

DESIMONE

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NORTHERN PATHOLOGY DEVELOPMENT LTD

OUTLINE DRAINAGE STRATEGY REPORT

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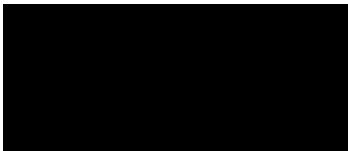
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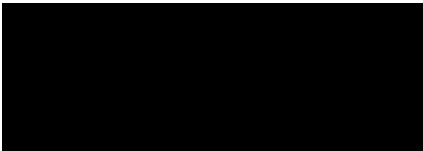
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Rev	Date	By	Comment
P01	11-07-2025	EW	First Issue
P02	25-07-2025	EW	Updates to Strategy
P03	31-10-2025	EW	Planning Comments (Addendum) + Stage 4 issue

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Executive Summary

Desimone have been appointed by the Northern Pathology Development to provide an Outline Drainage Strategy report in support of a planning application for the redevelopment of The Northern Pathology Development located on Wilmslow Road, Manchester.

The site is shown to be wholly situated within Flood Zones 1 of the Environment Agency Flood Map and therefore has a very low risk of fluvial flooding. The site is located within the 'Didsbury Critical Drainage Area' as per the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA.

Flooding from a number of sources have been assessed as part of a flood risk overview for this report and the site is considered to be at low risk of any form of flooding from external sources.

The proposed development site is located to the Northeast of The Christie hospital site and comprises of a new 3 story Pathology Unit with external surfacing and drop off / loading area.

The topographical survey provided identified that the site falls from East to West from Wilmslow Road with levels ranging from 35.100m AOD (pavement on Wilmslow Road) down to 34.100m AOD (at Western Site boundary).

The nearest watercourse is the River Mersey, which is located approximately 1.63km South West of the site, which meanders South of central Manchester. Shaw brook is an inland sub surface water course which is located 200m North East of site. A below ground ordinary water course culvert has also been identified which runs North to South in proximity to the site.

It is proposed that the ground floor level of the building will be set at 35.100m AOD, which is the same level as the pavement external to the building, to allow for internal ramped disabled access.

The proposed drainage strategy will comprise of different SuDS which complement the site constraints within the development boundary. Given the limited external space surrounding the proposed building the primary source of attenuation will be provided via a geo cellular attenuation tank, subject to receipt of a ground investigation report. Permeable rain gardens & planters will also be utilised across site to minimise the amount of impermeable surface area.

The site will utilise the existing private drainage system where practicable, thereby minimising the need for additional service diversions. Surface water runoff will discharge to the adjacent ordinary watercourse, restricted to a maximum rate of 5 l/s in accordance with the local planning authority's guidance and the drainage discharge hierarchy. Foul drainage will discharge to the nearby private drainage infrastructure located adjacent to the development boundary.

1. Introduction

1.1. Terms of Reference

Desimone have been appointed by the Northern Pathology Development Ltd to provide an Outline Drainage Strategy report in support of a planning application for the redevelopment of The Northern Pathology Unit located on Wilmslow Road, Manchester.

The site is shown to be wholly situated within Flood Zones 1 of the Environment Agency Flood Map and therefore has a very low risk of fluvial flooding.

1.2. Objectives of Drainage Strategy

The objective of the drainage strategy is to provide information and present proposals relating to the following:-

- The existing surface and foul water drainage systems within and in the vicinity of the site.
- Proposed surface water and foul water flows.
- Proposed surface water and foul water networks.
- Proposed surface water and foul water discharge points.
- Constraints imposed by the regulatory bodies, including; - The Environment Agency, LLFA, Local Water Company and Highway Authorities.

1.3. Data Sources

This assessment is based on desk-top study of information from the following sources:

- National Planning Policy Framework (2023)
- Planning Practice Guidance at www.gov.uk
- Building Regulations Approved Document H
- Environment Agency Flood Mapping
- Manchester, Salford and Trafford Strategic Flood Risk Assessment Level 1 (2010)
- Manchester, Salford and Trafford Strategic Flood Risk Assessment Level 2 (2011)
- MST and Environment Agency Strategic Flood Risk Assessment Joint Statement (2011)
- CIRIA C697 The SUDS Manual

1.4. Limitations

This document has been prepared solely for the Northern Pathology Development Ltd and is intended for use in support of a planning application. DeSimone disclaims any responsibility for use of this report by parties other than the client, and only in connection with the specific objectives outlined herein. No individual or organisation, aside from the client, is permitted to reproduce, utilise, or place reliance upon any part of this report without the prior written consent of DeSimone Consulting Engineering. Any guidance, views,

or conclusions contained in this document should be considered only within the full context of the report. DeSimone has made every effort to evaluate all information made available during the course of this assessment. The findings are based on a range of third-party sources, and as such, no assurance is given regarding the accuracy or completeness of the information used.

2. Existing Site Context

2.1. Site Location

The proposed development consists of a new 3 storey Pathology Unit situated at the Northeast of The Christie Hospital, Wilmslow, Manchester, M20 4BX.

The site is centred around National Grid Reference 384886E, 392662N.

What3Words: flap.fend.rally

2.2. Site Characteristics

Area		Following the demolition of the existing building, which has stood as a temporary measure it is proposed to provide a new 3 story Pathology Unit with external works regeneration and vehicular drop off & loading.
Existing Surface		Existing 2 storey temporary 'cabin' building. Hardscaped footpaths fronting the existing building with separation railings between pedestrian access and private service entrance. There is a liquid nitrogen tanks to the south of the building and existing trees under a TPO to the West of the building.
Existing Site Usage		Occupied for Hospital use.
Site Boundary	North	Hospital Boundary. Immediately North are a number of private small commercial properties.
	South	Private service road and existing Hospital Buildings.
	East	Wilmslow Road (B5093)
	West	Existing Tree canopy and Hospital boundary
	Site Access	
	Vehicular	No public access granted at service yard to south of existing building. Vehicular access gained from normal Hospital visitor routing.
	Pedestrian	Gained from normal Hospital visitor routing.

2.2.1. Topography & Ground Conditions

A topographical mapping survey of the site was undertaken by Layer Surveys Ltd in June 2024.

There is a fall in height of circa 1.0m between Wilmslow Road and the Western Edge Boundary of site. The service road leaving site is relatively flat and ultimately slopes away to circa 33.75 where the service road deviates. It is not anticipated that the proposed levels will deviate excessively from the existing topography.

Desktop assessment of the site's superficial geology indicates the presence of Devensian Till deposits, underlain by bedrock formations comprising pebbly sandstone and sandstone. The permeability of the underlying bedrock is classified as 'Mixed'.

At the time of reporting, a formal Ground Investigation has not been issued. However, a desktop study conducted by Groundsure in May 2024 identifies the site as having a 'Medium' groundwater vulnerability classification associated with secondary superficial deposits. Surface soil characteristics at the identified investigation point suggest a low infiltration potential, with indicative infiltration values below 70%. A definitive assessment of infiltration feasibility will be confirmed following on-site infiltration testing.

There are no groundwater abstraction points or designated Source Protection Zones (SPZs) within the vicinity of the site.

2.2.2. Existing Drainage

United Utilities asset records indicate the presence of two combined sewers within Wilmslow Road: a 1050 mm diameter brick (BR) combined sewer running in a north-south direction, and a 450 mm diameter vitrified clay (VC) combined sewer flowing in the opposite direction, from south to north.

In addition to the adopted public sewers in proximity to the site, a Ground Penetrating Radar (GPR) survey was undertaken by Layer Surveys Ltd in June 2024. The results of this survey identify several drainage outfalls from the existing building discharging into a carrier drain located beneath the service road, to the south of the existing Pathology Unit.

The GPR data does not clearly confirm the ultimate outfall location of this drainage. However, based on available desktop study information, it is currently assumed that the private drainage system beneath the service road connects into the public combined sewer network at its junction with Wilmslow Road. To validate this assumption and determine the alignment, condition, and discharge point of the existing foul system within the site boundary, a closed-circuit television (CCTV) drainage survey has been commissioned.

3. Historic Flooding

3.1. Internet Search

An internet search for flooding within the local vicinity of the application site came back with no results within 150m of the propose development.

3.2. Manchester City, Salford City and Trafford Councils Level 1 Hybrid SFRA

The Manchester City, Salford City and Trafford Councils Level 1 Hybrid SFRA LEVEL 2 SFRA was undertaken by JBA Consulting and was released in March 2010. Section 2.8 Historic Flooding does not specifically mention the site as having flooded.

