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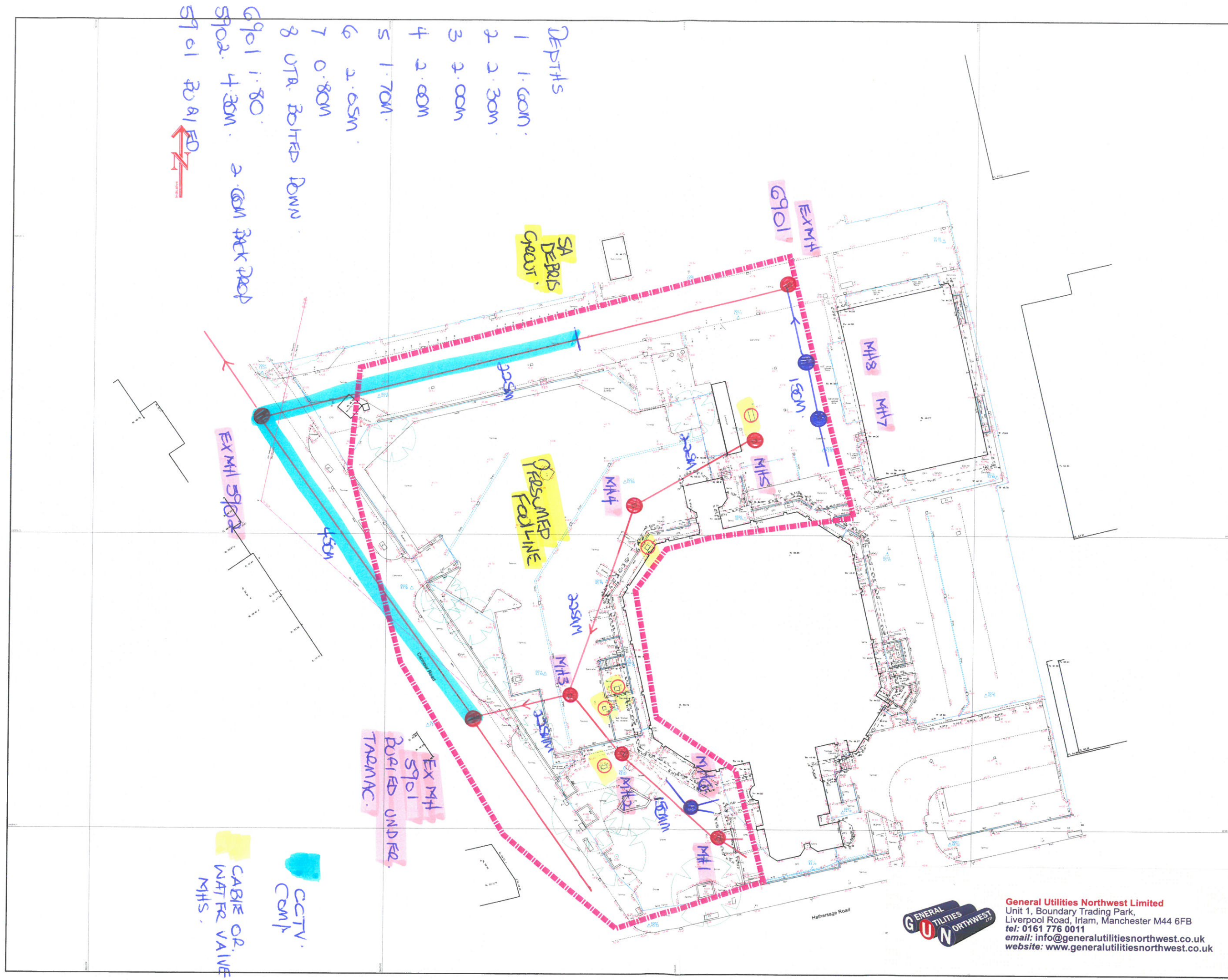
Topographical Survey
Octagon House
62 Hathersage Road
Manchester M13 0FN

Surveyed DI DB	Drawn GAT	
Date April 2021	Checked AG	
File name 20566	Revision No. _____	
Sheet size A0		

