



Drainage Strategy Report

Commercial Street | Constance St | Manchester |

M15 4QY

May 2021

Document Control Sheet

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Apartment Development

Commercial Street,

Manchester, M15 4QY

Project Number: 20633

Client: In-fill Developments Ltd

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1.0 Introduction

It is proposed to develop the site to provide 7 apartments over four floors including a roof top terrace. There are 6 No. integral garages at ground floor.

The subject land is currently a vacant brownfield site. The site was formerly occupied by a works. Other nearby buildings now serve as offices and domestic accommodation.

The new proposal completely fills the site. The two main elevations are immediately at the back of footpath.

Vehicular access will be from Commercial Street and Constance St.

The red line planning application boundary is approximately 0.045ha and is shown on the Environment Agency Flood Map for Planning to be deemed medium risk from flooding by fluvial flooding, pluvial flooding. It is not within the extent of flooding due to reservoir failure and is deemed very low risk of flooding by surface water.

National planning policy requires the incorporation of sustainable drainage systems unless there is clear evidence that this would be inappropriate.

This Drainage Report is intended to provide the background and design criteria used to arrive at the proposed drainage solution as presented on appended drawing.

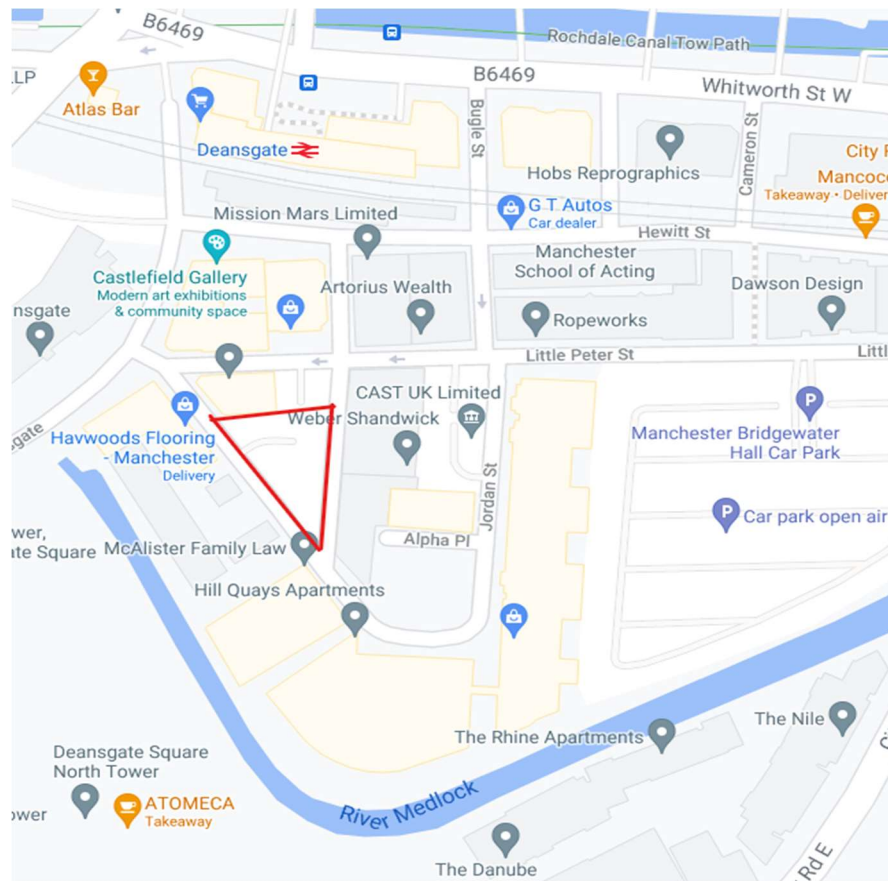


FIGURE 1 SITE LOCATION

2.0 Surface Water Drainage

2.1 Sustainable Drainage Systems (SuDS)

SuDS are a natural approach to managing drainage in and around properties and other developments. They work by slowing and holding back the water that runs off from a site, allowing natural processes to break down pollutants².

Manchester City Council are the Lead Local Flood Authority and a statutory consultee for major development planning applications. They have been consulted by means of pre-application advice for the proposed development and have commented that they require detailed drainage design information for review.

