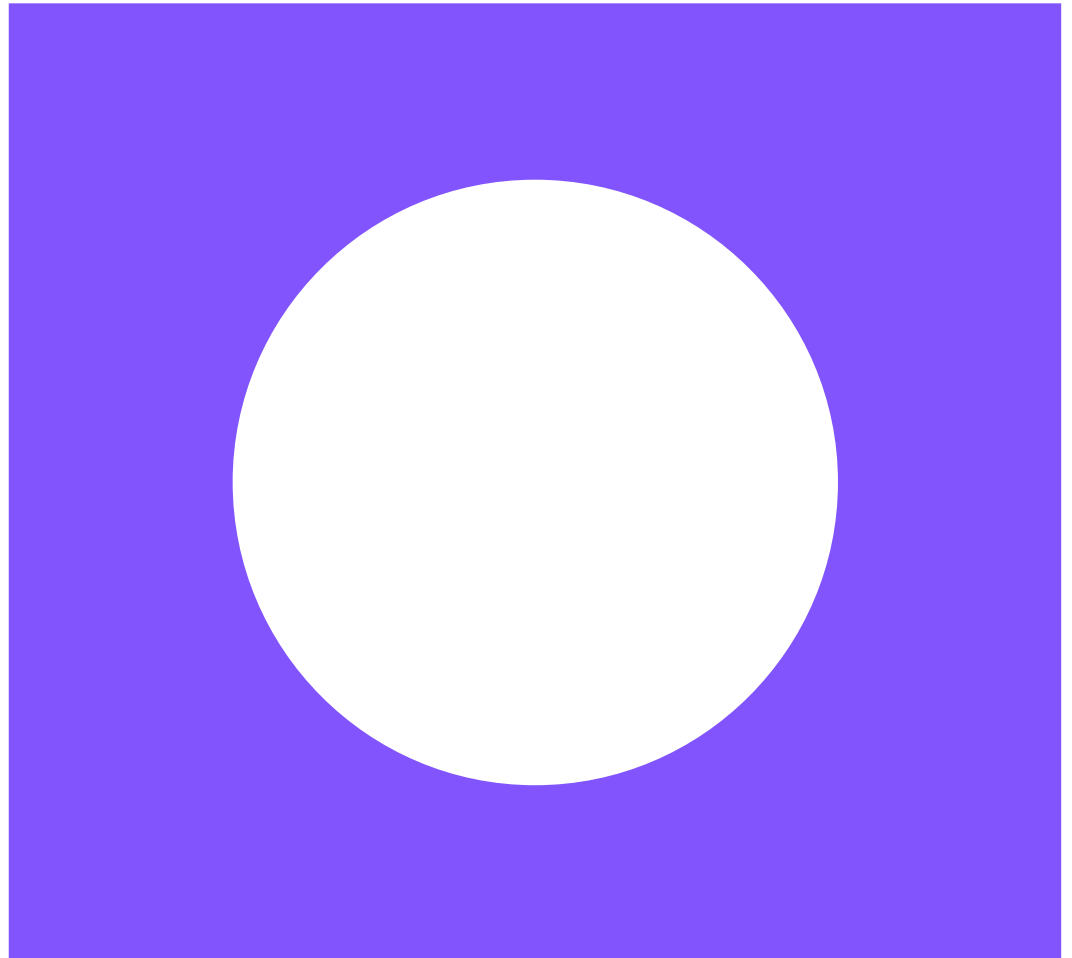




The Christie Advanced Scanning and Imaging Centre Development (CASICD)

Drainage Strategy

December 2025

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Drainage Strategy

December 2025

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1 Introduction

1.1 Scope of Report

Mott MacDonald have been commissioned by IHP to provide an outline drainage strategy for the proposed development of The Christie Advanced Scanning and Imaging Centre Development (CASICD).

This report sets out the key principles of taking forward a drainage solution for development, including the requirements of Manchester City Council (MCC) to obtain outline planning approval.

The report includes the following:

- Review of existing information;
- Assessment of existing site drainage;
- Drainage design criteria and existing discharge rates;
- Consultation with key stakeholders;
- Drainage strategy;

1.2 Existing Site and Background

1.2.1 Site Location

The proposed location for the Christie Advanced Scanning and Imaging Centre Development (CASICD) is in Withington, Greater Manchester and is bordered by Wilmslow Road to the East and other blocks of the Christie Hospital campus to all other sides. Access into the site is currently provided via Wilmslow Road to the East. The development site consists of existing Blocks 19 and 20 which are to be demolished along with the partial demolition of Block 21 and are to be replaced with a new CT department. The site is surrounded on three sides by existing hospital buildings.

1.2.2 Site Details

The site is located within Flood Zone 1, and therefore has a low risk from flooding from rivers and seas with less than 0.1% annual exceedance probability.

The Manchester City Council Strategic Flood Risk Assessment (SFRA) indicates that the site is located in the Didsbury Critical Drainage Area. Therefore, there is a need for surface water to be managed to a higher standard than normal to ensure the proposed development will contribute to a reduction in flooding risks in line with NPPF as outlined in Section 4.

It should be noted that there are no known records of sewer flooding in the vicinity of the site.

With reference to the site location plan (CASICD-DAY-XX-ZZ-DR-A-090001 - Site Location Plan), the overall area considered as the development site measures approximately 0.315ha

The site is bounded to the north by the Medical Physics & Engineering building, to the east by a pedestrian footway, a cycle path and Wilmslow Road, to the south by the newly constructed Paterson building redevelopment and to the west by the Christie Clinic.

The existing topographical survey (59603-SUR-TOP-(PUBLISHED) (06.01.23) see Appendix A) indicates that the site is generally flat. There is a high spot towards the south-east of the site (approx. 35.44mAOD). There is a low spot of approximately 34.82mAOD in the north of the site.

1.3 Development Proposals

The Christie Advanced Scanning and Imaging Centre Development (CASICD) project involves the demolition of part of the existing two and three storey hospital (Blocks 19 and 20 and part of Block 21) and construction of a new principally three-storey building with a level of plant above and additional plant equipment on the roof and a CT scanner, X-ray facility and associated accommodation at ground floor level. A stair core is also proposed to the north of the site rising to five storeys.

Levels 01 and 02 are anticipated to be ward accommodation, however the current proposals are for these levels to be built on a 'shell and core' basis at this stage. Plant will be located on level 03 and the roof. There is an existing basement that is used as a conduit for services to feed the wider site. The basement will be demolished, and services rerouted as part of the proposed development.

The pedestrian area between the new building and Wilmslow Road will be redeveloped and will include a rain garden along the front edge of the building and new raised planters adjacent to the existing cycle route and improved paving.

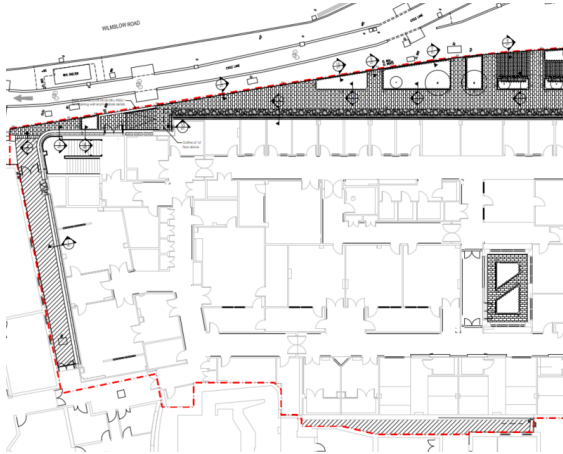
The Architectural GA and Landscape Architectural GA are included in Figure 1.1, Figure 1.2 & Figure 1.3.

Figure 1.1: Level 00 – Proposed GA Plan



Source: CASICD-DAY-XX-00-DR-A-200001_P15 (31.10.2025)

Figure 1.2: Landscape GA (North)



Source: CASICD-ITR-XX-00-DR-L-900101 P02
(12/11/25)

Figure 1.3: Landscape GA (South)



Source: CASICD-ITR-XX-00-DR-L-900102 P02
(12/11/25)

The development proposals consist of the following types:

- Combined roof area = 2550m² (of which 2046m² is attenuated by the blue roof)
- External hard paving = 466m²
- Raised planters = 88m²
- Rain Garden = 46m²

3 Foul Water Drainage Design

3.1 Design Standards

The foul water drainage systems will be designed with regard to the following documents:

- Building Regulations Approved Document Part H;
- Sewerage Sector Guidance – Design and Construction Guidance Appendix C;
- BS EN 752 – Drain and sewer systems outside buildings;
- BS EN 12056 – Gravity drainage systems inside buildings;
- Planning Practice Guidance – Technical Guidance (PPG-TG).

3.2 Discharge Rate

Based on the design criteria within Section 3.1, the peak foul discharge rate from the site has been estimated using the Discharge Unit method in BSEN12056 and the current proposed ground floor plan indicated on drawing DAY-XX-00-DR-A-700001 P15 and a system type II has been assumed. The first and second floor of the hospital are proposed to be 'shell and core', and as such the foul appliances on these floors are unknown. For the purposes of the foul water calculation, the discharge units have been assumed to be the same on the first and second floor as they are on the proposed ground floor layout. The third floor includes mechanical and electrical equipment and an allowance for six floor gullies has been added for these floors.

System type II is defined as a single discharge stack system with small branch pipes. Sanitary appliances are connected to small bore branch discharge pipes. The small-bore branch discharges pipes are designed with a filling degree of 0.7 (70%) and are connected to a single discharge stack.

Based on a varying frequency factor of 0.5 and 0.7, the estimated 170 discharge units give a peak flow rate of between 6.5 and 9.1/s with a typical average flow of between 1.1 and 3.0l/s.

It should be noted that the proposed scheme is a replacement of existing hospital accommodation and will have modernised facilities, such as a low flush WC's instead of traditional ones, as such this will significantly reduce water demand due to the difference in water usage during each flush.

Discharge Unit take-off tables are included in Appendix E for reference.

3.3 Discharge Strategy

The hospital site is part of a new larger development where foul water assets will be provided as part of the main development scheme. It is proposed that the foul water would ultimately discharge to the 450mm diameter public combined sewer within Wilmslow Road located to the east of the proposed development at an unrestricted rate, as per the existing scenario.

It is proposed that the majority of the site's foul flow discharges to the existing combined manhole (labelled C07 on the CCTV survey plan in Appendix D) at the south of the development site. The remaining, smaller volume of foul flow, is proposed to discharge to the diverted combined drain in the north that outfalls into the existing combined drain that ultimately outfalls into the 450mm diameter public combined sewer within Wilmslow Road.

It is likely that an indirect S106 application of the Water Industry Act will be needed to connect the drainage systems to the proposed adopted sewers. It should be noted that United Utilities

responded to a pre-development enquiry that was submitted on the 1st August 2023 confirming that it would be possible to connect to the 450mm diameter public combined sewer under Wilmslow Road at an unrestricted rate (UU Reference Number: 04370779 and see Appendix F).

4 Surface Water Drainage Design

4.1 Design Parameters and Assumptions

The below design parameters have been used for the purpose of design.

Table 4.1: Design Parameters

Parameter	Criteria
Return Period	Attenuation systems designed up to and including a 1-in-100 year event with climate change with no flooding
Climate Change	45%
FEH Rainfall Data	Version 2022. Point: GB 384906 392580 SJ 84906 92580
Runoff Coefficient Summer Storm (C_v)	1.00
Runoff Coefficient Winter Storm (C_v)	1.00

4.2 Design Standards

The surface water drainage systems has been designed primarily with regard to the following documents:

- Building Regulations Approved Document Part H;
- Sewerage Sector Guidance – Design and Construction Guidance Appendix C;
- BS EN 752 – Drainage outside buildings;
- CIRIA C753 SuDS Manual.

4.3 Existing Runoff Rate

Using the Rational Method assessment for direct runoff:

$$Q = 2.78 \cdot i \cdot A \cdot C_v$$

Where:

Q = Runoff rate (l/s)

i = rainfall intensity (mm/hr). [Taken as 50mm/hr for the purpose of this calculation]

A = Area in hectares

C_v = Coefficient of runoff [Conservatively taken as 1 for this assessment as all areas are impermeable]

The pre-development impermeable area is 0.300ha, resulting in an approximate discharge rate of 41.7l/s.

The post-development impermeable area is 0.315ha, resulting in an approximate discharge rate of 43.8l/s.

4.4 Climate Change

The Environment Agency requires, in accordance with the Government's PPG-TG document, that there should be no increase in the rate of surface water emanating from a newly developed

site above that of any previous development. Furthermore, it is the joint aim of the Environment Agency and Local Planning Authorities, to actively encourage a reduction in the discharge of storm water as a condition of approval for new developments.

In addition, all drainage systems will be sized to accommodate the runoff arising from a 1 in 100-year rainfall event and should include a further allowance to account for the future effects of climate change.

Table 4.2 below, shows the anticipated increases in rainfall intensities with time for the Upper Mersey Management Catchment.

Table 4.2: Peak Rainfall Intensity Climate Change Allowance

	2050s	2070s
Upper End	40%	45%
Central	25%	30%

Source: [Climate change allowances for peak rainfall](#)

As the development will have a design lifespan of 50-75 years, the 2070's epoch should be used. Given the sensitivity of the site use and the proposed layout and levels, a 45% climate change allowance has been used in the design.

4.5 Site Discharge Options

Part H of Building Regulations 2015 recommends that surface water run-off from developments shall discharge to one of the following, listed in order of priority:

- An adequate soakaway or other adequate infiltration system or where that is not reasonably practicable;
- A watercourse, or where that is not reasonably practicable;
- A surface water sewer or drain, or where that is not reasonably practicable;
- A combined sewer.

It is necessary to identify the appropriate methods of controlling and discharging surface water from the site. Where possible, surface water run-off from the developed site will be drained in such a way as to mimic the natural drainage systems and thereby implement a SuDS approach. The design seeks to improve the local run-off profile using systems that can either attenuate run-off and reduce peak flow or positively impact on the existing flood profile.

4.5.1 Infiltration Based System

Reference is made to the separately issued Geotechnical Desk Study (CASICD-MMD-XX-XX-RP-C-00002 P01 – Ground Investigation Report carried out by Mott MacDonald that indicates the site is underlain by drift deposits of Glacial Till. The bedrock comprises of the Chester Formation – Sandstone. Sedimentary bedrock formed approximately in the Triassic Period.

Given that the site has been previously developed this will have an impact on permeability as the presence of made ground suggests potential variations in the soil properties that will affect infiltration rates and water movement, thus making this stratum unsuitable for infiltration. Infiltration into made ground could cause many residual risks such as the forming of sink holes, the migration of fine material and mobilisation of contaminants. In addition, after correspondence with United Utilities infiltration has been ruled out (UU Reference Number: 04370779 and see Appendix F).

4.5.2 Watercourses

The nearest watercourse is the Shaw Brook which is approximately 400m north of the site before being culverted beneath the site approximately 85m to the west of the development. A connection to this watercourse would either require crossing third-party land and adopted carriageway or construction of below ground drainage beneath an existing live hospital site and is therefore not considered feasible. As such this has been discounted as a point of discharge for the site.

4.5.3 Public Sewers

With reference to the adopted sewer records (see Appendix C) the nearest adopted sewer is a 450mm diameter combined sewer that runs south to north on Wilmslow Road. It is proposed that surface water from the new development drains to this sewer via a connection to the existing site drainage network at the existing combined manhole in the south (labelled C07 on the CCTV survey plan in Appendix D). This existing manhole outfalls to the 450mm diameter combined sewer under Wilmslow Road.

An additional surface water connection is also proposed from the proposed refuelling area to the north of the development. This is proposed to discharge to the existing combined drain in the north that ultimately outfalls into the 450mm diameter public combined sewer within Wilmslow Road.

Formal agreement through an indirect S106 application with United Utilities is required to vary the upstream connection.

4.5.4 Allowable Site Discharge Rate

A pre-development enquiry was submitted to United Utilities (UU) on 19/07/2023. Further information was provided to United Utilities regarding the hierarchy of discharge as requested by UU, upon review they confirmed that a 5.0l/s discharge rate to the public combined sewer is acceptable in principle.

More recent correspondence was made with both United Utilities (UU) and the Lead Local Flood Authority (LLFA), and it was agreed that the peak surface water discharge rate from the development could be increased to 10.0l/s. This correspondence is included in Appendix F.

4.6 Attenuation on Site

The provision of suitable attenuation on site to mitigate flood risk resulting from the development of the site has been a key factor in the evolution of the site development layout.

The provision of attenuation is necessary in this case and can be achieved by a number of methods; however, not all systems can be assessed in direct comparison.

One of the aims of PPG is to provide not only flood risk mitigation but also maximise additional gains such as improvements in runoff quality and provision of amenity and biodiversity. Systems incorporating these features are often termed Sustainable Drainage Systems (SuDS) and it is a requirement of PPG that these are considered as the primary means of collection, control and disposal to storm water as close to source as possible.

The volume of attenuation required for the development has been estimated using design software. The proposed impermeable areas taken from the current layout may be used to evaluate the runoff response of the site during varying rainfall events.

The software uses FEH version 2022 data for point: GB 384906 392580 SJ 84906 92580.

Table 4.3: Summary of Anticipated Attenuation Volume for Post-Development Scenario

Total Impermeable Contributing Area (ha)	Unrestricted Runoff (l/s)	Flow Restriction (l/s)	Estimated Attenuation Volume (1 in 100 + 45% CC) (m³)
0.315	44	10.0	177

This assessment was undertaken to determine the necessary attenuation volume for the proposed development, aiding in the evaluation of suitable SuDS systems. The conclusion of this section will encompass the choice of SuDS types for the proposed development.

4.7 Runoff Quality

Receiving watercourses are sensitive to water quality in varying degrees. Discharges to ground and watercourses will require more treatment than to a public sewer.

Notwithstanding this, reference to the SuDS manual and the simplified index approach (Chapter 26) classifies the hardstanding runoff thus:

Table 4.4: Pollution Hazard Indices for Different Land Use Classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydrocarbons
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05

Source: Table 26.2, CIRIA SuDS Manual C753

Total SuDS mitigation index = mitigation index n_1 + 0.5 (mitigation index n_2)

Where: mitigation index n = mitigation index for component n

Table 4.5: Indicative SuDS Mitigation Indices for Discharges to Surface Waters

Type of SuDS Component	TSS	Metals	Hydrocarbons
Bioretention	0.8	0.8	0.8
Proprietary Systems	These must demonstrate they can address each of the containment types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event for inflow concentrations relevant to the contributing area.		

Source: Table 26.3, CIRIA SuDS Manual C753

The table above shows that the proposed SuDS features (blue roof and bioretention/raised planters) will provide water treatment in excess of the anticipated pollutant load for the hospital site and will meet the requirements of the Simple Index Approach.

4.8 Specific Pollution Risk

It is currently proposed that on the roof of the building a standby generator will be placed to provide backup power to the building in the event of a mains supply failure.

The generator has its own fuel store with a bund in the roof area, however, the tank will require occasional refuelling from ground level and there is an associated residual risk that during a refuelling operation of the tank there may be a leak of fuel, this could range from a minor spill (less than 10 litres) up to 7,500 litres (equivalent to a full cell of a road going bowser).