Drawing No **SSL:20566:200:1:1**

SURVEYsystems





Topographical Survey Legend			
1. Subsoil	2. Height	3. Air	4. Low Profile Obstructions
5. Fences	6. Another Fence	7. Water	8. Rail and
9. Paved/Unpaved Roads	10. Intersecting Corner	11. Street	12. Rail and
13. Rail	14. Road	15. Street	16. Rail and
17. Rail	18. Road	19. Street	20. Rail and
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93. Rail	94. Road	95. Street	96. Rail and
97. Rail	98. Road	99. Street	100. Rail and

Levels below edge of cantileverage are indicated as follows (please see notes):

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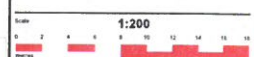
100. Level of edge of cantileverage

Survey Station Coordinates				
	Stn	Easting	Northing	Height
	0001	385648.41	395897.72	44.02
	0002	385895.18	395883.82	43.82
	0003	385854.41	395885.42	43.86
	0004	385828.61	395877.30	43.84
	0005	385621.27	395899.47	43.81
	0007	385901.40	395855.03	43.67
	0011	385623.04	395893.40	44.29
	0012	385603.64	395894.75	43.66
	0013	385607.82	395893.40	43.67
	0014	385577.28	395894.75	43.66
	0018	385557.13	395896.46	43.61
	0016	385877.49	395892.03	43.79
	0021	385850.43	395891.12	43.79
	0022	385602.32	395924.07	43.84
	0024	385630.22	395846.99	43.75
	0025	385624.23	395851.77	43.75
	0026	385617.99	395852.80	43.85
	0027	385605.48	395887.10	43.72
	0028	385647.38	395890.18	43.80
	0029	385657.35	395871.05	43.47

Please note

Any discrepancy found between an Ordnance Survey benchmark and an OSGB15 computed orthometric height is likely to be due to bench mark subsidence or uplift and, assuming precise GPS survey has been carefully carried out, the orthometric height given by OSGB15 should be considered correct in preference to arbitrary benchmark heights. OSGB15 converts GPS ellipsoid heights to orthometric heights above mean sea level.

Levels are related to OSGB15
Value n/a



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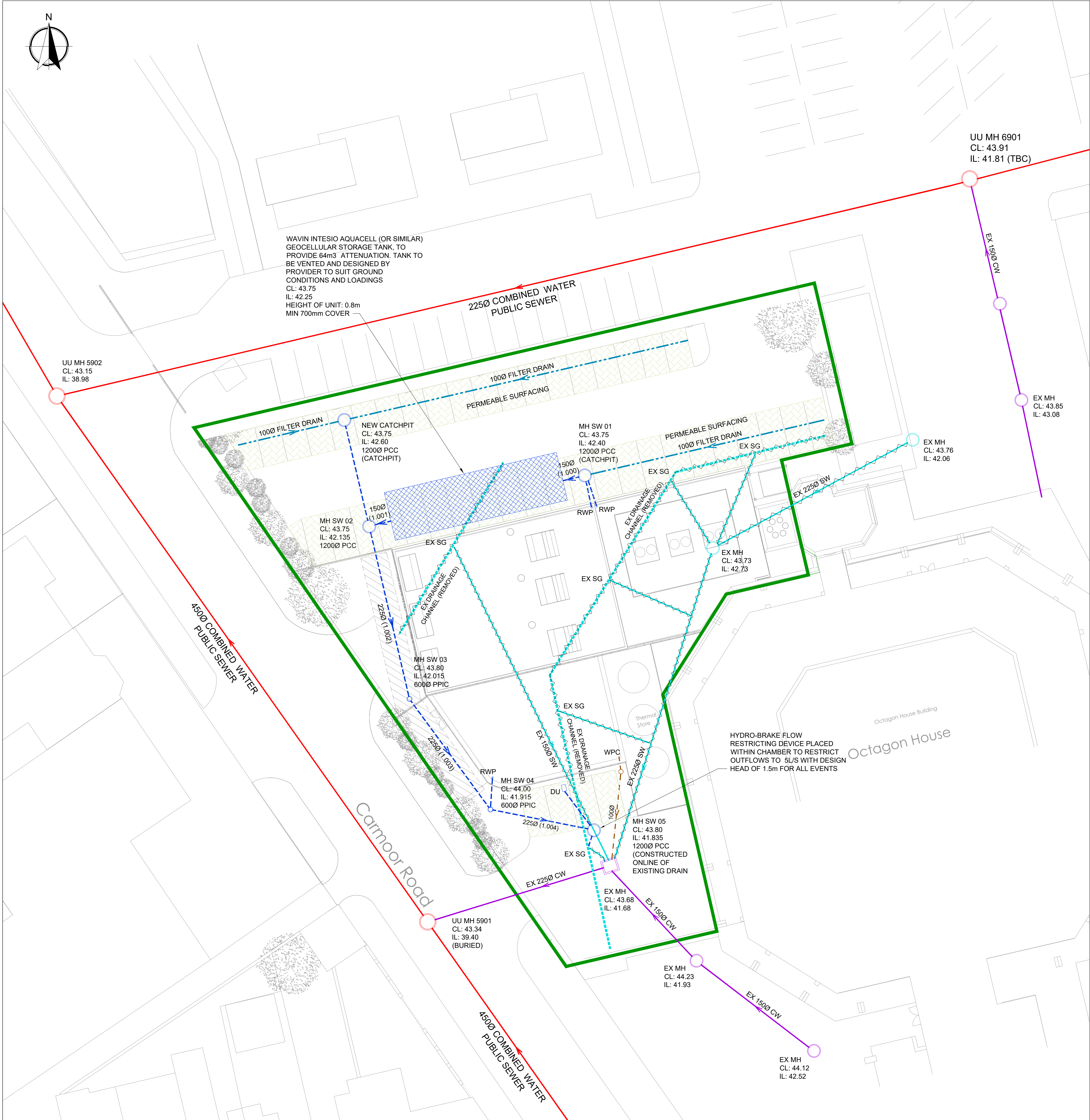
Surveyed: **DF DB** Drawn: **GAT**