2.2 Ground Conditions

An intrusive ground investigation was undertaken at the site and the associated validation report has been reviewed.

These revealed that there was initially either a made ground surface with a gravelly sub-base up to 450mm deep followed by made ground up to 1m in thickness across the site typically over a moderate clay.

The GIR indicates that the site is predominantly underlain by likely low permeability clay. Therefore, the use of soak-away drainage will not be practical, and as the lateral continuity of the MADE GROUND cannot be assured, it is not recommended that soak-aways are utilised for disposal of surface water runoff.

Other factors determining that the use of SUDs is inappropriate are clearly that the site is full developed leaving no space for attenuation.

2.3 Outfall Destination Hierarchy

Paragraph 080 of the PPG-FRCC advises a hierarchy which reflects the guidance of the Building Regulations Approved Document H:

‘Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1. into the ground (infiltration);
2. to a surface water body;
3. to a surface water sewer, highway drain, or another drainage system;
4. to a combined sewer.

As described in section 2.2, it is considered that the use of direct infiltration to the ground would not be effective as a primary means of surface water disposal at the site due low permeability soils that have been encountered. The seepages of groundwater (likely surface water / rainfall slowly draining through made ground) and presence of land drainage pipes also confirms that a positive outfall is required for effective drainage of the site.

The GIR confirms that there are no surface water features located within easy reach of the site.

Therefore, an outfall to public sewer will be required.

We believe the site has previously been connected to this system.

A copy of United Utilities sewer records for the site and surrounding area has been obtained. Copy appended. This is vague and a site drainage survey is to be undertaken.

There appears to be a combined surface water and foul water sewers serving the area to the south east of the proposed development. It is proposed that drainage from site will also be directed to this sewer, subject to formal connection agreement with the undertaker.

2.4 Water Quality

The 2015 SuDS Manual provides best practice for surface water drainage including water quality aspects.

It is conventional to provide gullies at rainwater pipe connections to the below ground drainage system which will allow for the removal of gross solids and sediments that is deemed adequate for low pollution hazard level areas.

2.5 Runoff Areas

The proposed roof is the only catchment area. The roof runoff is considered to be clean. Similarly, pedestrian roof top paved areas and the garages at ground floor are deemed to have a low contamination risk.

2.6 Urban Creep

This is not deemed applicable.

2.7 Rainfall Intensity

It is necessary to provide capacity in the drainage system for runoff due to 1in30year return period rainfall with runoff exceeding this up to and including 1in100year return period intensities increased for climate change managed safely on site. For the appended design, it has been decided to ensure that there will be capacity in the below ground drainage to attenuate runoff for the 1in100year+cc scenario.

2.8 Climate Change

The effect of changes in the climate have to be considered in respect of flood risk. Principally the effect of changes to rainfall intensity, duration and frequency is critical for surface water flood risk, rate of rise in river and minor watercourse water levels together with the extent of flooding when watercourse banksides and drainage system capacities are exceeded.

The Environment Agency provide advice for climate change allowances that should be considered in flood risk assessments for both river flows and rainfall intensities. Table 2 of the guidance shows anticipated changes in extreme rainfall intensity in small and urban catchments and it is advised that effects of both the central and upper end allowances are assessed to understand the range of impact. An increase of between 20% and 40% is to be considered for the '2080s' (2070 to 2115). An allowance of 30% has been used for the drainage design for this development.

2.9 Discharge Rate

Non-statutory technical standards for SuDS published by Defra require discharges from all development sites (previously developed and greenfield) to be limited to greenfield rates as far as reasonably practicable. The LLFA also require the flow rates from development of greenfield land to be limited to equivalent greenfield run off rates, but accept that a minimum flow of 5 l/s can be used when the greenfield run off rate falls below 5 l/s.

This acknowledges the technical difficulties that are associated with achieving a greenfield rate of runoff for small developments where the size of control aperture needs to be carefully considered in respect of the potential for blockage.

United Utilities presumably suggest a Pass Forward Flow into the drain in Commercial Street.

2.10 Attenuation sizing

Pipe sizes to be oversized.

2.11 Network Design

A pipe and chamber layout has been prepared as shown indicated on the appended drainage plan.

A hydro-brake optimum flow control has been included.

A design head has been taken as to allow for slight surcharging at the control chamber.