3.3. Critical Drainage Areas

Section 5.3 within the Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA LEVEL 2 SFRA Final March 2011 identifies that the site is located within Didsbury Critical Drainage Area due to the following reason.

'SFRA analysis shows significant surface water flooding hotspot between Didsbury and Heaton Mersey. 3 postcode areas with over 10 properties affected in the DG5 register'

At this stage, the site's location within the Didsbury Critical Drainage Area (CDA) is not considered to present a constraint to the proposed development, nor is it anticipated to necessitate additional mitigation measures beyond those already proposed as part of the overall drainage strategy.

4. Flood Risk Overview

4.1. Sources of Flooding

Table 1: Possible Flooding Mechanisms

Source/Pathway	Significant?	Comment/Reason
Fluvial	No	Shaw Brook is located 200m NE of site and has a recorded flood event in 2004.
Canal	No	Not Applicable
Tidal/Coastal	No	Not Applicable
Reservoir	No	Not applicable.
Pluvial (urban drainage)	Yes	Site is located within CDA therefore surface water flow reduction is required.
Groundwater	No	SFRA shows site within an area with a Medium Risk.
Surface Water Flooding	No	Site is located within an area that has a low risk.
Overland Flow	No	Generally, very low risk of pluvial flooding
Blockage	No	Not Applicable
Infrastructure failure	No	Not Applicable
Rainfall Ponding	No	Surface Water ponding indicated on the EA surface water flooding plan to the West of site during the 1 in 30 year storm event.

Fluvial Flooding

Flooding from rivers, streams and other natural inland watercourses is usually caused by prolonged or intense rainfall generating high rates of surface water runoff through the catchment. This in turn overwhelms the capacity of the fluvial system as a flood flow and as a result, spills into available flood plain storage areas.

The site is entirely located within Flood Zone 1, indicating a low probability of fluvial flooding. As such, it is not expected that fluvial flooding will pose a risk to the development or compromise access and egress during storm events up to and including the 1 in 100-year return period. Although a historical flooding incident was recorded at Shaw Brook in 2004, this is not considered relevant due to its distance from the proposed development site.

Flooding from Artificial Sources

Where significant infrastructure exists that retains, transmits or controls the flow of water, flooding may result if there is a structural, hydraulic, geotechnical, mechanical or operational failure. This may be infrastructure that has been specifically designed and implemented as a water controlling structure, such as a water main or dam, or a reservoir or canal storing water for other means.

There are no artificial sources located within close proximity of the site.

Surface Water Flooding (Sewers)

Artificial drainage systems designed to manage surface water, foul drainage and the like, can pose a flood risk and health risk if the system is overwhelmed. This is especially a problem if foul sewers discharge into a surface water system or a watercourse. This can occur through lack of capacity in significant rain events, lack of maintenance or an influx from another source such as rivers.

Groundwater Flooding

Flooding can occur in locations where groundwater is present at shallow depths. Prolonged periods of heavy rainfall can result in elevated groundwater levels that can lead to the groundwater level reaching the surface as flooding.

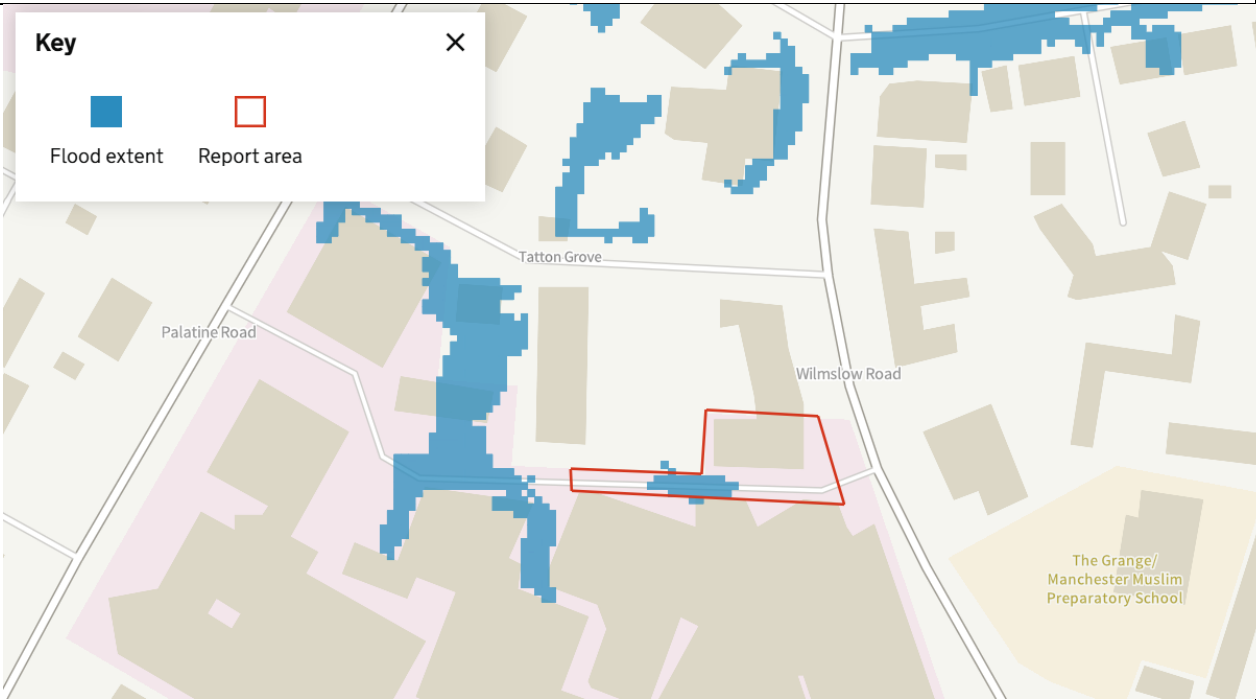
SFRA shows site within an area with a Medium Risk. The risk is not considered to adversely impact the site however this will be confirmed upon receipt of a Ground Investigation report.

Pluvial Flooding

A potential source of flooding is posed by rainwater that flows across the ground and inundates property or infrastructure before it is able to reach artificial or natural drainage features. This is a function of ground topography, the nature of the ground surface (permeability, vegetation etc) and intensity of rainfall.

The Environment Agency Risk of Flooding from Surface Water map indicates that the risk of surface water flooding at the site is largely considered to be low. The surface water flood map does indicate a small amount of surface water flooding during the 1 in 30 Year storm event. This is likely due to a low spot along the service road to the south of the development. The topographical levels indicate a level of circa 33.89m AOD in this area which is significantly lower than the proposed development FFL is 35.10m AOD. The risk of surface water impacting the site in this area are low.

Figure 1.0: Environment Agency Surface Water Flood Map (Surface Water Flooding 1 in 30 Year)



Source: www.gov.uk

5. Drainage Strategy

5.1. Surface Water Strategy

5.1.1. Introduction

It is proposed that the new surface water and foul water drainage will be separate systems and will remain private.

The drainage strategy and drainage proposals for the site have been developed in accordance with the principles of Sustainable Drainage Systems (SuDS) as set out in the National Planning Policy Framework, DEFRA's technical standards sustainable drainage systems, Manchester Council's Lead Local Flood Authority (LLFA) standing advice/guidance, Building Regulations and other standards and best practice guidance.

In general, this requires the separation of foul and surface water drainage systems and the management of surface water runoff in a sustainable manner, as far as practicable to mimic the surface water flows arising prior to the proposed development, whilst also reducing flood risk and considering climate change. There are three methods that have been reviewed for the management and discharge of surface water for the proposed development which are detailed below; these may be applied individually or collectively to form a complete strategy. They should be applied in the order of priority as listed.

5.1.2. Surface Water Drainage Hierarchy

The hierarchy for disposal of surface water from new developments is outlined within the Building Regulations Approved Document H and specifies the following methods in order of preference:

- Infiltration via soakaway or other suitable infiltration device
- Discharge to watercourse
- Discharge to public surface water sewer
- Discharge to public combined sewer

Infiltration

The feasibility of surface water discharge via infiltration will be further evaluated following receipt of the Ground Investigation report and infiltration testing, however, based on the available desktop study information, the site made ground is underlain by superficial deposits of Davensian Till (clay / sand) and therefore at this stage infiltration is currently assumed to be unsuitable at this site.

Watercourse

There is a culvert water course which runs North to South in proximity to the proposed development. It is anticipated that a surface water connection will be possible at this location, subject to confirmation of a CCTV report of the drain.