DATE April 2021 CHAIRMAN AG
FILE NAME 20566 Revision No. Sheet size AG
Drawing No. SSL:20566:200:1:1

SURVEYsystems

General Utilities Northwest Limited
Unit 1, Boundary Trading Park,
Liverpool Road, Irlam, Manchester M44 6FB
tel: 0161 776 0011
email: info@generalutilitiesnorthwest.co.uk
website: www.generalutilitiesnorthwest.co.uk

Appendix C – PGC Drawings



DRAINAGE NOTES

- THE CONTRACTOR IS RESPONSIBLE FOR THE CONFIRMATION OF ALL POSITIONS AND LEVELS OF EXISTING DRAINS, SEWERS AND MANHOLES PRIOR TO THE COMMENCEMENT OF THE PROPOSED WORKS AND ANY DISCREPANCIES REPORTED IMMEDIATELY TO PGC.
- ALL PRIVATE DRAINAGE WITHIN THE SITE IS TO COMPLY WITH THE REQUIREMENTS OF BS EN 752 AND BUILDING REGULATIONS PART H.
- NO DEVIATION FROM THE CONTENT OF THIS DRAWING IS ALLOWED WITHOUT PERMISSION OF PGC.
- FOR DETAILS OF WORKMANSHIP AND MATERIALS REFER TO THE SPECIFICATION, BUILDING REGULATIONS AND BRITISH STANDARDS CURRENT AT THE TIME OF THE WORK.
- ADEQUATE PROTECTION IS TO BE PROVIDED TO MAINTAIN INTEGRITY OF THE EXISTING SERVICES AND PROPOSED WORKS DURING CONSTRUCTION.
- COVER LEVELS ARE PROVISIONAL AND THE FINAL LEVEL SHOULD BE ADJUSTED AND SET TO SUIT THE PROPOSED FINISHED LEVELS AS CONFIRMED BY THE ARCHITECT.
- CONCRETE SURROUND IS TO BE PROVIDED TO ALL DRAINS WITH A COVER OF LESS THAN 1.2m OF THE FINISHED GROUND LEVEL IN HIGHWAY AREAS OR WITHIN 0.8m IF WITHIN LANDSCAPED AREAS. AN EXPANSION JOINT IS TO BE PROVIDED AT EACH AND EVERY PIPE JOINT.
- ANY GRADIENTS OF DRAINS INDICATED ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL INSTALL THE DRAINS TO THE SPECIFIED LEVELS SHOWN FOR EACH MANHOLE (U.O.N). CATCHPIT INVERT LEVELS ARE FOR THE OUTGOING PIPE WITH THE SUMP LEVEL SPECIFIED SEPARATELY.
- ALL PIPEWORK WITHIN MANHOLES ARE TO BE LAID SOFFIT TO SOFFIT (U.O.N). ALL CHAMBER INVERT LEVELS ARE FOR THE OUTGOING PIPE LEVELS. BACKDROP PIPEWORK SHALL BE CONNECTED AT SOFFIT TO SOFFIT WITH THE RODDING ACCESS LEVEL SPECIFIED.