The design limiting flow rate of given by UU will not be exceeded. There will be no flooding for any event. It can be seen from the that the finished ground profile will fall away from the building, so any flood flow due to localized blockage in the system would flow away from the building in an exceedance event.

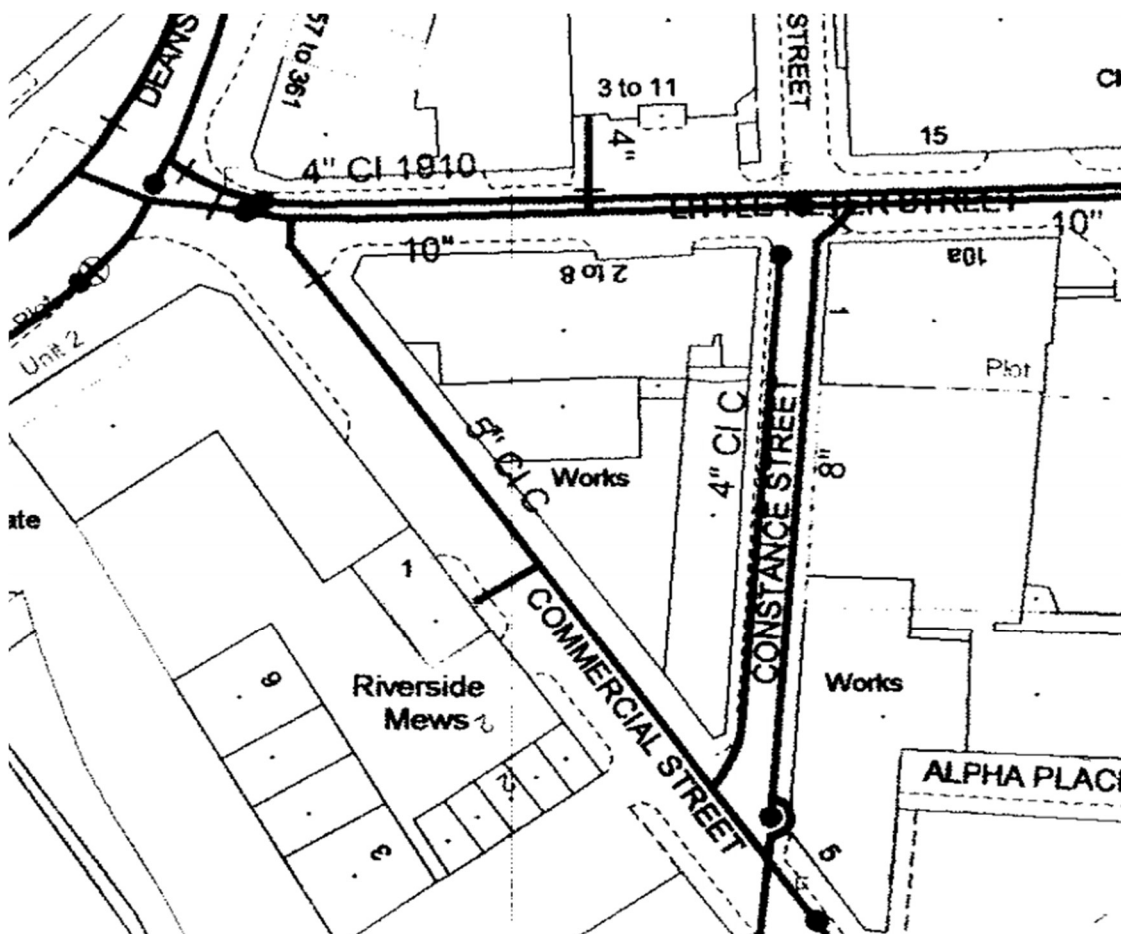
3.0 Foul Water Drainage

3.1 Public Sewer Availability

United Utilities (UU) are responsible for the mains foul water sewerage in the area. The nearest public foul water sewer is a combined sewer shown on UU records to be in Commercial St to the South East of the site.

Separate systems on site will be maintained.

The connection is subject to agreement under section 106 of the Water Industry Act.