It is proposed that a fuel tanker will park up on the hospital access road to the north of the Christie building, as shown on drawing CASICD-HLEA-XX-ZZ-DK-E-700001. The fuel pipe is proposed to connect from the tanker to the fuel fill point located at the north-eastern corner of the proposed building.

Additional surface water drainage channels are proposed to isolate the refuelling area. The area is to drain to the adopted network via a Class 1 full retention forecourt interceptor. Given the drainage constraints on the site, it is not viable to provide passive protection to the full length of pipework from the tanker to the fill point. As such it is proposed that the refuelling is managed by active systems such as the installation of temporary bunds on the site.

The exact details of the refuelling strategy for the site are to be confirmed. The refuelling specialist is to undertake a risk assessment to inform the drainage provisions required.

Additionally, a suitable risk management strategy should be developed for this activity and be subsequently utilised on the site when in operation.

4.9 Sustainable Drainage Systems (SuDS)

The most appropriate attenuation system should satisfy three main characteristics:

- Provide the required volume of storage
- Minimise the loss of developable land and;
- Where possible provide local amenity.

The SuDS Manual and EA guidance applies a sustainability hierarchy to the various types of SuDS systems, this is summarised in Table 4.1.

Figure 4.1: SuDS Hierarchy

	SuDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
Most Sustainable ↑ ↓ Less Sustainable	Living roofs	√	√	√
	Basins and Ponds	√	√	√
	- Constructed wetlands			
	- Balancing ponds			
	- Detention basins			
	- Retention ponds			
	Integrated vegetation systems	√	√	√
	- Filter Strips and Swales			
	- Rain Gardens			
	- Tree Pits			
	Infiltration devices	√	√	√
	- Soakaways			
	- Infiltration trenches & basins			
	Permeable surfaces and filter drains	√	√	
	- Gravelled areas			
	- Solid paving blocks			
	- Porous pavements			
	Tanked systems	√		
	- Over-sized pipes/tanks			

SuDS technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit
- Cellular Storage			

4.9.1 Living or Green/Blue Roofs

Larger areas of roof may be designed as living or green roofs to provide both point water treatment and significant enhancement of local biodiversity. The assessed gains are such that these systems are the preferred EA option for the provision of SuDS.

If considered at the outset of the design of a unit, a green roof can be integrated within the provision of a roof terrace area to multiply the benefits, alternatively, a maintained roof can be installed that may require specialist access.

There are numerous proprietary systems available on the market to suit various specific applications and it is recommended that if these systems are considered for the design, discussion with several suppliers is instigated as soon as possible.

For this development, there is a significant amount of plant on the roof with designated maintenance access areas and access walkways therefore a blue roof would be more suitable than a green roof as it would be easier to integrate with the access requirements.

4.9.2 Ponds and Basins

The nature of these systems is such that the run-off from the development can be treated by biological action and stilling to significantly improve the quality of water discharged from the site.

Basins also provide large areas of open space that can be developed for recreational uses for the students or as new habitat for wildlife.

Ponds are SuDS features with permanent water while basins have a similar structure to ponds, but they drain down completely. Therefore, ponds add biodiversity to the site, however the water in the structure can act as a hazard for visitors and staff. On the other hand, basins add to the amenity of an area and less maintenance is required for the structure compared to ponds.

Both systems do however take up developable land and have residual maintenance and liability issues attached to their implementation. The current development proposals for the site are not conducive to a pond or basin due to the systems being unsuitable from a health and safety perspective given the sensitive nature of site users and resultant issues created with stagnant water and due to the clear absence of space. Therefore, this option has been ruled out.

4.9.3 Integrated Vegetation Systems

These systems refer to sustainable stormwater management approaches that incorporate vegetation, such as plants, trees, shrubs, and grasses, into the design and implementation of drainage and stormwater management systems. These include: strips, swales, tree pits, and rain gardens.

Swales and filter strips are often situated adjacent to roads and footpaths, functioning to directly collect water from linear features, facilitating percolation, attenuation, and subsequent discharge into either conventional drainage systems or secondary SuDS devices.

In contrast, rain gardens emulate natural water retention found in undeveloped land, curbing runoff volume from impermeable surfaces and even addressing low levels of pollution. These localised systems are particularly advantageous for specific catchments. Bioretention, as seen

in rain gardens, proves valuable when water quality concerns arise, such as with highway runoff. Notably, tree pits stand as effective solutions in such scenarios and can accommodate larger drainage areas.

However, considering the site's drainage system is not interconnected at the surface, swales and filter strips are harder to integrate and thus less viable options.

Instead, tree pits emerge as more suitable alternatives, capable of integration with the raised planters.

The use of vegetated systems will provide a reduction in the total volume of surface water leaving the site. It is difficult to quantify the percentage reduction in surface water volume as it will depend on several factors, but it can be concluded that a well-designed rain garden and tree pit will reduce the surface water volume leaving the site, particularly for summer rainfall and for smaller intensity events. The use of these systems will also reduce, or even eliminate, the need for irrigation.

4.9.4 Pervious Surface and Permeable Sub-bases

Larger areas of paved hardstanding can easily be converted to provide significant volumes of storage. These systems also encourage biological treatment of flow and extraction of oils and heavy metals from the run-off. They also require less gritting in winter. Land take is reduced as storage is located under car parks, hardstanding and access roads.

This system could reduce the need for a separate collection system such as kerbs and gullies. It could also assist in reducing the flood profile of the site by detaining runoff from the development within the sub-base material. There is no specific amenity provided by the system other than enabling other areas to be utilised for development rather than potentially sterilizing areas with an easement for a sewer or stand-off for a basin.

These systems can also be integrated with basically all other forms of SuDS drainage and even on more steeply sloping sites (up to 1v:20h). A common sub-base level can be provided to link to tree pits, ponds and basins and thus contribute to site wide attenuation.

As rainfall infiltrates directly there is no requirement for gradients on the surface to aid drainage and can be effectively laid flat.

Where infiltration to the ground below is not proposed, then an impermeable membrane will be required at the formation level.

It is proposed that permeable paving is used in the southern courtyard and central internal courtyard, as this will simplify the collection system in these areas and also provide sustainability benefits.

4.10 Design Summary

The proposed drainage design makes use of four different types of SuDS systems (blue roof, rain garden, tree pits, permeable paving) to provide the required attenuation and pollution requirements.

The site has a total drained post-development impermeable area of 3,150m².

The blue roof is designed by Bauder and is proposed to limit flows to 7.57/s for the 1 in 100yr + 45% climate change event. The blue roof is proposed to drain 2,046m² of roof area, with a total attenuation volume of 123.1m³.

Runoff from the blue roof, and from the other hardstanding areas of the site (1,104m³) is proposed to drain into the below ground drainage network.

Externally, attenuation will be provided using a Hydrorock system, located under the raised planters. The Hydrorock system will be integrated with the raised planters, and will help provide irrigation for the trees and vegetation. The raised planters have a total attenuation volume of 53.5m³. The raised planters and rain garden will provide a degree of volume reduction, most notably for shorter duration events and summer rainfall.

A vortex flow control is proposed to limit the discharge rate to 10.0l/s for the 1 in 100yr + 45% climate change event. The upper end climate change allowance for the catchment has been used due to the sensitivity of the site use and the constraints of the proposed layout and levels.

The surface water is proposed to discharge to the existing combined manhole in the south (labelled C07 on the CCTV survey plan in Appendix D). This existing manhole outfalls to the 450mm diameter combined sewer under Wilmslow Road.

Several catchpits have also been added as and when required in the storm water network model to provide silt collection and capacity between roof drainage connections.

Additional surface water drainage channels are proposed to isolate the refuelling area. The area is to drain to the adopted network via a Class 1 full retention forecourt interceptor. Given the drainage constraints on the site, it is not viable to provide passive protection to the full length of pipework from the tanker to the fill point. As such it is proposed that the refuelling is managed by active systems such as the installation of temporary bunds on the site.

The exact details of the refuelling strategy for the site are to be confirmed. The refuelling specialist is to undertake a risk assessment to inform the drainage provisions required.

A suitable risk management strategy should be developed for this activity and be subsequently utilised on the site when in operation.

An additional surface water connection is proposed from the proposed refuelling area to the north of the development. This is proposed to discharge to the existing combined drain in the north that ultimately outfalls into the 450mm diameter public combined sewer within Wilmslow Road. This connection is proposed to discharge unrestricted, but the drained area is small (circa 40m²) and installing a serviceable flow control and attenuation for this area would not be feasible.

Indirect S106 applications are assumed to be required for the connections to the existing network.

The drainage masterplan is included in Appendix G, with typical details included in Appendix H

The InfoDrainage calculations are included in Appendix I.

4.11 Exceedance Management

The system has been designed to attenuate rainfall within the site with no surface flooding for the 1 in 100yr + 45% climate change event. A 45% climate change allowance is the upper end climate change allowance for the catchment (see Section 4.4).

The proposed site low spot in the positively drained area is (34.82mAOD) is located in the engineering corridor to the north of the Christie building. The proposed levels on the site are constrained by the tie in points to existing levels (e.g. the existing hospital building to the west and the need for equitable access and Wilmslow Road to the north). Wilmslow Road is at a higher elevation (35.20 to 35.37mAOD) than the proposed finished floor level. The levels surrounding the site mean that a safe exceedance route above ground away from the new hospital building is not feasible.

As the hospital is considered critical infrastructure, and will include expensive imaging equipment, additional measures are proposed to control exceedance flows.

Additional attenuation has been provided under the raised planters in the form of a granular blanket using 4-20mm open graded crushed rock (OGCR). This OGCR provides circa 23m³ of additional attenuation between the top of the Hydrorock units and the site's drained low spot (34.82mAOD).

A further measure has been included in the form of a high-level emergency overflow in the flow control chamber. This high-level overflow consists of a 100mm diameter pipe set at 34.540mAOD. The drainage model has been checked, and the additional overflow helps protect the site from surface flooding up to the 1 in 100yr + 100% climate change scenario, with a peak discharge rate of 30l/s into the United Utilities combined sewer.

It is proposed that a level sensor is installed in the flow control manhole to monitor water levels and alert the maintenance team if the water levels are high.

Events more extreme than the 1 in 100yr + 100% climate change scenario have an extremely low probability. In the event of a rainfall event more extreme than the 1 in 100yr + 100% climate change event, surface water would pond in the engineering corridor to the north of The Christie building, and water would back up in the system, and come out on the surface at the location of the permeable paving and at the linear drain by the entrance in the north.

United Utilities have been consulted about the overflow, and they noted that an overflow on flow control devices is part of their standard details. They will need to see evidence of the chain of conversation/documentation regarding the constraints with Final Floor Levels and mitigations to direct flows away from the habitable structures. Email correspondence with UU on this matter is included in Appendix F.

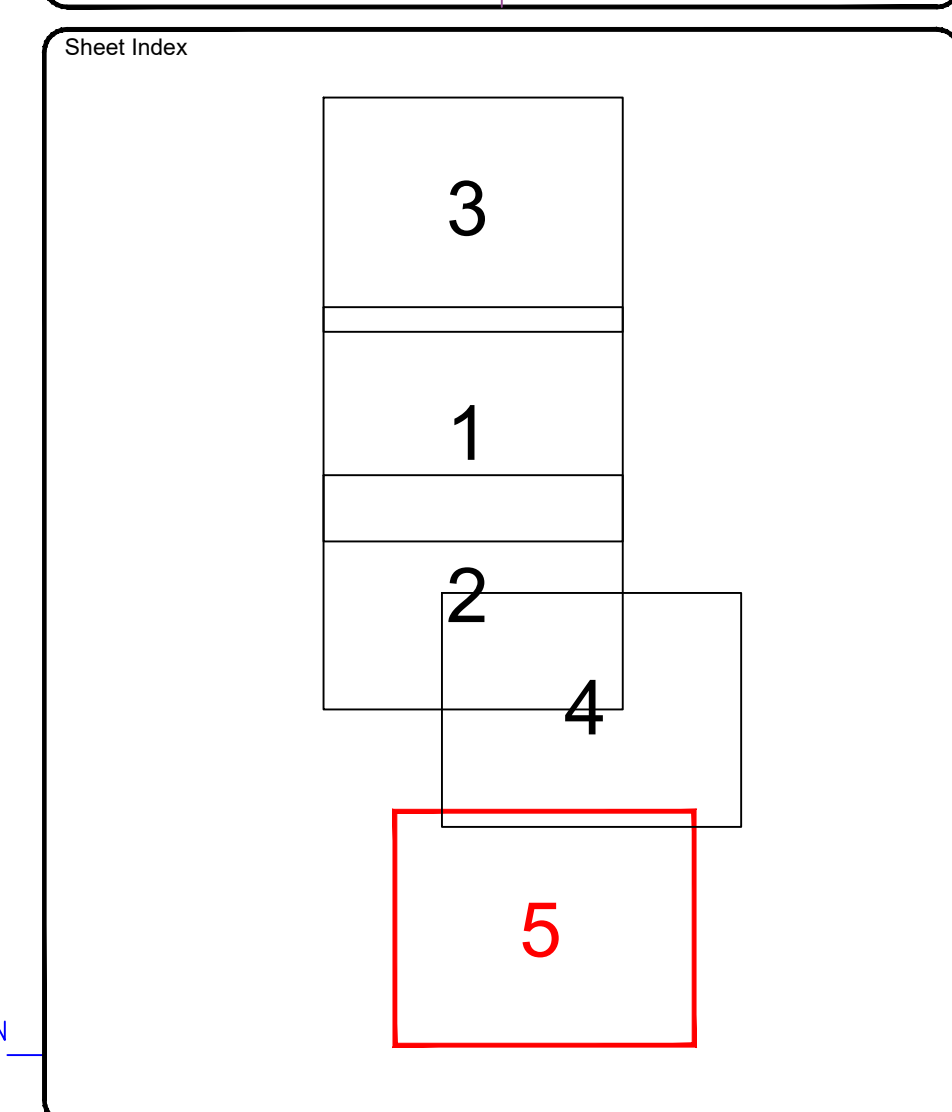
The Trust will need to ensure that they employ a robust maintenance regime of the drainage network (see section 5).

A plan showing the exceedance routes is included in Appendix J.

5 Maintenance and Operation Strategy

The whole of the drainage system is to be maintained as part of the existing experienced estates management team of the Christie NHS Foundation Trust. A typical maintenance strategy is included in Appendix K.

A. Topographical Survey

[illegible][illegible]

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HUGHES**

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www.malcolmhughes.co.uk
survey@mhfs.co.uk

Accreditations

 **RICS**

 **THE SURVEY
ASSOCIATION**

 **RICS**

 **UKPS**

 **FISPS**

Client

DAY ARCHITECTURAL LTD

STUDIO 1, LANCASTER BUILDINGS, 77 DEANSGATE

MANCHESTER, M3 2BW

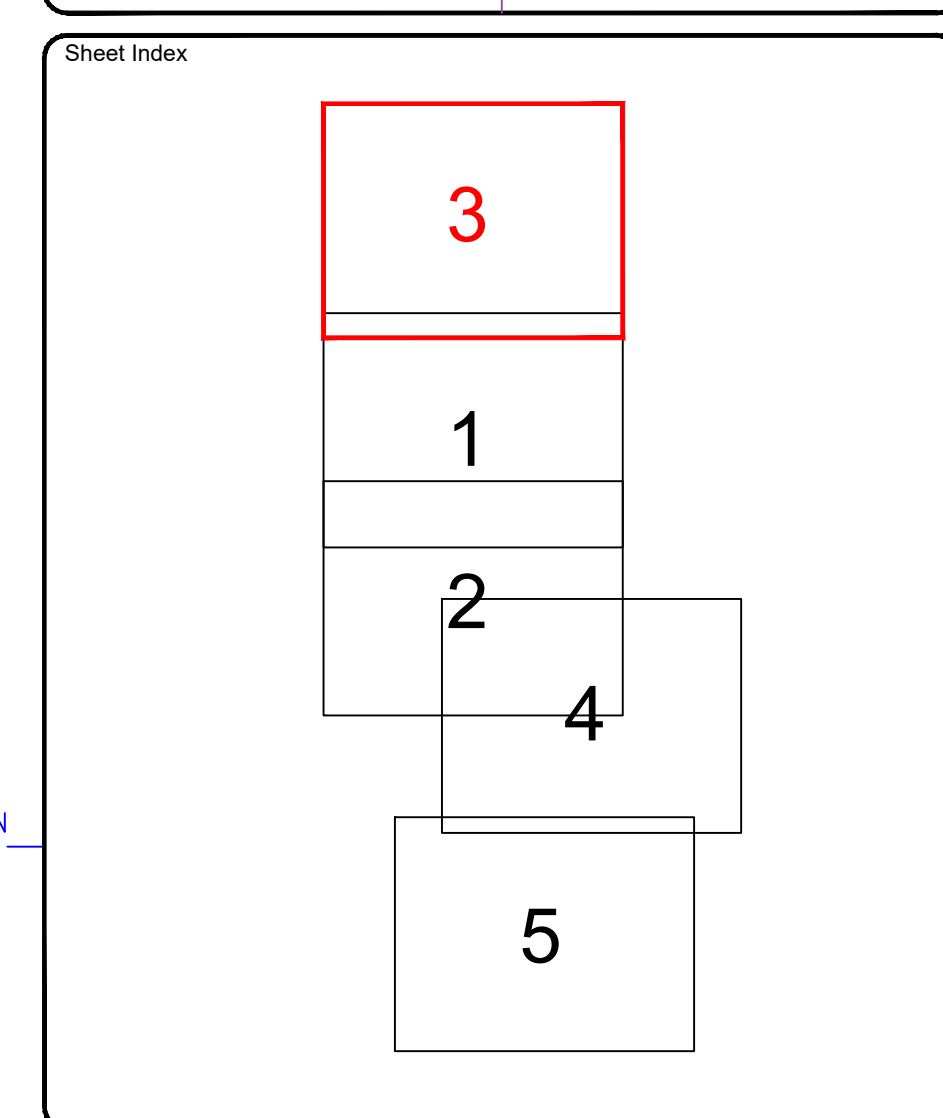
Project

HOLT BUILDING
THE CHRISTIE HOSPITAL, WILMSLOW ROAD
MANCHESTER, M20 4BX

Drawing Title TOPOGRAPHICAL SURVEY
--

Drawn By JW	03/03/23	Survey Date February 2023
Checked by EAD	03/03/23	Scale A0@1:100

Drawing No 59603/TOP5/1	Revision
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[illegible][illegible]