Sewer

Due to the presence of a culvert watercourse, this method of connection supersedes a connection to the local sewer network.

5.1.3. Sustainable Urban Drainage Systems (SUDS)

The CIRIA SuDS Manual encourages the use of the 'SuDS management train' concept to manage runoff. The hierarchy of techniques to be used is:

1. Prevention – Prevention of runoff by good site design and reduction of impermeable areas.
2. Source Control – Dealing with water where and when it falls (e.g., infiltration techniques).
3. Site Control – Management of water in the local area (e.g., swales, detention basins).
4. Regional Control – Management of runoff from sites (e.g., balancing ponds, wetlands).

Table 2: SUDS Summary

SUDS Method	Remarks	Feasibility
Rainwater Harvesting	Rainwater from roofs and hard surfaces can be stored and reused. The site is heavily constrained by existing services which does not allow enough space for the use of Rainwater Harvesting.	NO
Permeable Paving	Surfaces can be either porous or permeable. Rainwater infiltrates through the surface and into underlying layers where it is temporarily stored before either infiltrating into the ground or discharge through the drainage system. There is significant plant to be installed on the roof which would make such an installation difficult.	NO
Green / Blue Roof	Vegetated or hardstanding roof designed to store water, which can be used for irrigation, cooling water or non-potable use within the building. There is significant plant to be installed on the roof which would make such an installation difficult.	NO
Swales	Shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants. Check dams and	NO

	berms can also be installed along the flow path to promote settling and infiltration. The site is heavily constrained by existing services which does not allow enough space for the use of swales.	
Filter Drains	Shallow excavations filled with gravel to create temporary storage of runoff used to filter and convey rainwater. The site is heavily constrained by services which limits the use of filter drains.	NO
Basins / Ponds	Basins & Ponds provide stormwater attenuation and treatment. The site is heavily constrained by existing services which does not allow enough space for the use of a retention pond.	NO
Rain Garden / Raised Planters	Rain gardens and vegetated walls manage stormwater, reduce runoff, and enhance urban biodiversity. It is proposed to compliment the drainage strategy with rain gardens / raised planters within the site boundary to reduce the impermeable surface area.	YES
Geocellular Storage Systems	Geocellular systems can be used to control and manage surface water runoff. The modular systems mean that they can be tailored to suit specification requirements of any site. Geocellular storage tanks as attenuation structures will be installed beneath the building footprint to provide the temporary attenuation needed prior to discharge to the wider drainage system.	YES

5.1.4. Existing Runoff Rate

The existing runoff rate for the developable area has been estimated using the Modified Rational Method for a total area of 535m² (0.054Ha).

$$Q=2.78 \times C \times I \times A$$

Where:

- Q = Peak discharge (litres/second)
- C = Runoff coefficient (dimensionless)
- i = Rainfall intensity (mm/hr)
- A= Area (hectares)
- 2.78 is a unit conversion factor

$$Q=2.78 \times 0.9 \times 50 \times 0.054=6.8 \text{ l/s}$$

5.1.5. Restricted Discharge Rates

Due to the application site being located within the Didsbury Critical Drainage Area, proposed surface water discharge rates must be restricted to a minimum of 50% compared to existing situation during the 1 in 100 year + 50% climate change event i.e.

- $6.8 \text{ l/s} \times 0.5 = 3.4 \text{ l/s}$

With the local Flood Risk management Strategy (5.46) it states that, 'A 50% runoff rate reduction for Brownfield sites, with an aim of reducing runoff to Greenfield rates up to a 1 in 100-year storm event, including consideration of climate change'

Using the HR Wallingford Greenfield calculator the greenfield QBar rate has been calculated as 0.12 l/s. CIRIA SuDS Manual (C753) suggests that where flows are restricted to less than 5 l/s, particular care should be taken to avoid blockages, and the LLFA have advised that a blockage assessment must be carried out.

Therefore, a flow rate of **5 l/s** has been chosen for the proposed Surface water drainage strategy which has been agreed with the LLFA.

5.1.6. Climate Change

The NPPF requires the application of climate change over the lifetime of a development. As of September 2023 the Technical Guidance for NPPF has updated the climate change allowances based on river basin catchments. The climate change allowance for the Upper Mersey Management Catchment is tabulated below:

Table 3: Upper Mersey Management Catchment Climate Change Allowances 1% Annual Exceedance Rainfall event¹

Parameter	Allowance Category	2050's	2070's
Peak Rainfall Intensity	Upper End	+ 40%	+ 45%
	Central	+ 25%	+ 30%

The upper end value of 45% will be used for all climate change allowance calculations.

5.1.7. Indicative Attenuation Volumes

Indicative attenuation volumes have been estimated below restricting flows to 5 l/s for a proposed impermeable area of 0.078 Hectares for the 100 year + 45% climate change event.

Table 4: Indicative Attenuation Volumes, Proposed Impermeable Area 0.078Ha, 5l/s

Return Period	Storage Volume m ³
100 Year + 45% Climate Change	25 – 45

5.1.8. Preliminary Drainage Strategy

Following development, surface water runoff from the proposed developable area will discharge to an existing culvert identified in proximity to the site. This approach aligns with the drainage discharge hierarchy and is in accordance with the Lead Local Flood Authority's (LLFA) guidance, prioritising discharge to a watercourse where feasible.

The proposed discharge rate has been limited to 5 l/s, in accordance with the Local Flood Risk Management Strategy and the relevant guidance documents referenced within the preceding sections of this report. The drainage system has been designed to accommodate the 1 in 100-year storm event + 45% climate change allowance, without surface flooding.

To manage flows exceeding the allowable discharge rate, surface water will be managed through a combination of SuDS, including rain gardens, raised planters, and

geocellular storage systems. Due to significant constraints posed by existing underground utilities within the site, opportunities for further SuDS features are limited.

All external thresholds and pedestrian routes will be graded to fall away from the building envelope. In exceedance conditions, surface flows will be directed towards the adjacent service road, ensuring protection of internal areas and primary access routes.

A new drainage connection is proposed to the existing buried culvert located to the west of the site. A confirmatory CCTV survey will be undertaken to verify the culvert's condition and establish invert levels. The proposed discharge point will form part of an ordinary watercourse consent application and will be subject to final approval by the relevant authority.

A drainage strategy general arrangement is provided in Appendix A.

5.2. Surface Water Pollution Risk Assessment

This assessment evaluates the pollution risk associated with surface water runoff from a proposed development site, in accordance with the methodology outlined in Annex 5 of CIRIA C753 The SuDS Manual. It also determines the appropriate level of treatment required prior to discharge to an existing culverted watercourse.

The site comprises a small, non-residential parcel of hardstanding and roofing, with a total contributing surface area of approximately 0.071 ha, distributed as follows:

Table 5: Area Contribution table

Surface Type	Area (Ha)	% Contribution
Flat Roof	0.048	67.6%
Vehicle Layby	0.009	12.7%
Pedestrian Footpath	0.014	19.7%
Total	0.071	100%

Runoff from the vehicle layby is proposed to be collected by a channel drain (ACO type) discharging to the main drainage system, which ultimately outfalls to a culverted watercourse.

The impermeability and pollution indices from Table 26.14 have been derived using the land use categories and values set out in CIRIA C753, Annex 5. An area-weighted approach has been adopted to ensure accurate representation of the pollution potential of each contributing surface.

Table 6: Pollution Hazard Indices (Annex 5 Values)

Surface Type	TSS	Metals	Hydrocarbons	Source Classification
Flat Roof	0.2	0.2	0.05	Roof (non-trafficable)
Light-Use Layby	0.5	0.4	0.4	Residential/low-use car park
Pedestrian Footpath	0.2	0.2	0.05	Similar to roof/low-use hardstanding

Area-Weighted Composite Pollution Hazard Indices:

$$\text{TSS} = (0.048 \times 0.2 + 0.009 \times 0.5 + 0.014 \times 0.2) / 0.071 = 0.24$$

$$\text{Metals} = (0.048 \times 0.2 + 0.009 \times 0.4 + 0.014 \times 0.2) / 0.071 = 0.22$$

$$\text{Hydrocarbons} = (0.048 \times 0.05 + 0.009 \times 0.4 + 0.014 \times 0.05) / 0.071 = 0.10$$

The assessment demonstrates that the overall pollution hazard posed by the development is low, with all indices significantly below 0.5.

Given the low composite pollution hazard, the proposed water quality treatment measures have been selected to provide a level of mitigation proportionate to the actual risk.

