

File Note

Project title Manchester Engineering Campus Development
Job number 252173
File reference \\Global\europa\Manchester\Jobs\250000\252173-00 (MECD TA Role)\11_PlanningSupport\Surface Water Maintenance Plan\
cc
Prepared by Emily Stoddart
Date 11 August 2023
Subject SuDS and Surface Water Management and Maintenance Plan

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1. Introduction

This document has been prepared to outline the maintenance and management regime for the surface water and sustainable urban drainage systems (SuDS) installed as part of the Manchester Engineering Campus Development (MECD).

2. Surface Water and SuDS Design

The layout of the surface water drainage network can be seen on **drawings 5983-ARP-MECD-EXG-SI-C-52-2XE01 revision FC01 dated 26/03/2021 and 5983-ARP-MECD-EXG-SI-C-52-2XE09, 2XE10 and 2XE11** details of elements mentioned in this maintenance plan are shown in drawings **5983-ARP-MECD-EXG-SE-C-52-4XE07 and 4XE08** contained in Appendix B. The system comprises three main surface water (SW) networks, split by drainage area with the following components:

1. Network #1: External SW drainage for the Northwest of the Site. Site drainage connects to an existing United Utilities (UU) combined sewer located on York Street via an existing manhole. A rainwater attenuation tank (Tank **AT1**) is constructed at the downstream end of this system prior to connecting to the UU network. This is sized to provide storage of restricted flows in accordance with the approved Drainage Strategy Document; **5983-ARP-00-XX-DN-C-000005**.
2. Network #2: External SW drainage for the Southwest of the Site. Site drainage connects to an existing UU surface water sewer located within the MBSE/Aquatics Centre carpark via an existing manhole. A rainwater attenuation tank (Tank **AT2**) is constructed at the downstream end of this system prior to connecting to the UU network. This is sized to provide storage of restricted flows in accordance with the Drainage Strategy Document; **5983-ARP-00-XX-DN-C-000005**.
3. Network #3: External SW and Combined drainage for the North and East of the Site. This drainage connects to an existing UU combined sewer located within Upper Brook Street via an existing manhole. A rainwater attenuation tank (Tank **AT3**) is constructed at the downstream end of this system prior to connecting to the UU network. This is sized to

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provide storage of restricted flows in accordance with the Drainage Strategy Document; **5983-ARP-00-XX-DN-C-000005**. This network also takes flows from the existing James Chadwick Building in addition to the new MECD buildings and refurbished Oddfellows Hall. This network drains into the below ground drainage to the North, before being discharged to the UU sewer. Provision of bio-retention storage at the Southeast of the site serves to route rainwater to water trees and local landscaping.

3. Purpose of this Document

This document has been prepared in consultation with the University of Manchester to outline the proposed maintenance and management regime for all surface water drainage elements as summarised in Section 5.

The scope of the maintenance regime covers external surface water and combined water assets only, external foul water drainage should be addressed as part of the University's standard drainage maintenance procedures and in line with the requirements of Part H of the Building Regulations. Where similar maintenance tasks and frequencies are required by both the foul and surface water networks, efficiency may be improved by carrying out maintenance tasks simultaneously.

Proposed regular and remedial maintenance activities apply during normal day-to-day use and operation of the surface water networks, with the purpose of managing the flow of surface water, preventing flooding and protecting water quality. Site activities which might put additional strain on the networks (e.g. future construction works or change of use) may require additional or increased maintenance activities which are not covered in this document.

4. Maintenance Responsibility

All surface water and SuDS assets constructed as part of the scheme shall be the maintenance responsibility of the University of Manchester. The pipes connecting private drainage to the UU network are the maintenance responsibility of UU downstream of the external face of the private demarcation chamber (manhole), as indicated on drawing **5983-ARP-MECD-EXG-SI-C-52-2XE01** in Appendix B.

The section of sewer from UU-SW-03 to UU-SW-05 has been rebuilt as part of the scheme, this was an existing highway drain and is owned by Manchester City Council (MCC). CCTV surveys have shown that no highway runoff is captured by this drain, making the University of Manchester the only user of this section of sewer. Therefore, the maintenance of this sewer shall be the responsibility of the University of Manchester.

The University of Manchester Facilities, Maintenance and Compliance (FMC) team take responsibility for all planned preventative, reactive and emergency response maintenance. The University is sub-divided into areas with appointed area managers for each. Specialist and technical maintenance contracts are covered either by existing contracts or on a case-by-case basis.

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Contact details are stated in Section 7.

Novus Property Solutions are currently appointed as the Measured Term Contractor across the non-residential University campus to provide reactive maintenance and emergency repairs.

Current contracts covering specific elements of the surface water network are indicated in the relevant sections of this note, however these contracts are re-tendered on a cyclical basis to ensure compliance with OJEU Public Sector procurement requirements, and are subject to change through the lifetime of the development.

5. Basis of Design and Maintenance

The maintenance regime is proposed in Appendix A for each separate element of the surface water drainage system. Regular, occasional and remedial maintenance activities are presented in line with Ciria Report 753 'The SuDS Manual' 2015. The following sections summarise the basis of design for each of the surface water network elements.

5.1 Surface Water and Combined Pipe Networks

The surface water and combined pipe networks include the pipes and chambers making up the core surface water drainage network. Blockage of any part of the pipe networks will reduce the conveyance of the system and potentially cause flooding upstream due to systems functioning less optimally than designed.

5.2 Linear Drainage (Slot Drains)

Slot drains capture the water from the public realm areas of the site and convey these into the below ground pipe network. Sump units, typically at the end of each slot drain section, are designed to capture silt and prevent this being passed forward to the drainage network. Due to the width of the inlets, small items such as leaves, litter and siltation can easily cause blockages and prevent the system from functioning as designed.

5.3 Petrol Interceptors

2 n.o. Kingspan Klargestor NSFA10 full retention separators are included within two of the surface water networks in areas where contamination of the drainage network resulting from petrol spills is a potential risk. There is a third separator within the foul water network on the site. The maintenance of these elements should be carried out in accordance with the manufacturer's specifications and in line with BS EN 858-2. Failure to comply with maintenance guidelines for petrol interceptors could lead to fines or prosecution. The following key considerations for maintenance of petrol interceptors should be covered by the manufacturer or supplier:

- Sediment and litter monitoring and removal
- Oil and grease removal
- Changing of any filter media
- Replacement of malfunctioning parts or structures

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- Monitoring for evidence of poor operation and to inform appropriate maintenance frequencies.

Inspection and maintenance of the petrol interceptors may be undertaken by the supplier under a service agreement, or by an accredited engineer.

H2o Flowtech are the current maintenance and service contractors for UoM petrol interceptors (registered address: Unit 5 Phoenix House, 100 Brierley Street, Bury, Greater Manchester, BL9 9HN).

If a significant pollution event occurs, or a petrol interceptor is observed to be significantly damaged or underperforming, the pollution event should be reported to United Utilities by calling 0345 672 3723.

5.4 Attenuation Tanks & Flow Controls

3 n.o. geocellular attenuation tanks, constructed from Versavoid modular units, are located at the downstream end of all surface water networks on the site prior to discharge to the public sewer. Orifice flow controls for these tanks are located within Manhole chambers SW08, SW18 and SW36. The function of the tanks is to store runoff water during large storms, flow controls are designed to restrict the discharge from the tanks to the agreed rates back to the sewer network, and to reduce the risk of flooding. Tanks are wrapped in Geotex 300PP geotextile to reduce ingress of fine particles and silts into the tanks. The hydraulic design of the network is based on the specified tank volumes; therefore, the maximum volume of each tank should be maintained as much as possible through regular maintenance. Any evidence of siltation or other debris in the tanks should be removed as soon as they are identified.

5.5 Rainwater Harvesting Tank

An existing Kingspan Rainwater 26000 Rainwater Harvesting Tank (Tank IC1) to the North of the James Chadwick building has been retained at the upstream end of the surface water drainage network #3. The purpose of the tank is to store rainwater captured from the building prior to this being pumped or distributed back to the building for use in functions such as flushing toilets. The Kingspan maintenance guidelines are available in Appendix C and the recommended activities are incorporated into the maintenance regime in Appendix A. Maintenance of this system may be undertaken by the supplier through a service agreement, or by an approved engineer.

Stormsaver currently service and maintain this Rainwater Harvesting Tank (registered address: Stormsaver Ltd, Hockerton Moor Enterprise Park, Winkburn Lane, Kirklington, Newark, Nottinghamshire, NG22 8FL).

5.6 Bio-Retention Tree Pits and Filter Drains

Bio-retention tree pits are incorporated into the landscaped area at the Southeast of the site. Water is conveyed through filter drains and stored within the vegetated area during normal rainfall conditions for use in watering trees and to reduce the overall volume of water discharging site on an annual basis. During large storms, water is allowed to overflow into the drainage network through a connection between the filter drain and Manhole Chamber

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SW20. Blockage at any point within the filter drains or within the downstream drainage network could lead to flooding during large storms.

The maintenance of the bio-retention tree pits should be conducted in consideration of the landscape maintenance for the site. Similarly, landscape maintenance should only be carried out with consideration of the functionality of the drainage components of the design to ensure that no maintenance task leads to the blockage or damage of any drainage element.

6. Access

All drainage elements can be accessed by vehicle mounted equipment if required. Rumford Street bisects the site and provides access to drainage on the East of the site including tank AT3 to the South of Oddfellows Hall. Drainage features around the edge of Engineering Building B can be accessed via Upper Brook Street to the East or Rumford Street to the West. The bio-retention tree pit area can be accessed directly from Booth Street East or Upper Brook Street.

Drainage in the West of the site is accessible via the service access off York Street and the service corridor running north to south through the site. Tank AT2 and drainage running along the south of the site can be accessed directly from Booth Street East. Refer to Appendix B for a site access plan.

7. Contacts

Alan England, Senior Maintenance Manager (MECD Area Manager), Facilities Management and Compliance, University of Manchester. tel: 0161 275 2303, email: A.England@manchester.ac.uk

Brent Wills, Head of Facilities Maintenance and Compliance, University of Manchester. Tel: 0161 306 4952, email: Brent.Wills@manchester.ac.uk

Gary Rowlinson, Specialist Contracts Manager, Compliance Contract Team, The University of Manchester. Tel: 0161 275 7967, email: gary.rowlinson@manchester.ac.uk

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Appendix A Maintenance Schedule