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STUDIO 1, LANCASTER BUILDINGS, 77 DEANSGATE
MANCHESTER, M3 2BW

Project

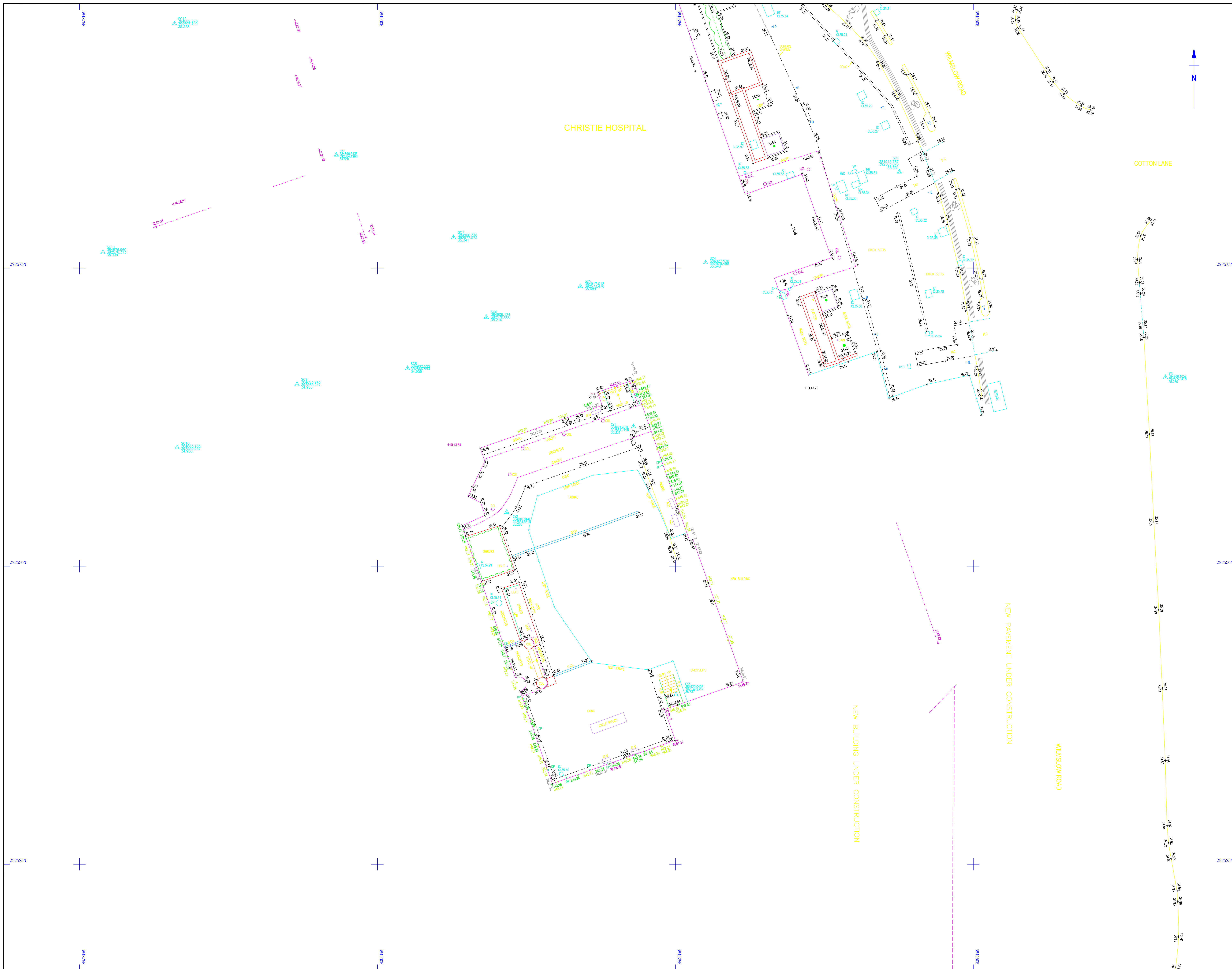
HOLT BUILDING
THE CHRISTIE HOSPITAL, WILMSLOW ROAD
MANCHESTER, M20 4BX

Drawing Title

TOPOGRAPHICAL SURVEY

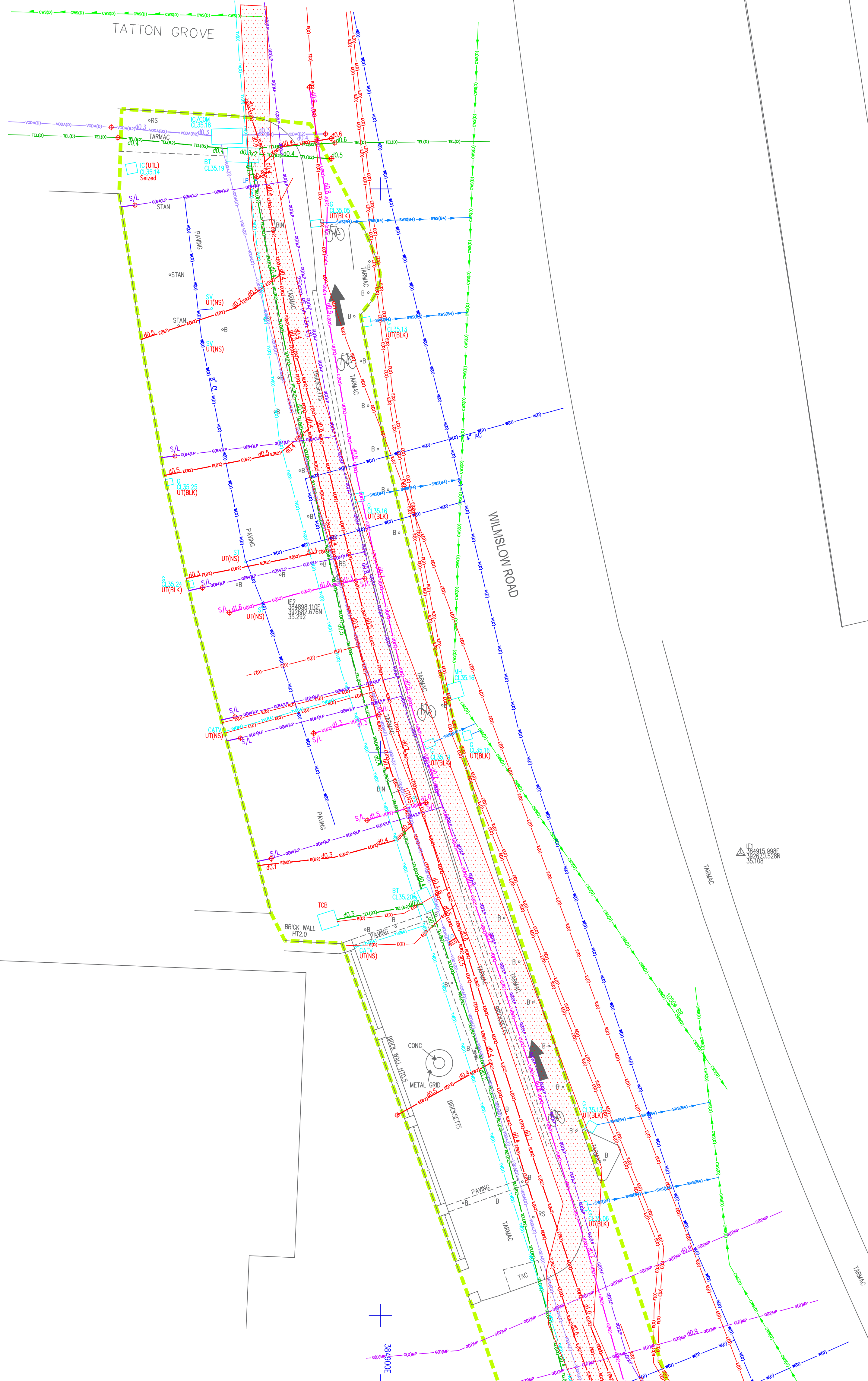
Drawn By JW	03/03/23	Survey Date February 2023
Checked by EAD	03/03/23	Scale A0@1:100

Drawing No 59603/TOP3/1	Revision
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[illegible]

B. Utilities Survey

[illegible]



Survey Notes	
Grid:	Local Plane Metric related to National at SC1
Levels:	OS datum from GNSS positioning, converted using the National Geoid model OSGM15

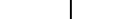
Notes

[illegible]

INSPECTION CHAMBERS		OVERHEAD FEATURES	
Inspection Cover	☐ IC	Electricity Pylon	
Inspection Cover (Dies)	☐ IC/DL	Electricity	
Manhole	☐ MH	Telephone	
British Telecom Cover	☐ BT		
Inspection Cover (Comms)	☐ IC/COM		
Cable TV	☐ CATV		

		LEVEL AND HEIGHT INFORMATION	
Inspection Cover Traffic Signals	☐ IC/TL	Cover Level	+0126.45
Gully	☐ G	Invert Level	+0123.15
Kerb Outlet	☐ KO	Reducing Slop Level	+0124.15

[illegible]

TYPICAL FEATURE DEPTH ANNOTATION		
ELECTRO-MAGNETIC DETECTION APPROX DEPTH TO CENTRE  CABLE FIBRE OPTIC	(GRAVITY DRAIN (VISUAL OBSERVATION)) APPROX DEPTH TO INVERT 	GROUND PENETRATING RADAR APPROX DEPTH TO EXTERNAL CROWN 

SD-PART 2018/2014 QUALITY LEVEL INFORMATION		
SURVEY TYPE	QUALITY LEVEL	DESCRIPTION
D - Dosing Study	Q-0	Location not established or site, taken from dossier
C - Site Reconnaissance	Q-4	A utility segment that has been determined but whose location can be located to existing street frontage and is supported by an aerial photograph
S - Detection	Q-1	A utility segment that has been determined but is suspected to exist. Derives utility segment from aerial photograph
	Q-2	Horizontal detection via geophysics to increase utility. Derives utility segment from aerial photograph. (via depth information)
	Q-3	Horizontal and vertical detection by multiple geophysical techniques only (electromagnetic Detection and Penetrating Radar). Medium confidence level for position and depth
	Q-4	Horizontal and vertical detection by multiple geophysical techniques (electromagnetic Detection and Penetrating Radar). High confidence level for position and depth
A - Verification	Q-4	Horizontal and vertical location of the utility established by re-survey. Inspection of as-built and plan view. (via depth information). (via depth information) (medium accuracy) and then detected (by the use of GPS PRN features)
OTHER ANNOTATIONS	(P)	Locality, utility segment, that have been determined by the use of GPS PRN features

Further information on PAS128 can be found on our resource website: www.pas128.co.uk

Sheet Index

Diagram illustrating a sequence of five overlapping rectangles labeled 1 through 5. Rectangle 3 is highlighted with a red border. The rectangles are arranged in a staggered, overlapping fashion, with 3 at the top, 1 below it, 2 to the right of 1, 4 to the right of 2, and 5 at the bottom center.

[illegible]



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Accreditations








Client

Day Architectural Ltd.

Studio 1, Lancaster Buildings, 77 Deansgate

Manchester M3 2BW

Project

Holt Building, The Christie Hospital
Wilmslow Road
Manchester M20 4BX

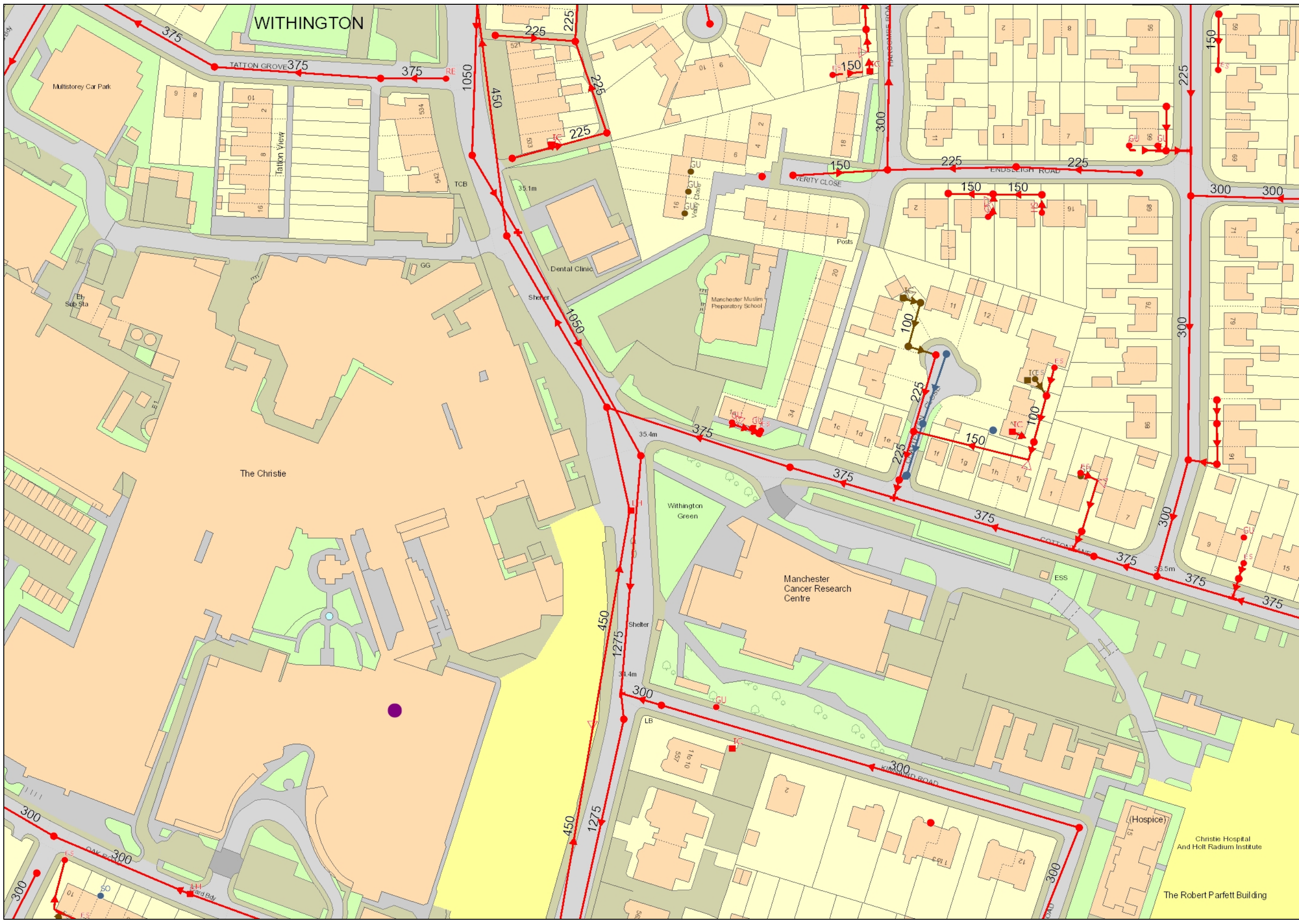
Drawing Title

Underground services
survey

Drawn By	PS	23/03/23	Survey Date	February 2023
Checked by	DJ	23/03/23	Scale	A0@1:100
Drawing No				Revision
59603/UG3				

[illegible]

C. United Utilities Sewer Records



United Utilities Maps for SafeDig

Date : 10/01/2023 08:59:31

Centre X: 384965

Centre Y: 392572

Scale : 1250

UserName: MOTTMACNRT

Extract from maps of United Utilities' Underground Assets

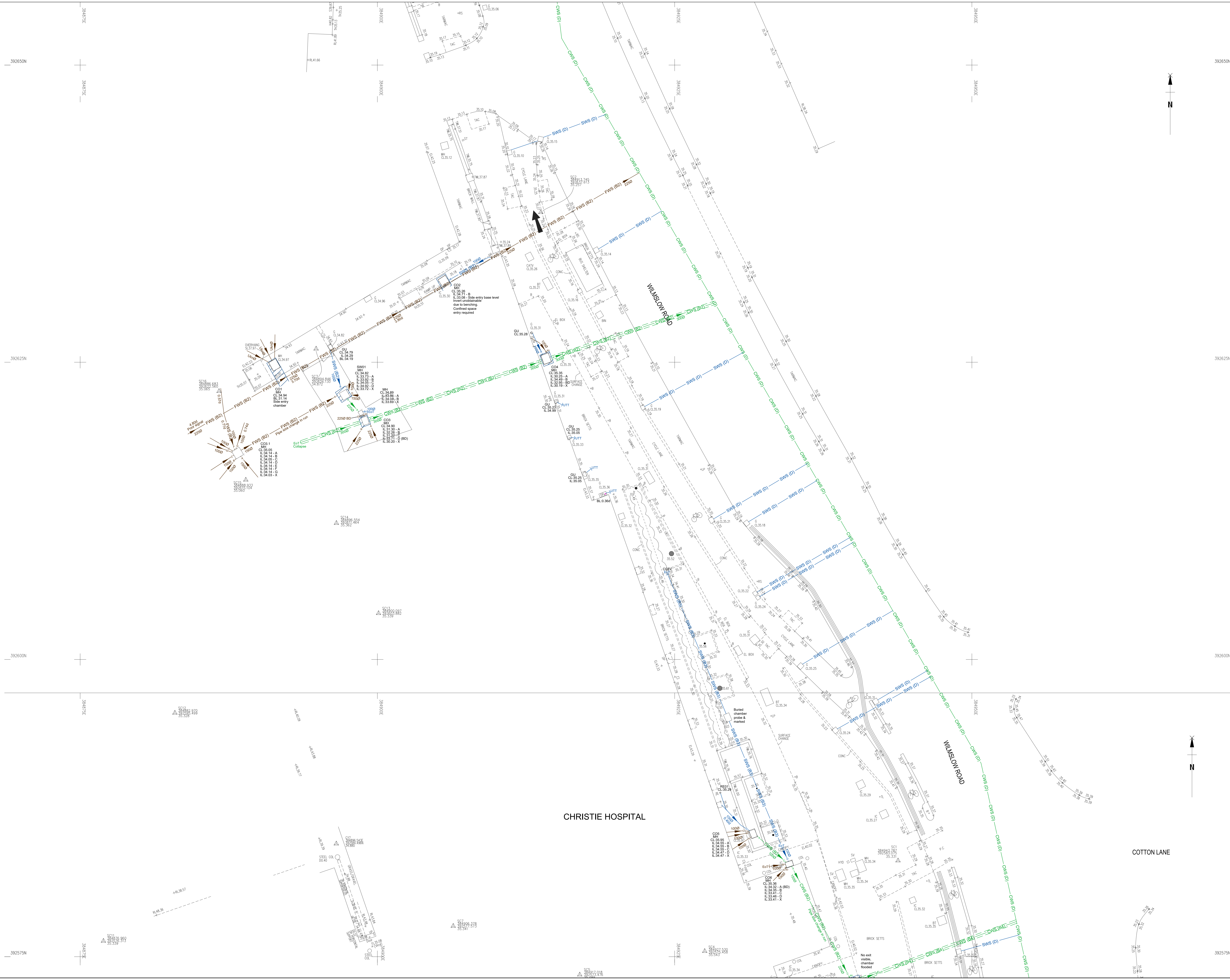
The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private service pipes may be shown by a blue broken line. United Utilities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

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D. CCTV Survey Plan

[illegible]



OS NORTH / INDICATIVE ONLY

Topographical Abbreviations

BH	Bornhole	MKR	Marker
BL	British Telecom	MT	Memory Telecom Cover
BT	British Telecom Cover	OHC	Overhead Cable
CATV	Cable TV Cover	CHP	Overhead Pipe
CCTV	Closed Circuit TV	CP	Post Box
CL	Cable Level	RE	Road Sign
CM	Cable Marker	RD	Road
CP	Down Pipe	RWP	Road Sign
DP	Electricity Junction Box	RS	Rain Water Pipe
EC	Electricity Cover	SC	Stop Cock
EP	Electricity Pole	STA	Station
ER	Earthling Rod	SV	Stop Valve
FI	Fire Hydrant	SVP	Soil Vent Pipe
G	Gully	TB	Telephone Box
GV	Gas Valve	TJB	Telephone Junction Box
IC	Inspection Cover	TL	Trail Light
IC	Inspection Cover	TL	Trail Light
LC	Lamp Column	TP	Telephone Pole
LP	Lamp Post	VP	Vent Pipe
LP	Lamp Post	WM	Water Meter
WH	Manhole	WV	Water Valve

Underground Services Abbreviations

A	Approximate	OSA	Offset Fill Point
AC	Asbestos Cement	OSA	Offset Survey Area
BD	Back Drop	PE	Polyethylene Pipe
BL	Base Level	PVC	Polyvinyl Chloride
BR	Brick	PS	Pipe Riser
CI	Cast Iron	PS	Post Signal
CO	Concrete	PT	Pipe Trip
CP	Catch Pit	RM	Rising Main
CR	Cable Riser	SA	Soakaway
D	Depth to Service (in metres)	SN	Swan Neck
DI	Ductile Iron	SL	Steel (Grey) Iron
ED	Empty Duct	SS	Stainless Steel
EDT	End of Trace	T	Tank
GR	Glass Reinforced Plastic	UTL	Unable to Find
GR	Glass Reinforced Plastic	UTGA	Unable to Gain Access
GR	Glass Reinforced Plastic	UTL	Unable to Locate
HV	High Voltage	UTR	Unable to Rod
HDPPE	High Density Polyethylene	VC	Vertical Clearance
IL	Invert Level	UTT	Unable to Trace
IL	Invert Level	VC	Vertical Clearance
NVD	No Visible Ducts	VR	Vapor Recovery
NVP	No Visible Pipes	WL	Water Level
NVE	No Visible Exit	WR	Water Riser

Utility Linetypes

Utility	Line Type	Color	Symbol
Water	Water	Blue	—
Gas	Gas	Red	—
Electricity	Electricity	Yellow	—
Telecom	Telecom	Green	—
Drainage	Drainage	Brown	—
Other	Other	Grey	—

Chamber Extents

Unknown Chamber Extents

Radar Area Anomaly

PAS 128:2014 Quality & Confidence Levels

(A) Horizontal and vertical position verified visually (Accuracy: Horizontal (50 mm) Vertical (25 mm))

(B1) Horizontal and vertical location of the utility detected by multiple geophysical techniques used (Estimated accuracy: ±150 mm or ±15% of detected depth whichever is greater)

(B2) Horizontal and vertical location of the utility detected by one of the geophysical techniques used (Estimated accuracy: ±250 mm or ±40% of detected depth whichever is greater)

(B3) Horizontal location only of the utility detected by one of the geophysical techniques used (Estimated accuracy: Horizontal (Undefined) Vertical (Undefined))

(B4) A utility segment which is suspected to exist but has not been detected and is therefore shown as an assumed route (Estimated accuracy: Undefined)

(C) Route transcribed from utility asset plans and correlated to visual indicators and surface features (Estimated accuracy: Undefined)

(D) Route transcribed from utility asset plans (Estimated accuracy: Undefined)

NB: 'Y' suffixed to the quality level indicates GPR data has been post-processed. Q(L)(A) is inferred at all MRIs & IC's unless otherwise stated.