4.0 Construction, Operation & Maintenance

4.1 General Requirements

As highlighted by S13 and S14 of Defra's non-statutory technical standards for SuDS, it is important to consider: the 'mode of construction of any communication with an existing sewer or drainage system'; and 'damage to the drainage system resulting from associated construction activities respectively. The requirements of S13 are safeguarded by the S106 (WIA) connection process. A competent contractor will ensure that S14 is observed, primarily through consideration of the sequence of works (i.e. postponing the installation of the attenuation structure until after the new building has been constructed or otherwise providing appropriate protection or restricted use of the affected area).

Standards S10 and S11 of the technical standards focus on the structural integrity of the drainage system allowing for the proximity and associated interaction with existing and proposed structures (eg buildings, walls, etc). The drainage system must also be designed to allow accessibility for inspection and maintenance, which may include repair or replacement work.

4.2 Site Specific Requirements

It is important that all of the drainage system is regularly inspected and cleansed as necessary including above ground elements (eg gutters). The most important below ground item where an attenuated solution with positive outfall is used is the flow control chamber that should be inspected on a monthly basis and after significant rainfall events.

By default, the site owner will be responsible for maintenance of the drainage system, but the inspection, management and operation of the system may be entrusted to a separate company / contractor. Similarly, if the site occupier is not the site owner, the day to day responsibility for the drainage system including the execution of operation and maintenance tasks would be managed by the occupier or their nominated agents. The following schedule is provided for guidance in relation to the principle components that are necessary for flood control. The frequency of activities may be varied as necessary.

Drainage Component	Comments	Operation & Maintenance Activity		
		Regular	Occasional	Remedial
Flow Control (hydro-brake) optimum units	<i>The chamber has been sited in an accessible area.</i>	Inspect monthly and after every significant rainfall event.	Check functionality of pivoting by-pass door facility and ensure steel operating rope is adequately secured within reach of chamber cover opening.	Cleansing of the chamber sump will be required possibly annually, but this can be assessed when the by-pass door facility is inspected.

Drainage Component	Comments	Operation & Maintenance Activity		
		Regular	Occasional	Remedial
Petrol Separators	<i>Sized to suit service yard and car park catchments.</i>	Inspect upstream channel sump units regularly, initially monthly and then bi-annually after 1year. Record the level of oil/light liquid and level of silt present in the separator unit. Check operation of oil level alarm at least annually and in line with manufacturer's instructions.	When full, oil and sediments are to be removed by a waste management contractor and disposed in accordance with EA and LA guidelines. Allow annual emptying, actual frequency to be determined via regular inspection. Coalescing filters are to be replaced annually or as directed in manufacturer's literature.	The separator should be inspected every five years to check structural adequacy, water-tightness, internal coatings and state of internal components, with repairs implemented as required. If the oil level alarm malfunctions it should be repaired or replaced as necessary.
Attenuation Tank (formed with crates)	<i>The crated units require upstream facilities to manage silt (catch pits are provided)</i>	Inspect inlets (catch pit chambers) and outlets (flow control chamber) monthly for signs of silt build up. Check for signs of settlement over the footprint of the tank annually.	Remove silts from inlet and outlet chambers as necessary.	If settlement occurs, monitor and consider trial pit excavation to verify structural adequacy of tank.