ACO Drainage System (with integrated sump/silt trap):

Runoff from the vehicle layby, the only traffic-bearing surface, is to be drained via an ACO channel system with a localised sediment capture sump positioned at the connection to the main network. This component will intercept suspended solids and minor pollutants.

Catchpit Chamber :

Runoff from all areas, including roof and footpath, will be routed through a catchpit manhole, offering an additional opportunity for settlement of fine sediments and particulate-bound contaminants.

Table 7: Estimated Pollution Mitigation Indices (PMIs):

SuDS Component	TSS	Metals	Hydrocarbons
ACO with sediment sump (layby)	0.3	0.2	0.2
Catchpit chamber (whole site)	0.2	0.1	0.1
Combined (conservative estimate)	0.5	0.3	0.3

The table below compares the calculated pollution hazard indices against the combined mitigation indices proposed.

Table 8: Pollutant Indices results.

Pollutant	Hazard Index	Mitigation Index	Result
TSS	0.24	0.5	Compliant
Metals	0.22	0.3	Compliant
Hydrocarbons	0.10	0.3	Compliant

The proposed treatment measures meet or exceed the required level of treatment for all pollutant types, as per CIRIA's Simple Index Approach.

The use of a full Class 1 bypass or full retention separator has been considered but is deemed disproportionate to the nature of the development. The key justifications are:

- Very limited contributing area (total hardstanding < 750 m²)
- Low vehicle use ($\leq$ 100 vehicles/day)
- Absence of fuel storage, delivery areas or wash-down facilities
- No sensitive receptors immediately downstream
- All runoff directed to controlled discharge system with localised treatment features

Accordingly, a sediment trap within the ACO system, combined with a downstream catchpit, provides a reasonable and technically sound solution.

The following Maintenance and Operational Notes are to be implemented. The sump within the ACO system shall be inspected at regular intervals (minimum biannually) and cleared

of any sediment, hydrocarbons, or litter. The catchpit chamber will form part of the routine surface water drainage maintenance regime.

This assessment confirms that the proposed pollution mitigation measures are commensurate with the actual level of risk posed by the development, and that runoff will not result in an unacceptable impact on receiving waters. The use of compact and passive treatment elements is consistent with CIRIA C753 guidance for small low risk sites, and negates the need for oversized or redundant infrastructure.

5.3. Foul Water Strategy

It is proposed that the new surface water and foul water drainage will be separate systems and will remain private.

The foul water system will be designed and constructed in accordance with the current Building Regulations, BS EN:752 drainage and sewer systems outside buildings, the local authority building control specifications and requirements & The Design and Construction Guidance (DCG).

The proposed foul network is to discharge to the main private sewer via below ground waste pipe gravity connections. The foul drainage will connect into the existing private foul system to the south of the development which in turn discharges to the UU sewer in Wilmslow Road. Final discharge units / flow rates will be confirmed upon receipt of information from the MEP engineer.

6. Conclusions & Recommendations

6.1.1. Gravity Drainage System

Based on available information it is expected that gravity connections for the proposed surface water to the buried culvert which runs through site will be achievable. A gravity connection for the proposed foul water to the private drainage within the wider development boundary will also be possible.

6.1.2. Adoption & Maintenance

It is likely that the existing onsite drainage would be the responsibility of the client.

It is proposed that the new surface water and foul water drainage will be separate systems and will remain private, with separate connections made to the existing surface water and foul water sewers within the existing private drainage network, subject to a CCTV survey being undertaken. It is unlikely that the existing drainage infrastructure directly connected to the existing building to be demolished can be reused and new proposed manholes will need to be constructed to serve the proposed development.

Appropriate discussions will be held with United Utilities prior to any connection works being carried out.

6.1.3. Performance Criteria

The foul and surface water drainage systems serving the site will be designed and installed in accordance with the following standards and best practice guidance.

- Manchester City Council's Lead Local Flood Authority's standing advice and guidance
- DEFRA Non-statutory Technical Standards for Sustainable Drainage Systems
- Approved Document H - Drainage and waste disposal
- BS EN 752:2008 - Drain and sewer systems outside buildings
- Design & Construction Guidance (DCG)
- National Planning Policy Framework
- CIRIA Report 697 – The SUDS Manual

7. Addendum

7.1.1. Feasibility Statement: Installation of Attenuation Tank Beneath Building Footprint

The proposed installation of a below-ground attenuation tank located beneath the building footprint has been assessed in relation to the structural integrity and performance of the building's piled foundation system. The design has been developed to ensure that the attenuation tank does not adversely impact the existing or proposed foundation arrangement, in accordance with the requirements of BS EN 1997-1:2004+A2:2019 (Eurocode 7: Geotechnical Design – General Rules) and CIRIA Report C737: Structural Design of Modular Geo cellular Drainage Tanks.

The proximity of the attenuation tank to the building foundations has been carefully considered as part of the design process. The tank will be installed maintaining a minimum horizontal clearance of 1.0 metre from the edge of the foundation piles to accommodate potential ground movements, mitigate stress transfer, and prevent any reduction in bearing capacity or stability of the pile group. This offset also ensures compliance with best practice guidance outlined within BS 8004:2015 – Code of Practice for Foundations.

Structural loading from the superstructure is transmitted through the pile system and associated pile caps directly to the underlying strata, ensuring that no direct or redistributed loads are transferred through or onto the attenuation tank. The design and positioning of the tank therefore eliminate any risk of load interaction between the structural and drainage systems.

The attenuation tank will be fully wrapped in an impermeable geomembrane to prevent water ingress or egress around the structure, thereby maintaining long-term performance and stability of both the tank and the surrounding ground. Furthermore, maintenance access points for jetting and inspection will be provided externally to the building footprint, ensuring that routine maintenance can be carried out without disturbance to the building structure or internal finishes.

In summary, based on the proposed arrangement, adherence to the cited standards, and incorporation of appropriate clearance, impermeable wrapping, and accessible maintenance provision, the installation of the attenuation tank beneath the building footprint is considered feasible and structurally compatible with the building's foundation design.

7.1.2. Feasibility Statement: Proximity of proposed works to buried culvert structure

A feasibility review has been undertaken to confirm that the proposed drainage design will not be located within 5 metres of the outer edge of the existing buried box culvert. The design has been developed to ensure that no structural or hydraulic impacts occur to the existing culvert during either construction or operation, in accordance with the guidance set out in CIRIA Report C737: Structural Design of Modular Geocellular Drainage Tanks, BS EN 1997-1:2004+A2:2019 (Eurocode 7 – Geotechnical Design), and BS 8004:2015 – Code of Practice for Foundations.

It is confirmed that no part of the culvert will be constructed over, built upon, or subject to additional permanent loading beyond that associated with the existing ground and previously approved construction works. The design intent is to preserve the culvert's current load regime and prevent any modification to the cover depth, bedding material, or surface profile directly above the culvert.

During any construction activities undertaken within the vicinity of the culvert, appropriate temporary protection measures will be implemented to avoid structural impact or differential settlement. This will include the use of load transfer matting, lightweight plant, and controlled construction sequencing, ensuring that construction-induced stresses remain within acceptable limits. All activities will be managed in accordance with the principles outlined in CDM Regulations 2015 and BS 6031:2009 – Code of Practice for Earthworks, to maintain the structural integrity of the culvert throughout the construction phase.

In conclusion, by maintaining a minimum 5 m exclusion zone, implementing appropriate construction controls, and avoiding any additional loading or overbuild above the culvert, it is demonstrated that the proposed works are feasible and compatible with the existing buried box culvert without introducing any adverse structural or geotechnical impacts.