Disclaimer

This drawing and information contained within is issued in confidence and is the copyright of Warner Surveys Utility Mapping Limited. If the topographical information or base mapping has been supplied by a third party, Warner Surveys Utility Mapping Limited is not liable for any inaccuracies contained therein.

Electronic and Ground Penetrating Radar techniques combined with visual inspection have been used to locate and map the underground services shown on this plan. Warner Surveys Utility Mapping Limited use all reasonable efforts expected of experienced and qualified staff combined with calibrated equipment to perform our surveys. However, the completeness of any underground survey cannot be guaranteed.

Depths are provided as a guide only. Services shown as Q(L)(C), Q(L)(D) or TFR (taken from records) and Q(L)(B) or AR (assumed route) have not been proven on site and are not guaranteed. Please note that not all buried pipes, utilities and features can be detected and mapped due to conditions outside of our control, such as depth, location, material type, geology and proximity to other services. It is recommended that trial holes are undertaken to confirm identification, location and depth of services at critical locations.

Warner Surveys Utility Mapping Limited cannot be held responsible for any inaccuracies beyond those that could be reasonably expected of a competent company. No utility mapping survey can be considered a 100% accurate depiction of the sub-surface environment and the use of these drawings does not remove the requirement for the use of safe digging techniques at all times in line with HSE 47. All information contained within this survey should be used in conjunction with the accompanying Utility Survey Report and Desktop Utility Search.

Notes

The survey has been oriented to Ordnance Survey (OS) National Grid (OSGB36) using industry Standard Network RTK GPS equipment utilising the OS Active Network (OS Net). A true OSGB36 coordinate has been established on site using the OS TN15 (transformation) & OSGB18 (geoid) models. The survey detail has been correlated to this point and a further one or more OSGB36 points established to produce a true OS bearing for angle orientation. Scale factor 1.0 has been applied therefore the survey coordinates are shown on a pseudo OS grid.

All levels are in metres unless otherwise specified

All heights are in millimetres unless otherwise specified

Rev	Svr	QA Check	Description	Date
0	TG	LL	Preliminary - Not Complete	-
1	-	-	First Complete Issue	03/05/24
2	-	-	-	-
3	-	-	-	-

WARNER SURVEYS

Utility Mapping Ltd

Birmingham, Reading, Bristol, London

www.WarnerSurveysUtilityMapping.com

contact@warnersurveys.com

Surveyed

TG, JL

Drawn

DM

Scale

1:100

NRC

The Christie Hospital, M20 3DD

Drainage Survey

Job No

UM/224/0164

Drawing Number

UM/224/0164/P/0002

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A0 Landscape

E. Discharge Units of Sanitary Appliances

System = System ii

Frequency Factor (k) = 0.5 to 0.7

Total DU = 170.4

Peak foul flow = 6.5l/s (k = 0.5), 9.1l/s (k = 0.7)

Table 5.1: Ground Floor

Appliance	No	DU	Total
Kitchen Sink	6	0.6	3.6
Floor Gully (70)	0	0.9	0
WC (6l)	14	1.8	25.2
Shower without Plug	1	0.4	0.4
Bath	0	0.6	0
Wash Basin	66	0.3	19.8
Washing Machine (12kg)	4	1.2	4.8
Dishwasher	2	0.6	1.2
Kitchen Sink	6	0.6	3.6

Table 5.2: First Floor

Appliance	No	DU	Total
Kitchen Sink	6	0.6	3.6
Floor Gully (70)	0	0.9	0
WC (6l)	14	1.8	25.2
Shower without Plug	1	0.4	0.4
Bath	0	0.6	0
Wash Basin	66	0.3	19.8
Washing Machine (12kg)	4	1.2	4.8
Dishwasher	2	0.6	1.2
Kitchen Sink	6	0.6	3.6

Table 5.3: Second Floor

Appliance	No	DU	Total
Kitchen Sink	6	0.6	3.6
Floor Gully (70)	0	0.9	0

Appliance	No	DU	Total
WC (6l)	14	1.8	25.2
Shower without Plug	1	0.4	0.4
Bath	0	0.6	0
Wash Basin	66	0.3	19.8
Washing Machine (12kg)	4	1.2	4.8
Dishwasher	2	0.6	1.2
Kitchen Sink	6	0.6	3.6

Table 5.4: Third Floor

Appliance	No	DU	Total
Kitchen Sink	0	0.6	0
Floor Gully (70)	6	0.9	5.4
WC (6l)	0	1.8	0
Shower without Plug	0	0.4	0
Bath	0	0.6	0
Wash Basin	0	0.3	0
Washing Machine (12kg)	0	1.2	0
Dishwasher	0	0.6	0
Kitchen Sink	0	0.6	0

F. Email Correspondence with United Utilities and the LLFA

[REDACTED]

Subject: RE: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX
04370779

Date: 10.08.2023 15:26:36 (+02:00)

UU Reference Number :

Hi Tari.

Thanks for your email. Upon assessing the submitted ground investigation report and following our comments in the pre-development enquiry response to investigate the potential for surface water infiltration to ground, it is agreed that the current ground conditions are likely not feasible for infiltration methods for your development site.

We can also confirm a maximum restricted surface water discharge rate of 5l/s to the public combined sewer, as advised in our pre-development response, is acceptable in principle.

Kind regards,

Shoaib.

Shoaib Tauqeer
Developer Engineer
Developer Services & Metering

[REDACTED]

If you have received a great service today why not tell us?
Visit: unitedutilities.com/wow

[REDACTED]
Sent: 10/08/2023 11:38

To: seweradoptions@uuplc.co.uk; shoaib.tauqeer@uuplc.co.uk

Subject: RE: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi Shoaib,

Thanks for the call, have you had a chance to review the below and could you confirm you are happy for this site to discharge at 5l/s.

Many thanks,

Tari

Tarisiro Fundira

Pronunciation : 'Please call me Tari or Tarisiro - pronounced Taa-rrrrrr-isirooo'

Pronouns: he, him, his

Graduate Civil Engineer
Sheffield Local Office Champion
BNC Advance Unit Champion

From: Tarisiro Fundira

Sent: 07 August 2023 10:30

To: seweradoptions@uuplc.co.uk; [REDACTED] >

Subject: RE: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi Shoaib,

I hope you had a lovely weekend. Just checking if you had the time to look at this.

Many thanks,

Tari

Tarisiro Fundira

Pronunciation : 'Please call me Tari or Tarisiro - pronounced Taa-rrrrrr-isirooo'

Graduate Civil Engineer
Sheffield Local Office Champion
BNC Advance Unit Champion

[REDACTED]

From: Tarisiro Fundira

Sent: 02 August 2023 16:18

To: seweradoptions@uuplc.co.uk; Tauqeer, Shoaib

Subject: RE: Pre Development Enquiry for: Wilmslow

UU Reference Number : 04370779

Hi Shoaib,

Following our conversation today, could you please review the  [Ground Investigation report](#).

From our review we saw that the site is composed of drift deposits of Glacial Till. Therefore, considering the presence of made ground and the site's history, we concluded that the stratum is unsuitable for infiltration. Could you please confirm this with regards to our pre-development enquiry.

Many thanks,

Tari

Tarisiro Fundira

Pronunciation : 'Please call me Tari or Tarisiro - pronounced Taa-rrrrrr-isirooo'

Graduate Civil Engineer
Sheffield Local Office Champion
BNC Advance Unit Champion

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Sent: 31 July 2023 10:43

To: Tarisiro Fundira < >

Subject: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX

UU Reference Number : 04370779

Good morning Tarisiro,

Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer system.

Our preferred point of discharge would be to the 450mm diameter public combined sewer within Wilmslow Road located to the East of your proposed development at an unrestricted rate.

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

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy. *Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.*

This is outlined as follows, in order of priority:

1. **into the ground (infiltration);**
2. **to a surface waterbody;**
3. **to a surface water sewer or highway drain;**
4. **to a combined sewer.**

For guidance, The [North West SuDS Pro-Forma](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible. A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

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

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

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

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 450mm diameter public combined sewer within Wilmslow Road located East 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.

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

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 6m which is measured 3m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer.

Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

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

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address: DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

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

Connection Application

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

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

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

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

Kind regards,

Eireann Thompson
Assistant Developer Engineer
Developer Services & Metering
Customer Services

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

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

Subject: PDE CA28, The Christie NHS Foundation Trust

Good Afternoon,

PRE DEVELOPMENT APPLICATION AT: The Christie NHS Foundation Trust – UU Ref 04370779

Please accept this email as receipt of your application received on 19/07/2023 for the above development. This has now been logged on our system and the job reference is 04370779 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Ashleigh for technical assessment. You will receive their response on or before 02/08/2023.

Kind regards,

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Outlook

Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

From seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Date Thu 20/11/2025 10:30

To [REDACTED]

Hello John

Thank you for all the information provided.

I can confirm that the proposed discharge rate of 10l/s is acceptable.

Kind Regards

Gulshan

**Gulshan Seetulparsad, MEng
(Hons)**

Developer Engineer (Greater
Manchester Area)

Developer Services & Metering
Customer Services

[REDACTED]
unitedutilities.com



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

From: John Lea-Wilson [REDACTED]

Sent: 13/11/2025 12:42

To: seweradoptions@uuplc.co.uk

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi Gary,

The site is 0.31 hectares. The site is a brownfield site with existing connections to the combined sewer under Wilmslow Road (see attached GPR). Whilst not all drains have been traced to the combined sewer under Wilmslow Road, it is assumed that the whole site drains to the combined sewer under Wilmslow Road.

The existing site is almost entirely made up of buildings and hardstanding and can be assumed to have a drained impermeable area of 0.30ha.

An impermeable area of 0.30ha would generate a runoff rate of 41.7l/s in a 50mm/hr storm event. Therefore a proposed discharge rate of 10l/s would reduce the peak runoff rate by approximately 76%.

Do let me know if you require anything further from me to review this.

Kind regards,

John Lea-Wilson

Senior Civil Engineer

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Sent: Thursday, November 13, 2025 11:39

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi John,

I understand the site area is 0.33 hectares, and so the greenfield rate would be significantly less than the 5l/s we have requested.

In order to review this, could you confirm the proven brownfield runoff rates from this site?

Kind regards



Gary Jaundrell
Developer Engineer
Developer Services & Metering
Customer Services
[Redacted]
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----- Original Message -----

From: John Lea-Wilson [Redacted]
Sent: 12/11/2025 13:28
To: seweradoptions@uuplc.co.uk
Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Thank you

John Lea-Wilson
Senior Civil Engineer
[Redacted]

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>
Sent: Wednesday, November 12, 2025 12:51
To: John Lea-Wilson <[Redacted]>
Subject: RE: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Good Afternoon

Thank you for your email.

I've forwarded it onto the engineer who will respond to you directly.

Kind Regards
Yvonne

If you believe you have received a good service today, you can report this on the link below.
This only takes a minute, and I would really appreciate it.

<https://unitedutilities.thewowawards.co.uk/nominate>



Yvonne Manboard

Customer Advisor Advanced
Developer Services & Metering
Customer Services
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(Option 2 for Wastewater Services)

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

From: John Lea-Wilson

Sent: 10/11/2025 11:23

To: seweradoptions@uuplc.co.uk

Subject: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi,

I'm getting in touch regarding the pre-development enquiry that was submitted by my colleague Tarisiro Fundira on the 19/07/2023 regarding The Christie NHS site by Wilmslow Road, Manchester.

The previous correspondence is attached.

In this correspondence the surface water discharge rate to the combined sewer was confirmed by UU that it needs to be restricted to a maximum rate of 5l/s.

The project is now at RIBA stage 4 design. The scheme includes a blue roof and below ground attenuation however the constrained nature of the site is creating difficulties with regards to locating sufficient attenuation to achieve a flow restriction of 5l/s. I'm contacting to see if there is scope that this maximum discharge rate can be increased to 10l/s?

My contact details are below.

Kind regards,

John Lea-Wilson

MEng (Hons) CEng MICE
Senior Civil Engineer

[Image is no longer available]

Mott MacDonald
4th Floor
Derwent House
150 Arundel Gate
Sheffield S1 2JY
United Kingdom

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Outlook

Re: 138282/FO/2023 - The Christie, Manchester. Request to increase offsite flow rate

From Laura Peacock <[REDACTED]>**Date** Tue 25/11/2025 14:16**To** John Lea-Wilson <[REDACTED]>**Cc** [REDACTED]

1 attachment (104 KB)

Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779.eml;

Good Afternoon John,

Hope you're well and thank you for your email about **138282/FO/2023**.

We will accept 10 l/s at your submission to discharge the CDN on the basis of your attached UU agreement.

For the proposal to be acceptable, please also ensure that:

1. All points in the Decision Notice 'Condition 6 informative' are addressed.
2. All updates due to your increased design flow rate are addressed. The layout and calculations must be jointly updated to account for any edits required. When preparing a resubmission, the applicant must ensure that the drainage layout and model simulations correspond, and that they can be cross-referenced for checks. This includes layout annotations and schedule printouts.

I have copied in the Planning Officer for info & will file this in our planning folder.

Kind Regards,
Laura

Laura Peacock

Flood Risk Team (LLFA) Manager
[REDACTED]

Highways Service

Neighbourhoods Directorate

Manchester City Council

PO Box 532

Town Hall

Manchester

M60 2LA

Web: <http://www.manchester.gov.uk>

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From: [REDACTED]

Sent: Friday, November 21, 2025 09:08

Subject: CASICD - The Christie, Manchester. Request to increase offsite flow rate

Hi Laura,

I'm the below ground drainage designer on the CASICD project at The Christie, Wilmslow Road, Manchester (planning permission attached).

The project is now at RIBA stage 4 design. The scheme includes a blue roof and below ground attenuation however the constrained nature of the site is creating difficulties with regards to locating sufficient attenuation to achieve a flow restriction of 5l/s (as per the existing planning condition no.6). I'm contacting to see if there is scope that the maximum discharge rate can be increased to 10l/s?

The site is 0.31 hectares. The site is a brownfield site with existing connections to the combined sewer under Wilmslow Road (see attached GPR). Whilst not all drains have been traced to the combined sewer under Wilmslow Road, it is assumed that the whole site drains to the combined sewer under Wilmslow Road.

The existing site is almost entirely made up of buildings and hardstanding and can be assumed to have a drained impermeable area of 0.30ha.

An impermeable area of 0.30ha would generate a runoff rate of 41.7l/s in a 50mm/hr storm event. Therefore a proposed discharge rate of 10l/s would reduce the peak runoff rate by approximately 76%.

I've been in touch with United Utilities about this and they have confirmed that an increase to 10l/s would be acceptable (see attached email chain).

Do let me know if you require anything further from me to review this.

Thanks,

John Lea-Wilson

MEng (Hons) CEng MICE

Senior Civil Engineer

john.lea-wilson@mottmac.com



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4th Floor
Derwent House
150 Arundel Gate
Sheffield S1 2JY
United Kingdom

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Outlook

Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

From seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Date Fri 19/12/2025 10:25

To



Good Morning John

Thank you for the meeting today as discussed:

The high level overflow is a standard design we expect with flow controls. Please see our standard details below:

[Developer Services Construction Details](#) STND/19/005 Rev A (Page 7)

As further mentioned, you will need to evidence the chain of conversation/document regarding the constraints with Final Floor Levels and mitigations to direct flows away for the habitable structures as we may push back on the recommendation to discharge the drainage conditions when the covers levels are higher than FFLs.

Kind Regards and Season Greetings

Gulshan

**Gulshan Seetulparsad, MEng
(Hons)**

Developer Engineer (Greater
Manchester Area)

Developer Services & Metering
Customer Services



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

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi Gulshan,

Many thanks for confirming this.

Kind regards,

John Lea-Wilson
Senior Civil Engineer

From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Sent: Thursday, November 20, 2025 10:30

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hello John

Thank you for all the information provided.

I can confirm that the proposed discharge rate of 10l/s is acceptable.

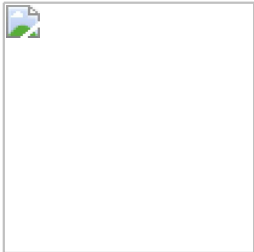
Kind Regards

Gulshan

**Gulshan Seetulparsad, MEng
(Hons)**

Developer Engineer (Greater
Manchester Area)
Developer Services & Metering
Customer Services

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

From: John Lea-Wilson [REDACTED]

Sent: 13/11/2025 12:42 [REDACTED]

To: seweradoptions@uuplc.co.uk

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi Gary,

The site is 0.31 hectares. The site is a brownfield site with existing connections to the combined sewer under Wilmslow Road (see attached GPR). Whilst not all drains have been traced to the combined sewer under Wilmslow Road, it is assumed that the whole site drains to the combined sewer under Wilmslow Road.