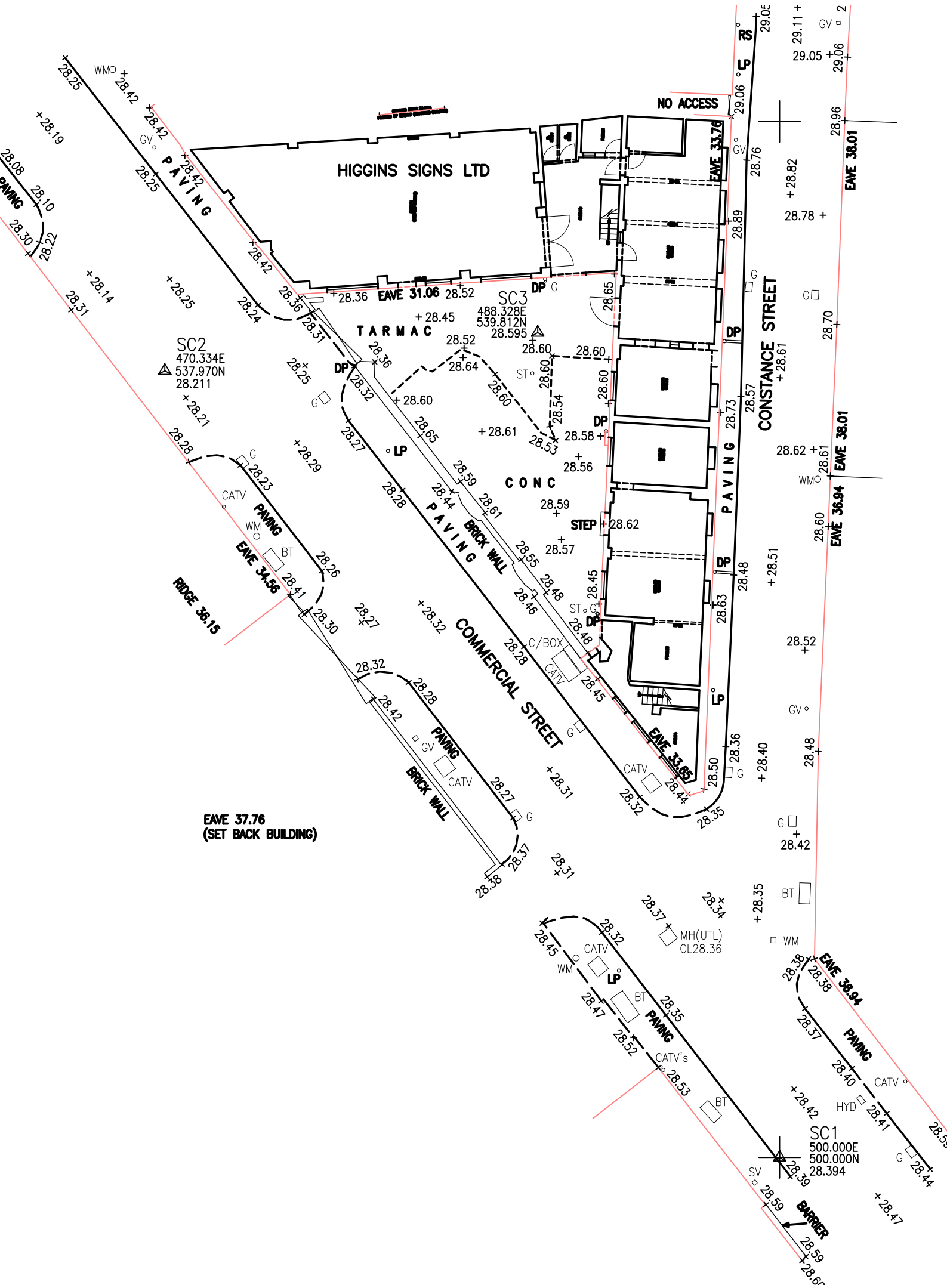
Once the drainage system has been constructed, a record plan of the as built information (if varied from the design layout and details) should be created that can be used as a reference for those who will manage and maintain the system.

It is also recommended that an initial survey of the new system should be undertaken (eg camera survey of pipes, removal and replacing chamber covers, etc) to verify the condition and accessibility of the system as a baseline condition for further inspection and maintenance works.

