



STM-REN-00-ZZ-RP-00010

Drainage Technical Note

Project: ST Michaels, Manchester

Project No: 2203-05

Revision	Description	Issued By	Date	Checked
P01	First Issue	H. Wilkinson	25.09.2023	A Isherwood

1.0. ABSTRACT

This Technical Note has been produced to support the discharge of planning condition 10 and 14 associated with planning application ref 131612/JO/2021.

- 10) Prior to the commencement of each part of development, except demolition works, (as defined by condition 51), details of surface water drainage for that part of the development shall have been submitted to and approved in writing by the Local Planning Authority. For the avoidance of doubt these shall be in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards.
- 14) No part of the development hereby permitted (as defined by condition 51) shall be occupied until details of the implementation, maintenance and management of the sustainable drainage scheme for that part have been submitted to and approved by the local planning authority. The scheme for that part of the development shall be implemented and thereafter managed and maintained in accordance with the approved details.

Those details shall include:

- Verification report providing photographic evidence of construction as per design drawings;
- As built construction drawings if different from design construction drawings;
- Management and maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

The document provides supplementary information to the overarching drainage strategy for phase 2 of the proposed ST Michaels, Manchester development, detailing drainage maintenance generally and specifically the Sustainable Drainage Systems (SuDS) utilised on-site. It is to be read in conjunction with the manufacturer's recommendations and the project's drainage drawings and reports.

2.0. THE SITE

2.1. Site Location

The proposed development site is located off Jackson Row, Manchester.

The site location is described below:

- Post Code M2 5GU
- OS X (Easting) 383643
- OS Y (Northing) 398030
- Nat. Grid SJ836980

The site location is illustrated in Figure 2.1 below.



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Figure 2.1: Site Location

3.0. PROPOSED DRAINAGE NETWORK

The proposed onsite networks for the development have been assessed previously and the proposed discharge rates discussed and agreed with United Utilities and the LLFA for the developments.

Details of the proposed drainage networks for the development can be found within the following documents:

WSP Drainage Strategy date November 2019:	70061860-DSR001
WSP Drainage Strategy Addendum date September 2021	70088013-DSR-001:
WSP Drainage Strategy Addendum date October 2022	70101665-DSR-001
Renaissance Below Ground Drainage General Arrangement	STM-REN-XX-FN-DR-C-01103
Renaissance Basement Below Ground Drainage General Arrangement	STM-REN-XX-FN-DR-C-01103

4.0. FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SuDS techniques in accordance with the CIRIA SUDS Manual C753. The following SUD's feature has been adopted in the ST Michaels drainage strategy:-

- Attenuation tank at ground floor level

The following components have also been included within the drainage strategy for the proposed development:

- Inspection chambers, manholes and catchpits.
- Pipes.
- Drainage channels and gullies.
- Flow control Device

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

The Main Contractor delivering the development is to update the general requirements to reflect the product specific requirements of the as installed proprietary SuDS and incorporate these into the Operation & Maintenance manual for the building.

It should be noted that the Main Contractor should provide a Verification Report, including photographic evidence, to demonstrate that the drainage has been constructed as per the design drawings. As-built drawings should be supplied by the Main Contractor where the construction of the drainage varies from the construction drawings.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

4.1. General Maintenance & Inspection Requirements

No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.

Maintenance/inspection work shall be carried out in a safe/planned manner.

All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.

Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped personnel working in accordance with current statutory safe working policies.

Drainage systems shall be inspected on a regular basis or when any problems arise. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.

It is recommended that the drainage system is inspected a minimum of twice a year, with the system also being inspected after all major storm events.

Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;

- Rodding – Manual/Mechanical with flexible rods.
- Jetting – High pressure water jetting.
- Plunging.

4.2. Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually:

- Covers of inspection chambers and manholes shall be removed and the sides, benching and channels cleared.
- Deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall has halted.
- Main and branch drains shall be cleared as required and afterwards be flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

4.3. Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, failure to do so would expose the development to flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, the manufacturer's recommendations should be followed. Access for maintenance of the pipes is

provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required, take remedial action.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
Remedial Actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.

4.4. Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullies components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal.	Monthly or as required.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.

4.5. Flow Control Device

Regular inspection and maintenance is important, to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a risk of flooding.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, the manufacturer's recommendations should be followed.

Normally, little maintenance is required as a vortex flow control device has no moving parts.

If blockages occur they tend to do so at the intake of the vortex flow control device.

Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the vortex flow control device it is vitally important that any building materials etc. are removed from the unit and the chamber.

After the system is made fully functional, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

4.6. Attenuation Tank

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for cellular attenuation tanks are outlined within Table 21.3 of the CIRIA SUDS Manual C753. A copy of that table is replicated below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

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

Note: The above is to be undertaken in accordance with the manufacturers specification and details.

4.7. Surface Water Management During Construction

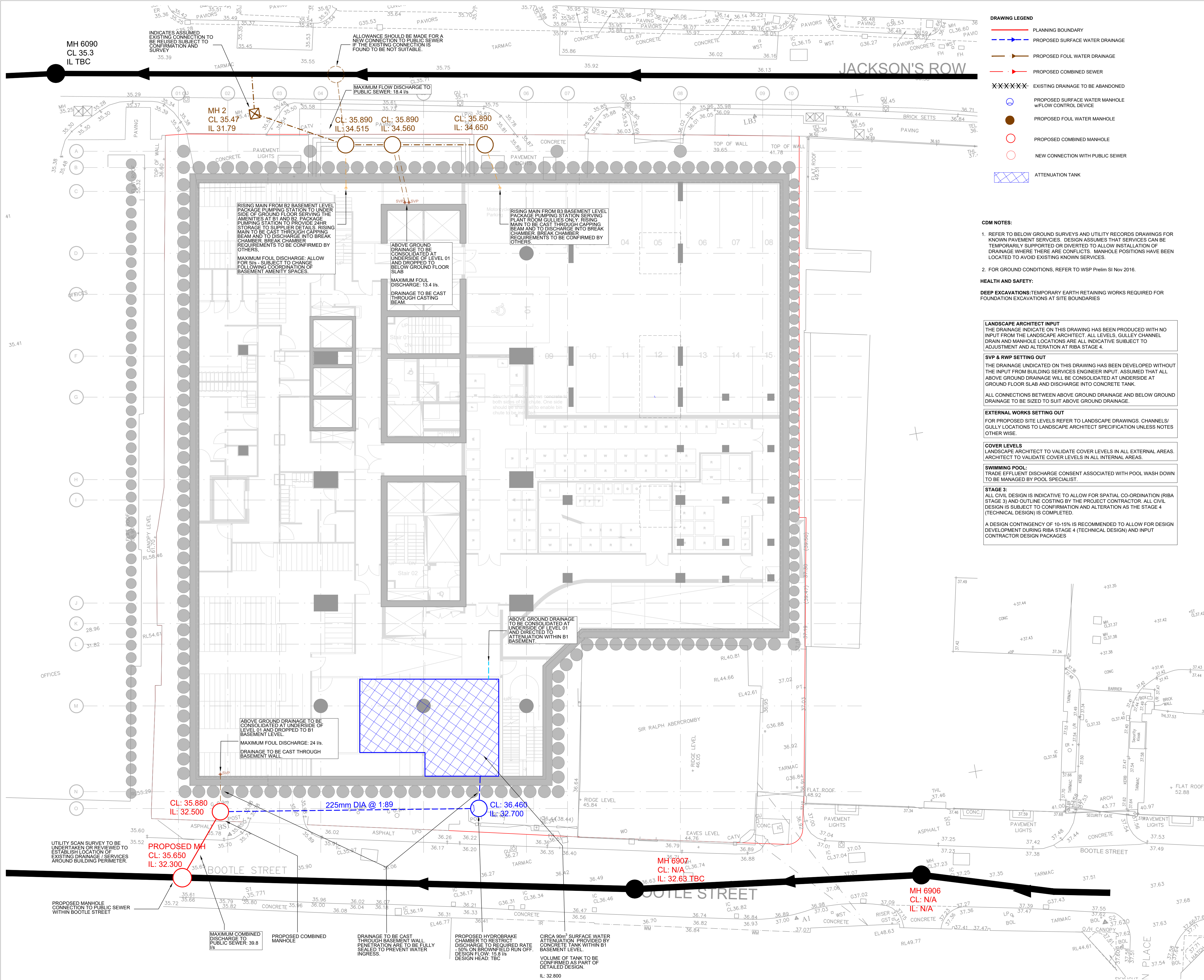
The management of surface water management during construction will be addressed by the Main Contractor as part of their 'Construction Management Plan'.