The existing site is almost entirely made up of buildings and hardstanding and can be assumed to have a drained impermeable area of 0.30ha.

An impermeable area of 0.30ha would generate a runoff rate of 41.7l/s in a 50mm/hr storm event. Therefore a proposed discharge rate of 10l/s would reduce the peak runoff rate by approximately 76%.

Do let me know if you require anything further from me to review this.

Kind regards,

John Lea-Wilson
Senior Civil Engineer



From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Sent: Thursday, November 13, 2025 11:39

To [REDACTED]

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi John,

I understand the site area is 0.33 hectares, and so the greenfield rate would be significantly less than the 5l/s we have requested.

In order to review this, could you confirm the proven brownfield runoff rates from this site?

Kind regards



Gary Jaundrell

Developer Engineer

Developer Services & Metering

Customer Services

T: 01925 429099

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

From: [REDACTED]

Sent: 12/11/2025 13:28

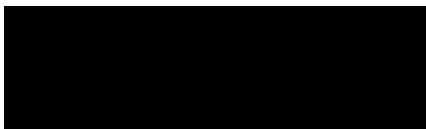
To: seweradoptions@uuplc.co.uk

Subject: Re: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Thank you

John Lea-Wilson

Senior Civil Engineer



From: seweradoptions@uuplc.co.uk <seweradoptions@uuplc.co.uk>

Sent: Wednesday, November 12, 2025 12:51

[REDACTED]

Subject: RE: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Good Afternoon

Thank you for your email.

I've forwarded it onto the engineer who will respond to you directly.

Kind Regards

Yvonne

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Yvonne Manboard

Customer Advisor Advanced
Developer Services & Metering
Customer Services
unitedutilities.com



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

From: John Lea-Wilson

Sent: 10/11/2025 11:23

To: seweradoptions@uuplc.co.uk

Subject: Pre Development Enquiry for: Wilmslow Road, Manchester, M20 4BX UU Reference Number : 04370779

Hi,

I'm getting in touch regarding the pre-development enquiry that was submitted by my colleague Tarisiro Fundira on the 19/07/2023 regarding The Christie NHS site by Wilmslow Road, Manchester.

The previous correspondence is attached.

In this correspondence the surface water discharge rate to the combined sewer was confirmed by UU that it needs to be restricted to a maximum rate of 5l/s.

The project is now at RIBA stage 4 design. The scheme includes a blue roof and below ground attenuation however the constrained nature of the site is creating difficulties with regards to locating sufficient attenuation to achieve a flow restriction of 5l/s. I'm contacting to see if there is scope that this maximum discharge rate can be increased to 10l/s?

My contact details are below.

Kind regards,

John Lea-Wilson

MEng (Hons) CEng MICE

Senior Civil Engineer



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4th Floor
Derwent House
150 Arundel Gate
Sheffield S1 2JY
United Kingdom

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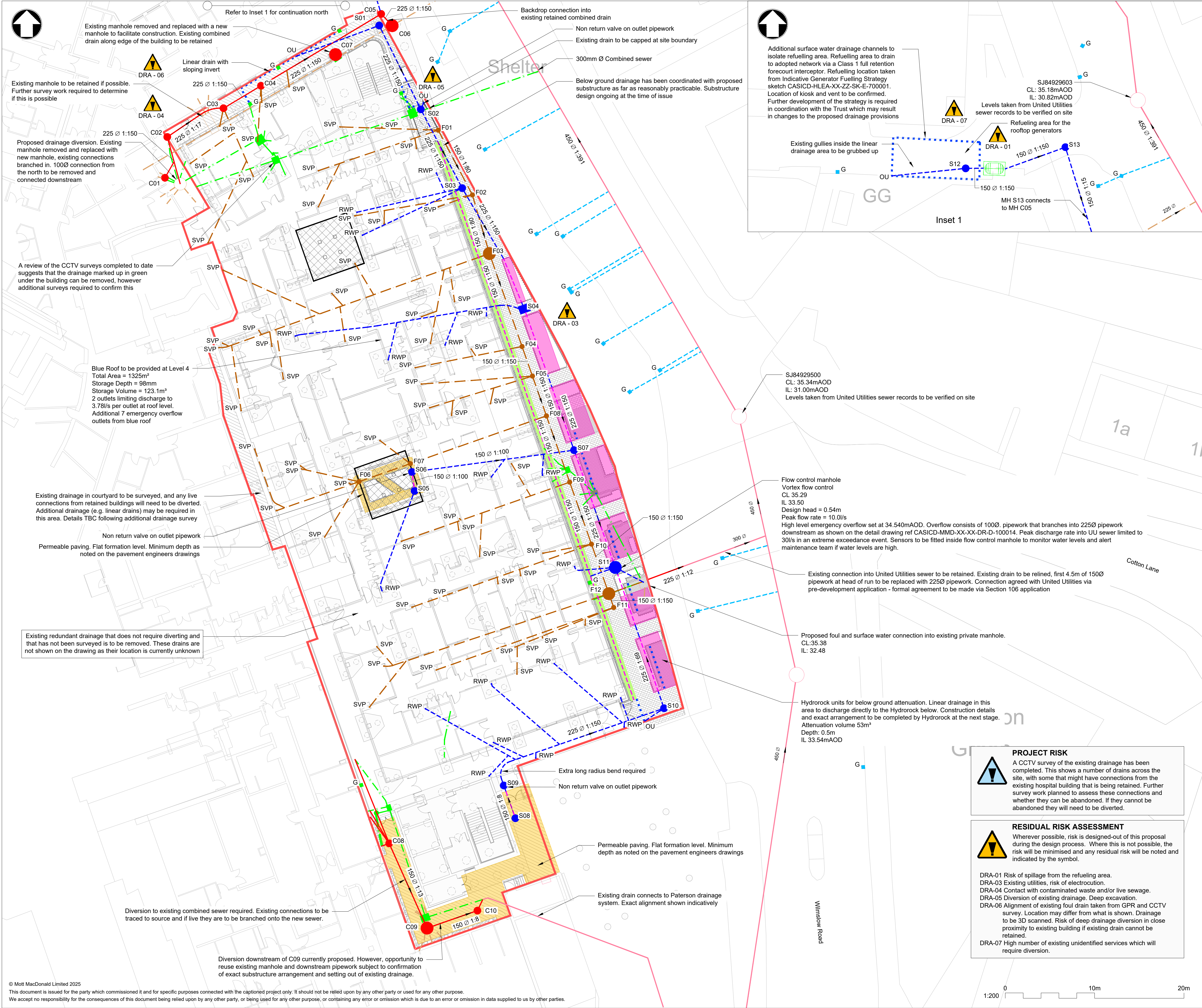


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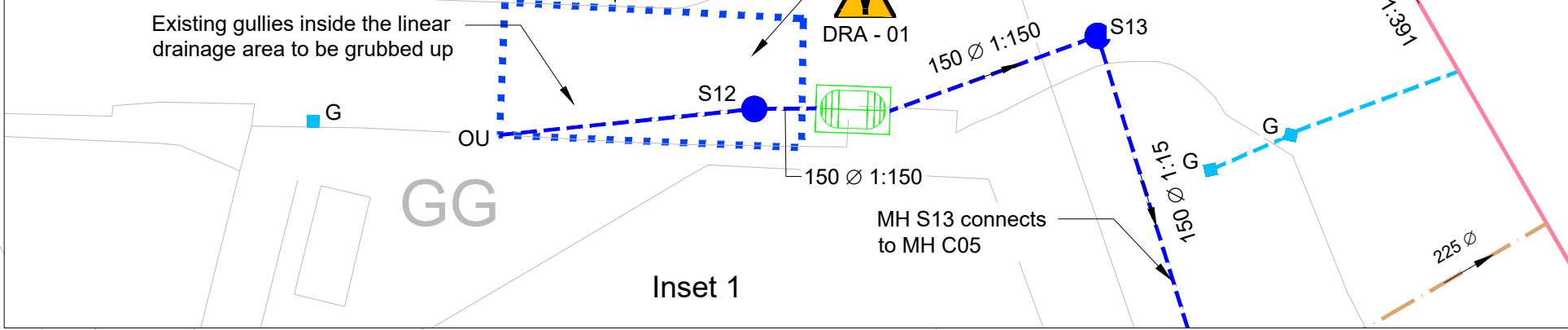


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G. Drainage Masterplan



Additional surface water drainage channels to isolate refuelling area. Refuelling area to drain to adopted network via a Class 1 full retention forecourt interceptor. Refuelling location taken from Indicative Generator Fuelling Strategy sketch CASICD-HLEA-XX-ZZ-SK-E-700001. Location of kiosk and vent to be confirmed. Further development of the strategy is required in coordination with the Trust which may result in changes to the proposed drainage provisions



- Notes
- This drawing is to be read in conjunction with all relevant drawings.
 - Do not scale from this drawing.
 - All measurement are in metres (m), unless noted otherwise
 - All levels are shown in metres above ordnance datum (mAOD) unless noted otherwise.
 - All layouts are preliminary only and subject to review and are to be printed in colour.
 - Adopted drainage assets taken from sewer records and are shown indicatively.
 - All foul water pipes are 100mmØ and surface water pipes are 150mmØ unless noted otherwise. All pipe gradients to be compliant with Part H of Building Regulations.
 - Minimum buried under slab foul and surface water gradients to be 1v:40h and 1v:100h respectively.
 - Pipe bedding for solid wall pipes to be Type 'S' unless pipe cover is less than 1.2m or below slab; whereupon concrete surround shall be used.
 - Offsite connections subject to LFAEA and UU approval as required.
 - Blue Roof is based on a Bauder system. Bauder calculations Revision F Option 1 (05.11.2025).
 - Crane sizing and setting out is indicative only, drainage to be reviewed once this is confirmed.
 - Additional drainage surveys to be completed to confirm the drainage diversion / abandonment strategy.
 - Long radius bends to be used for any proposed pipe bends.
 - SVP and RWP locations based on CASICD-HLEA-XX-XX-M3-MEP-100001 P27.
 - Any alterations in foul and surface water flow rates to be formally agreed with United Utilities via a Section 106 application.

- Key to symbols
- Proposed red line boundary
 - Existing surface water drain and manhole
 - Existing foul drain and manhole
 - Existing combined water sewer and manhole
 - Existing road gully
 - Proposed surface water and manhole
 - Proposed foul water and manhole
 - Proposed perforated pipe
 - Proposed linear drain and outlet unit
 - Proposed rain water pipe connection
 - Proposed foul soil vent pipe connection
 - Existing drain to be abandoned
 - Existing manhole to be abandoned
 - Existing road gully to be abandoned
 - Proposed permeable pavement
 - Proposed Hydrorock
 - Proposed rain garden
 - Proposed crane foundation (Crane Foundation shown indicatively. Size and exact setting out TBC. Base shown here is based on CCHWC-AJP-01-00-DR-S-01415 from Countess of Chester Hospital project)
 - Proposed Class 1 Interceptor

Reference drawings

CASICD-MMD-XX-XX-DR-D-100010-100015	Typical Details
CASICD-MMD-XX-XX-DR-D-100016	Exceedance Plan
CASICD-MMD-XX-XX-SH-D-000001	MH Schedule
CASICD-MMD-XX-XX-DR-C-00001	Proposed Footway General Arrangement
CASICD-HLEA-XX-XX-M3-MEP-100001-P27	MEP Model
CASICD-TR-XX-00-SK-L-900101 & 900102	Rev P02 Landscape General Arrangement
CASICD-TR-XX-00-DR-L-900501 & 900502	Landscape Proposed Levels Plan
CASICD-MMD-XX-FN-DR-S-000230	Foundation Zone 1 GA Plan
CASICD-MMD-XX-FN-DR-S-000231	Foundation Zone 2 GA Plan
CASICD-DAY-XX-ZZ-M3-A-000001	P30 Architectural Model
CASICD-NRC-XX-SU-K-000015	Drainage Survey
CASICD-TR-XX-00-SK-L-900101-P02	Landscape General Arrangement
United Utilities Adopted Sewer Records	
59603-SUR-TOP (Published) 06.01.23	Topographical Survey
59603-UG1 to UGS	Underground Services Survey

P07	19/12/2025	CC	Overflow added	AJP	AS
P06	12/12/2025	CC	Issued for IHP comment	AJP	AS
P05	12/03/2025	LS	Updated CCTV Survey	AS	JH
P04	20/10/2023	TAF	Work In Progress	AS	JH
P03	25/08/2023	TAF	Issued for Planning	AJP	JH
P02	14/08/2023	TAF	Draft for Comment	AJP	JH
Rev	Date	Drawn	Description	Ch'k'd	App'd

Status Stamp

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M

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MACDONALD

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F +44 (0)114 272 4699
W www.mottmac.com

Client
The Christie NHS Foundation Trust

Title
The Christie Advanced Scanning & Imaging Centre Development
Drainage Masterplan

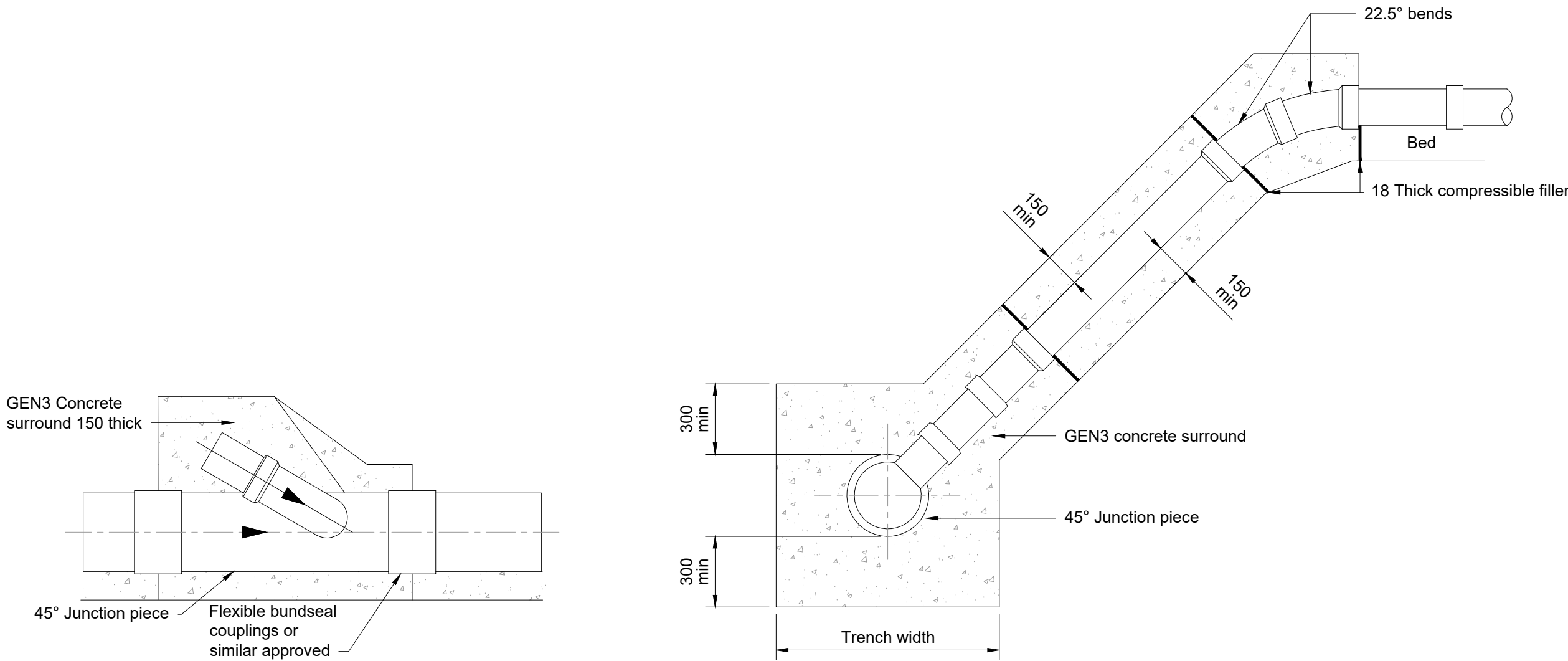
Designed	T Fundira	TAF	Eng. check.	A Precious	AJP
Drawn	T Fundira	TAF	Coordination	C Smith	CS
Dwg. check.	A Precious	AJP	Approved	J Heeds	JH
MMD Project Number	100110787	Scale at A1	1:200	Security	STD
Suitability Description	Suitable for Review and Comment				Suit. Code S3
Drawing Number	CASICD-MMD-XX-XX-DR-C-100000				Rev P07

PROJECT RISK
A CCTV survey of the existing drainage has been completed. This shows a number of drains across the site, with some that might have connections from the existing hospital building that is being retained. Further survey work planned to assess these connections and whether they can be abandoned. If they cannot be abandoned they will need to be diverted.

RESIDUAL RISK ASSESSMENT
Wherever possible, risk is designed-out of this proposal during the design process. Where this is not possible, the risk will be minimised and any residual risk will be noted and indicated by the symbol.

DRA-01 Risk of spillage from the refuelling area.
DRA-03 Existing utilities, risk of electrocution.
DRA-04 Contact with contaminated waste and/or live sewage.
DRA-05 Diversion of existing drainage. Deep excavation.
DRA-06 Alignment of existing foul drain taken from GPR and CCTV survey. Location may differ from what is shown. Drainage to be 3D scanned. Risk of deep drainage diversion in close proximity to existing building if existing drain cannot be retained.
DRA-07 High number of existing unidentified services which will require diversion.