MECD SuDS and Surface Water Maintenance Regime

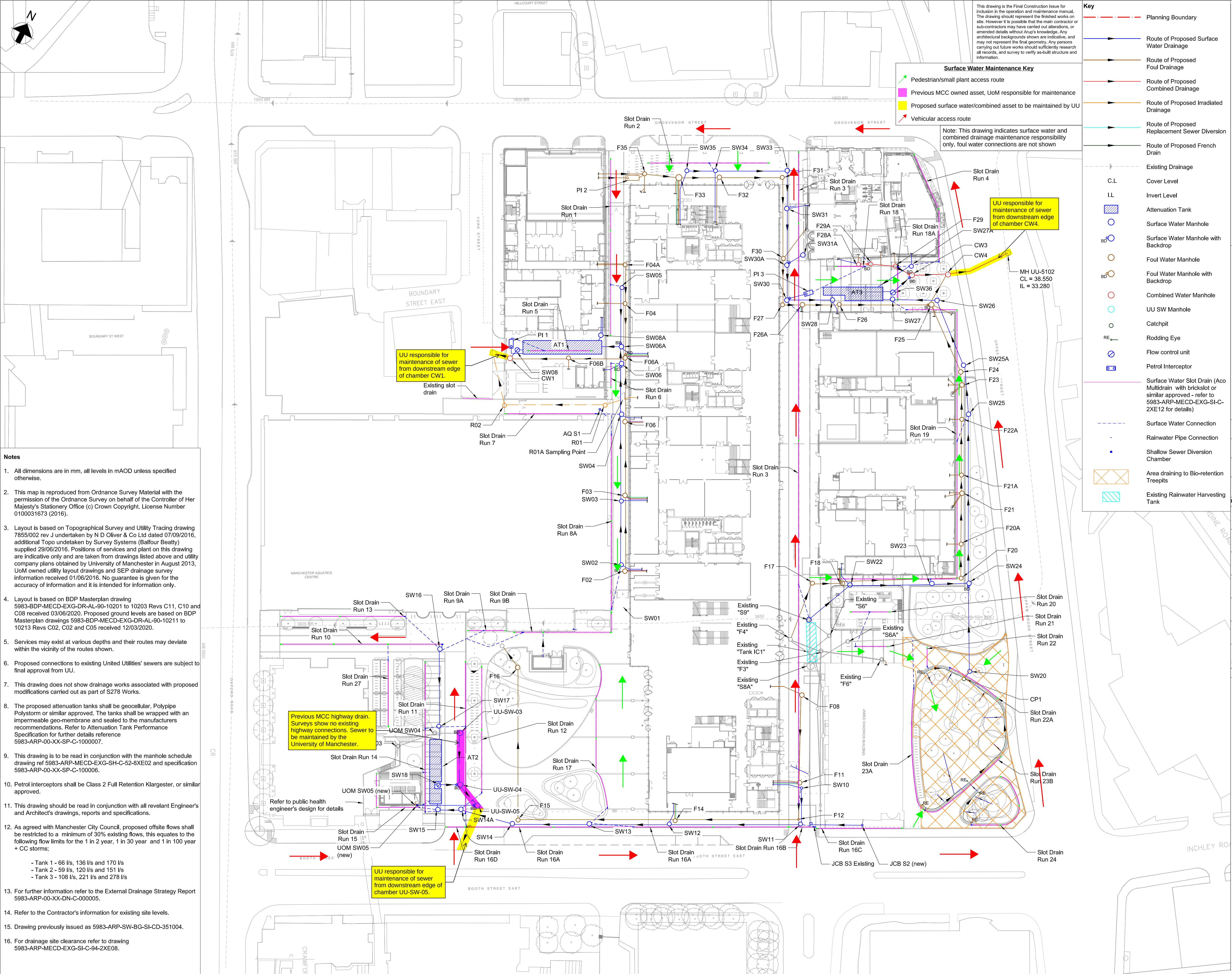
by	ES
chd	TS
date	07/07/2023

Maintenance Tasks						Inspection Log - to be updated after every inspection or maintenance activity			
Element(s)		Inspection Activity	Frequency	Duration	Plant & Equipment Requirement	Date	Observations	Actions	Adjustment to regular inspection frequency required?
Regular Maintenance Tasks	Surface Water Pipe Network, Combined Pipe Network, Linear Drainage (Slot Drains)	Visual inspection of surface features, inlets & access covers to inspect for structural damage (cracks, subsidence) or defects.	Monthly	1 day	N/A				
	Surface Water Pipe Network, Combined Pipe Network	Lift access covers to visually inspect condition of access chambers and presence of silt, debris and oil, remove as necessary.	Annually	1 day	Gully emptier trucks if sediment removal is required				
	Linear Drainage (Slot Drains)	Remove access unit trays, dispose of silt within sump units and jet the channels according to manufacturer's specification.	Annually	1 day	Access chamber lifting tools, pipe jetting rig				
	Petrol Interceptors PI1 & PI3	Monitor for evidence of poor operation to inform appropriate maintenance frequencies. Remove sediment, litter oil and grease within any part of the petrol interceptor tank and structures, in line with manufacturer's guidance.	Twice-yearly or as required	1 day	Chamber lifting tools, gully suction cleaner				
	Petrol Interceptors PI1 & PI3	Change filter media in line with manufacturer's guidance.	Annually or as required	1 day	Chamber lifting tools, replacement filter material				
	Attenuation Tanks	Inspect tanks to identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually	1 day for 3n.o. tanks	Equipment to open access shaft, equipment required for internal inspection (e.g. torch)				
	Attenuation Tanks Inlets, Bio-Retention Tree Pits & Filter Drains Inlets	Remove debris and weeds from catchment surface where it may cause risks to performance.	Monthly	1 day	Equipment to clear debris including sweeper brushes, litter bags				
	Rainwater Harvesting Tank Inlets	Cleaning of tank inlets, outlets, gutters, withdrawal devices and roof drain filters of silt and other debris.	Annually (and following poor performance)	1 day	Lifting tools for tank inspection chambers. equipment to clear debris including sweeper brushes, litter bags				
	Rainwater Harvesting Tank	Record indicated water level, monitor display panel for any alert symbols.	Daily in line with manufacturer recommendations	<1 day	N/A				
	Rainwater Harvesting Tank	Inspect and clean rainwater & in-line filter cartridges.	6-Monthly	<1 day	N/A				
	Rainwater Harvesting Tank	Drain and clean tank, remove and clean pump filter.	Annually	1 day	Lifting tools for tank inspection chambers, gully suction cleaner or similar				
	Attenuation Tanks Forebays and Downstream Chambers	Remove sediment from internal forebays and flow control chambers (chambers SW08, SW18, SW36).	Annually, or as required	1 day for 3n.o. tanks	Gully suction cleaner				
	Flow Controls	Inspect flow control structures SW08, SW18 and SW36 to identify defects or blockages. If required, take remedial action.	Annually	1 day for 3n.o. tanks	Chamber cover lifting equipment				
	Attenuation Tanks, Rainwater Harvesting Tank	Inspect all inlets, outlets, vents, overflows to ensure they are in good condition and operating as designed. Inspect for signs that geomembrane is damaged or is allowing infiltration to the ground.	Annually	1 day for 3n.o. tanks	Equipment to open access shaft, equipment required for internal inspection (e.g. torch)				
	Bio-Retention Tree Pits & Filter Drains	Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in filter drains to determine if maintenance is necessary.	Quarterly	1 day	Recording equipment				

Maintenance Tasks						Inspection Log - to be updated after every inspection or maintenance activity			
Element(s)		Inspection Activity	Frequency	Duration	Plant & Equipment Requirement	Date	Observations	Actions	Adjustment to regular inspection frequency required?
Regular Maintenance Tasks	Bio-Retention Tree Pits & Filter Drains	Check operation of filter drains by inspection of flows after rain, visually inspect flow through downstream chamber (Chamber CP1), note that flow through chamber SW20 should only be observed during large return-period storms.	Annually	1 day	Manhole lifting equipment				
	Bio-Retention Tree Pits & Filter Drains	Assess vegetated area for signs of disease infection, poor growth, invasive species etc. and replace as necessary.	Quarterly	1 day	Landscaping equipment if replacement of vegetation is required.				
	Bio-Retention Tree Pits & Filter Drains	Inspect inlets, outlets and perforated pipework for siltation and blockage, establish appropriate silt removal frequency.	Quarterly	1 day	Manhole lifting equipment to visually inspect downstream chambers (CP1 & SW20)				
	Bio-Retention Tree Pits & Filter Drains	Remove sediment, litter and debris build up from inlets, perforated pipes and outlets, access to be gained from rodding eyes or chamber CP1.	Quarterly to biannually depending on rate of build up	1 day	Equipment for debris clearance, e.g. litter bags Pipe rodding or jetting equipment				
	Bio-Retention Tree Pits & Filter Drains	Water vegetated area.	As required (during periods of little rain)	1 day	Water hose				
Occasional Maintenance Tasks	Surface Water Pipe Network, Combined Pipe Network	Inspection of sewer condition using CCTV or other intrusive survey method.	Biannually	1 week	CCTV push-rod or robotic crawler depending on size of pipe				
	Surface Water Pipe Network, Combined Pipe Network	Rodding or jetting of pipes to clear siltation or blockages.	As required following survey	1 week	Pipe jetting rig of appropriate pressure according to pipe manufacturer specifications				
	Attenuation Tanks, Rainwater Harvesting Tank	Survey inside of tanks for sediment build-up and remove from silt traps/filters if necessary.	Every 5 years or as required	1 week	Equipment to open access shaft, any equipment required for internal inspection (e.g. torch). Gully suction cleaner				
	Bio-Retention Tree Pits & Filter Drains	Replace any plants to maintain planting density.	As required	1 week	Landscaping equipment, e.g. shovels, trowels etc.				
	Bio-Retention Tree Pits & Filter Drains	Remove or control tree roots where they are encroaching on the sides of the filter drain, using methods as recommended in BS 3998:2010.	As required	1 week	Landscaping equipment (dependant on method of root management)				
	Bio-Retention Tree Pits & Filter Drains	Infill any holes or scour in the filter medium, improve erosion protection if required.	As required	<1 week	Landscaping equipment e.g. shovels, trowels, material for erosion protection if required				
	Bio-Retention Tree Pits & Filter Drains	Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch.	As required	<1 week	Rake or mechanical scarifier				
Remedial Maintenance Tasks	Surface Water Pipe Network, Combined Pipe Network	Repair of structural damage or defects to any part of the sewerage system including chamber lids and pipe bedding/surround.	As required following biannual survey	Varies	Plant requirement dependant on methodology for repair				
	Attenuation Tanks, Rainwater Harvesting Tank	Repair/ rehabilitate inlet, outlet, overflows, vents, flow controls, geomembrane.	As required following 5-year survey	Varies	Plant requirement dependant on methodology for repair				
	Rainwater Harvesting Tank	Repair of pumps, repair of damage to tank.	As required following 5-year survey	Varies	Plant requirement dependant on methodology for repair				
	Bio-Retention Tree Pits & Filter Drains	Remove and replace filter medium and vegetation above.	As required, likely >20years	1-2 weeks	Landscaping equipment, excavators, dumpers				
	Petrol Interceptors PI1 & PI3	Replace malfunctioning parts or structures. In line with manufacturer's guidelines.	As required following twice yearly survey	Varies	Plant requirement dependant on methodology for repair				
	All surface water and SuDS elements	Replacement at the end of serviceable lifetime.	As required	Varies	Plant requirement dependant on element methodology for replacement				

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Appendix B Drainage Drawings and Access Plan



- Notes**
- All dimensions are in mm, all levels in mAOD unless specified otherwise.
 - This map is reproduced from Ordnance Survey Material with the permission of the Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office (c) Crown Copyright, License Number 0100031673 (2016).
 - Layout is based on Topographical Survey and Utility Tracing drawing 7855/002 rev J undertaken by N D Oliver & Co Ltd dated 07/09/2016, additional Topo undertaken by Survey Systems (Balfour Beatty) supplied 29/06/2016. Positions of services and plant on this drawing are indicative only and are taken from drawings listed above and utility company plans obtained by University of Manchester in August 2013, UoM owned utility layout drawings and SEP drainage survey information received 01/06/2016. No guarantee is given for the accuracy of information and it is intended for information only.
 - Layout is based on BDP Masterplan drawing 5983-BDP-MECD-EXG-DR-AL-90-10201 to 10203 Revs C11, C10 and C08 received 03/06/2020. Proposed ground levels are based on BDP Masterplan drawings 5983-BDP-MECD-EXG-DR-AL-90-10211 to 10213 Revs C02, C02 and C05 received 12/03/2020.
 - Services may exist at various depths and their routes may deviate within the vicinity of the routes shown.
 - Proposed connections to existing United Utilities' sewers are subject to final approval from UU.
 - This drawing does not show drainage works associated with proposed modifications carried out as part of S278 Works.
 - The proposed attenuation tanks shall be geocellular, Polypipe Polystorm or similar approved. The tanks shall be wrapped with an impermeable geo-membrane and sealed to the manufacturers recommendations. Refer to Attenuation Tank Performance Specification for further details reference 5983-ARP-00-XX-SP-C-1000007.
 - This drawing is to be read in conjunction with the manhole schedule drawing ref 5983-ARP-MECD-EXG-SH-C-52-8XE02 and specification 5983-ARP-00-XX-SP-C-1000006.
 - Petrol interceptors shall be Class 2 Full Retention Klargestor, or similar approved.
 - This drawing should be read in conjunction with all relevant Engineer's and Architect's drawings, reports and specifications.
 - As agreed with Manchester City Council, proposed offsite flows shall be restricted to a minimum of 30% existing flows, this equates to the following flow limits for the 1 in 2 year, 1 in 30 year and 1 in 100 year + CC storms;
 - Tank 1 - 66 l/s, 136 l/s and 170 l/s
 - Tank 2 - 59 l/s, 120 l/s and 151 l/s
 - Tank 3 - 108 l/s, 221 l/s and 278 l/s
 - For further information refer to the External Drainage Strategy Report 5983-ARP-00-XX-DN-C-000005.
 - Refer to the Contractor's information for existing site levels.
 - Drawing previously issued as 5983-ARP-SW-BG-SI-CD-351004.
 - For drainage site clearance refer to drawing 5983-ARP-MECD-EXG-SI-C-94-2XE08.

The University of Manchester

Keyplan: North:

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS :-

Item	Hazard	Risk
FC01	Final Construction	AM 26/03/21 TH TWS

MANCHESTER
The University of Manchester

Directorate of Estates and Facilities
Beyer Building
The University of Manchester
Oxford Road
Manchester
M13 9PL

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www.arup.com

Drawing Status

Final Construction

Project

Manchester Engineering Campus Development -5983

Building Name

-

Sub Site Name

-

Site Name

MECD

Drawing Title

Drainage Strategy
Proposed Foul and Surface Water Layout
General Arrangement

PM

AM

Checked

TH

Authorised

TWS

Scale

1:500

Date

26/03/21

Date

26/03/21

Date

26/03/21

Drawing No.

5983-ARP-MECD-EXG-SI-C-52-2XE01

Revision

FC01

Notes

- All dimensions are in mm, all levels in mAOD unless specified otherwise.
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- Layout is based on Topographical Survey and Utility Tracing drawing 7855/002 rev J undertaken by N D Oliver & Co Ltd dated 07/09/2016, additional Topo undertaken by Survey Systems (Balfour Beatty) supplied 29/06/2016. Positions of services and plant on this drawing are indicative only and are taken from drawings listed above and utility company plans obtained by University of Manchester in August 2013 and UoM owned utility layout drawings. No guarantee is given for the accuracy of information and it is intended for information only.
- Layout is based on BDP Masterplan drawing 5983-BDP-MECD-EXG-DR-AL-90-10201 to 10203 Revs C08, C09 and C05 dated 14/02/2020.
- Proposed ground levels are based on based on BDP Masterplan drawings 5983-BDP-MECD-EXG-DR-AL-90-10211 Rev C03 dated 05/06/2018 and BDP drawings 5983-BDP-ACC-EXG-DR-AL-90-10212 to 10213 Rev C01.
- Services may exist at various depths and their routes may deviate within the vicinity of the routes shown.
- Proposed connections to existing United Utilities' sewers are subject to final approval from UU.
- This drawing does not show drainage works associated with proposed modifications carried out as part of S278 Works.
- The proposed attenuation tanks shall be geocellular. Polypipe Polystorm or similar approved. The tanks shall be wrapped with an impermeable geo-membrane and sealed to the manufacturers recommendations. Refer to Attenuation Tank Performance Specification for further details reference 5983-ARP-00-XX-SP-C-1000007.
- This drawing is to be read in conjunction with the manhole schedule drawing ref 5983-ARP-MECD-EXG-SH-C-52-8XE02 and specification 5983-ARP-00-XX-SP-C-100006.
- Petrol interceptors shall be Class 2 Full Retention Klargestor, or similar approved.
- This drawing should be read in conjunction with all relevant Engineer's and Architect's drawings, reports and specifications.
- As agreed with Manchester City Council, proposed offsite flows shall be restricted to a minimum of 30% existing flows, this equates to the following flow limits for the 1 in 2 year, 1 in 30 year and 1 in 100 year + CC storm;
 - Tank 1 - 66 l/s, 136 l/s and 170 l/s
 - Tank 2 - 59 l/s, 120 l/s and 151 l/s
 - Tank 3 - 108 l/s, 221 l/s and 278 l/s
- For further information refer to the External Drainage Strategy Report 5983-ARP-00-XX-DN-C-000005.
- Refer to the Contractor's information for existing site levels.
- For drainage site clearance refer to drawing 5983-ARP-MECD-EXG-SI-C-94-2XE08.
- Drainage from the building between building exit and the 1st external manhole (i.e Public Health Drainage) is shown on this drawing to aid the Contractor in the construction of the manholes only. Please refer to the PH drawing series 5983-ARP-MCH-B-GA-P-52 for further details of this drainage and for any setting out/construction details/materials.
- All slot drain connection pipework between sump units and MH connections are to be 150mm dia at gradient of 1:150 unless otherwise stated.
- Petrol Interceptor and Attenuation Tank ventilation pipes should be as short as is practicable. They should not terminate less than 2.1m above paving (unless noted otherwise) nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m where practicable. The Petrol Interceptor electrical supply should be provided for the oil level alarm, which is to be fitted, tested and commissioned by a competent installer to ensure the excess oil probe is calibrated correctly. A water supply is required for the Petrol Interceptors for routine cleansing and refilling after removal of waste material and liquid. This can come from water provision for façade cleaning.
- This drawing supercedes 5983-ARP-ACC-EXG-SI-C-78-2XE16.