- ALL INVERT LEVELS PROVIDED FOR 475mm PPIC CHAMBER ARE TO THE LOWEST PIPE WITHIN THE BENCHING ARRANGEMENT.
- MANHOLE COVERS AND FRAMES ARE TO BE IN ACCORDANCE WITH BS EN 124 AND THE FOLLOWING:
 - VEHICULAR AREAS: CLASS D400 (E600 IN SERVICE YARD LOCATIONS), DOUBLE TRIANGULAR, 150mm DEEP DUCTILE IRON COVER AND FRAME WITH THREE POINT COVER SEATING, (NON-ROCK DESIGN) BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
 - PEDESTRIAN AREAS: CLASS B125, 100mm DEEP, BADGED FW OR SW FOR FOUL OR SURFACE WATER DRAINAGE.
 - IF COVERS ARE REQUIRED TO BE RECESSED A HOWE GREEN 1050 HEAVY DUTY, STAINLESS STEEL EDGE, EXTERNAL USE, 100mm RECESS OR SIMILAR APPROVED SHALL BE USED.
- REFER TO ARCHITECT'S DRAWING FOR RWP/SWPC'S POP UP SIZES. ALL REST BENDS ARE ASSUMED TO BE 1000/SET 600mm BELOW SSL, UNLESS OTHER SPECIFIED. THE CONTRACTOR SHALL ALLOW FOR SUITABLE VIKING JOHNSON ADAPTORS/COUPLINGS FOR JOINING THE DIFFERENT PIPE MATERIALS/PIPE SIZES.
- ALL BRICKWORK IN CONNECTION WITH DRAINAGE IS BE SOLID ENGINEERING BRICK CLASS B TO BS 3921.
- ALL INSITU CONCRETE TO BE GEN3 UNLESS SPECIFIED OTHERWISE.
- DRAINAGE CHANNELS ARE TO BE ACO MD SYSTEM C/W 'HEELGUARD' GRATES OR 'BRICKSLOT' TO LANDSCAPE ARCHITECT APPROVAL.
- ALL PRECAST CONCRETE PIPES, CHAMBER PRODUCTS AND ROAD GULLIES SHALL BE TO BS 5911 AND BE KITEMARKED.
- VITRIFIED CLAY PIPES TO CONFORM TO BS EN 295 MANUFACTURER: HEPWORTH SUPERSLEEVE;
 - 100/150mmØ -40 kN/m
 - 225mmØ -45 kN/m
 - 300mmØ -72 kN/mAND BE SUPPLIED WITH EPDM SEALING RINGS AS STANDARD.
- PLASTIC PIPEWORK IS ACCEPTABLE AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS
- UPON COMPLETION OF THE WORKS, ALL THE DRAINS SHALL BE CLEANED BY JETTING, REMOVING ALL DEBRIS FROM SITE. NO DEBRIS SHALL BE PERMITTED TO ENTER THE EXISTING DRAINAGE SYSTEM.
- UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL SURVEY THE WORKS AND PROVIDE A SUITABLY 'MARKED-UP' DRAWINGS FOR 'RECORD' PURPOSES'.