5.0 Conclusions

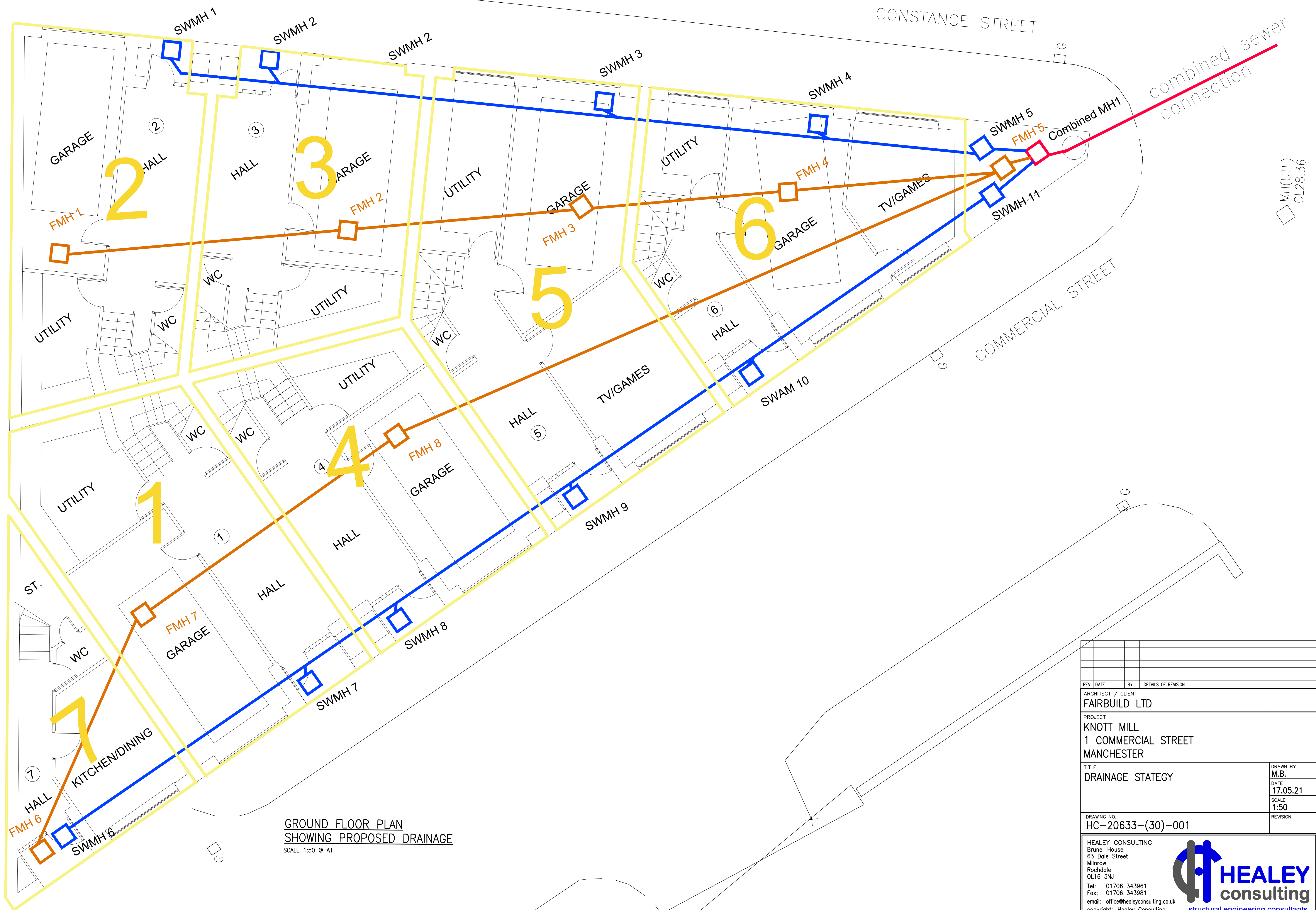
This drainage strategy report demonstrates that within the confines of the site, surface water runoff and foul water drainage can be adequately managed and that a viable outfall is available to the existing combined water sewer within Commercial Street, immediately adjacent to the site, subject to formal agreement with United Utilities.

Appendix A – Site Topographic Survey



Appendix B – Proposed Drainage Plan

DO NOT SCALE FROM THIS DRAWING. USE GIVEN DIMENSIONS ONLY.
ALL DIMENSIONS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR.
ANY DIMENSIONAL DISCREPANCIES TO BE REPORTED BACK TO HEALEY
CONSULTING PRIOR TO PROCEEDING WITH CONSTRUCTION



GROUND FLOOR PLAN
SHOWING PROPOSED DRAINAGE
SCALE 1:50 © A1

REV		DATE	BY	DETAILS OF REVISION
ARCHITECT / CLIENT				
FAIRBUILD LTD				
PROJECT				
KNOTT MILL 1 COMMERCIAL STREET MANCHESTER				
TITLE				DRAWN BY
DRAINAGE STRATEGY				M.B.
				DATE
				17.05.21
				SCALE
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DRAWING NO.				REVISION
HC-20633-(30)-001				
HEALEY CONSULTING Brunel House 63 Dale Street Milnrow Rochdale OL16 3NU Tel: 01706 343981 Fax: 01706 343981 email: office@healeyconsulting.co.uk copyright: Healey Consulting				 HEALEY consulting structural engineering consultants