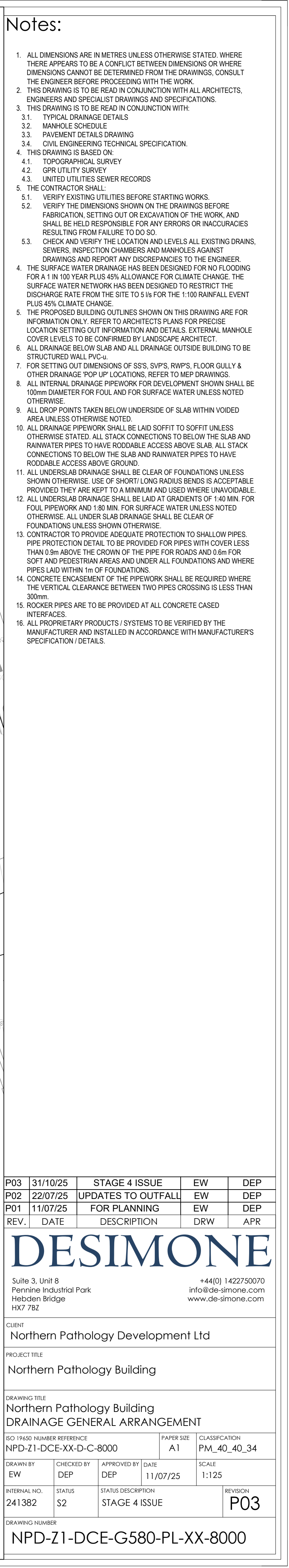
In accordance with LLFA and asset protection requirements, no planting or landscaping with deep-rooting vegetation will be permitted directly above or within close proximity to the culvert alignment. Root systems from shrubs or trees have the potential to penetrate joints, compromise the culvert's watertightness, or alter ground moisture conditions, thereby impacting the structural performance of the asset. As such, all planting within this area will be restricted to shallow-rooted grass or turf finishes only, ensuring minimal disturbance to the underlying structure.

This approach aligns with best practice guidance from LLFAs and watercourse asset protection policies, which stipulate that the surface above buried hydraulic structures should remain free of deep-rooting vegetation, significant hardstanding, or permanent obstructions. These restrictions facilitate ease of future inspection, maintenance, and potential excavation works, while preserving the hydraulic and structural integrity of the culvert system.

In conclusion, by maintaining a minimum 5 m exclusion zone, avoiding planting and construction over the culvert, and implementing appropriate construction and protection measures, it is demonstrated that the proposed works are feasible, compliant, and fully compatible with the continued safe operation of the existing buried box culvert.

8. Appendices

Appendix A: - Proposed Drainage Layout GA



Appendix B:- Hydraulic Calculations

Project:

NORTHERN PATHOLOGY
DEVELOPMENT

DATE: 31/10/25

Designed by:

Ethan Worral

Checked by:

Approved By:

Report Details:

Type: Inflows
Storm Phase: Phase

Company Address:

I

DRN

 **Building 1**

Type : Catchment Area

Area (ha)

0.051

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

 **Layby**

Type : Catchment Area

Area (ha)

0.017

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

 **Bin Store**

Type : Catchment Area

Area (ha)

0.004

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

 **Footpath 1**

Type : Catchment Area

Area (ha)

0.001

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: NORTHERN PATHOLOGY DEVELOPMENT	DATE: 31/10/25			
	Designed by: Ethan Worrall	Checked by:	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



Footpath 2

Type : Catchment Area

Area (ha)	0.001
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Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	0.900
Winter Volumetric Runoff	0.900
Time of Concentration (mins)	5
Percentage Impervious (%)	100

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Junctions Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:		Approved By:
		Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SWIC04	Manhole	384852.791	392649.870	34.910	1.629	33.281	Circular	0.600
SWIC01	Manhole	384878.518	392649.166	35.100	1.672	33.428	Circular	0.600
SWIC05	Manhole	384845.467	392651.206	34.287	1.048	33.239	Circular	1.050
Culvert Outfall	Manhole	384839.798	392651.594	34.210	1.003	33.207	Circular	1.400
SWIC02	Manhole	384872.061	392649.321	34.910	1.519	33.391	Circular	0.600
SWIC03	Manhole	384867.221	392649.429	34.910	1.546	33.364	Circular	0.600

Name	Lock
SWIC04	None
SWIC01	None
SWIC05	None
Culvert Outfall	None
SWIC02	None
SWIC03	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SWIC04	Inlet	Layby Footpath 1 Bin Store	(None)	No Restriction
	Inlet (1)	SW1.003	(None)	No Restriction
SWIC01	Inlet	Building 1	(None)	No Restriction
SWIC05	Inlet	SW1.004	(None)	No Restriction
Culvert Outfall	Inlet	SW1.005	(None)	No Restriction
SWIC02	Inlet	SW1.001	(None)	No Restriction
	Inlet (1)	SW2.001	(None)	No Restriction
SWIC03	Inlet	SW1.002	(None)	No Restriction
	Inlet (1)	Footpath 2	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SWIC04	Outlet	SW1.004	Free Discharge
SWIC01	Outlet	SW1.001	Free Discharge
SWIC05	Outlet	SW1.005	Depth / Flow
	Invert Level (m)	33.239	
	Depth (m)	Outflow (L/s)	
	0.100	3.247	
	0.200	4.188	
	0.300	4.353	
	0.400	3.768	
	0.500	3.191	
	0.600	3.325	
	0.700	3.542	
	0.800	3.797	
	0.900	4.020	
	1.000	4.221	
SWIC02	Outlet	SW1.002	Free Discharge
SWIC03	Outlet	SW1.003	Free Discharge

Project: NORTHERN PATHOLOGY DEVELOPMENT	DATE: 31/10/25			
	Designed by: Ethan Worrall	Checked by:	Approved By:	
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:			



Cellular Storage

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	34.230
Depth (m)	0.800
Base Level (m)	33.410
Number of Crates Long	1
Number of Crates Wide	1
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	6.5
Crate Width (m)	4
Crate Height (m)	0.8
Total Volume (m³)	19.780
Outlets	
Outlet	
Outgoing Connection	SW2.001
Outlet Type	Free Discharge

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25		
Report Details: Type: Manhole Schedule Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:	
		Approved By:		
		Company Address:		

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWIC04	34.910 33.281	Diameter / Length: 0.600	{1} SW1.003	Pipe	33.281	Diam/Width:225	Manhole
E:384852.791 N:392649.870	1.629						
			{a} SW1.004	Pipe	33.281	Diam/Width:225	Not Applicable
SWIC01	35.100 33.428	Diameter / Length: 0.600					Manhole
E:384878.518 N:392649.166	1.672						
			{a} SW1.001	Pipe	33.428	Diam/Width:225	Not Applicable
SWIC05	34.287 33.239	Diameter / Length: 1.050	{1} SW1.004	Pipe	33.239	Diam/Width:225	Manhole
E:384845.467 N:392651.206	1.048						
			{a} SW1.005	Pipe	33.239	Diam/Width:150	Not Applicable
Culvert Outfall	34.210 33.207	Diameter / Length: 1.400	{1} SW1.005	Pipe	33.207	Diam/Width:150	Manhole
E:384839.798 N:392651.594	1.003						
							Not Applicable
SWIC02	34.910 33.391	Diameter / Length: 0.600	{1} SW1.001	Pipe	33.391	Diam/Width:225	Manhole
E:384872.061 N:392649.321	1.519		{2} SW2.001	Pipe	33.391	Diam/Width:225	
			{a} SW1.002	Pipe	33.391	Diam/Width:225	Not Applicable

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
		Designed by: Ethan Worrall	Checked by:		Approved By:
Report Details: Type: Manhole Schedule Storm Phase: Phase		Company Address:			

Name	Cover Level (m) Invert Level (m)		Connection Details				Type
Coordinates (m)	Depth (m)	Manhole Size (m)	Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
			Outgoing Connections				Cover
SWIC03	34.910 33.364	Diameter / Length: 0.600	{1} SW1.002	Pipe	33.364	Diam/Width:225	Manhole
E:384867.221 N:392649.429	1.546		{a} SW1.003	Pipe	33.364	Diam/Width:225	Not Applicable

Project:		DATE: 31/10/25			
NORTHERN PATHOLOGY DEVELOPMENT		Designed by:	Checked by:		Approved By:
		Ethan Worrall			
Report Details:		Company Address:			
Type: Network Design Criteria					
Storm Phase: Phase					

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐
--------------	--------------------------

Project:	DATE: 31/10/25			
NORTHERN PATHOLOGY DEVELOPMENT	Designed by:	Checked by:		Approved By:
Report Title:	Company Address:			
Rainfall Analysis Criteria				

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall	
FEH	Type: FEH
Site Location	GB 384894 392658 SJ 84894 92658
Rainfall Version	2022
Summer	☒
Winter	☒

Return Period	
Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
100.0	45.000

Storm Durations	
Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
240	480
360	720
480	960
960	1920
1440	2880