A brief overview of the key consideration relating to surface water management and flood risk that will need to be incorporated into the Main Contractors construction methodology include:

- The existing buildings on site are to be demolished. Stockpiling of material on site is to be minimised to ensure that the flood storage capacity for the 1 in 1000 year (0.1% AEP) event is not compromised.
- Due to the industrial history of the site it is anticipated that ground remediation may be required. A working platform will also be required during construction to allow for formation of piled foundations etc. The top of the working platform is to be located at or lower than existing site levels to ensure that the flood storage capacity for the 1 in 1000 year (0.1% AEP) event is not compromised.
- Subject to the level of contamination beneath the site, level of site remediation, and quality of working platform compaction to reduce infiltration, consideration should be given to the risk of residual contamination on site affecting groundwaters.
- The risk of spillage of diesel and other contamination risks during construction activities are to be assessed, and measures implemented to ensure they do not cause a risk to groundwaters.

APPENDIX A

Proposed Drainage Drawings



DRAWING LEGEND

- PLANNING BOUNDARY
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL WATER DRAINAGE
- PROPOSED COMBINED SEWER
- EXISTING DRAINAGE TO BE ABANDONED
- PROPOSED SURFACE WATER MANHOLE W/FLOW CONTROL DEVICE
- PROPOSED FOUL WATER MANHOLE
- PROPOSED COMBINED MANHOLE
- NEW CONNECTION WITH PUBLIC SEWER
- ATTENUATION TANK

CDM NOTES:

- REFER TO BELOW GROUND SURVEYS AND UTILITY RECORDS DRAWINGS FOR KNOWN PAVEMENT SERVICES. DESIGN ASSUMES THAT SERVICES CAN BE TEMPORARILY SUPPORTED OR DIVERTED TO ALLOW INSTALLATION OF DRAINAGE WHERE THERE ARE CONFLICTS. MANHOLE POSITIONS HAVE BEEN LOCATED TO AVOID EXISTING KNOWN SERVICES.
- FOR GROUND CONDITIONS, REFER TO WSP Prelim SI Nov 2016.

HEALTH AND SAFETY:

DEEP EXCAVATIONS: TEMPORARY EARTH RETAINING WORKS REQUIRED FOR FOUNDATION EXCAVATIONS AT SITE BOUNDARIES

LANDSCAPE ARCHITECT INPUT

THE DRAINAGE INDICATE ON THIS DRAWING HAS BEEN PRODUCED WITH NO INPUT FROM THE LANDSCAPE ARCHITECT. ALL LEVELS, GULLY CHANNEL DRAIN AND MANHOLE LOCATIONS ARE ALL INDICATIVE SUBJECT TO ADJUSTMENT AND ALTERATION AT RIBA STAGE 4.

SVP & RWP SETTING OUT

THE DRAINAGE INDICATED ON THIS DRAWING HAS BEEN DEVELOPED WITHOUT THE INPUT FROM BUILDING SERVICES ENGINEER INPUT. ASSUMED THAT ALL ABOVE GROUND DRAINAGE WILL BE CONSOLIDATED AT UNDERSIDE AT GROUND FLOOR SLAB AND DISCHARGE INTO CONCRETE TANK.

ALL CONNECTIONS BETWEEN ABOVE GROUND DRAINAGE AND BELOW GROUND DRAINAGE TO BE SIZED TO SUIT ABOVE GROUND DRAINAGE.

EXTERNAL WORKS SETTING OUT

FOR PROPOSED SITE LEVELS REFER TO LANDSCAPE DRAWINGS. CHANNELS/ GULLY LOCATIONS TO LANDSCAPE ARCHITECT SPECIFICATION UNLESS NOTES OTHERWISE.

COVER LEVELS

LANDSCAPE ARCHITECT TO VALIDATE COVER LEVELS IN ALL EXTERNAL AREAS. ARCHITECT TO VALIDATE COVER LEVELS IN ALL INTERNAL AREAS.

SWIMMING POOL:

TRADE EFFLUENT DISCHARGE CONSENT ASSOCIATED WITH POOL WASH DOWN TO BE MANAGED BY POOL SPECIALIST.

STAGE 3:

ALL CIVIL DESIGN IS INDICATIVE TO ALLOW FOR SPATIAL CO-ORDINATION (RIBA STAGE 3) AND OUTLINE COSTING BY THE PROJECT CONTRACTOR. ALL CIVIL DESIGN IS SUBJECT TO CONFIRMATION AND ALTERATION AS THE STAGE 4 (TECHNICAL DESIGN) IS COMPLETED.