H. Typical Drainage Details

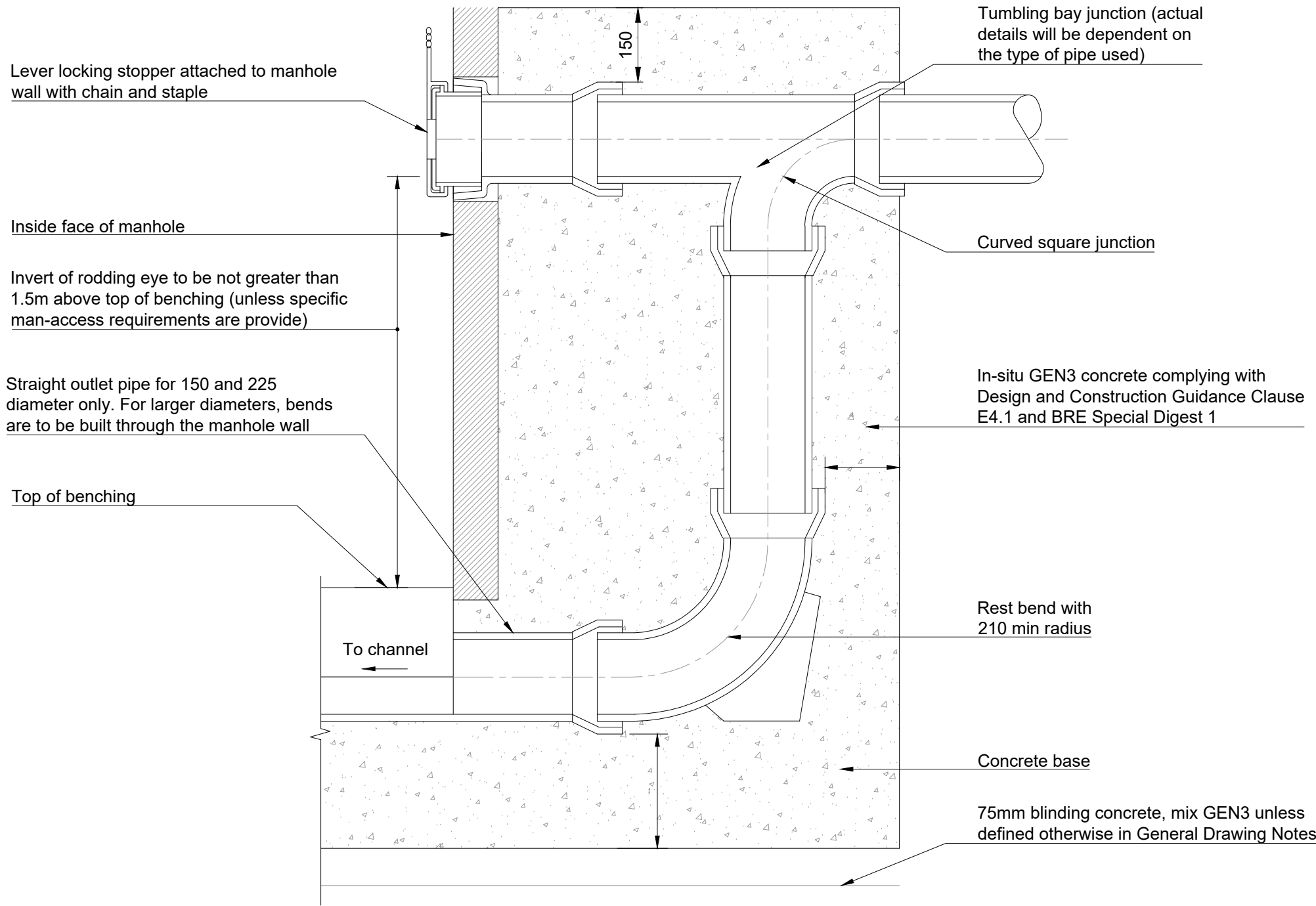


Typical Saddle Connection Plan

Scale 1:20

Typical Saddle Connection Section

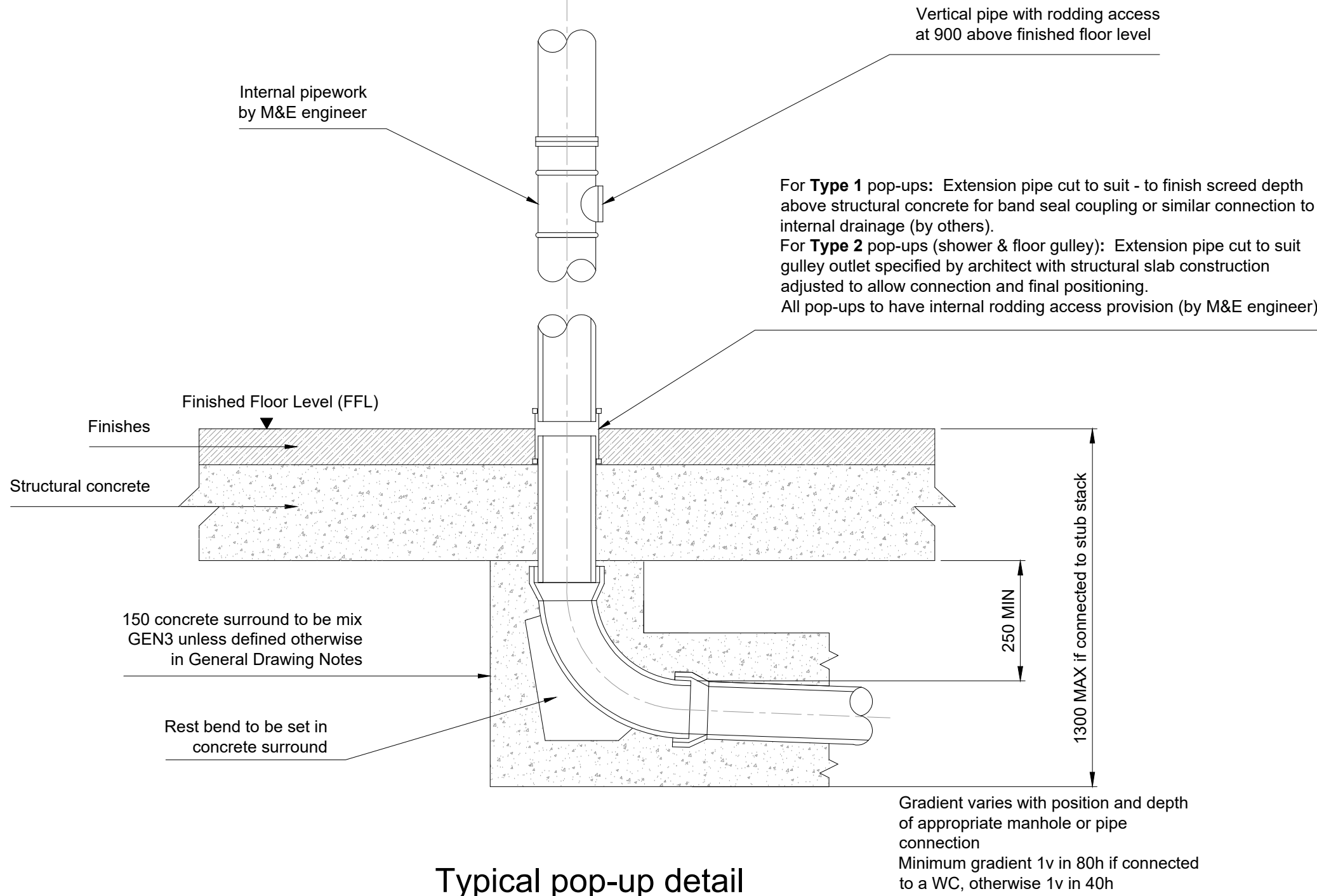
Scale 1:20



External backdrop detail

(Refer to Figure B16 in Design and Construction Guidance)

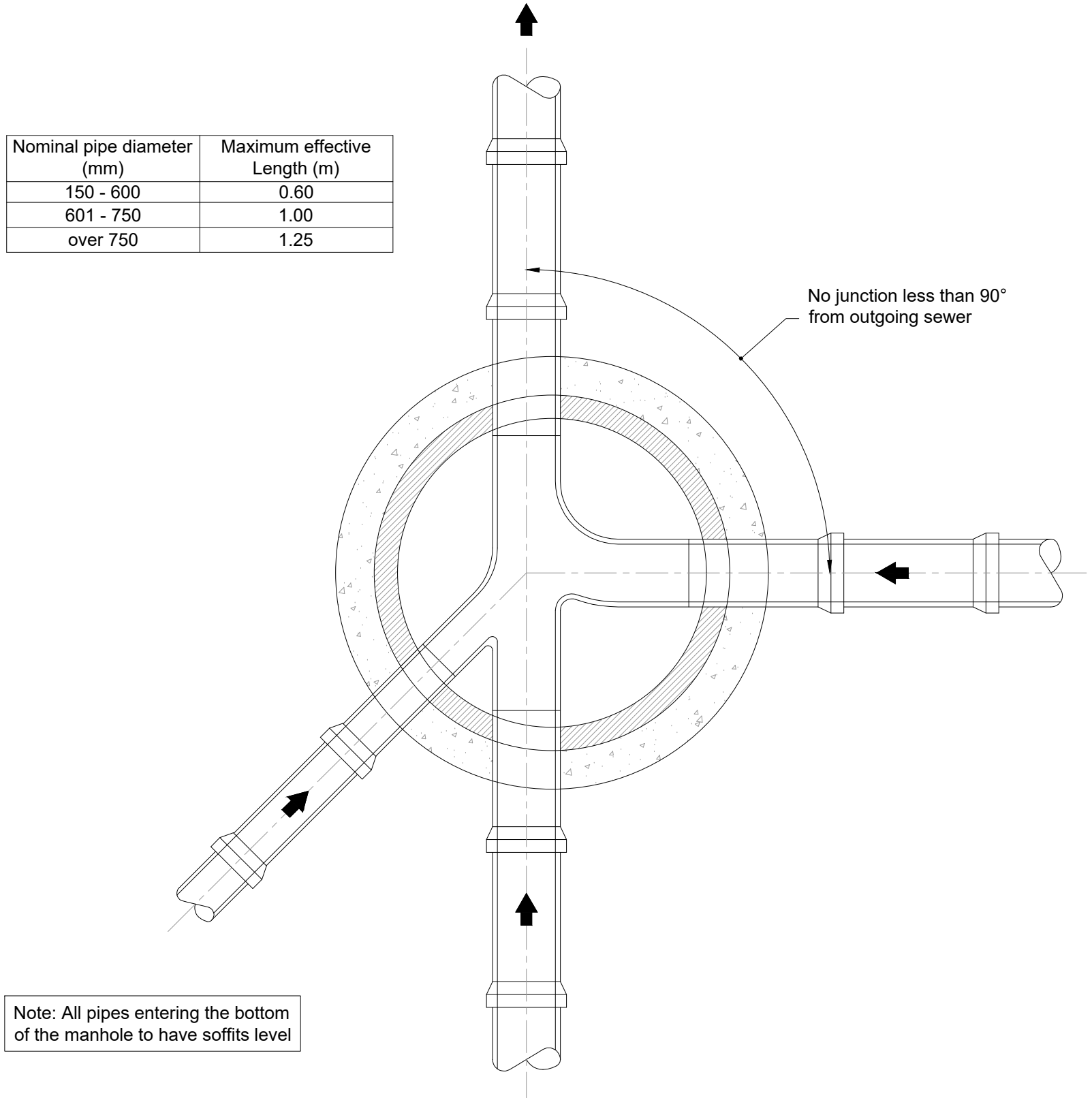
Scale 1:10



Typical pop-up detail

Scale 1:10

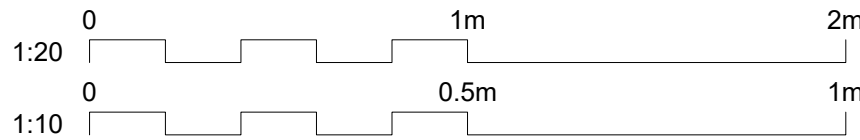
Nominal pipe diameter (mm)	Maximum effective Length (m)
150 - 600	0.60
601 - 750	1.00
over 750	1.25



Typical arrangement of pipe junctions within manholes

(Refer to Figure B13 in Design and Construction Guidance)

Scale 1:20



- Notes
- Do not measure from this drawing.
 - Drawing measurements in millimetres unless stated otherwise
 - Levels in metres above ordnance datum (mAOD).
 - Proposed drainage designed in accordance with Building Regulations Part H and Sewerage Sector Guidance (SSG) Appendix C.

Key to symbols

Reference drawings

CASICD-MMD-XX-XX-DR-D-100000 - Drainage Masterplan
CASICD-MMD-XX-XX-DR-D-100010 - Typical Drainage Details Sheet 1 of 6
CASICD-MMD-XX-XX-DR-D-100012 - Typical Drainage Details Sheet 3 of 6
CASICD-MMD-XX-XX-DR-D-100013 - Typical Drainage Details Sheet 4 of 6
CASICD-MMD-XX-XX-DR-D-100014 - Typical Drainage Details Sheet 5 of 6
CASICD-MMD-XX-XX-DR-D-100015 - Typical Drainage Details Sheet 6 of 6

Rev	Date	Drawn	Description	Ch'k'd	App'd
P02	12/12/2025	JLW	Issued for IHP Comment	AP	AS
P01	20/10/2023	LS	RIBA Stage 3 Issue	AS	JH

Status Stamp

PRELIMINARY

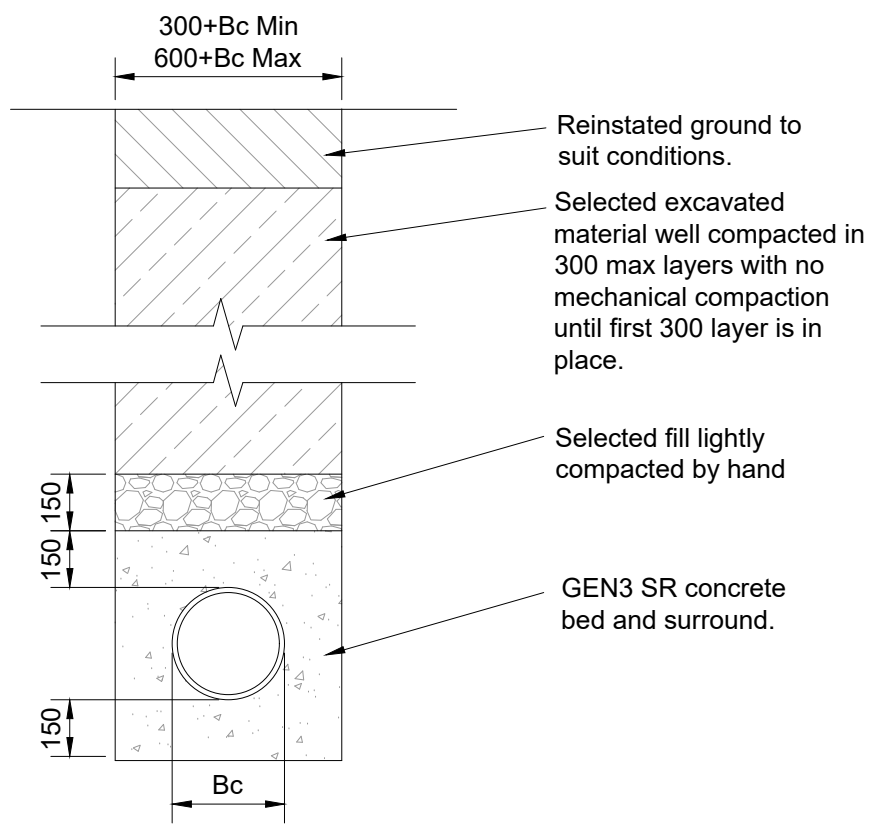
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Title
**The Christie Advanced Scanning & Imaging Centre Development
Typical Drainage Details
Sheet 2 of 6**

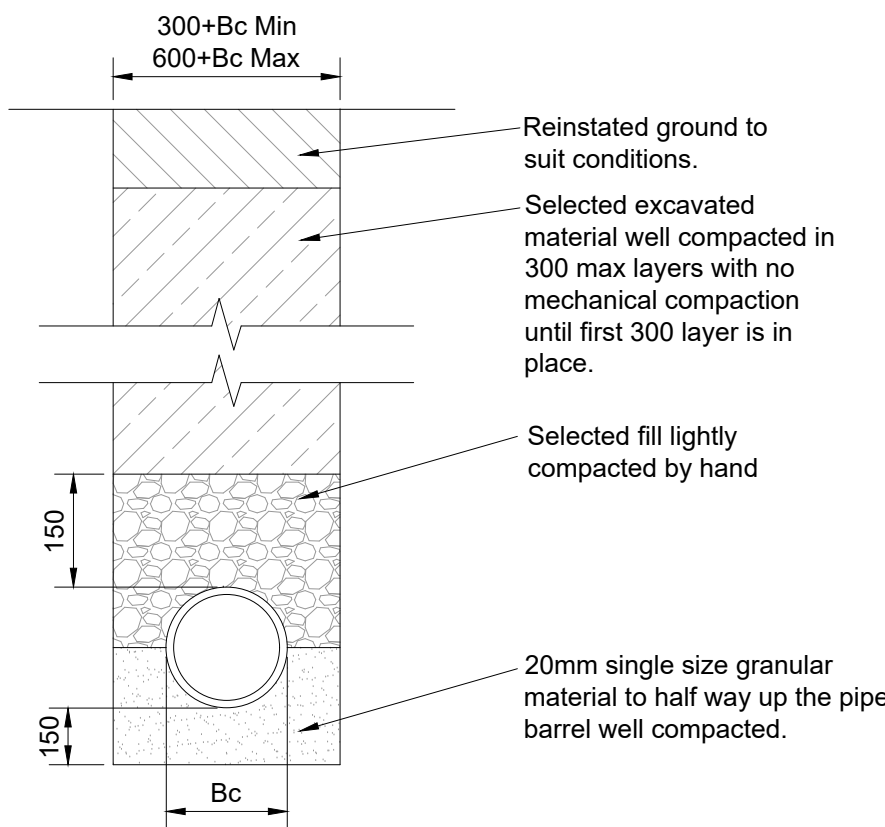
Designed	T Fundira	TAF	Eng check	A Sims	AS
Drawn	L Shipley	LS	Coordination	C Smith	CS
Dwg check	A Sims	AS	Approved	J Heeds	JH
MMD Project Number	100114293	Scale at A1	As Shown	Security	STD
Suitability Description	Suitable for Review and Comment	Suit. Code	S3		
Drawing Number	CASICD-MMD-XX-XX-DR-D-100011	Revision	P02		



Concrete Surround

Scale: 1:20

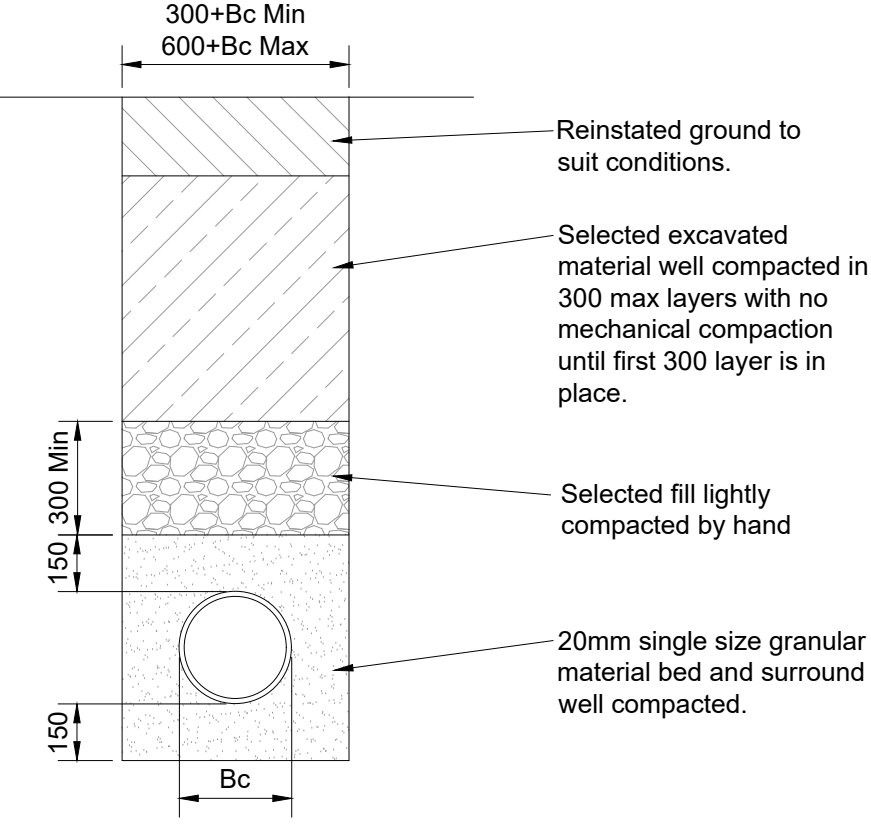
Trench Widths for Poly Pipe		
Pipe Diameter	Min Width	Max Width
100	450	750
150	500	800
225	600	900
300	700	1000
375	750	1050
450	850	1150