GENERAL NOTES

- DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT SPECIFICATIONS, ENGINEERS, ARCHITECTS & SERVICES DRAWINGS, INCLUDING APPROVED BUILDERS WORK DRAWINGS. CONTRACTOR TO NOTIFY ENGINEER OF DISCREPANCIES BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS OR OTHER DRAWINGS.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- DETAILS OF EXISTING SEWERS SHALL BE CONFIRMED BY THE CONTRACTOR ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY. THE CONTRACTOR SHOULD CHECK THE LEVELS OF ALL NEW OUT FALLS IN RELATION TO EXISTING SEWERS PRIOR TO ANY CONSTRUCTION TO ENSURE THE PROPOSED DESIGN CAN BE ACHIEVED.
- DO NOT SCALE FROM THIS DRAWN, WORK TO DIMENSIONS OR COORDINATES PROVIDED. ALL LEVELS ARE IN MILLIMETRES, UNLESS OTHERWISE NOTED. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY.

KEY

- EXISTING COMBINED WATER SEWER
- EXISTING COMBINED WATER DRAINAGE
- EXISTING SURFACE WATER DRAINAGE
- EXISTING SURFACE WATER DRAINAGE ABANDONED
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FILTER DRAIN
- SITE BOUNDARY
- RWP RAINWATER PIPE
- WPC WASTE POINT CONNECTION (FOUL)
- DU DIFFUSER UNIT AS BASE OF TYPE 3 SUB BASE

NOTE ALL RWP AND WPC LOCATIONS TO BE CONFIRMED BY OTHERS

ALL PIPEWORK TO BE 1000 UNLESS NOTED OTHERWISE

ALL LEVELS AND FALLS TO TO BE CONFIRMED BY OTHERS

P2	27.08.24	PG	PG	EXISTING DRAINAGE DETAILS ADDED
P1	06.02.24	PG	PG	PRELIMINARY ISSUE
REV	DATE	DRAWN	REV'D ENG.	NOTES
CLIENT MANCHESTER ENERGY PARTNERSHIPS LTD				
PROJECT PROPOSED ENERGY CENTRE, OCTAGON HOUSE, MANCHESTER				
DRAWING TITLE DRAINAGE GA				
DRAWING STATUS INFORMATION				
SCALE	1:200	DRAWN BY PG	ENGINEER PG	SHEET A1
DRAWING No PGC952-DR-C-001			REVISION P2	
PGConsulting Civil & Infrastructure Engineers 108 Aok Lane West, Cheshire Hulme, Cheshire, SK9 7ES Tel: 07710 758971 Email: paul@pgcd.co.uk				

Appendix D – Hydraulic Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	4	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	4.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
SW01	0.058	4.00	43.750	1200	1.350
TANK 1			43.750	100	1.500
SW02	0.087	4.00	43.750	1200	1.615
SW03			43.800	600	1.785
SW04	0.026	4.00	44.000	600	2.085
SW05	0.029	4.00	43.800	1200	1.965
EXISTING			43.760	1200	2.060

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	SW01	TANK 1	3.000	0.600	42.400	42.350	0.050	60.0	150	4.04	50.0
1.001	TANK 1	SW02	3.000	0.600	42.250	42.210	0.040	75.0	150	4.08	50.0
1.002	SW02	SW03	18.000	0.600	42.135	42.015	0.120	150.0	225	4.36	50.0
1.003	SW03	SW04	14.000	0.600	42.015	41.915	0.100	140.0	225	4.57	50.0
1.004	SW04	SW05	11.000	0.600	41.915	41.835	0.080	137.5	225	4.74	50.0
1.005	SW05	EXISTING	3.000	0.600	41.835	41.700	0.135	22.2	225	4.76	50.0

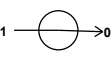
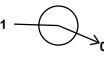
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.301	23.0	7.9	1.200	1.250	0.058	0.0	61	1.182
1.001	1.162	20.5	7.9	1.350	1.390	0.058	0.0	64	1.084
1.002	1.065	42.3	19.7	1.390	1.560	0.145	0.0	108	1.046
1.003	1.103	43.8	19.7	1.560	1.860	0.145	0.0	106	1.075
1.004	1.113	44.3	23.2	1.860	1.740	0.171	0.0	116	1.125
1.005	2.787	110.8	27.1	1.740	1.835	0.200	0.0	75	2.307