A DESIGN CONTINGENCY OF 10-15% IS RECOMMENDED TO ALLOW FOR DESIGN DEVELOPMENT DURING RIBA STAGE 4 (TECHNICAL DESIGN) AND INPUT CONTRACTOR DESIGN PACKAGES

NOTES:

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RENAISSANCE, ARCHITECTS, LANDSCAPE ARCHITECTS AND BUILDING SERVICES ENGINEERS DRAWINGS.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE BELOW GROUND DRAINAGE SPECIFICATION SP-C-00050 AND DETAILS SHOWN ON DRAWING SERIES C-03100 & C-03101 TO C-03102.
- MANHOLE SCHEDULE TO BE PRODUCED AT RIBA STAGE 4
- THE FINAL CONNECTION TO THE PUBLIC SEWER IS SUBJECT TO UNITED UTILITIES APPROVAL AND IS TO BE IN ACCORDANCE WITH THEIR AGREED DETAILS.
- FOR ALL ABOVE GROUND DRAINAGE AND ASSOCIATED PUMPS REFER TO BUILDING SERVICES AND ARCHITECT'S DRAWINGS.
- ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C: DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
- THE CONCRETE TANK AND FLOW CONTROL ARE TO BE TO SUPPLIERS DESIGN AND DETAILS. INSTALLATION IS TO BE IN ACCORDANCE WITH THE SUPPLIERS REQUIREMENTS.
- THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
- THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A FINAL CONSTRUCTION ISSUE DRAWING.
- DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE DESIGNER AND AGREED WITH RENAISSANCE IN WRITING.
- THE CHAMBER SIZE OF PCC MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
- MANHOLE COVERS ARE TO BE IN ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
- ALL INTERNAL COVERS TO BE RECESSED AND TRIPLE SEALED
- COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING REDUCING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO REQUIRED SIZE.
- ALL SEWERS TO BE BSI KITEMARK (CERTIFIED TO WIS 4-35-01)
- ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m).
- BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2).
- IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
 - A BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
 - B PIPES LESS THAN OR EQUAL TO 500mm DIA
 - C BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
- THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA. 40kN/m, 225mm DIA. 45kN/m AND 300mm DIA. 72kN/m.
- THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
- SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
- SEWER PIPES TO BE LAID IN MAXIMUM 3 METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.
- FLOW CONTROL IS INDICATIVE AND SUBJECT TO STAGE 4 TECHNICAL DESIGN.
- ALL CHANNEL LOCATIONS, MANHOLE AND DRAINAGE LOCATIONS SUBJECT TO RECEIPT OF STAGE 4 STACK LOCATIONS AND CONFIRMATION OF FLOW RATE / DISCHARGE UNITS BY BUILDING SERVICES ENGINEER.
- ALL COVER LEVELS ASSUMED. SCHEME DEVELOPED WITHOUT INPUT FROM LANDSCAPE ARCHITECT.
- ALL FOUL AND SURFACE WATER BELOW GROUND SYTEMS ARE TO BE VENTED WITHIN THE ABOVE GROUND DRAINAGE TO THE BUILDING SERVICES ENGINEERS DETAILS.

P03	STAGE 3	15.02.23	HW	AI
P02	STAGE 2 UPDATE	24.11.22	JB	AI
P01	STAGE 2	09.09.22	SA	AI
Rev.	Description:	Date:	By:	Chkd:



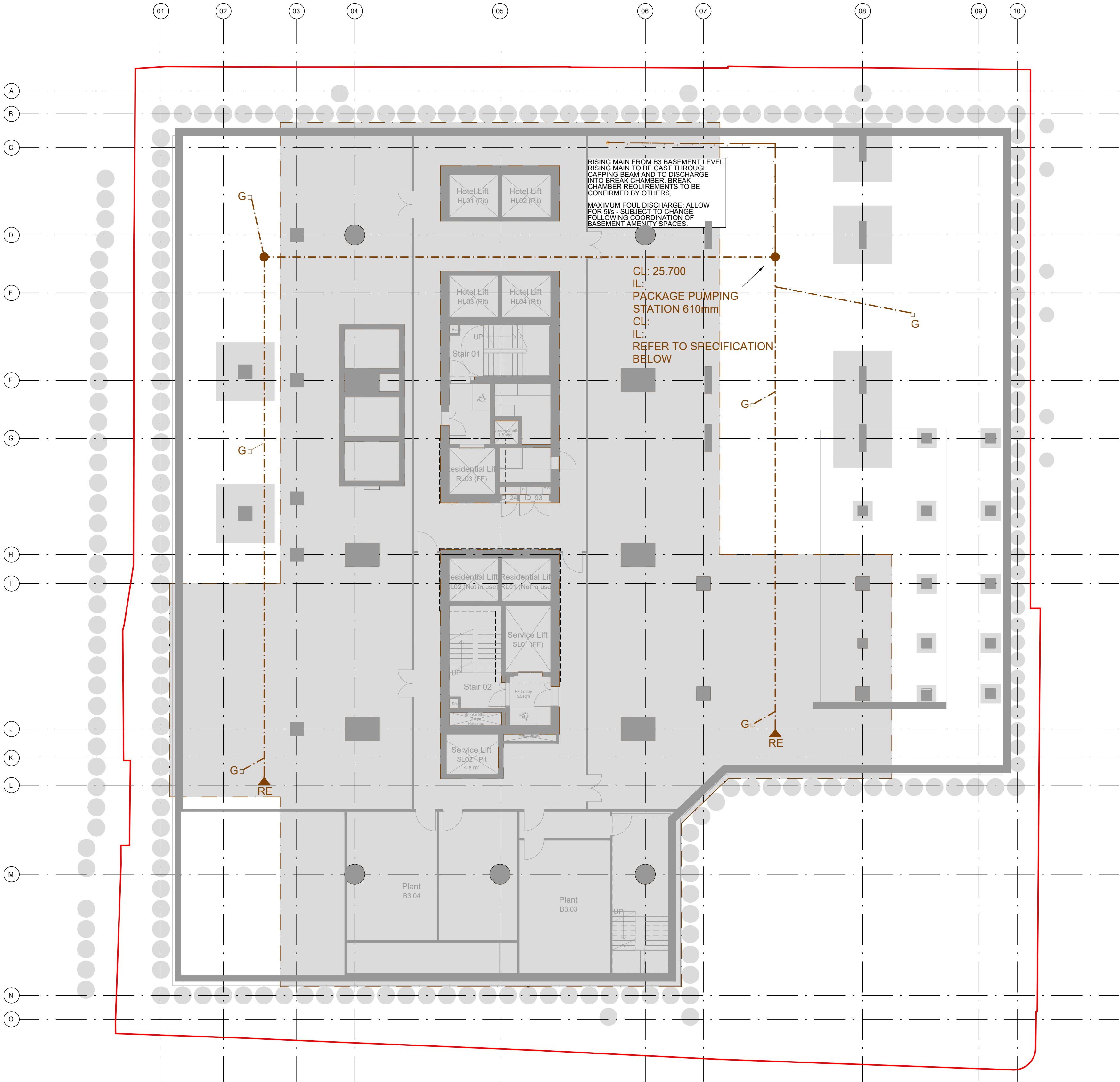
ST MICHAELS, MANCHESTER

BELOW GROUND DRAINAGE PLAN

STAGE 3

Size: A1	Date: FEB 23	Drawn by: HW	Designed by: --	Checked by: AI
Scale: 1:125		Project No: 2203-05		

STM-REN-XX-FN-DR-C-01103-P03



DRAWING LEGEND

- PLANNING BOUNDARY
- PROPOSED FOUL WATER DRAINAGE
- FOUL WATER RISING MAIN
- EXISTING DRAINAGE TO BE ABANDONED
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER GULLY
- PROPOSED FOUL WATER RODDING EYE

CDM NOTES:

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HEALTH AND SAFETY:

DEEP EXCAVATIONS: TEMPORARY EARTH RETAINING WORKS REQUIRED FOR FOUNDATION EXCAVATIONS AT SITE BOUNDARIES

GULLY SETTING OUT

ALL GULLY POSITIONING INDICATIVE AND SUBJECT TO DESIGN DEVELOPMENT AT RIBA STAGE 4

COVER LEVELS

LANDSCAPE ARCHITECT TO VALIDATE COVER LEVELS IN ALL EXTERNAL AREAS. ARCHITECT TO VALIDATE COVER LEVELS IN ALL INTERNAL AREAS.

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- THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
- SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
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P01	STAGE 3	15.02.23	HW	AI
Rev:	Description:	Date:	By:	Chkd:



Project:
**ST MICHAELS,
MANCHESTER**

Drawing Title:
**B3 LEVEL BELOW GROUND
DRAINAGE PLAN**

Status:
STAGE 3

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	FEB 23	HW	--	AI

Scale:	1:125	Project No:	2203-05
Project:	Originator:	Volume:	Level: Type: Role: Category/Number: Rev:

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