Key

- Planning Boundary
- Route of Proposed Surface Water Drainage
- Route of Proposed Foul Drainage
- Route of Proposed Combined Drainage
- Route of Proposed Irradiated Drainage
- Route of Proposed Replacement Sewer Diversion
- Route of Proposed French Drain
- Route of Pumping Main
- Route of Lab Drainage
- Existing Drainage
- Cover Level
- Invert Level
- Attenuation Tank
- Surface Water Manhole
- Surface Water Manhole with Backdrop
- Foul Water Manhole
- Foul Water Manhole with Backdrop
- Combined Water Manhole
- UU SW Manhole
- Catchpit
- Rodding Eye
- Flow control unit
- Petrol Interceptor
- Surface Water Slot Drain (Aco Multidrain with brickslot or similar approved - refer to 5983-ARP-MECD-EXG-SI-C-2XE12 for details)
- Access Unit for Slot Drain
- Sump Unit for Slot Drain
- Surface Water Connection
- Area draining to Bio-retention Treepits
- Existing Rainwater Harvesting Tank



OXFORD ROAD

7m

750x600 BR

750x600 BR

750x600 BR

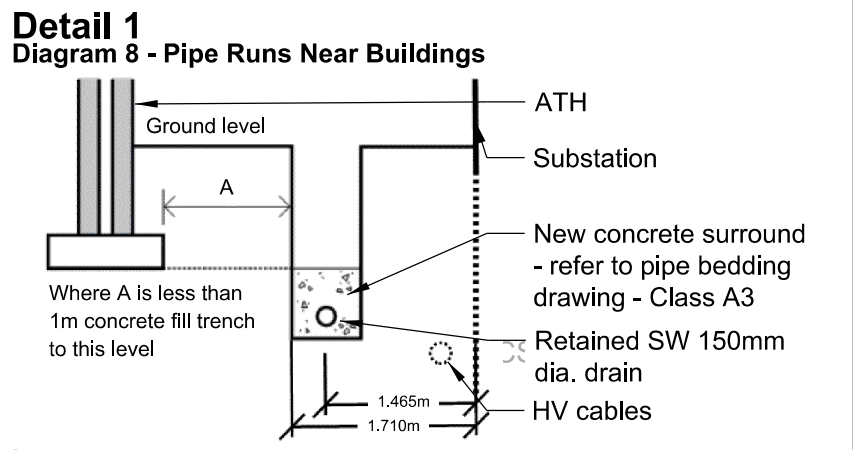
750x600 BR

750x600 BR

750x600 BR

750x600 BR

This drawing is the Final Construction Issue for inclusion in the operation and maintenance manual. The drawing should represent the finished works on site. However it is possible that the main contractor or sub-contractors may have carried out alterations, or amended details without Arup's knowledge. Any architectural backgrounds shown are indicative, and may not represent the final geometry. Any persons carrying out future works should sufficiently research all records, and survey to verify as-built structure and information.



Extent of slot drain channel and surround to be positioned to avoid obscuring manhole cover

Surface water drainage from slot drain to pass beneath existing BT Telecoms. Minimum IL at connection of 36.800mAOD or lower. Refer to drawing 5983-ARP-MECD-EXG-SE-C-52-4XE04 for connection details.

Surface water drainage in close proximity to existing BT chamber. Contractor to ensure clashes are avoided.

Surface water drainage for structure to be provided via a 100mm diameter pipe at 1@100 gradient connecting into Slot Drain Run 9. Connection point is to be made via a removable side wall panel in a 500mm section of brickslot channel. Located to avoid HV incoming feed to Aquatics Centre.

Existing Private MH. Connection utilises existing backdrops to UU shaft CL=37.86 IL=32.86

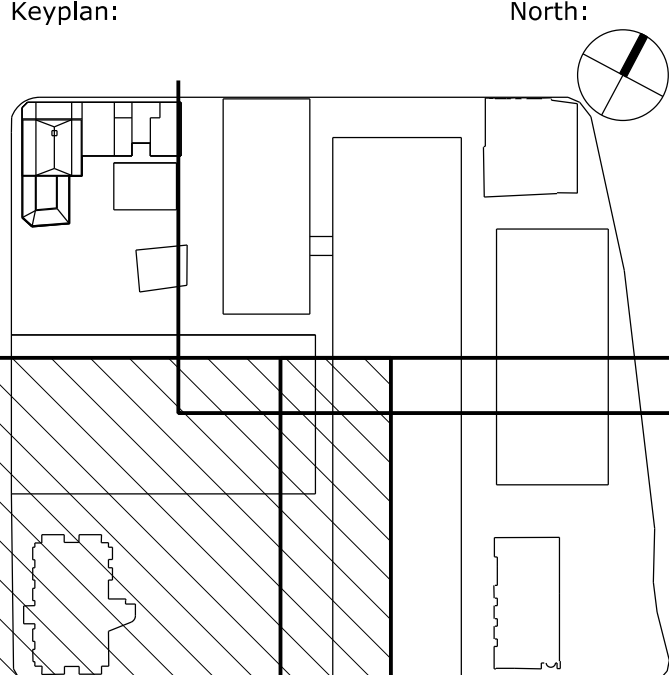
Position of drainage to the west of MEC Hall to be installed within allocated drainage corridor. Please refer to Utilities - External Service Corridors drawing 5983-ARP-MECD-EXG-SI-C-94-2XE01 for further details.

See Sheet 3 of 3

See Sheet 2 of 3

See Sheet 2 of 3

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IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS :-

Item	Hazard	Risk
All	Relevant hazards are indicated on this drawing sheet. Hazards are described in greater detail on the Anup Hazard Risk Register	Per Hazard Risk Register

FC01	Final Construction	AM	23/03/21	TH	TWS
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MANCHESTER 1824

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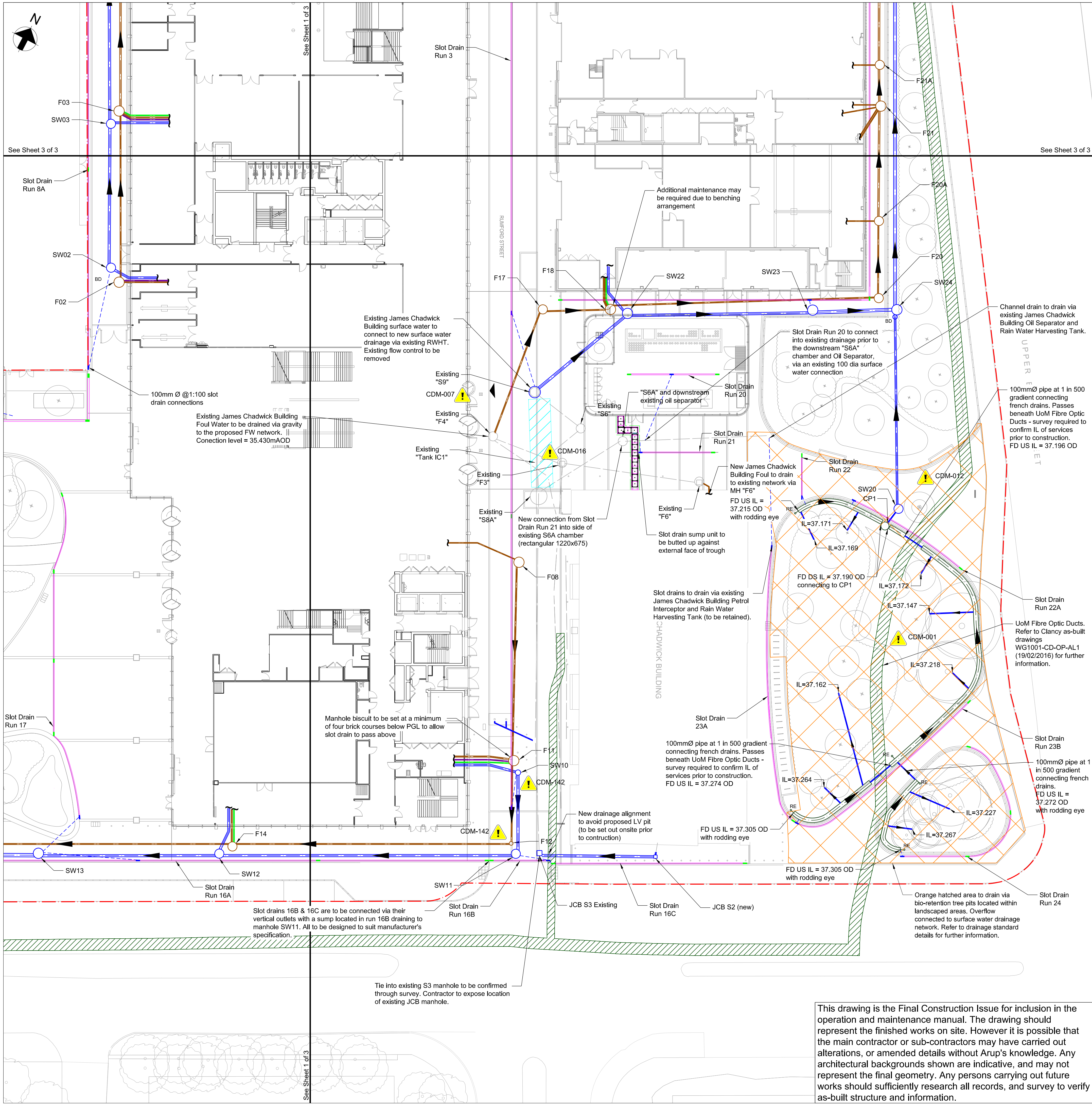
Drawing Status **Final Construction**

Project
Manchester Engineering Campus Development -5983

Building Name
Sub Site Name
Site Name
MECD

Drawing Title
Drainage Strategy
Proposed Foul and Surface Water Layout
Sheet 1 of 3

PM	Drawn	Checked	Authorised
-	AM	TH	TWS
Scale	Date	Date	Date
1:250	26/03/21	26/03/21	26/03/21
Drawing No.	Revision		
5983-ARP-MECD-EXG-SI-C-52-2XE09	FC01		



Notes

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- Layout is based on Topographical Survey and Utility Tracing drawing 7855/002 rev J undertaken by N D Oliver & Co Ltd dated 07/09/2016, additional Topo undertaken by Survey Systems (Balfour Beatty) supplied 29/06/2016. Positions of services and plant on this drawing are indicative only and are taken from drawings listed above and utility company plans obtained by University of Manchester in August 2013 and UoM owned utility layout drawings. No guarantee is given for the accuracy of information and it is intended for information only.
- Layout is based on BDP Masterplan drawing 5983-BDP-MECD-EXG-DR-AL-90-10201 to 10203 Revs C08, C09 and C05 dated 14/02/2020.
- Proposed ground levels are based on based on BDP Masterplan drawings 5983-BDP-MECD-EXG-DR-AL-90-10211 Rev C03 dated 05/06/2018 and BDP drawings 5983-BDP-ACC-EXG-DR-AL-90-10212 to 10213 Rev C01.
- Services may exist at various depths and their routes may deviate within the vicinity of the routes shown.
- Proposed connections to existing United Utilities' sewers are subject to final approval from UU.
- This drawing does not show drainage works associated with proposed modifications carried out as part of S278 Works.
- The proposed attenuation tanks shall be geocellular, Polypipe Polystorm or similar approved. The tanks shall be wrapped with an impermeable geo-membrane and sealed to the manufacturers recommendations. Refer to Attenuation Tank Performance Specification for further details reference 5983-ARP-00-XX-SP-C-1000007.
- This drawing is to be read in conjunction with the manhole schedule drawing ref 5983-ARP-MECD-EXG-SH-C-62-8XE02 and specification 5983-ARP-00-XX-SP-C-100006.
- Petrol interceptors shall be Class 2 Full Retention Klargester, or similar approved.
- This drawing should be read in conjunction with all relevant Engineer's and Architect's drawings, reports and specifications.
- As agreed with Manchester City Council, proposed offsite flows shall be restricted to a minimum of 30% existing flows, this equates to the following flow limits for the 1 in 2 year, 1 in 30 year and 1 in 100 year + CC storms:
 - Tank 1 - 66 l/s, 136 l/s and 170 l/s
 - Tank 2 - 59 l/s, 120 l/s and 151 l/s
 - Tank 3 - 108 l/s, 221 l/s and 278 l/s
- For further information refer to the External Drainage Strategy Report 5983-ARP-00-XX-DN-C-000005.
- Refer to the Contractor's information for existing site levels.
- For drainage site clearance refer to drawing 5983-ARP-MECD-EXG-SI-C-94-2XE08.
- Drainage from the building between building exit and the 1st external manhole (i.e Public Health Drainage) is shown on this drawing to aid the Contractor in the construction of the manholes only. Please refer to the PH drawing series 5983-ARP-MCH-B-GA-P-52 for further details of this drainage and for any setting out/construction details/materials.
- All slot drain connection pipework between sump units and MH connections are to be 150mm dia at gradient of 1:150 unless otherwise stated.
- Petrol Interceptor and Attenuation Tank ventilation pipes should be as short as is practicable. They should not terminate less than 2.1m above paving (unless noted otherwise) nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m where practicable. The Petrol Interceptor electrical supply should be provided for the oil level alarm, which is to be fitted, tested and commissioned by a competent installer to ensure the excess oil probe is calibrated correctly. A water supply is required for the Petrol Interceptors for routine cleansing and refilling after removal of waste material and liquid. This can come from water provision for façade cleaning.