Class B Bedding

Scale: 1:20

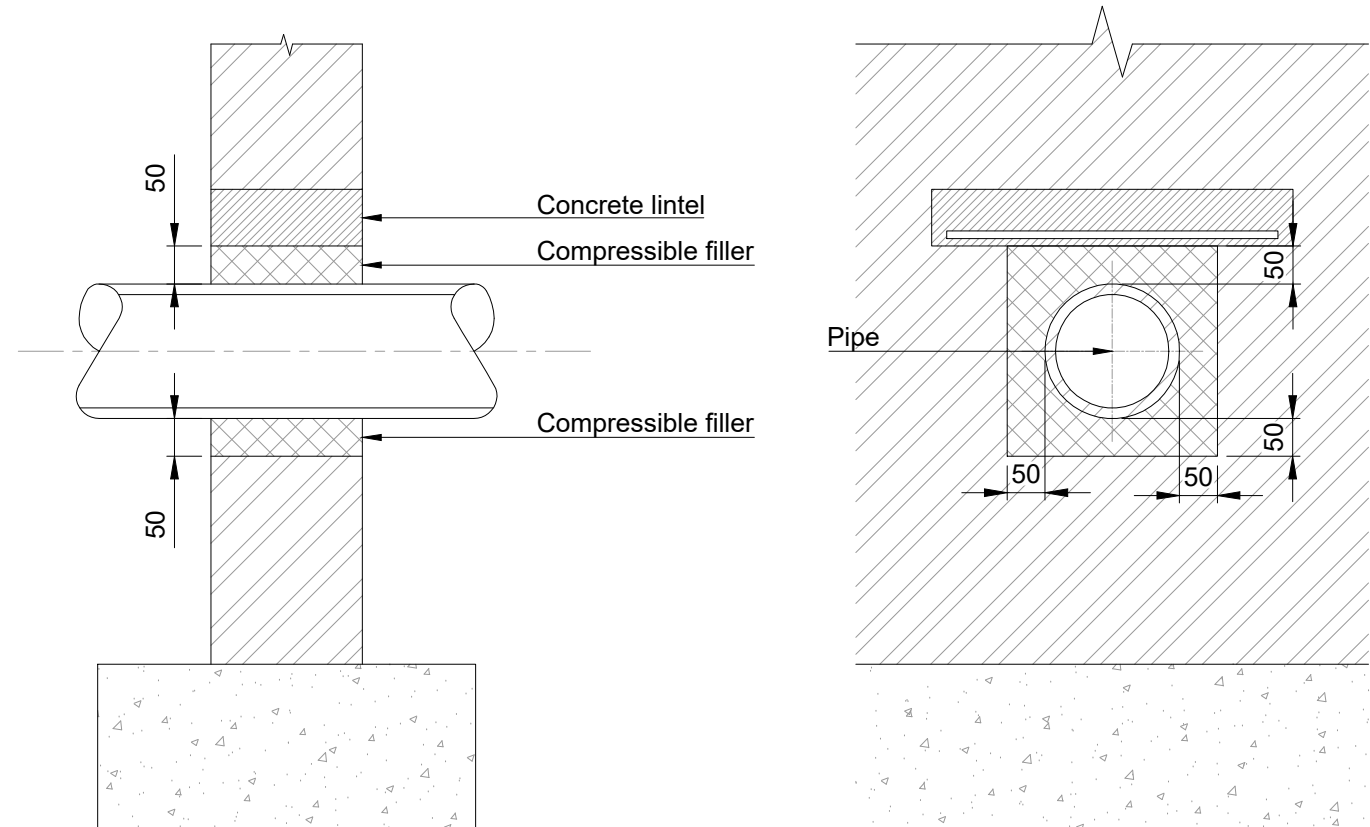
Trench Widths for Clay Pipe		
Pipe Diameter	Min Width	Max Width
100	450	750
150	500	800
225	600	875
300	700	1000
400	800	1100
450	850	1150



Class S Bedding

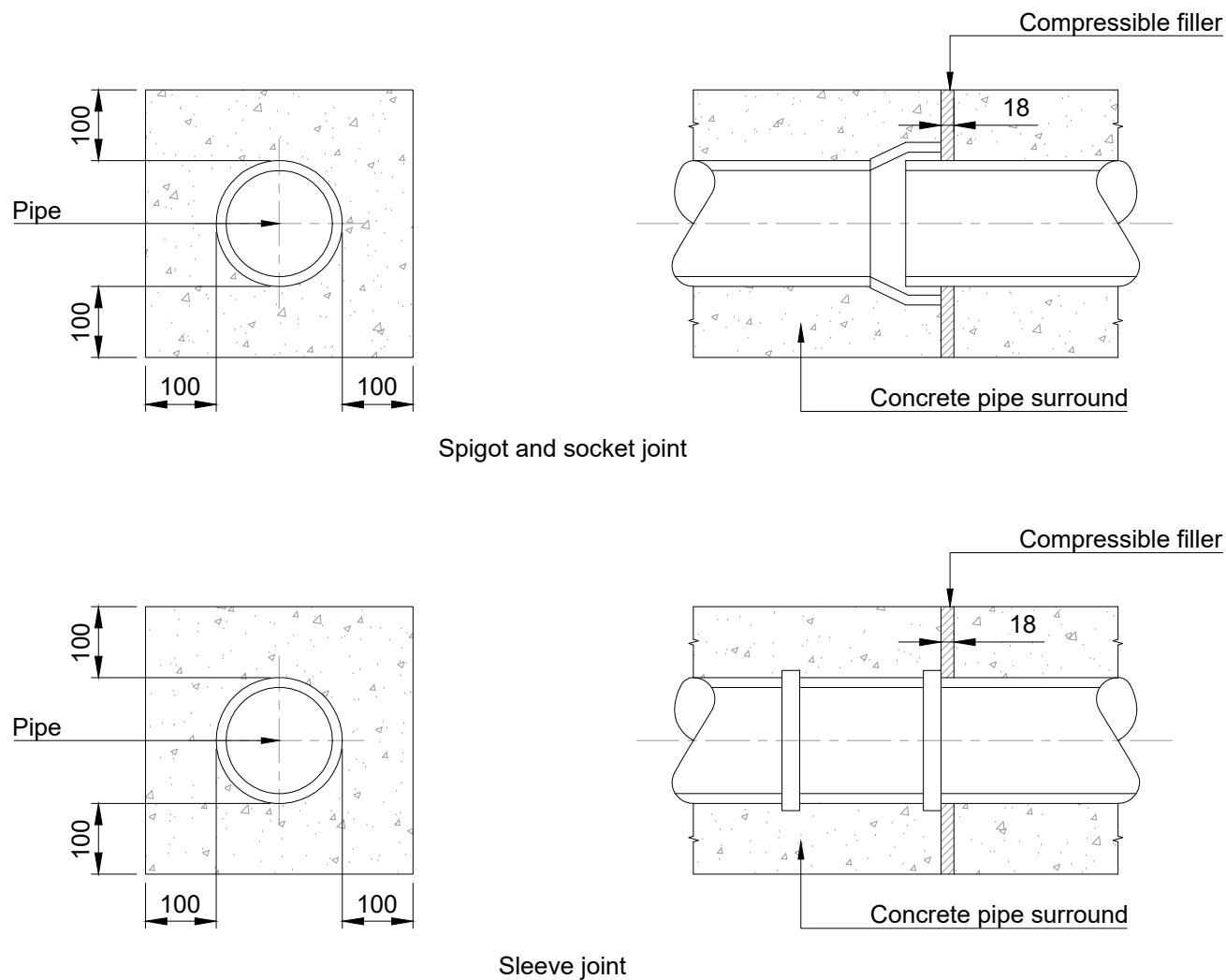
Scale: 1:20

Nominal Bore of Pipe (mm)	Size of Bedding Material	
	Single Size	Graded
100 - 125	10	-
150 - 200	10 or 14	14 to 5
225 - 300	10, 14 or 20	14 to 5 or 20 to 5
375 - 500	14 or 20	14 to 5 or 20 to 5
Exceeding 500	14, 20 or 40	14 to 5, 20 to 5 or 40 to 5



Protection of pipes penetrating single leaf boundary walls

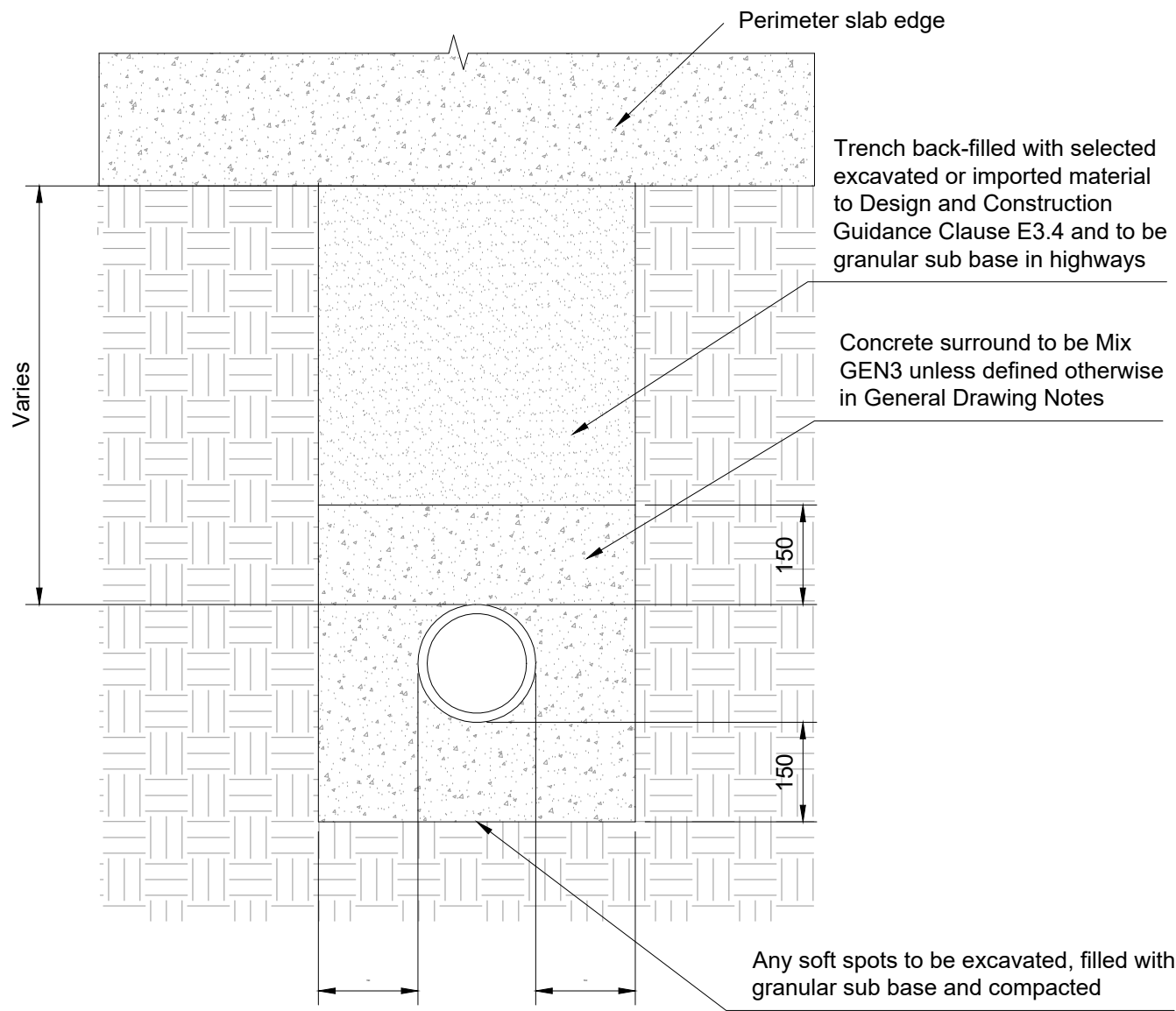
(Refer to Figure B29 in Design and Construction Guidance)
Scale 1:10



Joints for encased pipes

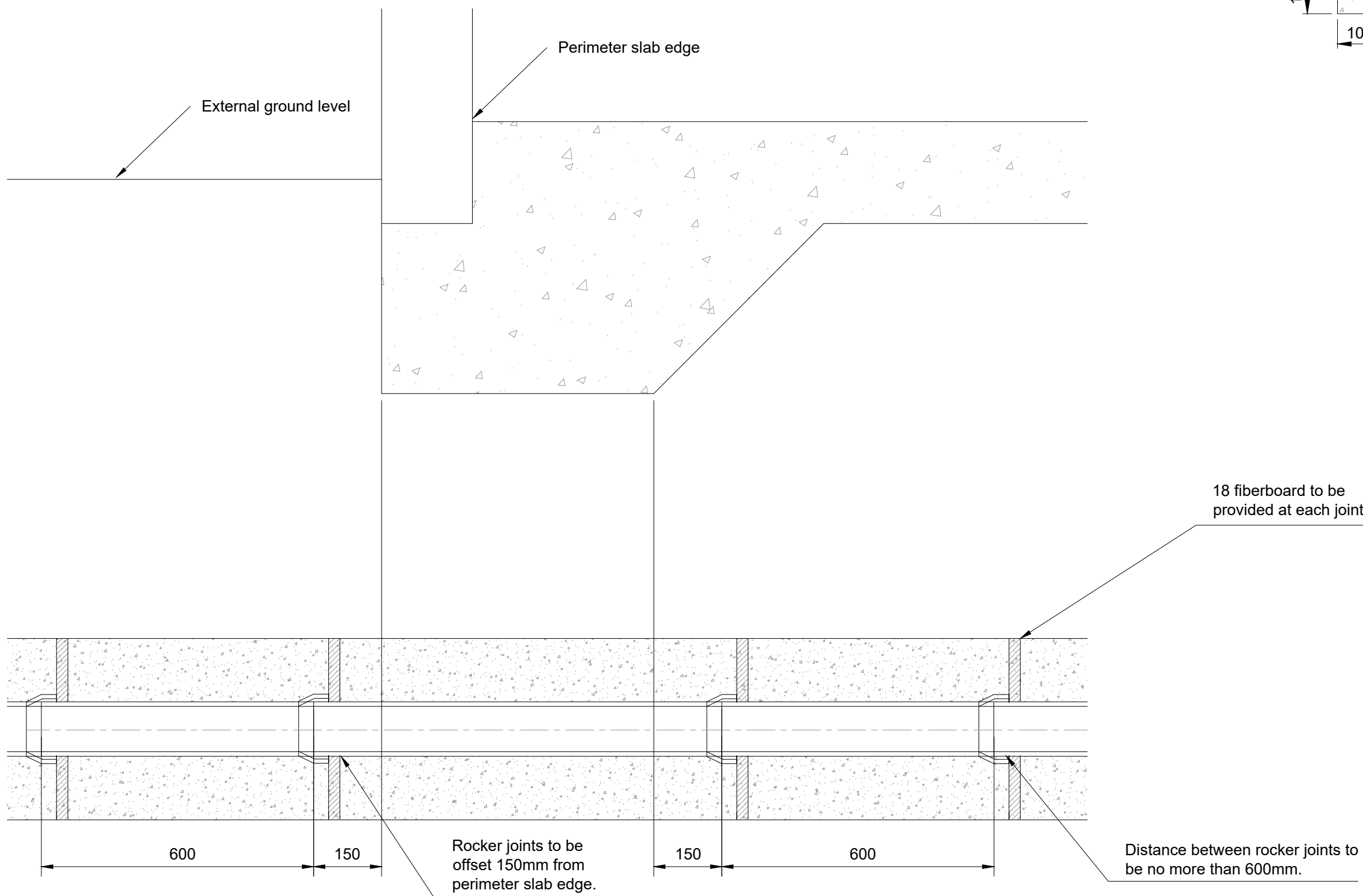
(Refer to Figure B28 in Design and Construction Guidance)
Scale 1:10

- Notes:**
- a. Concrete protection of pipes to be 150 MIN surround and Mix GEN3 with sulphate resistance. Rocker joints to extend so that a minimum of 2 rocker joints are located past the edge of perimeter slab on both internal and external sides to the building.
 - b.



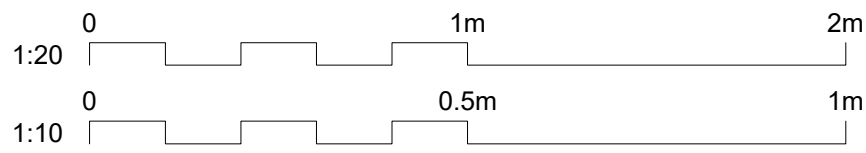
Concrete surround to pipes passing beneath structural slab edge

Scale 1:10



Concrete surround to pipes passing beneath structural slab edge

Scale 1:10



- Notes**
1. Do not measure from this drawing.
 2. Drawing measurements in millimetres unless stated otherwise
 3. Levels in metres above ordnance datum (mAOD).
 4. Proposed drainage designed in accordance with Building Regulations Part H and Sewerage Sector Guidance (SSG) Appendix C.