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	3.000	60.0	150	Circular	43.750	42.400	1.200	43.750	42.350	1.250
1.001	3.000	75.0	150	Circular	43.750	42.250	1.350	43.750	42.210	1.390
1.002	18.000	150.0	225	Circular	43.750	42.135	1.390	43.800	42.015	1.560
1.003	14.000	140.0	225	Circular	43.800	42.015	1.560	44.000	41.915	1.860
1.004	11.000	137.5	225	Circular	44.000	41.915	1.860	43.800	41.835	1.740
1.005	3.000	22.2	225	Circular	43.800	41.835	1.740	43.760	41.700	1.835

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	SW01	1200	Manhole	Adoptable	TANK 1	100	Manhole	Adoptable
1.001	TANK 1	100	Manhole	Adoptable	SW02	1200	Manhole	Adoptable
1.002	SW02	1200	Manhole	Adoptable	SW03	600	Manhole	Adoptable
1.003	SW03	600	Manhole	Adoptable	SW04	600	Manhole	Adoptable
1.004	SW04	600	Manhole	Adoptable	SW05	1200	Manhole	Adoptable
1.005	SW05	1200	Manhole	Adoptable	EXISTING	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW01	29.503	14.237	43.750	1.350	1200				
						0	1.000	42.400	150
TANK 1	0.735	31.017	43.750	1.500	100		1	1.000	42.350
						0	1.001	42.250	150
SW02	-3.209	54.192	43.750	1.615	1200		1	1.001	42.210
						0	1.002	42.135	225
SW03	-3.718	80.339	43.800	1.785	600		1	1.002	42.015
						0	1.003	42.015	225
SW04	30.350	80.339	44.000	2.085	600		1	1.003	41.915
						0	1.004	41.915	225
SW05	70.122	79.068	43.800	1.965	1200		1	1.004	41.835
						0	1.005	41.835	225
EXISTING	100.350	66.271	43.760	2.060	1200		1	1.005	41.700
									225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	0	0

Node SW05 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	41.835	Product Number	CTL-SHE-0098-5000-1500-5000
Design Depth (m)	1.500	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node TANK 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	42.250
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	138

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	80.0	0.0	0.800	80.0	0.0	0.801	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	92.521	26.180	1 year 600 minute winter	5.249	2.101
1 year 15 minute winter	64.927	26.180	1 year 720 minute summer	6.859	1.838
1 year 30 minute summer	60.022	16.984	1 year 720 minute winter	4.609	1.838
1 year 30 minute winter	42.121	16.984	1 year 960 minute summer	5.653	1.489
1 year 60 minute summer	40.398	10.676	1 year 960 minute winter	3.745	1.489
1 year 60 minute winter	26.839	10.676	1 year 1440 minute summer	4.127	1.106
1 year 120 minute summer	24.980	6.602	1 year 1440 minute winter	2.773	1.106
1 year 120 minute winter	16.596	6.602	30 year 15 minute summer	226.195	64.005
1 year 180 minute summer	19.271	4.959	30 year 15 minute winter	158.733	64.005
1 year 180 minute winter	12.527	4.959	30 year 30 minute summer	147.452	41.724
1 year 240 minute summer	15.301	4.043	30 year 30 minute winter	103.475	41.724
1 year 240 minute winter	10.165	4.043	30 year 60 minute summer	98.615	26.061
1 year 360 minute summer	11.775	3.030	30 year 60 minute winter	65.517	26.061
1 year 360 minute winter	7.654	3.030	30 year 120 minute summer	59.946	15.842
1 year 480 minute summer	9.342	2.469	30 year 120 minute winter	39.827	15.842
1 year 480 minute winter	6.207	2.469	30 year 180 minute summer	45.598	11.734
1 year 600 minute summer	7.682	2.101	30 year 180 minute winter	29.640	11.734