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:		Approved By:
		Company Address:			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWIC04	FEH: 2 years: +0 %: 15 mins: Summer	34.910	33.281	33.512	0.231	6.0	0.065	0.000	5.1	5.041	Surcharged
SWIC01	FEH: 2 years: +0 %: 15 mins: Summer	35.100	33.428	33.517	0.089	8.9	0.025	0.000	8.4	3.893	OK
SWIC05	FEH: 2 years: +0 %: 15 mins: Summer	34.287	33.239	33.511	0.272	5.1	0.236	0.000	4.2	4.953	Surcharged
Culvert Outfall	FEH: 2 years: +0 %: 15 mins: Summer	34.210	33.207	33.264	0.057	4.2	0.000	0.000	4.2	4.917	OK
SWIC02	FEH: 2 years: +0 %: 30 mins: Summer	34.910	33.391	33.486	0.095	5.8	0.027	0.000	4.6	6.480	OK
SWIC03	FEH: 2 years: +0 %: 30 mins: Summer	34.910	33.364	33.486	0.122	4.7	0.034	0.000	3.5	4.882	OK

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25		
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: Ethan Worrall	Checked by: Approved By:	
		Company Address:		



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWIC04	FEH: 30 years: +0 %: 15 mins: Winter	34.910	33.281	33.654	0.373	7.8	0.106	0.000	5.3	7.503	Surcharged
SWIC01	FEH: 30 years: +0 %: 15 mins: Summer	35.100	33.428	33.662	0.234	19.8	0.066	0.000	19.2	8.448	Surcharged
SWIC05	FEH: 30 years: +0 %: 60 mins: Summer	34.287	33.239	33.708	0.469	4.7	0.406	0.000	4.3	20.186	Surcharged
Culvert Outfall	FEH: 30 years: +0 %: 60 mins: Summer	34.210	33.207	33.266	0.059	4.3	0.000	0.000	4.3	20.174	OK
SWIC02	FEH: 30 years: +0 %: 15 mins: Winter	34.910	33.391	33.655	0.264	19.6	0.075	0.000	4.3	10.980	Surcharged
SWIC03	FEH: 30 years: +0 %: 15 mins: Winter	34.910	33.364	33.655	0.291	4.4	0.082	0.000	4.2	4.998	Surcharged

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Junctions Summary Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:		Approved By:
		Company Address:			



FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SWIC04	FEH: 100 years: +45 %: 15 mins: Summer	34.910	33.281	33.996	0.715	15.1	0.202	0.000	5.7	9.131	Surcharged
SWIC01	FEH: 100 years: +45 %: 15 mins: Summer	35.100	33.428	33.997	0.569	36.0	0.161	0.000	33.7	15.189	Surcharged
SWIC05	FEH: 100 years: +45 %: 120 mins: Winter	34.287	33.239	34.123	0.884	4.7	0.765	0.000	4.3	44.342	Flood Risk
Culvert Outfall	FEH: 100 years: +45 %: 120 mins: Winter	34.210	33.207	33.266	0.059	4.3	0.000	0.000	4.3	44.331	OK
SWIC02	FEH: 100 years: +45 %: 15 mins: Summer	34.910	33.391	33.998	0.607	39.9	0.172	0.000	5.6	18.453	Surcharged
SWIC03	FEH: 100 years: +45 %: 15 mins: Summer	34.910	33.364	33.997	0.633	8.2	0.179	0.000	4.3	5.712	Surcharged

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
		Designed by: Ethan Worrall	Checked by:		Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address:			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 2 years: +0 %: 15 mins: Summer	33.479	33.479	0.069	0.069	3.5	1.716	0.000	0.000	2.4	1.235	91.322	OK

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
		Designed by: Ethan Worrall	Checked by:		Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address:			



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 30 years: +0 %: 60 mins: Summer	33.710	33.710	0.300	0.300	10.6	7.407	0.000	0.000	3.5	7.183	62.552	OK

Project:

NORTHERN PATHOLOGY DEVELOPMENT

DATE: 31/10/25

Designed by:

Ethan Worrall

Checked by:

Approved By:

Report Details:

Type: Stormwater Controls Summary

Storm Phase: Phase

Company Address:

I

DRN



FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By:
Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FEH: 100 years: +45 %: 60 mins: Winter	34.217	34.217	0.807	0.807	17.2	19.776	0.000	0.000	3.2	10.107	0.023	OK

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: Ethan.Worrall	Checked by:		Approved By:
		Company Address:			



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.004	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SWIC04	SWIC05	34.910	33.512	0.225	5.041	0.2	0.13	5.1	Surcharged
SW1.005	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SWIC05	Culvert Outfall	34.287	33.511	0.060	4.917	0.6	0.31	4.2	Surcharged
SW1.001	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SWIC01	SWIC02	35.100	33.517	0.104	3.893	0.5	0.21	8.4	OK
SW2.001	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	Cellular Storage	SWIC02	35.100	33.479	0.078	0.000	0.4	0.07	2.4	OK
SW1.002	FEH: 2 years: +0 %: 30 mins: Summer	Pipe	SWIC02	SWIC03	34.910	33.486	0.108	4.783	0.5	0.12	4.6	OK
SW1.003	FEH: 2 years: +0 %: 30 mins: Summer	Pipe	SWIC03	SWIC04	34.910	33.486	0.163	4.882	0.3	0.09	3.5	OK

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:		Approved By:
		Company Address:			



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.004	FEH: 30 years: +0 %: 15 mins: Winter	Pipe	SWIC04	SWIC05	34.910	33.654	0.225	7.012	0.2	0.14	5.3	Surcharged
SW1.005	FEH: 30 years: +0 %: 60 mins: Summer	Pipe	SWIC05	Culvert Outfall	34.287	33.708	0.061	20.174	0.6	0.33	4.3	Surcharged
SW1.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SWIC01	SWIC02	35.100	33.662	0.225	8.448	0.6	0.49	19.2	Surcharged
SW2.001	FEH: 30 years: +0 %: 60 mins: Summer	Pipe	Cellular Storage	SWIC02	35.100	33.710	0.225	0.000	0.4	0.11	3.5	Surcharged
SW1.002	FEH: 30 years: +0 %: 15 mins: Winter	Pipe	SWIC02	SWIC03	34.910	33.655	0.225	4.196	0.6	0.11	4.3	Surcharged
SW1.003	FEH: 30 years: +0 %: 15 mins: Winter	Pipe	SWIC03	SWIC04	34.910	33.655	0.225	3.974	0.3	0.11	4.2	Surcharged

Project: NORTHERN PATHOLOGY DEVELOPMENT		DATE: 31/10/25			
Report Details: Type: Connections Summary Storm Phase: Phase		Designed by: Ethan Worrall	Checked by:		Approved By:
		Company Address:			



FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
SW1.004	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	SWIC04	SWIC05	34.910	33.996	0.225	6.755	0.1	0.15	5.7	Surcharged
SW1.005	FEH: 100 years: +45 %: 120 mins: Winter	Pipe	SWIC05	Culvert Outfall	34.287	34.123	0.061	44.331	0.6	0.33	4.3	Flood Risk
SW1.001	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	SWIC01	SWIC02	35.100	33.997	0.225	15.189	0.8	0.86	33.7	Surcharged
SW2.001	FEH: 100 years: +45 %: 120 mins: Summer	Pipe	Cellular Storage	SWIC02	35.100	34.137	0.225	0.000	0.4	0.1	3.4	Surcharged
SW1.002	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	SWIC02	SWIC03	34.910	33.998	0.225	1.622	0.4	0.15	5.6	Surcharged
SW1.003	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	SWIC03	SWIC04	34.910	33.997	0.225	1.129	0.2	0.11	4.3	Surcharged