Appendix C – Flow Control & Attenuation Tank Data Sheets

Technical Specification

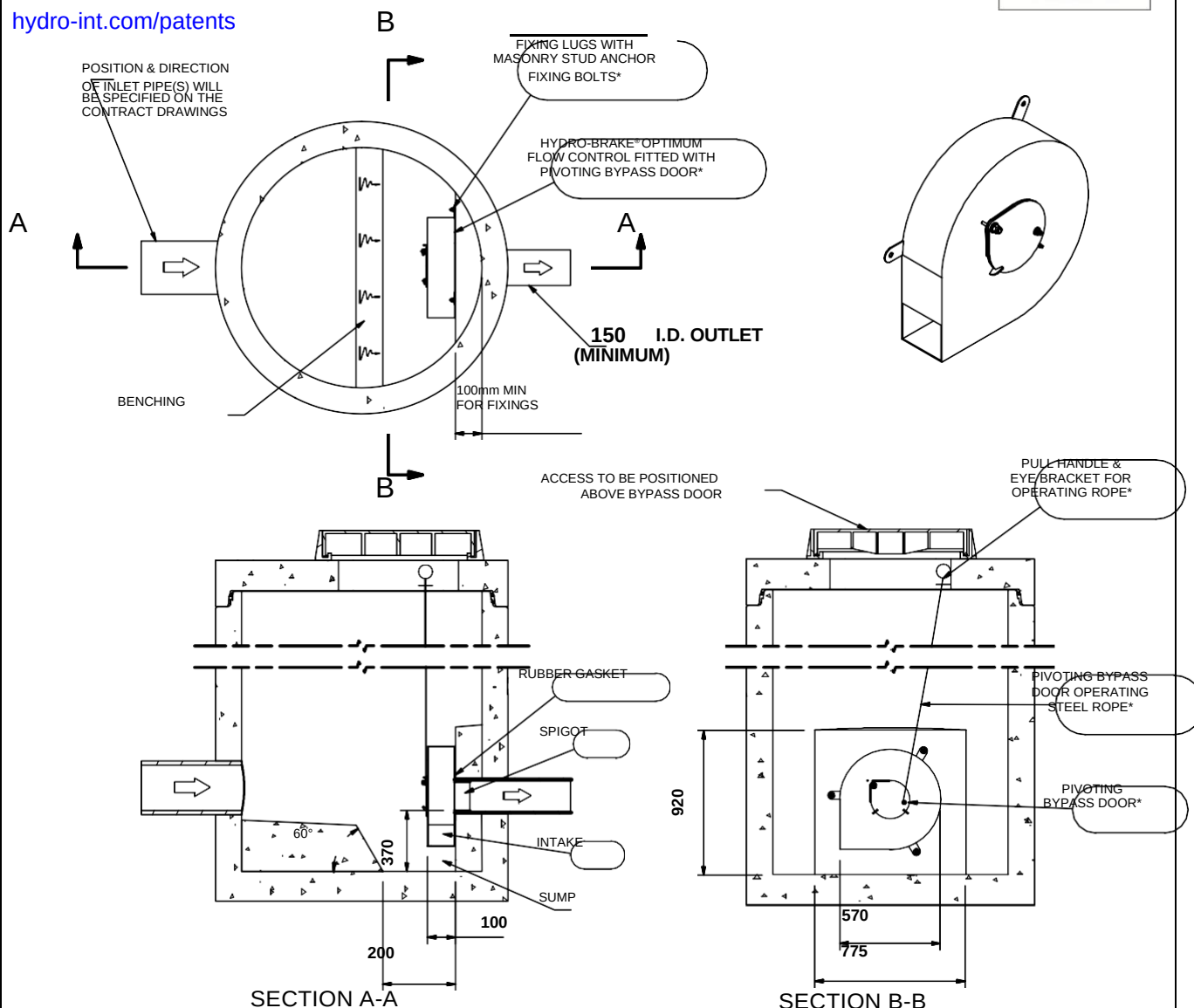
Control Point	Head (m)	Flow (l/s)
Primary Design	1.800	5.000
Flush-Flo™	0.411	4.387
Kick-Flo®	0.838	3.510
Mean Flow		4.064

OL11 4EZ,
Tel: 01706 374416
Fax: 01706 376785
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet



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IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW
CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0094-5000-1800-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

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DATE 12.04.21

SITE LSP

DESIGNER Paul Healey

REF 20677

SHE-0094-5000-1800-5000

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