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
30 year 240 minute summer	35.759	9.450	100 year +45% CC 60 minute winter	124.515	49.529
30 year 240 minute winter	23.758	9.450	100 year +45% CC 120 minute summer	114.312	30.209
30 year 360 minute summer	26.939	6.932	100 year +45% CC 120 minute winter	75.946	30.209
30 year 360 minute winter	17.511	6.932	100 year +45% CC 180 minute summer	86.951	22.375
30 year 480 minute summer	20.981	5.545	100 year +45% CC 180 minute winter	56.520	22.375
30 year 480 minute winter	13.940	5.545	100 year +45% CC 240 minute summer	68.114	18.001
30 year 600 minute summer	17.039	4.661	100 year +45% CC 240 minute winter	45.253	18.001
30 year 600 minute winter	11.642	4.661	100 year +45% CC 360 minute summer	51.133	13.158
30 year 720 minute summer	15.093	4.045	100 year +45% CC 360 minute winter	33.238	13.158
30 year 720 minute winter	10.143	4.045	100 year +45% CC 480 minute summer	39.658	10.480
30 year 960 minute summer	12.278	3.233	100 year +45% CC 480 minute winter	26.348	10.480
30 year 960 minute winter	8.133	3.233	100 year +45% CC 600 minute summer	32.099	8.780
30 year 1440 minute summer	8.788	2.355	100 year +45% CC 600 minute winter	21.932	8.780
30 year 1440 minute winter	5.906	2.355	100 year +45% CC 720 minute summer	28.365	7.602
100 year +45% CC 15 minute summer	423.061	119.712	100 year +45% CC 720 minute winter	19.063	7.602
100 year +45% CC 15 minute winter	296.885	119.712	100 year +45% CC 960 minute summer	22.984	6.052
100 year +45% CC 30 minute summer	278.374	78.770	100 year +45% CC 960 minute winter	15.225	6.052
100 year +45% CC 30 minute winter	195.350	78.770	100 year +45% CC 1440 minute summer	16.353	4.383
100 year +45% CC 60 minute summer	187.417	49.529	100 year +45% CC 1440 minute winter	10.990	4.383

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.54%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	SW01	10	42.467	0.067	7.3	0.1330	0.0000	OK
30 minute winter	TANK 1	26	42.308	0.058	10.2	4.6048	0.0000	OK
30 minute winter	SW02	20	42.338	0.203	9.1	0.4474	0.0000	OK
15 minute winter	SW03	11	42.354	0.339	11.2	0.0959	0.0000	SURCHARGED
15 minute winter	SW04	11	42.349	0.434	10.7	0.2310	0.0000	SURCHARGED
15 minute winter	SW05	11	42.339	0.504	10.1	0.7181	0.0000	SURCHARGED
15 minute summer	EXISTING	1	41.700	0.000	4.9	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	SW01	1.000	TANK 1	7.3	1.053	0.318	0.0208	
30 minute winter	TANK 1	1.001	SW02	-5.8	0.747	-0.285	0.0294	
30 minute winter	SW02	1.002	SW03	8.4	0.771	0.198	0.6971	
15 minute winter	SW03	1.003	SW04	7.9	0.601	0.180	0.5568	
15 minute winter	SW04	1.004	SW05	7.0	0.346	0.158	0.4375	
15 minute winter	SW05	Hydro-Brake®	EXISTING	4.9				10.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.54%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	SW01	57	42.548	0.148	8.7	0.2951	0.0000	OK
60 minute winter	TANK 1	58	42.548	0.298	24.1	23.8477	0.0000	SURCHARGED
15 minute winter	SW02	10	42.627	0.492	38.4	1.0858	0.0000	SURCHARGED
15 minute winter	SW03	10	42.637	0.622	15.3	0.1759	0.0000	SURCHARGED
15 minute summer	SW04	10	42.650	0.735	10.9	0.3911	0.0000	SURCHARGED
15 minute summer	SW05	10	42.652	0.817	9.8	1.1645	0.0000	SURCHARGED
15 minute summer	EXISTING	1	41.700	0.000	4.9	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
60 minute winter	SW01	1.000	TANK 1	8.7	1.098	0.379	0.0528	
60 minute winter	TANK 1	1.001	SW02	-15.4	-0.946	-0.752	0.0528	
15 minute winter	SW02	1.002	SW03	15.3	0.876	0.360	0.7159	
15 minute winter	SW03	1.003	SW04	-12.0	0.637	-0.275	0.5568	
15 minute summer	SW04	1.004	SW05	4.8	0.381	0.109	0.4375	
15 minute summer	SW05	Hydro-Brake®	EXISTING	4.9				23.6