Appendix C:- Environment Agency Flood Data



Flood map for planning

Your reference
Unspecified

Location (easting/northing)
384876/392653

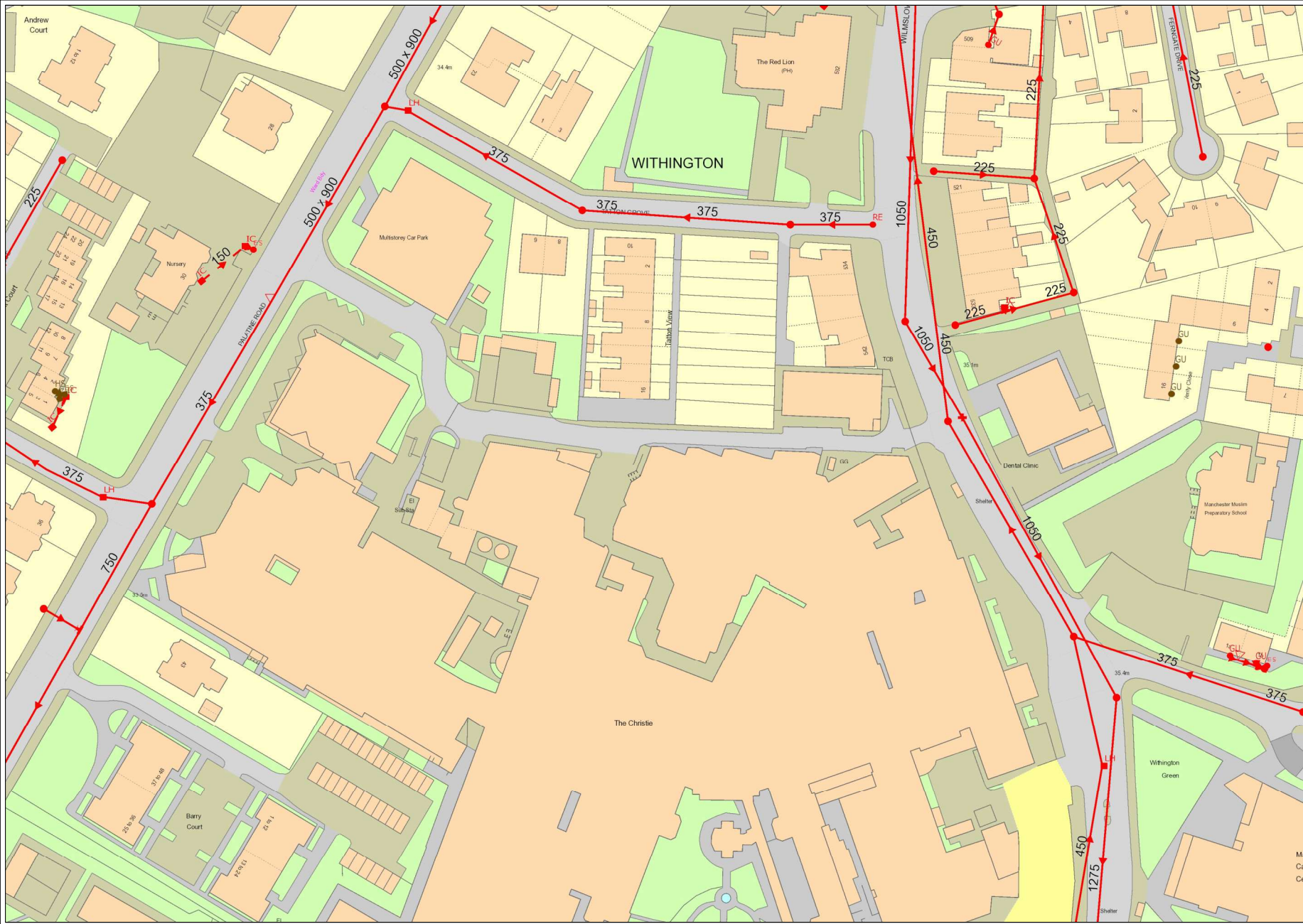
Scale
1:2,500

Created
2 Jul 2025 08:44

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area

0 20 40 60m

Appendix D:- Sewer Records



United Utilities Maps for SafeDig

Date :	22/05/2024 11:54:56
Centre X:	384833
Centre Y:	392640
Scale :	1000
UserName:	MOTTMACNRT

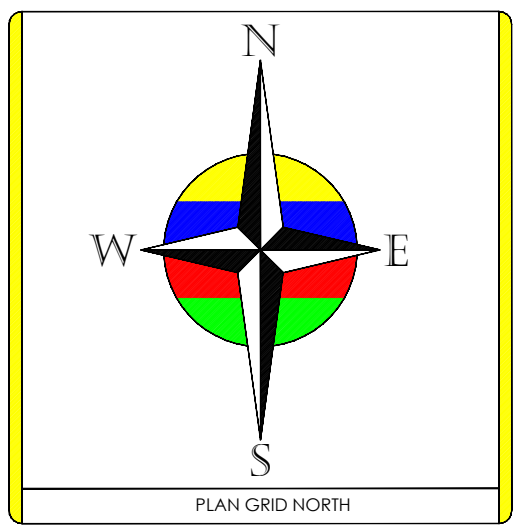
Extract from maps of United Utilities' Underground Assets

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities Water will not accept liability for any damage caused by the actual position being different from those shown.

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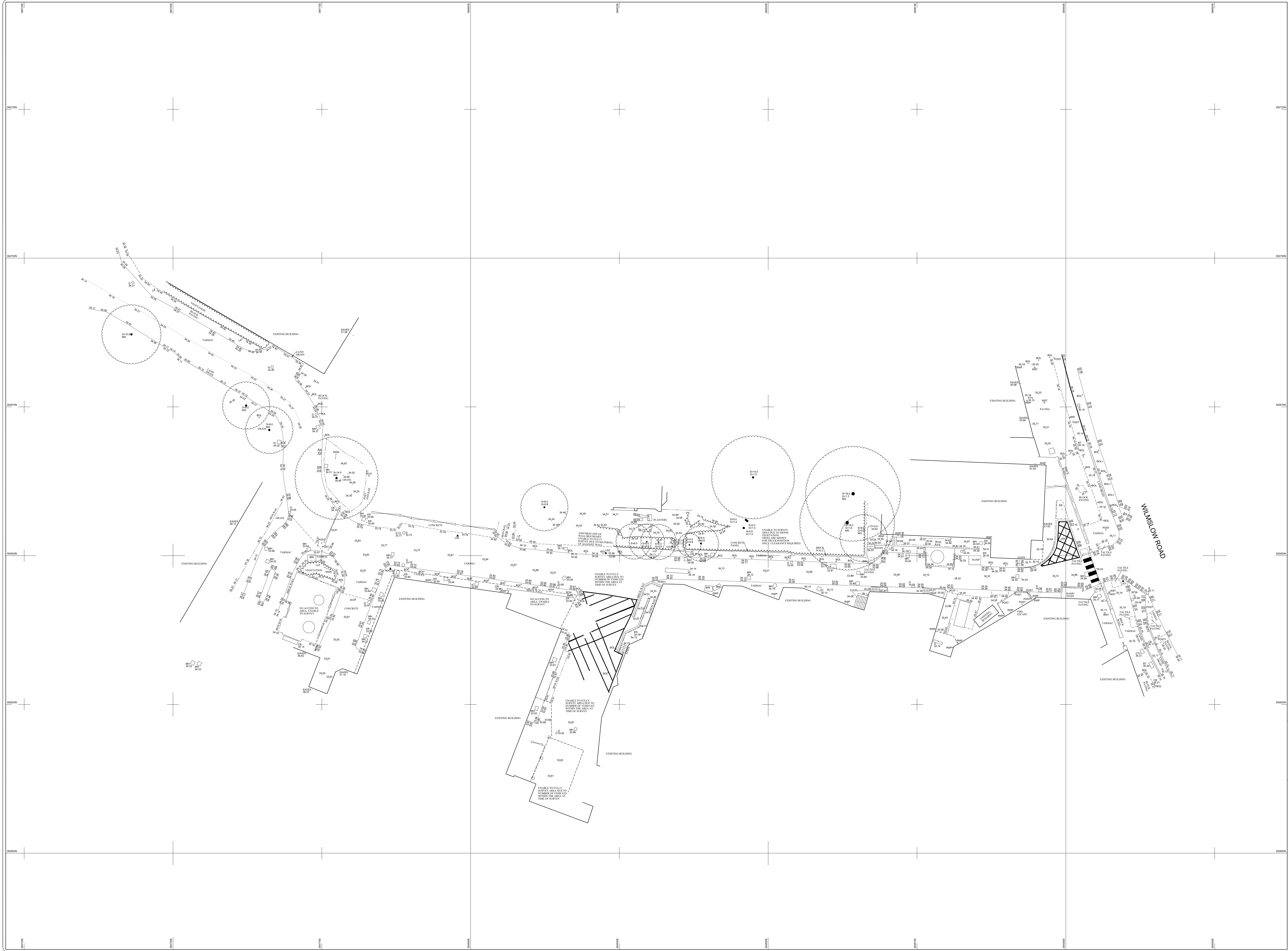