Key

- Planning Boundary
- Route of Proposed Surface Water Drainage
- Route of Proposed Foul Drainage
- Route of Proposed Combined Drainage
- Route of Proposed Irradiated Drainage
- Route of Proposed Replacement Sewer Diversion
- Route of Proposed French Drain
- Route of Pumping Main
- Route of Lab Drainage
- Existing Drainage
- Cover Level
- Invert Level
- Attenuation Tank
- Surface Water Manhole
- Surface Water Manhole with Backdrop
- Foul Water Manhole
- Foul Water Manhole with Backdrop
- Combined Water Manhole
- UU SW Manhole
- Catchpit
- Rodding Eye
- Flow control unit
- Petrol Interceptor
- Access Unit for Slot Drain
- Sump Unit for Slot Drain
- Surface Water Connection
- Area draining to Bio-retention Treepits
- Existing Rainwater Harvesting Tank
- Enabling Works Communications Corridor

Keyplan:

North:

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS :-

All Item	Hazard	Risk		
FC01 Final Construction	AM	26/03/21	TH	TWS

Rev	Description	By	Date	Chkd	Auth
-	-	-	-	-	-

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Drawing Status

Final Construction

Project

Manchester Engineering Campus Development -5983

Building Name

-

Sub Site Name

-

Site Name

MECD

Drawing Title

Drainage Strategy
Proposed Foul and Surface Water Layout
Sheet 2 of 3

PM	Drawn	Checked	Authorised
-	AM	TH	TWS
Scale	Date	Date	Date
1:250	26/03/21	26/03/21	26/03/21

Drawing No.	Revision
5983-ARP-MECD-EXG-SI-C-52-2XE10	FC01

This drawing is the Final Construction Issue for inclusion in the operation and maintenance manual. The drawing should represent the finished works on site. However it is possible that the main contractor or sub-contractors may have carried out alterations, or amended details without Arup's knowledge. Any architectural backgrounds shown are indicative, and may not represent the final geometry. Any persons carrying out future works should sufficiently research all records, and survey to verify as-built structure and information.

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10. This drawing is to be read in conjunction with the manhole schedule drawing ref 5983-ARP-MECD-EXG-SH-C-52-8XE02 and specification 5983-ARP-00-XX-SP-C-100006.
11. Petrol interceptors shall be Class 2 Full Retention Klargester, or similar approved.
12. This drawing should be read in conjunction with all relevant Engineer's and Architect's drawings, reports and specifications.
13. As agreed with Manchester City Council, proposed offsite flows shall be restricted to a minimum of 30% existing flows, this equates to the following flow limits for the 1 in 2 year, 1 in 30 year and 1 in 100 year + CC storms:
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14. For further information refer to the External Drainage Strategy Report 5983-ARP-00-XX-DN-C-000005.
15. Refer to the Contractor's information for existing site levels.
16. For drainage site clearance refer to drawing 5983-ARP-MECD-EXG-SI-C-94-2XE08.
17. Drainage from the building between building exit and the 1st external manhole (i.e Public Health Drainage) is shown on this drawing to aid the Contractor in the construction of the manholes only. Please refer to the PH drawing series 5983-ARP-MCH-B-GA-P-52 for further details of this drainage and for any setting out/construction details/materials.
18. All slot drain connection pipework between sump units and MH connections are to be 150mm dia at gradient of 1:150 unless otherwise stated.
19. Petrol Interceptor and Attenuation Tank ventilation pipes should be as short as is practicable. They should not terminate less than 2.1m above paving (unless noted otherwise) nor less than 1m above the head of an openable window or other opening into a building within a horizontal distance of 3m where practicable. The Petrol Interceptor electrical supply should be provided for the oil level alarm, which is to be fitted, tested and commissioned by a competent installer to ensure the excess oil probe is calibrated correctly. A water supply is required for the Petrol Interceptors for routine cleansing and refilling after removal of waste material and liquid. This can come from water provision for façade cleaning.

Proposed termination location of separator 1100 vent pipe. Terminated 2.1m above external ground level, with vented cover to stop debris ingress.

1000 cable duct for alarm probe electrical connection

Petrol Interceptor Area drained=410m² L=2.61m W=1.225m Klargester NSFA10 or similar

Flow control 290mm orifice

Existing UU MH4002 CL=38.10 IL=31.96

Non-return valve required prevent backing up from downstream combined sewer.

Attenuation Tank Area=93m² D=2m V=180m³

Slot Drain Run 5

CDM-053

CDM-018/046

Refer to Public Health drawings for details of the compacter area channel drain arrangements.

See Sheet 1 of 3

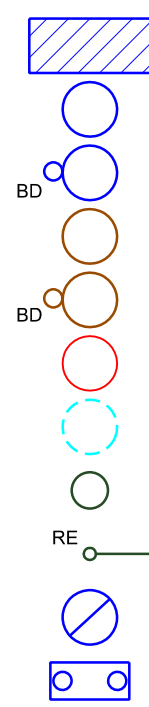
Existing manhole to be relocated along existing sewer line and live incoming connections diverted to the new manhole location. Note, existing slot drains incoming to this location are to be abandoned. Connection to Aquatics roof drainage to be re-formed.

Position of drainage to the west of MEC Hall is dictated by adjacent utility corridors. Please refer to drawing 5983-ARP-MECD-EXG-SI-C-94-2XE01 for further details.