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.54%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	SW01	116	43.033	0.633	10.3	1.2604	0.0000	SURCHARGED
120 minute winter	TANK 1	116	43.033	0.783	28.4	62.6501	0.0000	SURCHARGED
15 minute winter	SW02	11	43.247	1.112	67.2	2.4562	0.0000	SURCHARGED
15 minute winter	SW03	11	43.285	1.270	20.9	0.3593	0.0000	SURCHARGED
15 minute winter	SW04	11	43.316	1.400	22.9	0.7451	0.0000	SURCHARGED
15 minute winter	SW05	11	43.320	1.485	16.7	2.1177	0.0000	SURCHARGED
15 minute summer	EXISTING	1	41.700	0.000	4.9	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	SW01	1.000	TANK 1	9.6	1.057	0.417	0.0528	
120 minute winter	TANK 1	1.001	SW02	-18.9	-1.076	-0.923	0.0528	
15 minute winter	SW02	1.002	SW03	-21.8	0.849	-0.516	0.7159	
15 minute winter	SW03	1.003	SW04	-20.9	0.658	-0.477	0.5568	
15 minute winter	SW04	1.004	SW05	-8.6	0.428	-0.195	0.4375	
15 minute winter	SW05	Hydro-Brake®	EXISTING	5.0				49.5

Appendix E – UU Pre Development Enquiry Response

Paul Graveney

From: seweradoptions@uuplc.co.uk
Sent: 05 February 2024 12:02
To: Paul Graveney
Subject: RE: PDE CA28, Octogan House, Manchester, M13 0EA - 05242610

Good morning Paul,

Pre Development Enquiry for: Octogan House, Manchester, M13 0EA UU Reference Number : 05242610

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.

We would not object to the existing foul connection being utilised.

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 225mm diameter public combined sewer 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 the CIRIA SuDS manual all previously developed sites should strive for greenfield rates where reasonably practicable.

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
Developer Engineer
Developer Services & Metering
Customer Services
T: 07826891650
[unitedutilities.com](https://www.unitedutilities.com)

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

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

Sent: 30/01/2024 13:47

To: paul@pgcl.co.uk

Subject: PDE CA28, Octogan House, Manchester, M13 0EA - 05242610

Good Afternoon,

PRE DEVELOPMENT APPLICATION AT: Octogan House, Manchester, M13 0EA – UU Ref 05242610

Please accept this email as receipt of your application received on 30/01/2024 for the above development. This has now been logged on our system and the job reference is 05242610 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 for technical assessment. You will receive their response on or before 13/02/2024.

Kind regards,



Katie Houghton
Customer Advisor Advanced
Developer Services & Metering
Customer Services
Tel: 0345 072 6067 (option 4)
[unitedutilities.com](https://www.unitedutilities.com)

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

From: Paul Graveney [paul@pgcl.co.uk]

Sent: 30/01/2024 12:29

To: wastewaterdeveloperservices@uuplc.co.uk

Subject: Octogan House, Manchester - Pre Development Enquiry

Good Afternoon,

Please find attached our pre development enquiry for a new energy centre in the car park of Octogan House, Manchester.

The site is fully impermeable and currently discharges unrestricted to the adjacent 450mm diameter combined sewer.

At 0.25ha, the current discharge rates are estimated at:

1yr (30mm/hr) - 21l/s

30yr (65mm/hr) – 45l/s

100yr (95mm/hr) – 66l/s

Note that Manchester Policy for Brownfield sites is a 50% reduction in the existing brownfield rates and therefore we propose the following peak post development flow rates:

1yr - 11/s

30yr - 22l/s

100yr - 33l/s

Please confirm you would agree to this approach?

We look forward to hearing from you.

Regards,

Paul

Paul Graveney

BEng(Hons) CEng MICE

Director

[Image is no longer available]

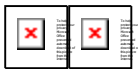
Tel: 07710 758971

E-mail: paul@pgcl.co.uk

Address: 108 Ack Lane West, Cheadle Hulme, Cheshire, SK8 7ES

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(Paul Graveney Consulting Ltd: Trading as PG Consulting)



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