Appendix E:- Topographical Survey



NOTES:
All works made to 100mm (1:100) scale. All dimensions are to the centre of the line unless otherwise stated.
The survey was carried out on 10th June 2024. The survey was carried out by the following personnel:
Surveyor: J. J. F. (J.J.F.)
Assistant: A. L. (A.L.)
The survey was carried out in accordance with the following standards:
BSI: BS 5400-6:1990
BSI: BS 5400-7:1990
BSI: BS 5400-8:1990
BSI: BS 5400-9:1990
BSI: BS 5400-10:1990
BSI: BS 5400-11:1990
BSI: BS 5400-12:1990
BSI: BS 5400-13:1990
BSI: BS 5400-14:1990
BSI: BS 5400-15:1990
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BSI: BS 5400-26:1990
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BSI: BS 5400-29:1990
BSI: BS 5400-30:1990
BSI: BS 5400-31:1990
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BSI: BS 5400-41:1990
BSI: BS 5400-42:1990
BSI: BS 5400-43:1990
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BSI: BS 5400-98:1990
BSI: BS 5400-99:1990
BSI: BS 5400-100:1990

LEGEND:	SYMBOL	DESCRIPTION
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100	101	102



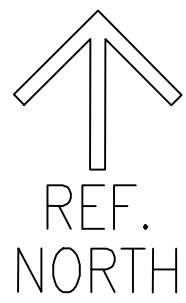
SHEET LAYOUT
1:1000 Scale

LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

NO.	DATE	DESCRIPTION
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Appendix F:- Utilities Survey

Appendix G:- Exceedance Flood Routing



- Notes:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED. WHERE THERE APPEARS TO BE A CONFLICT BETWEEN DIMENSIONS OR WHERE DIMENSIONS CANNOT BE DETERMINED FROM THE DRAWINGS, CONSULT THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
 3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH:
 - 3.1. TYPICAL DRAINAGE DETAILS
 - 3.2. MANHOLE SCHEDULE
 - 3.3. PAVEMENT DETAILS DRAWING
 - 3.4. CIVIL ENGINEERING TECHNICAL SPECIFICATION.
 4. THIS DRAWING IS BASED ON:
 - 4.1. TOPOGRAPHICAL SURVEY
 - 4.2. GPR UTILITY SURVEY
 - 4.3. UNITED UTILITIES SEWER RECORDS
 5. THE CONTRACTOR SHALL:
 - 5.1. VERIFY EXISTING UTILITIES BEFORE STARTING WORKS.
 - 5.2. VERIFY THE DIMENSIONS SHOWN ON THE DRAWINGS BEFORE FABRICATION, SETTING OUT OR EXCAVATION OF THE WORK, AND SHALL BE HELD RESPONSIBLE FOR ANY ERRORS OR INACCURACIES RESULTING FROM FAILURE TO DO SO.
 6. CHECK AND VERIFY THE LOCATION AND LEVELS ALL EXISTING DRAINS, SEWERS, INSPECTION CHAMBERS AND MANHOLES AGAINST DRAWINGS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
 7. THE SURFACE WATER DRAINAGE HAS BEEN DESIGNED FOR NO FLOODING FOR A 1 IN 100 YEAR PLUS 45% ALLOWANCE FOR CLIMATE CHANGE. THE SURFACE WATER NETWORK HAS BEEN DESIGNED TO RESTRICT THE DISCHARGE RATE FROM THE SITE TO 2.5 l/s FOR THE 1:100 RAINFALL EVENT PLUS 45% CLIMATE CHANGE.
 8. THE PROPOSED BUILDING OUTLINES SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. REFER TO ARCHITECTS PLANS FOR PRECISE LOCATION SETTING OUT INFORMATION AND DETAILS. EXTERNAL MANHOLE COVER LEVELS TO BE CONFIRMED BY LANDSCAPE ARCHITECT.
 9. ALL DRAINAGE BELOW SLAB AND ALL DRAINAGE OUTSIDE BUILDING TO BE STRUCTURED WALL PVC-U.
 10. FOR SETTING OUT DIMENSIONS OF S/S, S/VPS, RWPS, FLOOR GULLY & OTHER DRAINAGE POP UP LOCATIONS, REFER TO MEP DRAWINGS.
 11. ALL INTERNAL DRAINAGE PIPEWORK FOR DEVELOPMENT SHOWN SHALL BE 100mm DIAMETER FOR FOUL AND FOR SURFACE WATER UNLESS NOTED OTHERWISE.
 12. ALL DRAINAGE PIPEWORK TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE STATED. ALL STACK CONNECTIONS TO BELOW THE SLAB AND RAINWATER PIPES TO HAVE RODDABLE ACCESS ABOVE GROUND.
 13. ALL DROP POINTS TAKEN BELOW UNDERSIDE OF SLAB WITHIN VOIDED AREA UNLESS OTHERWISE NOTED.
 14. ALL DRAINAGE PIPEWORK SHALL BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE STATED. ALL STACK CONNECTIONS TO BELOW THE SLAB AND RAINWATER PIPES TO HAVE RODDABLE ACCESS ABOVE SLAB. ALL STACK CONNECTIONS TO BELOW THE SLAB AND RAINWATER PIPES TO HAVE RODDABLE ACCESS ABOVE GROUND.
 15. ALL UNDERSLAB DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE. USE OF SHORT/LONG RADIUS BENDS IS ACCEPTABLE PROVIDED THEY ARE KEPT TO A MINIMUM AND USED WHERE UNAVOIDABLE.
 16. ALL UNDERSLAB DRAINAGE FOR TOWNHOUSES SHALL BE LAID AT GRADIENTS OF 1:40 MIN. FOR FOUL PIPEWORK AND 1:80 MIN. FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL UNDERSLAB DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE.
 17. CONTRACTOR TO PROVIDE ADEQUATE PROTECTION TO SHALLOW PIPES. PIPE PROTECTION DETAIL TO BE PROVIDED FOR PIPES WITH COVER LESS THAN 0.9m ABOVE THE CROWN OF THE PIPE FOR ROADS AND 0.6m FOR SOFT AND PEDESTRIAN AREAS AND UNDER ALL FOUNDATIONS AND WHERE PIPES LAID WITHIN 1m OF FOUNDATIONS.
 18. CONCRETE ENCASMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300mm.
 19. ROCKER PIPES ARE TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.
 20. ALL PROPRIETARY PRODUCTS / SYSTEMS TO BE VERIFIED BY THE MANUFACTURER AND INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION / DETAILS.

P01	11/07/25	FOR PLANNING	EW	DEP
REV.	DATE	DESCRIPTION	DRW	APR

DESIMONE

Suite 3, Unit 8
Pennine Industrial Park
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+44(0) 1422750070
info@de-simone.com
www.de-simone.com

CLIENT
Northern Pathology Development Ltd

PROJECT TITLE
Northern Pathology Building

DRAWING TITLE
Northern Pathology Building
FLOOD EXCEEDANCE DRAWING

ISO 15926 NUMBER REFERENCE
NPD-Z1-DCE-XX-D-C-8001

PAPER SIZE
A1

CLASSIFICATION
PM_40_40_34

DRAWN BY EW	CHECKED BY DEP	APPROVED BY DEP	DATE 11/07/25	SCALE 1:125
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INTERNAL NO. 241382	STATUS S2	STATUS DESCRIPTION FOR PLANNING	REVISION P01
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DRAWING NUMBER
NPD-Z1-DCE-G580-PL-XX-8001

Do not scale from this drawing, figured dimensions only should be used. If in doubt ASK.

Appendix B:- Drained Areas General Arrangement

EXISTING DRAINED AREA : 0.053 Ha

PROPOSED DRAINED AREA : 0.078 Ha

Notes:

- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED. WHERE THERE APPEARS TO BE A CONFLICT BETWEEN DIMENSIONS OR WHERE DIMENSIONS CANNOT BE DETERMINED FROM THE DRAWINGS, CONSULT THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
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- ALL DRAINAGE PIPEWORK TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE STATED. ALL STACK CONNECTIONS TO BELOW THE SLAB AND RAINWATER PIPES TO HAVE RODDABLE ACCESS ABOVE SLAB. ALL STACK CONNECTIONS TO BELOW THE SLAB AND RAINWATER PIPES TO HAVE RODDABLE ACCESS ABOVE GROUND.
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- CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300mm.
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P01	23/07/25	FOR PLANNING	EW	DEP
REV.	DATE	DESCRIPTION	DRW	APR

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DRAINED AREAS GENERAL ARRANGEMENT

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PAPER SIZE
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APPROVED BY
DEP

DATE
11/07/25

SCALE
1:125

INTERNAL NO.
241382

STATUS
S2

STATUS DESCRIPTION
FOR PLANNING

REVISION
P01

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NPD-Z1-DCE-G580-PL-XX-8002