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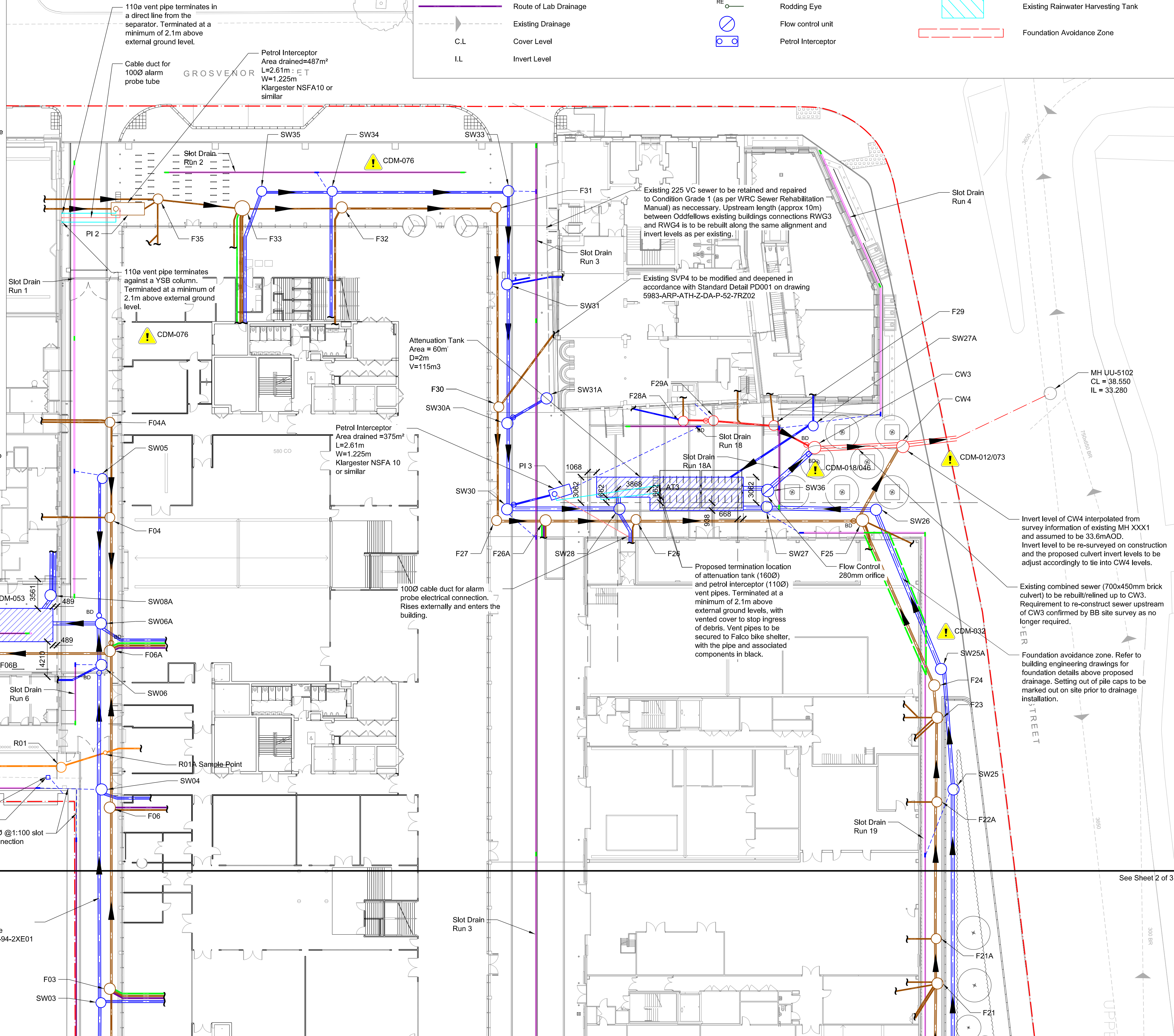
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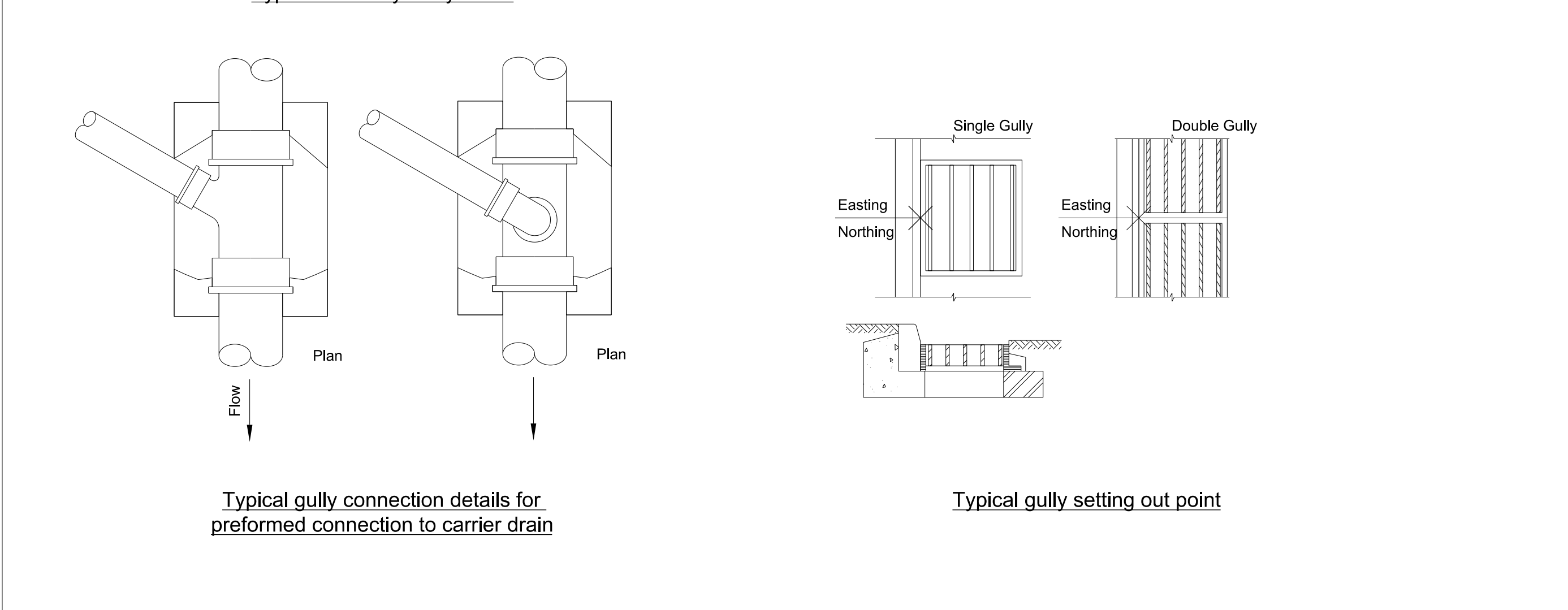
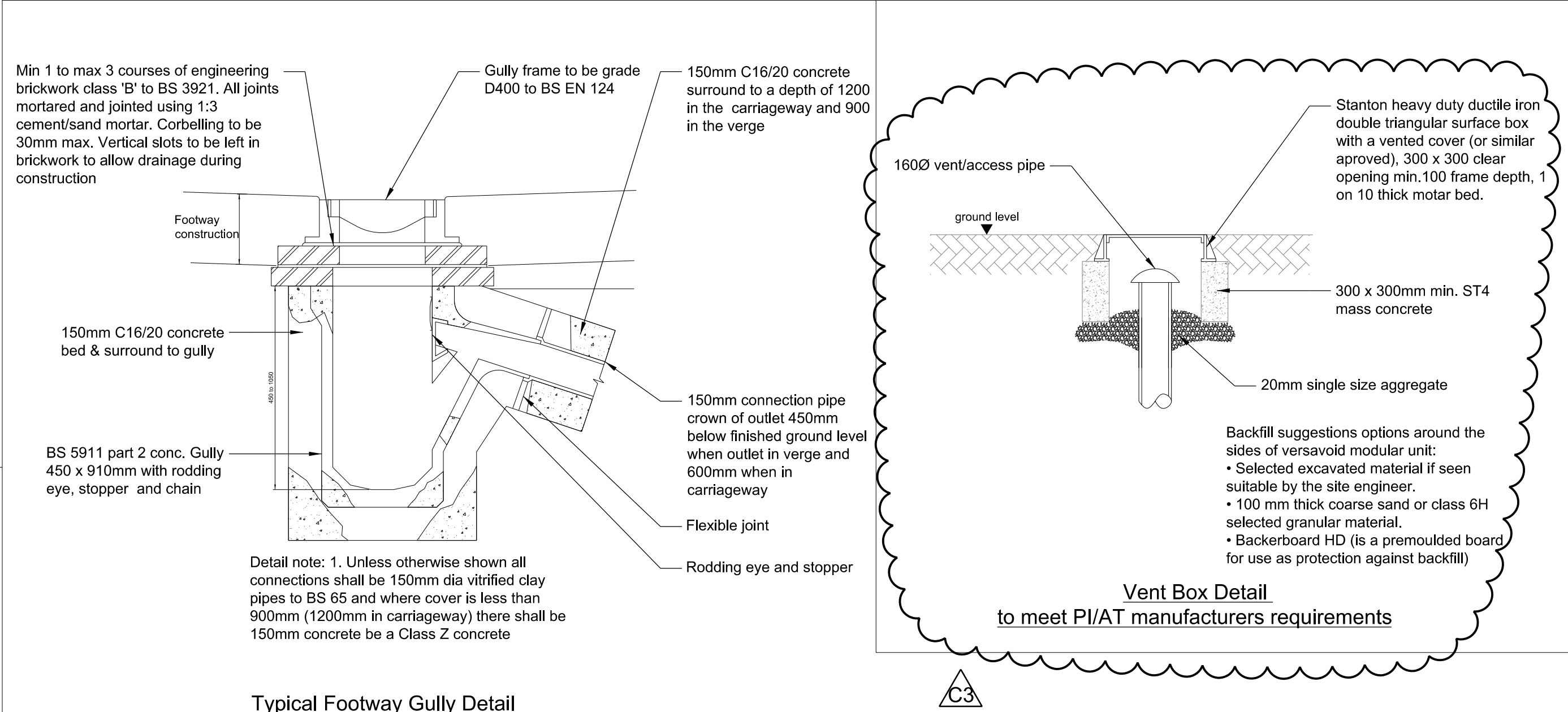
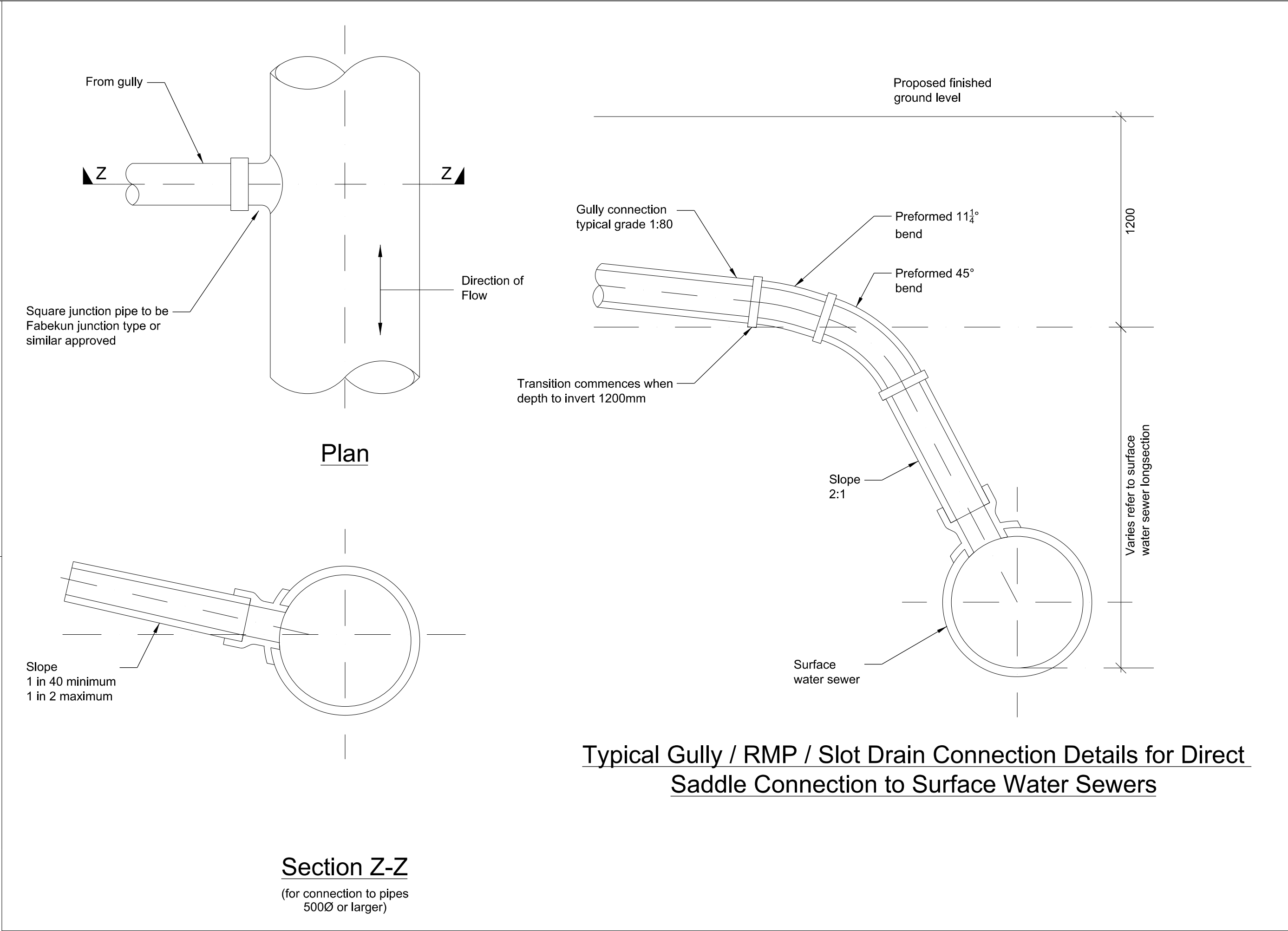
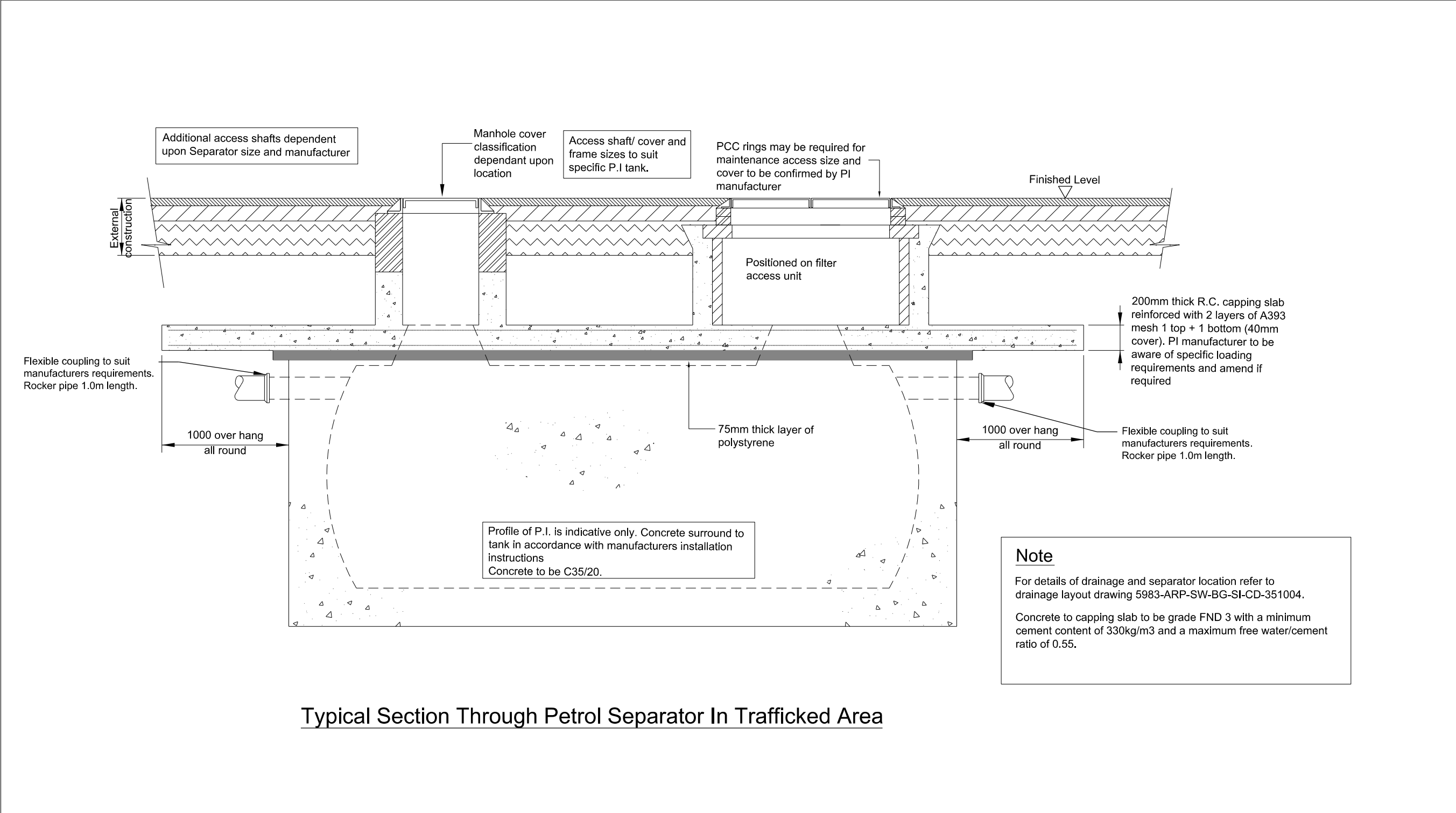
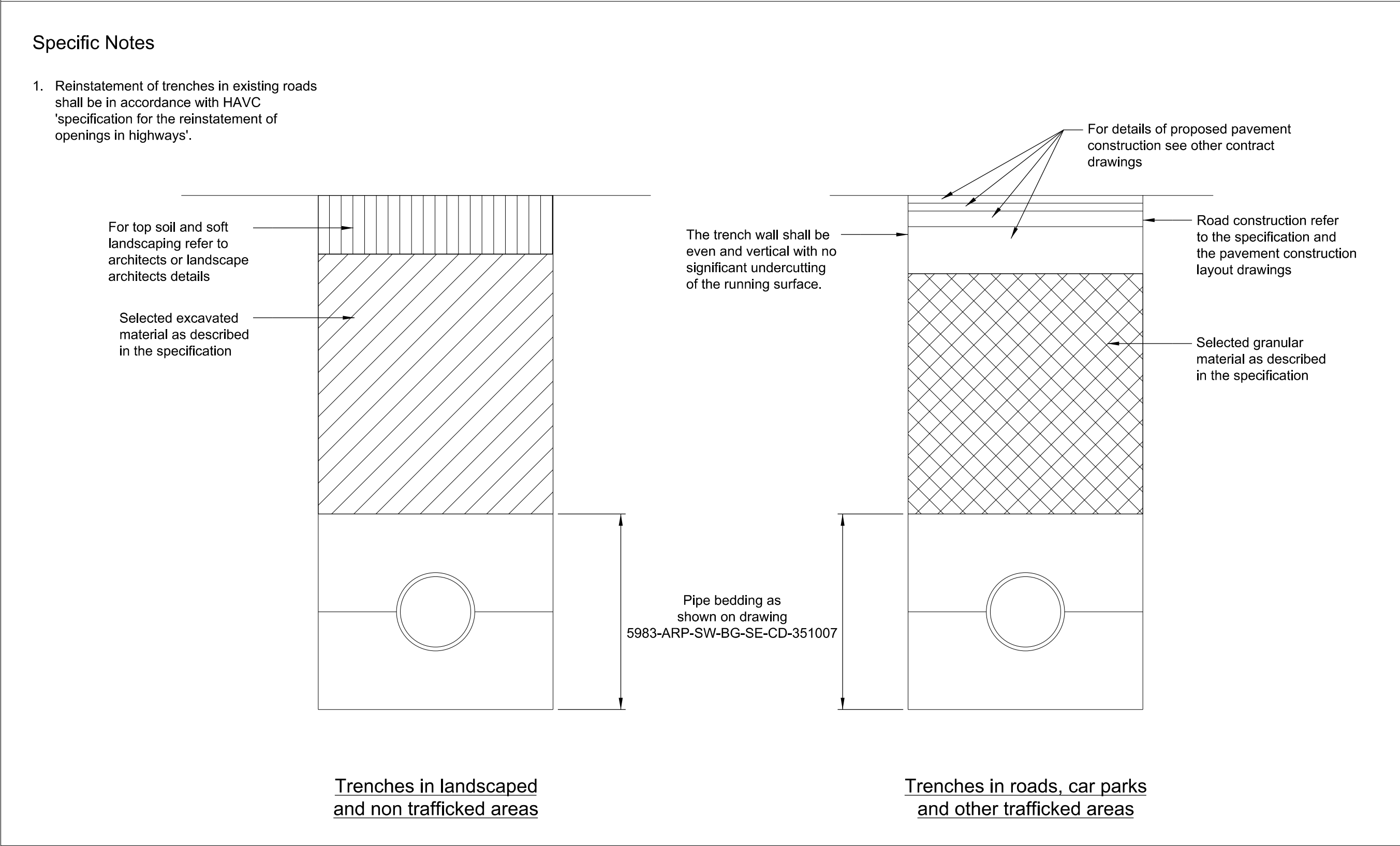
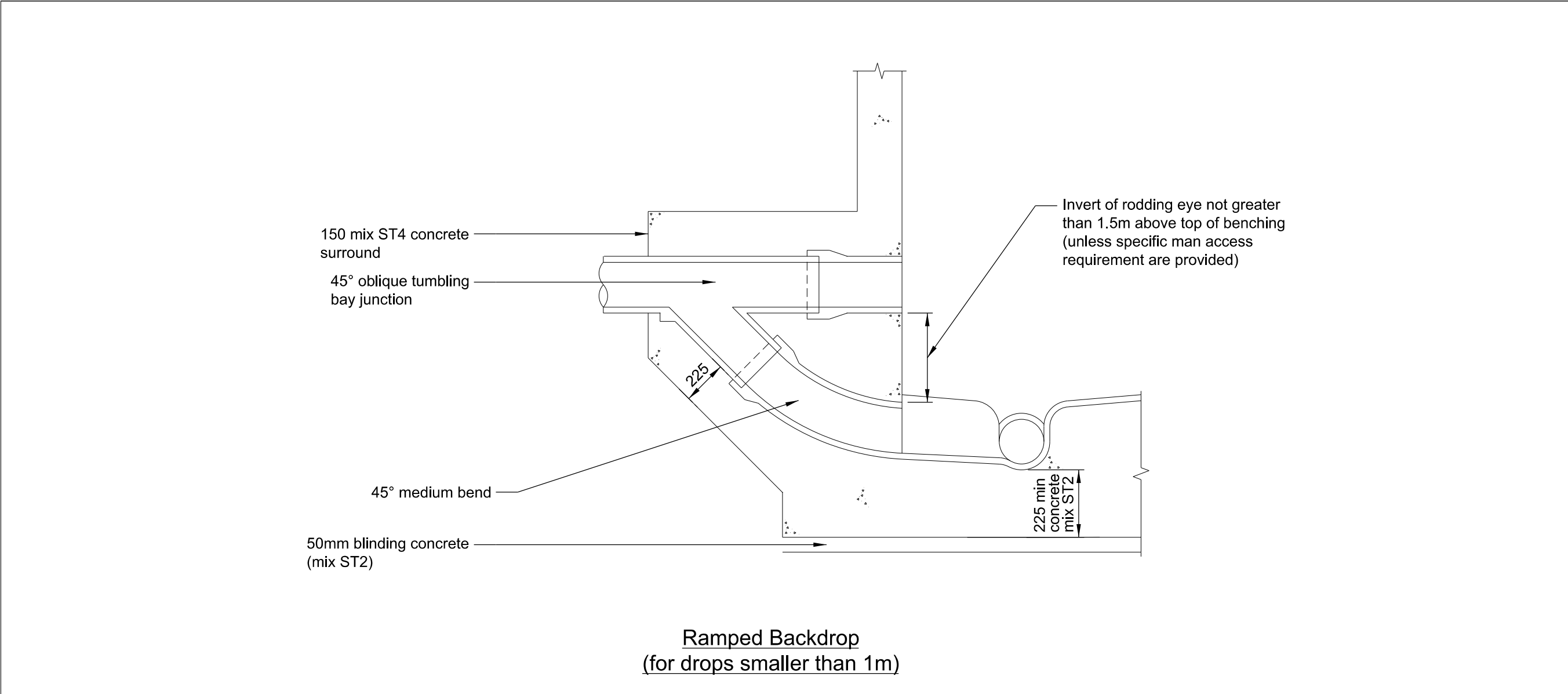
- Planning Boundary
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- Route of Proposed Combined Drainage
- Route of Proposed Irradiated Drainage
- Route of Proposed Replacement Sewer Diversion
- Route of Proposed French Drain
- Route of Pumping Main
- Route of Lab Drainage
- Existing Drainage
- C.L Cover Level
- I.L Invert Level