Key to symbols

Reference drawings

CASICD-MMD-XX-XX-DR-D-100000 - Drainage Masterplan
CASICD-MMD-XX-XX-DR-D-100010 - Typical Drainage Details Sheet 1 of 6
CASICD-MMD-XX-XX-DR-D-100011 - Typical Drainage Details Sheet 2 of 6
CASICD-MMD-XX-XX-DR-D-100013 - Typical Drainage Details Sheet 4 of 6
CASICD-MMD-XX-XX-DR-D-100014 - Typical Drainage Details Sheet 5 of 6
CASICD-MMD-XX-XX-DR-D-100015 - Typical Drainage Details Sheet 6 of 6

P02	12/12/2025	JLW	Issued for IHP Comment	AP	AS
P01	20/10/2023	LS	RIBA Stage 3 Issue	AS	JH
Rev	Date	Drawn	Description	Ch'k'd	App'd

Status Stamp

PRELIMINARY

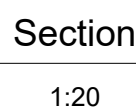
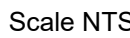
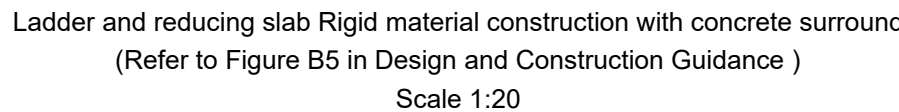
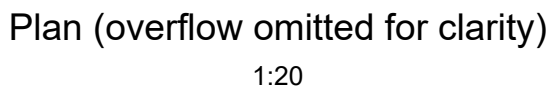
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Client **The Christie NHS Foundation Trust**

Title **The Christie Advanced Scanning & Imaging Centre Development
Typical Drainage Details
Sheet 3 of 6**

Designed	T Fundira	TAF	Eng check	A Sims	AS
Drawn	L Shipley	LS	Coordination	C Smith	CS
Dwg check	A Sims	AS	Approved	J Heeds	JH
MMD Project Number 100114293		Scale at A1 As Shown			Security STD
Suitability Description Suitable for Review and Comment					Suit. Code S3
Drawing Number CASICD-MMD-XX-XX-DR-D-100012					Revision P02



Vortex flow control chamber: Sump type
(Hydro-Brake or similar approved)

Key to symbols

Reference drawings
CASICD-MMD-XX-XX-DR-D-100000 - Drainage Masterplan
CASICD-MMD-XX-XX-DR-D-100010 - Typical Drainage Details Sheet 1 of 6
CASICD-MMD-XX-XX-DR-D-100011 - Typical Drainage Details Sheet 2 of 6
CASICD-MMD-XX-XX-DR-D-100012 - Typical Drainage Details Sheet 3 of 6
CASICD-MMD-XX-XX-DR-D-100013 - Typical Drainage Details Sheet 4 of 6
CASICD-MMD-XX-XX-DR-D-100015 - Typical Drainage Details Sheet 6 of 6

P03	19/12/2025	JLW	Overflow added	AP	AS
P02	12/12/2025	JLW	Issued for IHP Comment	AP	AS
P01	20/10/2023	LS	RIBA Stage 3 Issue	AS	JH
Rev	Date	Drawn	Description	Ch'k'd	App'd

Status Stamp

PRELIMINARY

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Client

The Christie NHS Foundation Trust

Title

The Christie Advanced Scanning & Imaging Centre Development
Typical Drainage Details
Sheet 5 of 6

Designed	T Fundra	TAF	Eng check	A Sims	
Drawn	L Shipley	LS	Coordination	C Smith	
Dwg check	A Sims	AS	Approved	J Heeds	
MMD Project Number 100114293		Scale at A1 As Shown			Security ST
Suitability Description Suitable for Review and Comment					Suit. C S
Drawing Number CASICD-MMD-XX-XX-DR-D-100014					Revision P0

I. InfoDrainage Calculations

CASICD:	Date: 11/12/2025			
	Designed by: JLW	Checked by: AJP	Approved By:	
Report Details: Type: Inflows Storm Phase: Phase	Surface Water Design:			



Catchment Area

Type : Catchment Area

Area (ha)	0.204
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100



Catchment Area (1)

Type : Catchment Area

Area (ha)	0.111
-----------	-------

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	100

CASICD:	Date: 11/12/2025		
	Designed by: JLW	Checked by: AJP	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Surface Water Design:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
Manhole	Manhole	384900.838	392585.167	38.000	1.000	37.000	Circular	1.200
Manhole (1)	Manhole	384923.468	392582.566	37.000	0.500	36.500	Circular	1.200
Manhole (2)	Manhole	384930.158	392584.876	35.240	1.170	34.070	Circular	1.200
Manhole (3)	Manhole	384937.381	392577.558	35.240	1.740	33.500	Circular	1.200
Manhole (4)	Manhole	384942.249	392562.440	35.240	2.000	33.240	Circular	1.200
Manhole (5)	Manhole	384952.032	392565.608	35.240	2.500	32.740	Circular	1.200

Name	Lock
Manhole	None
Manhole (1)	None
Manhole (2)	None
Manhole (3)	None
Manhole (4)	None
Manhole (5)	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
Manhole	Inlet	Catchment Area	(None)	No Restriction
Manhole (1)	Inlet (1)	S1.001	(None)	No Restriction
Manhole (2)	Inlet	S1.002	(None)	No Restriction
Manhole (3)	Inlet	S1.004	(None)	No Restriction
Manhole (4)	Inlet	S1.005	(None)	No Restriction
Manhole (5)	Inlet	S1.006	(None)	No Restriction

CASICD:	Date: 11/12/2025		
	Designed by: JLW	Checked by: AJP	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Surface Water Design:		



Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
Manhole	Outlet	S1.000	Free Discharge
Manhole (1)	Outlet	S1.002	Hydro-Brake®
	Invert Level (m)	36.500	
	Design Depth (m)	0.400	
	Design Flow (L/s)	7.6	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☐	
	Unit Reference	CHE-0132-7600-0400-7600	
Manhole (2)	Outlet	S1.003	Free Discharge
Manhole (3)	Outlet	S1.005	Hydro-Brake®
	Invert Level (m)	33.500	
	Design Depth (m)	0.540	
	Design Flow (L/s)	10.0	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☒	
	Unit Reference	SHE-0151-1000-0540-1000	
Manhole (4)	Outlet	S1.006	Free Discharge

CASICD:	Date: 11/12/2025			
	Designed by: JLW	Checked by: AJP	Approved By:	
Report Details:	Surface Water Design:			
Type: Stormwater Controls Storm Phase: Phase				



Blue Roof

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	36.900
Depth (m)	0.100
Base Level (m)	36.800
Number of Crates Long	51
Number of Crates Wide	22
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	0.1
Total Volume (m³)	106.590
Inlets	
Inlet	
Inlet Type	Point Inflow
Incoming Item(s)	S1.000
Bypass Destination	(None)
Capacity Type	No Restriction
Outlets	
Outlet	
Outgoing Connection	S1.001
Outlet Type	Free Discharge

CASICD:	Date: 11/12/2025			
	Designed by: JLW	Checked by: AJP	Approved By:	
Report Details:	Surface Water Design:			
Type: Stormwater Controls Storm Phase: Phase				



Hydrorock

Type : Cellular Storage

Dimensions	
Exceedance Level (m)	34.820
Depth (m)	0.500
Base Level (m)	33.540
Number of Crates Long	3
Number of Crates Wide	37
Number of Crates High	1
Porosity (%)	95
Crate Length (m)	1
Crate Width (m)	1
Crate Height (m)	0.5
Total Volume (m³)	53.505
Inlets	
Inlet	
Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (1) S1.003
Bypass Destination	(None)
Capacity Type	No Restriction
Outlets	
Outlet	
Outgoing Connection	S1.004
Outlet Type	Free Discharge

CASICD:	Date: 11/12/2025			
	Designed by: JLW	Checked by: AJP	Approved By:	
Report Title: Rainfall Analysis Criteria	Surface Water Design:			

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 384906 392580 SJ 84906 92580	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period

Return Period (years)	Increase Rainfall (%)
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
4320	8640
7200	14400
10080	20160

CASICD:	Date: 11/12/2025		
	Designed by: JLW	Checked by: AJP	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Surface Water Design:		



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

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FEH: 100 years: +45 %: 15 mins: Summer	0.20	160.3	69.586
Catchment Area (1)	FEH: 100 years: +45 %: 15 mins: Summer	0.11	87.2	37.866

CASICD:	Date: 11/12/2025		
	Designed by: JLW	Checked by: AJP	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Surface Water Design:		





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

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
Manhole	FEH: 100 years: +45 %: 15 mins: Summer	38.00 0	37.00 0	37.475	0.475	160.3	0.537	0.000	155.4	69.632	Surcharged
Manhole (1)	FEH: 100 years: +45 %: 15 mins: Summer	37.00 0	36.50 0	36.857	0.357	10.5	0.404	0.000	7.5	7.652	Flood Risk
Manhole (2)	FEH: 100 years: +45 %: 15 mins: Summer	35.24 0	34.07 0	34.103	0.033	7.5	0.038	0.000	7.5	7.557	OK
Manhole (3)	FEH: 100 years: +45 %: 15 mins: Summer	35.24 0	33.50 0	33.857	0.357	10.1	0.403	0.000	9.9	13.063	Surcharged
Manhole (4)	FEH: 100 years: +45 %: 15 mins: Summer	35.24 0	33.24 0	33.286	0.046	9.9	0.052	0.000	9.9	12.849	OK
Manhole (5)	FEH: 100 years: +45 %: 15 mins: Summer	35.24 0	32.74 0	32.785	0.045	9.9	0.000	0.000	9.9	12.849	OK

CASICD:	Date: 11/12/2025			
	Designed by: JLW	Checked by: AJP	Approved By:	
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Surface Water Design:			



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

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
Blue Roof	FEH: 100 years: +45 %: 240 mins: Summer	36.899	36.899	0.099	0.099	41.5	105.833	0.000	0.000	10.7	135.736	0.711	OK
Hydrorock	FEH: 100 years: +45 %: 120 mins: Winter	34.734	34.734	1.194	1.194	32.5	53.421	0.000	0.000	11.5	116.595	0.156	OK

CASICD:	Date: 11/12/2025		
	Designed by: JLW	Checked by: AJP	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Surface Water Design:		

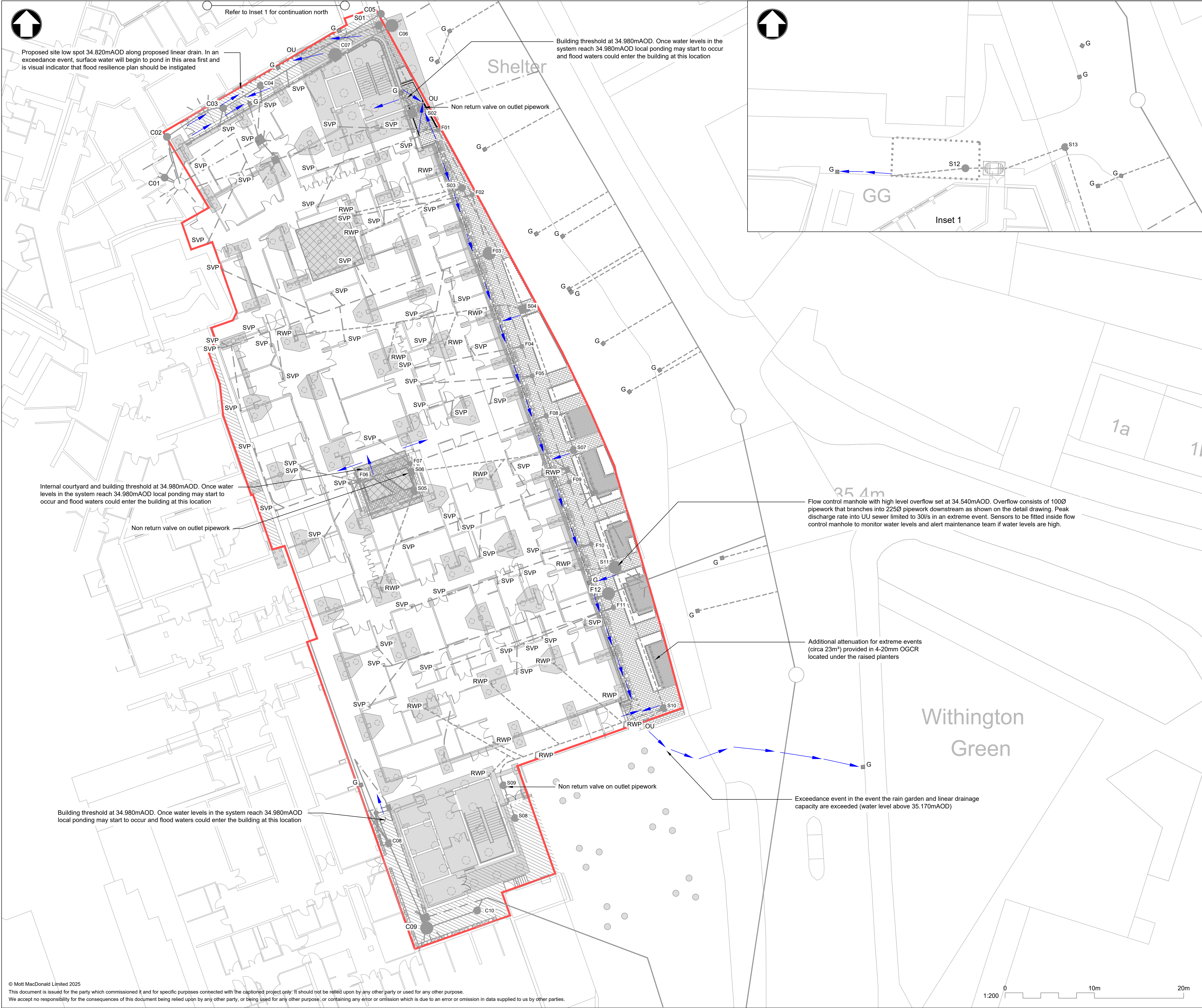




FEH: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

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
S1.000	FEH: 100 years: +45 %: 15 mins: Summer	Pipe	Manhole	Blue Roof	38.000	37.475	0.253	69.632	2.7	1.53	155.4	Surcharged
S1.002	FEH: 100 years: +45 %: 1440 mins: Summer	Pipe	Manhole (1)	Manhole (2)	37.000	36.862	0.028	255.947	2.3	0.01	7.6	Flood Risk
S1.003	FEH: 100 years: +45 %: 120 mins: Summer	Pipe	Manhole (2)	Hydrorock	35.240	34.654	0.225	80.670	0.3	0.07	9.3	Surcharged
S1.005	FEH: 100 years: +45 %: 480 mins: Summer	Pipe	Manhole (3)	Manhole (4)	35.240	34.317	0.057	280.947	1.4	0.16	10.9	Surcharged
S1.001	FEH: 100 years: +45 %: 60 mins: Summer	Pipe	Blue Roof	Manhole (1)	35.240	36.894	0.243	40.834	0.4	0.11	12.9	OK
S1.006	FEH: 100 years: +45 %: 120 mins: Summer	Pipe	Manhole (4)	Manhole (5)	35.240	33.289	0.048	114.886	1.8	0.09	10.9	OK
S1.004	FEH: 100 years: +45 %: 240 mins: Winter	Pipe	Hydrorock	Manhole (3)	35.240	34.493	0.225	216.562	0.3	0.19	12.4	Surcharged

J. Exceedence Flow Routes



Notes

- This drawing is to be read in conjunction with all relevant drawings.
- Do not scale from this drawing.
- The proposed drainage system has been designed to attenuate rainfall for the 1 in 100yr + 45% (upper end) climate change event within the site with no surface flooding. The system also has additional attenuation (circa 23m³) within 4-20mm OGCR under the raised planters for events in excess of the 1 in 100yr + 45% climate change event. An additional high level emergency overflow is also included in the flow control manhole in the most extreme events to discharge additional surface water offsite.

Key to symbols

- Proposed red line boundary
- Exceedance flow path
- Existing surface water drain and manhole
- Existing foul drain and manhole
- Existing combined water sewer and manhole
- Existing road gully
- Proposed surface water and manhole
- Proposed foul water and manhole
- Proposed perforated pipe
- Proposed linear drain and outlet unit
- Proposed rain water pipe connection
- Proposed foul soil vent pipe connection
- Existing drain to be abandoned
- Existing manhole to be abandoned
- Existing road gully to be abandoned
- Proposed crane foundation (Crane Foundation shown indicatively. Size and exact setting out TBC. Base shown here is based on CCHWC-AJP-01-00-DR-S-01415 from Countess of Chester Hospital project
- Proposed Class 1 Interceptor

Reference drawings

CASICD-MMD-XX-XX-DR-D-100010-100015 Typical Details
CASICD-MMD-XX-XX-SH-D-000001 MH Schedule
CASICD-MMD-XX-XX-DR-C-00001 Proposed Footway General Arrangement
CASICD-HLEA-XX-XX-M3-MEP-100001-P27 MEP Model
CASICD-ITR-XX-00-SK-L-900101 & 900102 Rev P02 Landscape General Arrangement
CASICD-ITR-XX-00-DR-L-900501 & 900502 Landscape Proposed Levels Plan
CASICD-MMD-XX-FN-DR-S-000230 Foundation Zone 1 GA Plan
CASICD-MMD-XX-FN-DR-S-000231 Foundation Zone 2 GA Plan
CASICD-DAY-XX-XX-M3-A-000001_P30 Architectural Model
CASICD-ITR-XX-XX-SU-K-000015 Drainage Survey
CASICD-ITR-XX-00-SK-L-900101-P02 Landscape General Arrangement
United Utilities Adopted Sewer Records
59603-SUR-TOP-(Published)(06.01.23) Topographical Survey
59603-UG1 to UG5 Underground Services Survey

P02	19/12/2025	CC	Revised exceedance plan	AJP	AS
P01	12/12/2025	CC	Issued for IHP comment	AJP	AS
Rev	Date	Drawn	Description	Ch'k'd	App'd

Status Stamp

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Client

The Christie NHS Foundation Trust

Title

The Christie Advanced Scanning & Imaging Centre Development Exceedance Plan

Designed	J Lea-Wilson	JLW	Eng. check.	A J Precious	AJP
Drawn	C Chau	CC	Coordination	C Smith	CS
Dwg. check.	J Lea-Wilson	JLW	Approved	A Simpson	AS
MMD Project Number	100110787	Scale at A1	1:200	Security	STD
Suitability Description	Suitable for Review and Comment				Suit. Code
Drawing Number	CASICD-MMD-XX-XX-DR-C-100016				Rev
					P02

K. Maintenance Strategy

Typical SuDS Drainage Maintenance Regime

Schedule	Required Action	Typical Frequency				
		Hydrorock	Permeable Paving	Flow Control	Collection Systems	Bio-retention / Rain Gardens
Regular	Visual Inspection	Monthly for three months after installation	Monthly for three months after installation	Monthly	Monthly	Monthly for three months after installation
	Remove Litter and Debris	Monthly removal of litter from catchment area	Once a year after Autumn leaves fall, or reduced frequency as required	Once a year after Autumn leaves fall, or reduced frequency as required	Monthly	Monthly (or as required)
	Inspect and Identify Any Areas Not Operating Correctly.	Monthly or 3 months, then annually	Every month for first year, then annually	-	Monthly	-
	Cut Grass - In and Around Basin	-	-	-	-	
	Manage Other Vegetation and Remove Nuisance Plants	-	As required - once per year	-	Monthly	At end of growing season, leave 50% of cuttings as mulch
	Inspect Inlets, Outlets and Overflows for Blockages/Damage	Monthly for first year then annually	-	Monthly	Monthly	Monthly
	Inspect Water Bodies for Signs of Poor Quality	-	-	-	-	-
	Inspect Vegetation Coverage	-	-	-	-	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect Banksides, Pipework and Structures for Physical Damage	-	-	-	-	Monthly
	Inspect Inlets and facility surface for silt accumulation	-	-	-	-	Half Yearly until appropriate removal frequency is established
	Tidy All Dead Growth Before Start of Growing Season	-	-	-	-	Remove visible dead material
	Remove Sediment from Inlets, Outlets and Forebays	-	-	Annually	Annually	As required
	Check surface of permeable paving for blockages and clear	Annually	Annually	-	-	-
	Manage Wetland Plants	-	-	-	-	-
Occasional	Reseed Areas of Poor Vegetation Growth	-	-	-	-	As required or if bare soil is exposed over 10% or more of treatment area
	Remove Sediment from Main Body	Every 5 years or as required	Inspect annually, repair as required	-	-	As required
	Remove Sediment from Inlets, Outlets and Forebays	-	Inspect annually, repair as required	-	Annually	As required
Remedial Actions	Repair Erosion or other Damage by Reseeding or Re-turfing	-	-	-	-	As required
	Repair /Rehabilitation of Inlets, Outlets and Overflows	Visual inspection after storm, replace as required	-	-	-	-
	Relevel Uneven Surfaces and Reinstate Design Levels	-	As required to remove or replace cracked blocks and remediate surrounding landscape	-	-	As required
	Rehabilitate of surface and upper substructure by vacuum sweeping	-	every 5 years or as required	-	-	-
	Remove and dispose of oils or petrol residues using safe practices	-	-	Annually	Annually	As required - dig out and replace growing medium and reseed