- Attenuation Tank
- Surface Water Manhole
- Surface Water Manhole with Backdrop
- Foul Water Manhole
- Foul Water Manhole with Backdrop
- Combined Water Manhole
- UU SW Manhole
- Rodding Eye
- Flow control unit
- Petrol Interceptor

- Surface Water Slot Drain (Aco Multidrain with brickslot or similar approved - refer to 5983-ARP-MECD-EXG-SI-C-2XE12 for details)
- Access Unit for Slot Drain
- Sump Unit for Slot Drain
- Surface Water Connection
- Area draining to Bio-retention Treepits
- Existing Rainwater Harvesting Tank
- Foundation Avoidance Zone





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- Refer to the Contractor's information for existing site levels.
- Drawing previously issued as 5983-ARP-SW-BG-SE-CD-351011.

Keyplan:

North:

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS :-

Item	Hazard	Risk
C3	Vent Box Detail Added	AS 13/04/18 RJ TWS
C2	Details moved from sheet 1	AS 05/09/17 RJ TWS
C1	Construction Issue	AS 07/09/16 RJ TWS
T1	For Tender	SH 17-06-16 MT TWS

Rev	Description	By	Date	Chk'd	Auth

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Drawing Status

For Construction

Project
Manchester Engineering Campus Development -5983

Building Name
-

Sub Site Name
-

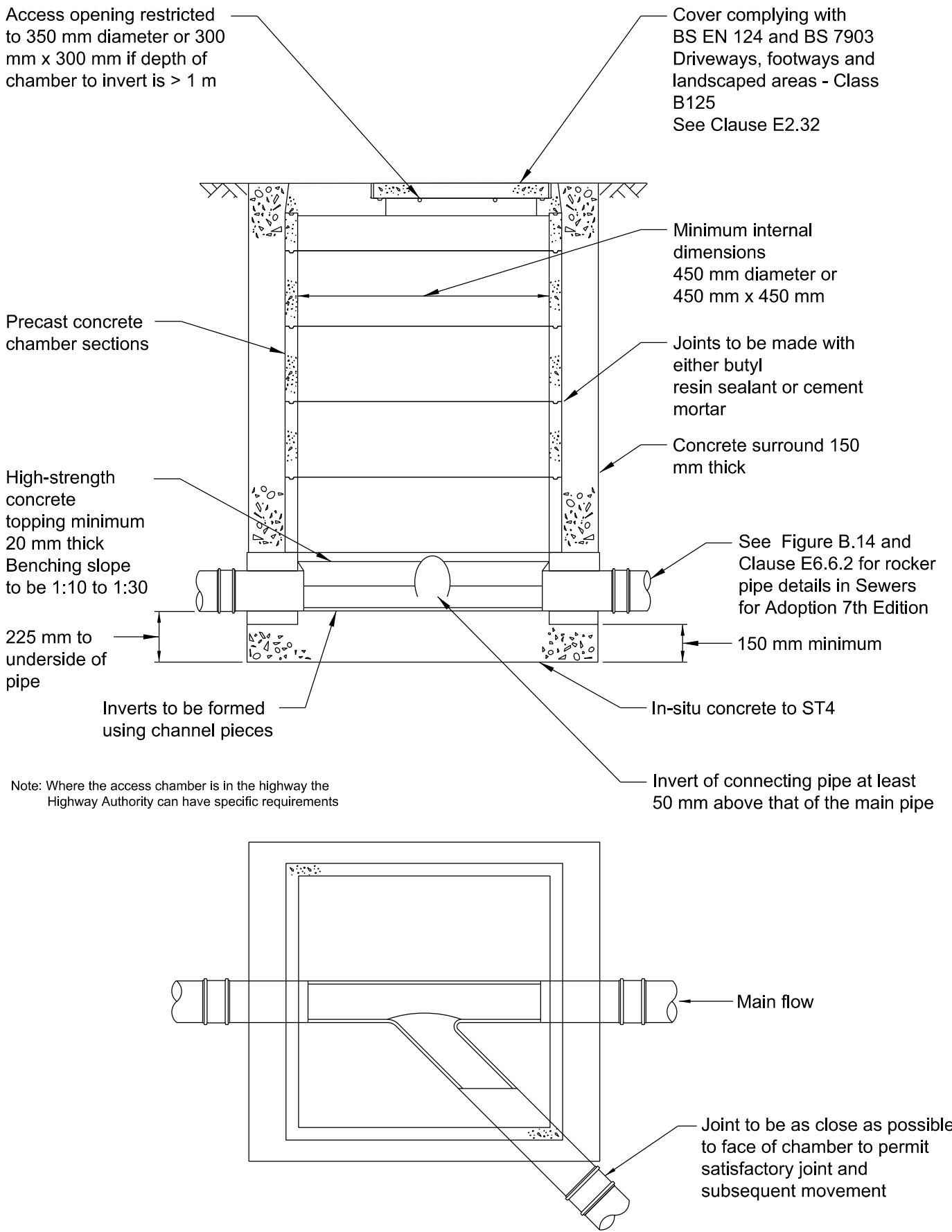
Site Name
MECD

Drawing Title
Drainage Strategy
Standard Details Sheet 5

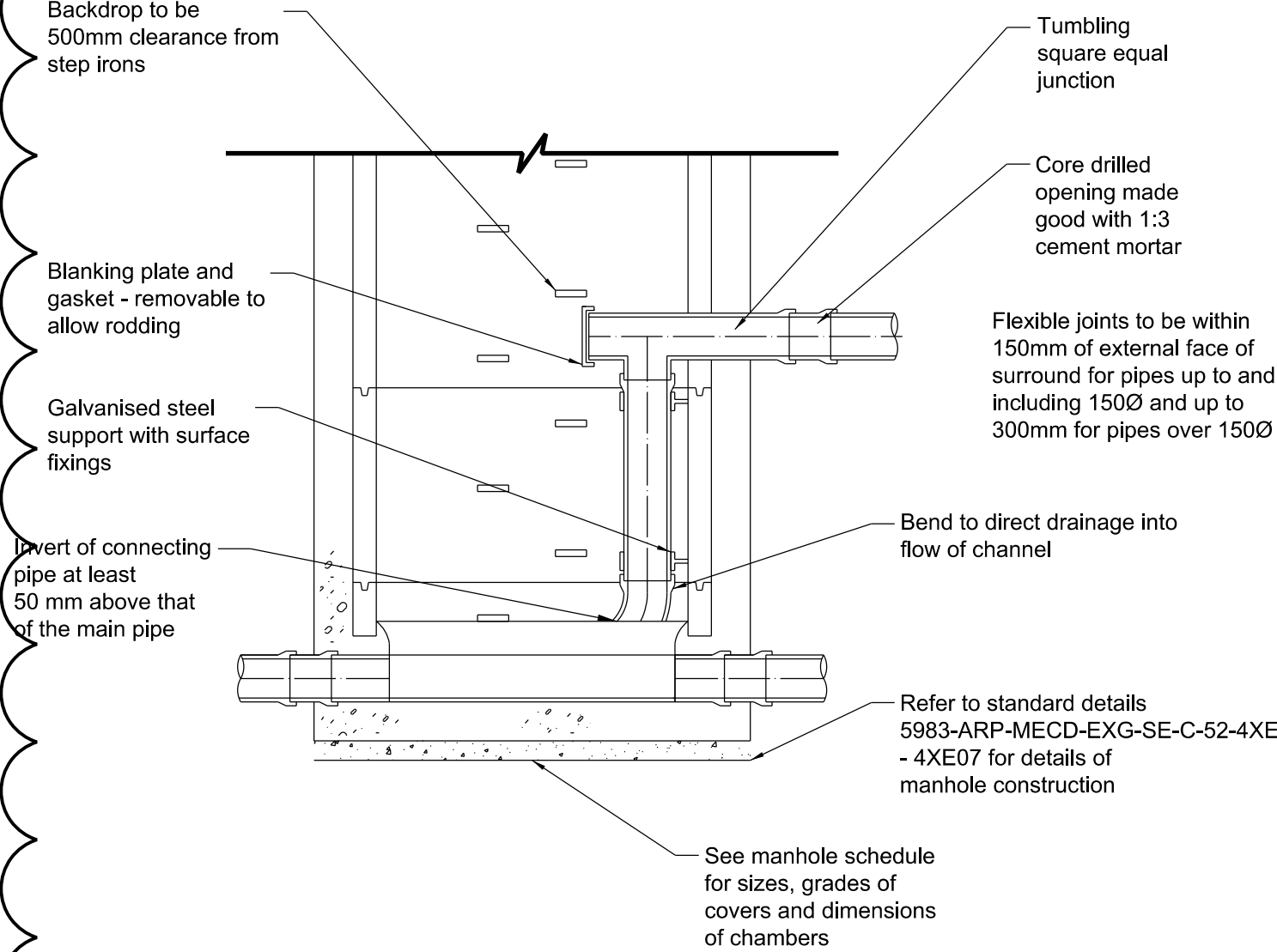
PM	Drawn	Checked	Authorised
-	APS	RJ	TWS

Scale	Date	Date	Date
NTS	17/06/16	07/09/16	07/09/16

Drawing No.	Revision
5983-ARP-MECD-EXG-SE-C-52-4XE07	C3

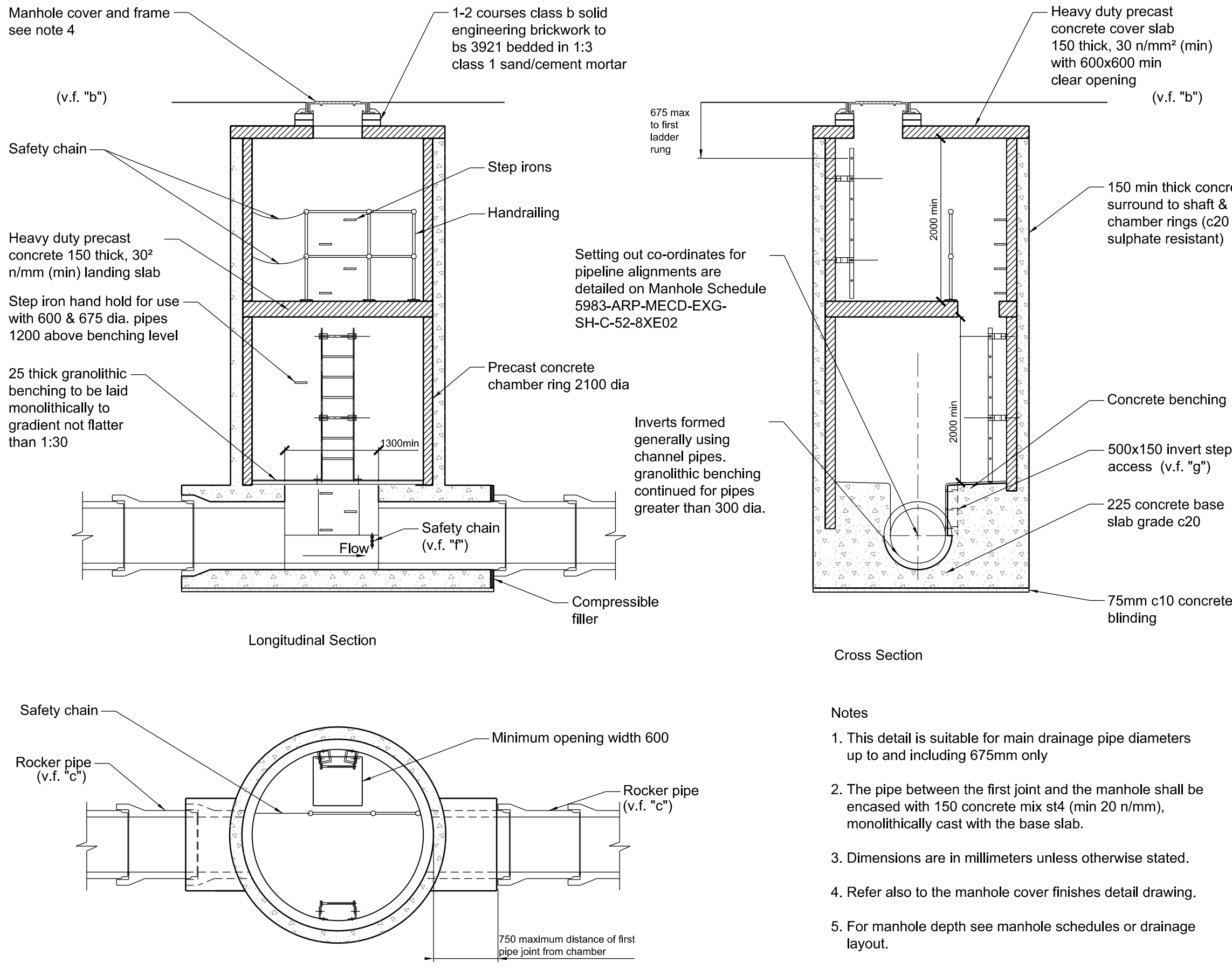


450 x 450 Shallow Sewer Diversion Chamber

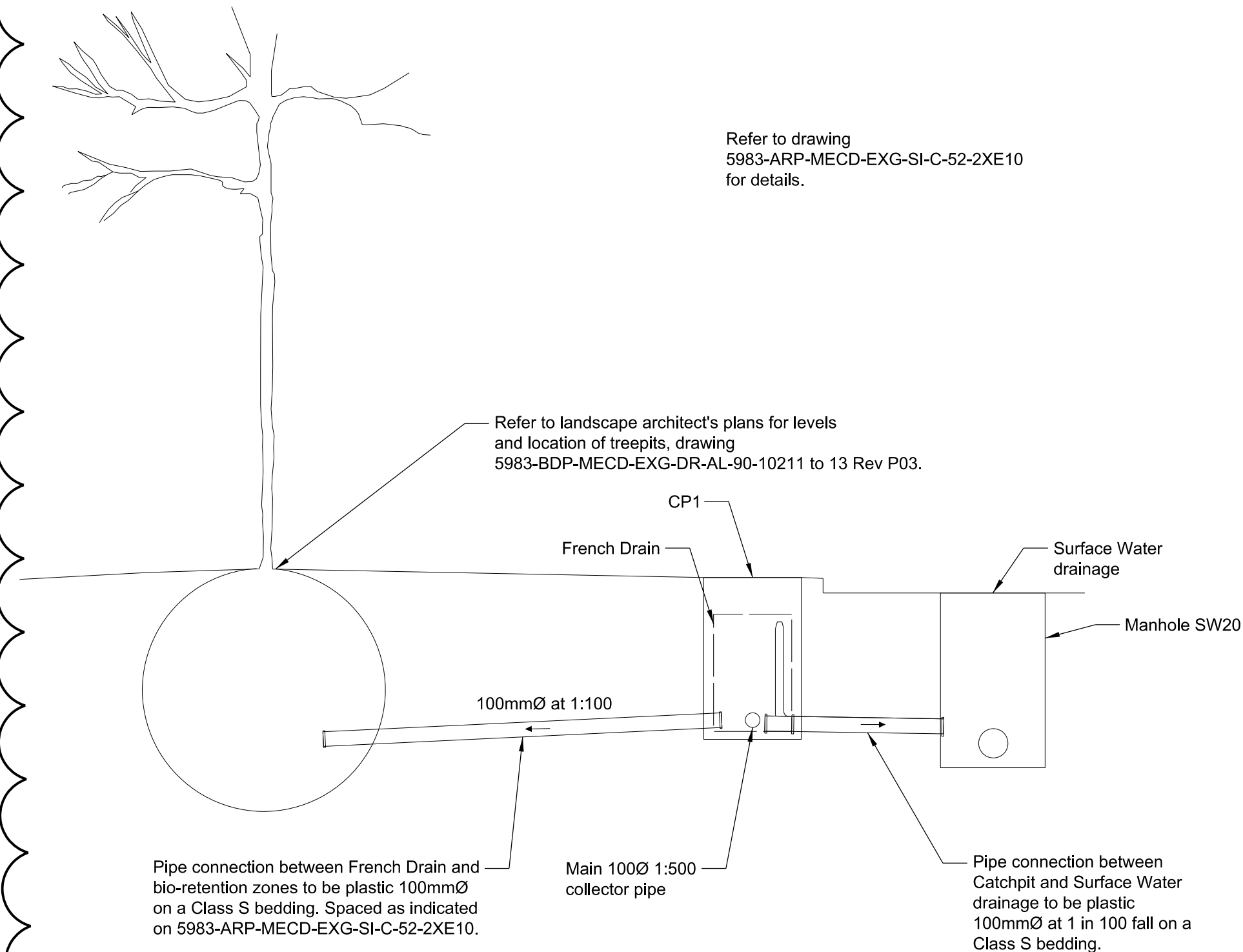


Typical Detail Internal Backdrop Manhole

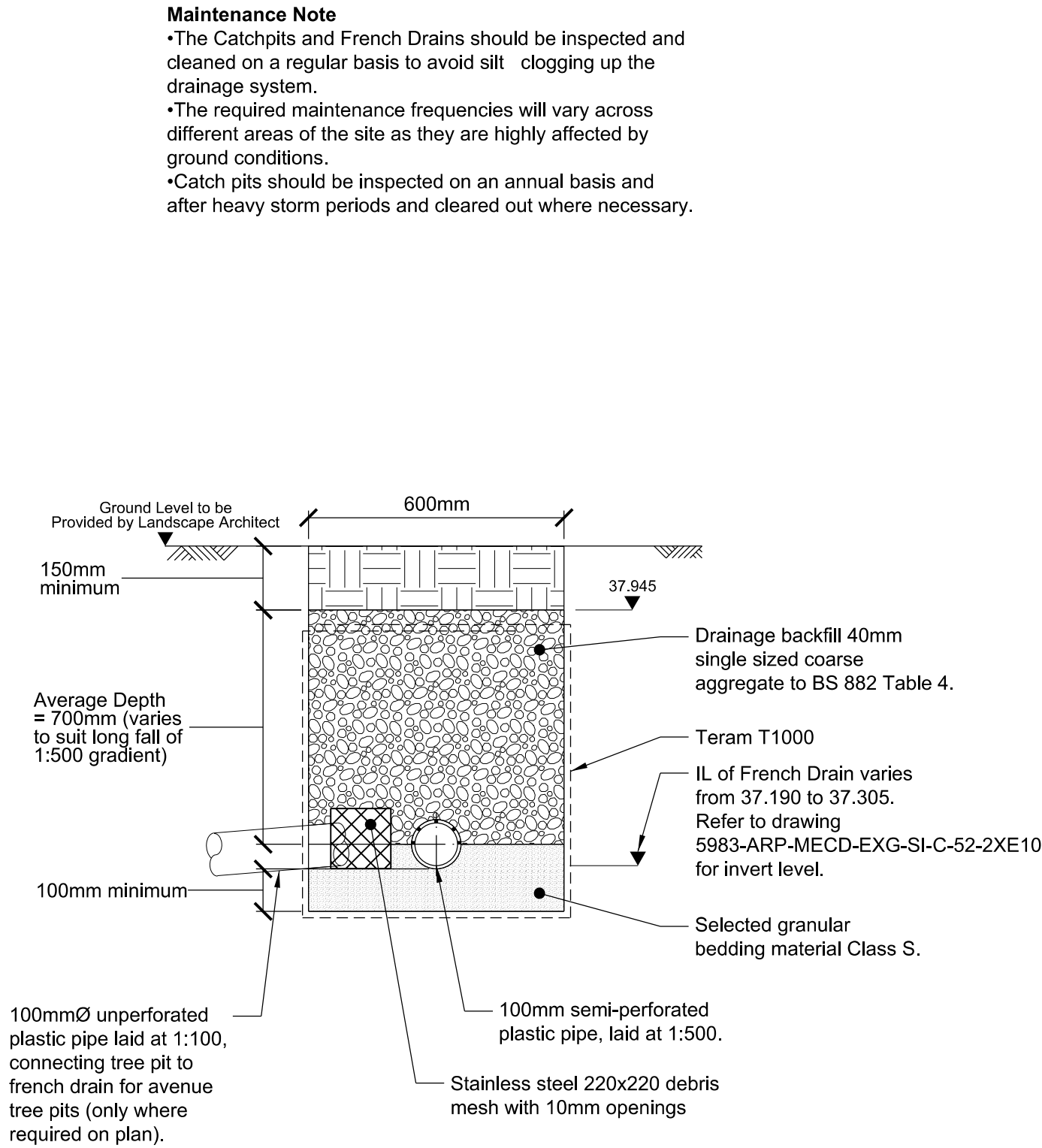
Refer to manhole schedule 5983-ARP-MECD-EXG-SH-C-52-8XE02 for location of internal backdrops



Deep Manhole Including Landing

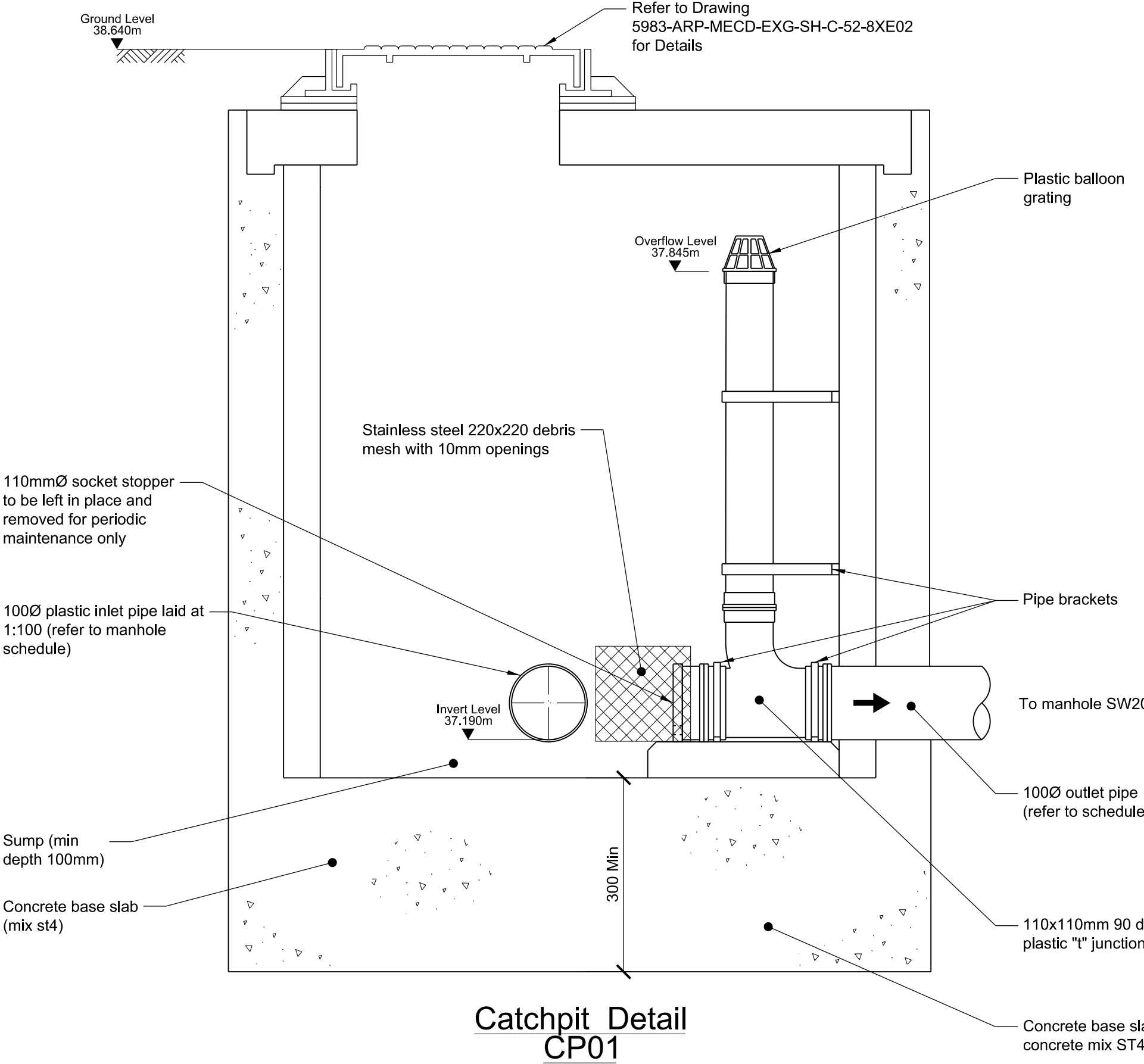


French Drain and Catchpit Section
In Green Zone Landscaping



Details of French
Drain Construction

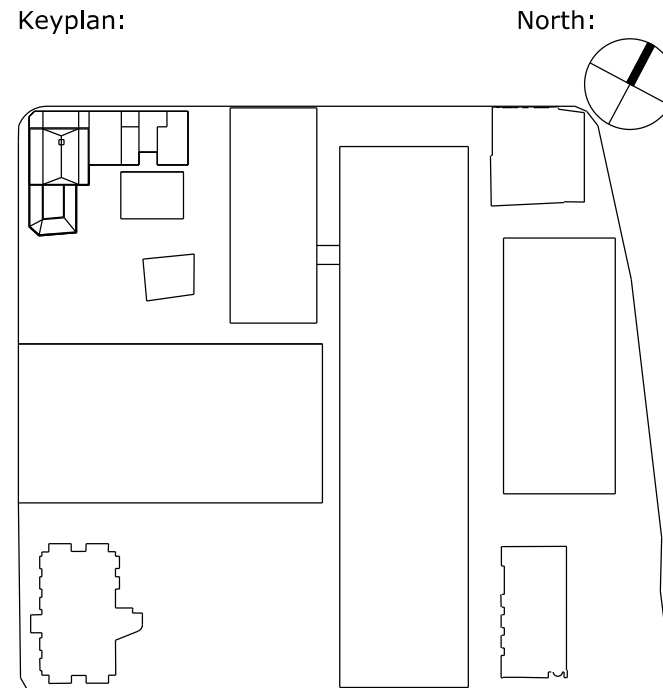
Pipe Setting Out			Catchpit Details							IL of incoming french drain	Outlet overflow pipe				Connection to SWNetwork			Comments	
Catchpit Number	Easting	Northing	Cover Level (mOD)	Catchpit Depth (m)	Catchpit IL	Catchpit Diameter (mm)	Cover Clear Opening	Cover Class	Cover Type		Diameter (mm)	Gradient (1 / x)	Pipe Bedding	Overflow Level	IL of Outlet Pipe	Into SW MH	Connection IL		Manhole IL
CP1	384625.813	397031.874	38.640	1.450	37.190 +100mm sump	1050	600x600	B125	Standard	37.190	100	100	Class S	37.845	37.190	SW20	37.168	37.009	Cover level indicative, refer to Landscape Architects plans for soft landscape levels



Catchpit Detail
CP01

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IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS :-

Item	Hazard	Risk			
C3	Updated to reflect latest masterplan, proposed ground levels and RFI queries	AS	03/07/17	RJ	TWS
C2	Detail Added	AS	11/11/16	RJ	TWS
C1	Construction Issue	TH	07/09/16	RJ	TWS
T1	For Tender	SH	17-06-16	MT	TWS
Rev	Description	By	Date	Chk'd	Auth



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For Construction

Project
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Building Name
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Drawing Title
Drainage Strategy
Standard Details Sheet 6

PM
Scale
NTS

Drawn
RJ
Date
07/09/16

Checked
RJ
Date
07/09/16

Authorised
TWS
Date
07/09/16

Drawing No.
5983-ARP-MECD-EXG-SE-C-52-4XE08

Revision
C3

Job number 252173
Date 11 August 2023

Appendix C Supplier Information

Job number 252173
Date 11 August 2023

James Chadwick Kingspan 26000 Rainwater Harvesting Tank IC1

Contact Numbers:

UK:

Service Tel: +44 (0) 845 355 0555

Ireland:

Service Tel: +44 (0) 28 302 54077

Service Fax: +44 (0) 28 302 60046

HEALTH & SAFETY

These warnings are provided in the interest of safety. You must read them carefully before installing, using the equipment or carrying out routine maintenance.

It is important that this document is retained with the equipment for future reference. Should the equipment be transferred to a new owner, always ensure that all relevant documents are supplied in order that the new owner can be acquainted with the functioning of the equipment and the relevant warnings.

Installation should only be carried out by a suitably experienced contractor, following these guidelines.

Electrical work should be carried out by a qualified electrician.

Any person carrying out maintenance on the equipment should wear suitable protective clothing, including gloves. Good hygiene practice must also be observed.

We recommend the use of a dust mask and gloves when cutting GRP components.

Access covers should be selected with reference to the location of the unit and traffic loads to be accommodated. These are not (normally) part of the units supply.

When covers are removed precautions must be taken against personnel falling into the unit.

Should you wish to look into the tank, please observe all necessary precautions, including those listed below, which apply to maintenance procedures.

Ensure that you are familiar with the safe working areas and accesses. Ensure that the working area is adequately lit.

Take care to maintain correct posture, particularly when lifting. Use appropriate lifting equipment when necessary. Keep proper footing and balance at all times. Avoid any sharp edges.

This RWH system is supplying harvested rainwater to Non-Potable appliances, such as WC's and urinals. Even though this water should never come into contact with users on occasion it can (splashes from toilet flushes and hose pipes etc). To ensure the water is safe for use at all times there must be chlorine in the system to inhibit any bacteria growth.

It is the responsibility of the client to monitor and maintain the chlorine levels in their system to ensure it is safe for use. These checks must be tied into a routine maintenance procedure. Advice on this will be given by our technical team when we supply the system.

Issue	Description	Date
01	Initial Issue CC936	December 2010

MAINTENANCE

As with anything mechanical, maintenance is vital to make sure maximum benefit can be gained by users. And it is no less true for a water reuse system.

A few simple frequent checks may be all that is needed to ensure a system functions at its optimum, as the manufacturer intended.

It is critical that users are aware of this and it is in your interest to follow the maintenance requirements specified. If you fail to get the system serviced or maintained due to the costs involved, this could lead to your system failing or contamination of the water you hope to reuse.

You must never cross-connect to the mains water supply, it can have severe consequences. It is therefore critical these factors are considered during the design stage when selecting the most suitable water reuse system.

There are many types of rainwater recycling systems, from the most simple water butt for garden use to a system that offers complete self-sufficiency without the need for utility mains water or sewage connections. Our systems are for non-portable water use.

A typical system, somewhere in the middle of this range, will supply untreated rainwater for toilet, urinals & WC, outside use and laundry. Water is collected from the roof, fed through a filter into a storage tank.

1. Water collection pipes - Guttering

Plastic pipework is expected to have a service life of more than 50 years. Check the inlet and outlet pipes are clear, remove debris if necessary. Check all pipe and connections for fractures and damage. The overflow discharge pipe must be connected to a suitable drainage or soak away system, check connecting pipework.

2. Filters

Rainwater filter remove leaves, dirt and excess solids. Stainless steel and plastic filters, would be expected to last over 50 years. Regular, simple filter maintenance is required to make sure the filter is not blocked with debris. Blocked filters significantly reduce the efficiency of the unit as most rainwater will be wasted. Maintenance inspections are especially useful in spring and autumn, after long dry periods.

For all storage tanks. The tank overflow pipe includes a stainless steel mesh as a vermin guard.

Compact Filters

Monitor the filter regularly. When testing the sieve, examine the filter by holding up against the light and inspect for any blocked holes in the filter mesh. As necessary clean the filter with a brush, using a little washing up liquid to help dissolve any fatty deposits or hydrocarbon build up.

3P VolumeFilter VF1

The VF1 is self cleaning, low maintenance internals, the filter insert is easily removed for cleaning with the use of a hose and does not have to be replaced. The filter should be cleaned 1 – 2 times per year, depending on contamination.

3P VolumeFilter VF2 – VF6

Monitor the filter regularly and clean if necessary. Once a year flush out the sump and manhole with a hose. The sump can be emptied through a little orifice in the sump floor. Therefore the inlet to the tank should be sealed temporarily.

The lamella unit can be cleaned with a high pressure cleaner, but take care not to hold any close to the delicate mesh, lest it damage the mesh itself.

3P Twin Filter

Spray the inside of the filter with water, clean the sump. Remove the filter inserts and rinse with water. High-pressure cleaners may also be used. Afterwards loosen the filter mesh with an Allen key. To degrease the mesh fabric (pollen, heating oils etc) the mesh must be thoroughly cleansed using a detergent and a brush. Rinse well, re-insert the mesh, place the cascade inserts back into the filter. In the first year, check the filter every three months, to obtain an idea of the degree of contamination, then clean as required, at least twice a year.

Trident Inline Filters

Are used in large rainwater harvesting systems, consisting of stainless steel filter grids with sprinklers for self-clearing effect. Periodic visual inspection is advised.

Rectangular Turret Filters

Are used in large rainwater harvesting systems, fitted with stainless steel filter grids. Periodic inspection is advised, with cleaning using a hose, brushes or high pressure washer if required.

Compact



3P VF3-VF6

3P VF1

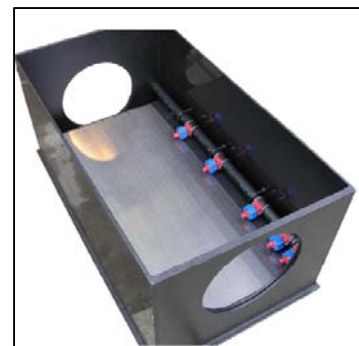


3P Twin

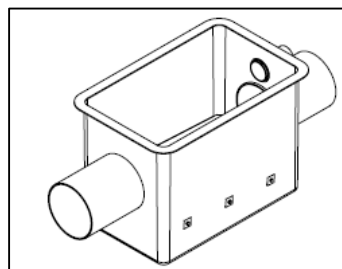
3P VF2



Trident Inline



Rectangular Turret



3. Water storage tanks

Tanks are made from plastic, high-density polyethylene located above ground or glass reinforced plastics (GRP) to BS 4994 located below ground. Above ground tanks require space but have much reduced installation costs.

The removal of solids which accumulate in the storage tanks should be carried out by a contractor. It will require emptying periodically. The period between emptying depends upon the condition of the surface being flushed. You should inspect and assess the sludge/silt build up every 6 months. Any excess build up of silt will reduce the life expectancy of the pump, therefore it is essential to inspect the rainwater tank, to prevent costly pump replacements.

4. Water Distribution Pipes

These are MDPE material. Where exposed ensure clean joints no breakages.

5. Vent Pipes

Check and clear and debris from pipes. Ensure vent pipes are not blocked.

6. Water Treatment

Rainwater harvested from roofs can contain animal and bird faeces, mosses and lichens, windblown dust, particulates from urban pollution, silt, pesticides etc. Although some rooftop materials may produce rainwater that is harmful to human health, it can be useful in flushing toilets, washing clothes, watering the garden and washing cars; these uses alone can halve the amount of water used by a typical home or business.

7. Pumps

Submersible pumps located in the tank are sealed, and if there is a fault they have to be fully replaced. Life expectancy is related to running hours - typically 5 to 10 years.

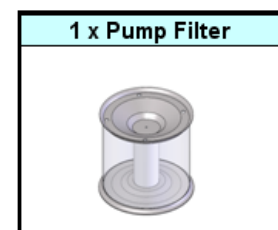
i) Intelligent Pumps – AquaBank System. In self contained units, to check for operation, raise the pump and create a demand. With the pump raised, for Direct systems only, check that the pump float can move freely and switches the solenoid on and off for Mains top up.

ii) Standard Submersible Pumps – RWSS System. To check for operation, raise the pump and create a demand. With the pump raised, for Direct systems only, check that the solenoid switches on and off for Mains top up.

If a pump fails, the water level rises, if unchecked water will automatically overflow into the discharge pipe.

Remove pump from the tank using the attached rope/chain to check the pump filter, remove any debris which will restrict flow and reduce the life expectancy of the pump.

iii) Pump Filters. Check can filters periodically for blockages.



8. Inline Filter

Each control system contains an inline filter unit fitted to the supply pipe from the storage tank, usually just before the Control panel. Periodic inspection is advised, by closing the check valves either side of the filter, unscrew the filter housing, inspect and clean filter as required, replace filter and housing. Remember to open the check valves.



9. Controls

Electronic controls have expected service lives of 10 to 15 years. Please refer to the Trouble shooting section of your Installation & Operation Manual for detailed information.

10. Header Tank

Check that the mains ball valve and the rainwater float valve can move freely and are free of debris. Clean overflow to remove any buildup of debris. Review the levels in the header tank, check that they correspond to the information given in the Operation manual. Flush a toilet to check correct operation.

General Maintenance

It is recommended that all guttering is checked and cleared of debris as required.

The storage tank is designed to collect and store rainwater. It should not be used for any other purpose without the agreement of Kingspan.

Our Rainwater units are designed and engineered for the minimum possible maintenance requirements, consistent with proper performance. Nevertheless, it is important that routine preventive electro/mechanical maintenance and de-sludging are carried out at the appropriate intervals by suitably qualified persons.

As a back-up to routine servicing and to assist trouble-free operation, we recommend that you familiarise yourself with the operation of your rainwater system and make the following checks from time to time.

- * Remove debris from pump and inline filters.
- * Check the pump operation.
- * Review the appearance of the water, what colour, are solids present.
- * Regularly check the accumulated solids level in the bottom of the unit, and desludge as required.

Rainwater recycling systems incur periodic inspection, servicing, cleaning and component replacement costs.

Service Contract

We recommend that Rainwater Harvesting units are inspected and serviced by an approved engineer.

Kingspan provide a Bronze Service Agreement for Rainwater tanks, which includes an annual service and a reduced call out charge if needed.

We recommend that a separate log is kept of all maintenance and service visits, the log should detail the date and any action taken, e.g. Regular maintenance service, breakdown visit, desludge volume removed, parts replaced.

RAINWATER HARVESTING MAINTENANCE – GENERAL SCHEDULE

The following table is a guide to maintenance required for your Rainwater Harvesting System:

ABOVE GROUND SYSTEMS

PERIOD	REQUIRED TASK	ACTION
DAILY	Dosing	Perform water chlorine test and enter data into log
	Water Usage	Record the indicated water level at the end of each day and enter into log
	Display Panel	Check display panel for any alert symbols
WEEKLY	System Operation	Check normal operation of system Visual check of components and connections
		Check pipes & guttering
6 MONTHLY	Dosing	Check stock levels of chlorine tablets, and Reagent of handheld chlorine tester and restock as required (www.hannahchecker.co.uk)
	Rainwater Filter	Full inspection, clean filter cartridge
	In-Line filter	Remove filter cartridge and clean
YEARLY	Storage Tanks	Fully drain and clean to remove any sediment buildup.
	Pumps	Remove and clean filter.

RAINWATER HARVESTING MAINTENANCE LOG



Site address

Location

Total capacity

Inspection/ Maintenance Date	Chlorine Dosing Reading	Comments

The following table is a guide to maintenance required for your Rainwater Harvesting System:

BELOW GROUND SYSTEMS

PERIOD	REQUIRED TASK	ACTION
DAILY	Water Usage	Record the indicated water level at the end of each day and enter into log
	Display Panel	Check display panel for any alert symbols
WEEKLY	System Operation	Check normal operation of system Visual check of components and connections
		Check pipes & guttering
6 MONTHLY	Rainwater Filter	Full inspection, clean filter cartridge
	In-Line filter	Remove filter cartridge and clean
YEARLY	Storage Tanks	Fully drain and clean to remove any sediment buildup.
	Pumps	Remove and clean filter.

RAINWATER HARVESTING MAINTENANCE LOG



Site address

Location

Total capacity

Inspection/ Maintenance Date	Comments

Job number 252173
Date 11 August 2023

Versavoid Geocellular Attenuation Tanks AT1, AT2, AT3



ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD

Sustainable Drainage Systems
Roof Gardens, Water Re-cycling
ECOSOIL – Filtration, Porous Surfacing
Solar Power, Geo-Thermal System
Contaminated Remediation

Maintenance

Responsibility

The responsibility for maintenance should be clearly defined before handover of the completed system.

Attenuations, Soakaways and RWH storages for individual houses

The only necessary maintenance of the GeoCell system is to keep gullies clear of debris such as leaves.

Large installations

For the large installations or where the receiving waters are environmentally sensitive, a system of regular inspections should establish.

The main aim of these will be to prevent siltation of the system which if allowed to develop, would reduce its effectiveness.

Inspection

The following elements should be inspected regularly as part of this preventative routine:

- Catchpits
- Control manholes
- Interceptors
- Inspection chambers

They should also be inspected after every major storm event, End of winter (April) – to collect winter debris, Mid-summer (July/August) – to collect dust, flower and grass-type deposits, and after autumn leaf fall (November).

Catchpits and interceptors should be emptied regularly to prevent them from becoming full. The frequency of this being necessary will be determined on the basis of the regular inspections.

Paved surfaces above and GeoCell units installation should be inspected at the same time to ensure the units continue to provide the required structural support.